

SUBSIDIES TO THE STEEL INDUSTRY

INSIGHTS FROM THE OECD DATA
COLLECTION

OECD SCIENCE, TECHNOLOGY
AND INDUSTRY
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Executive Summary

Subsidies to the steel sector are widely used yet lack transparency

- Subsidies and government support to steel firms are a pervasive aspect of many industrial policies around the world, although the lack of transparency surrounding their provision makes their quantification challenging.
- The OECD has been actively collecting information from a wide range of sources on subsidies and other support measures provided to steel firms since 2008 and analysed the context in which such subsidisation occurs.
- National context shapes the extent of the support, the transparency of the instruments used, and, potentially, their effects on global steel markets.

Subsidies are mostly provided for capacity extension, R&D and the environment...

- Subsidies provided to steel firms most often aim to extend capacity, or support new investment, and capital equipment (40%), support R&D – including R&D related to green technologies (28%) and the environment (13%), such as the purchase and installation of filters to reduce CO₂ emissions¹. Raw materials, land and energy (8%), export support (6%) and social purposes, such as on-the-job training, reconversion for employees, etc. (5%) only account for smaller shares of the stated purposes.
- Subsidies for capacity extension, new investment, and capital equipment have consistently been significant for all years during the 2008-2020 period except for the year 2009, when they decreased, and subsidies provided for social reasons rose sharply.
- Technological development and research subsidies have more than tripled their share as a percentage of stated purposes from 2008 to 2020, whereas subsidies provided for social reasons have plummeted by 75% over the same period.
- Subsidies for environmental purposes have increased fivefold from 2008 to 2016 as a share of total purpose stated, but have been decreasing continuously since then, resulting in an overall 136% increase from 2008 to 2020.

...through cash transfers, tax benefits and subsidised financing

- Cash grants, awards and cost refunds make up for 76% of the instances of subsidies collected at the recipient level, followed by tax benefits (11%) and subsidised lending, equity infusions and debt-to-equity swaps (4%).
- Cash grants tend to be of smaller amounts than subsidised loans, equity infusions and debt-to-equity swaps, and to be much more dispersed across both recipients and programmes.
- The data show fewer subsidies provided through lower input and energy costs, despite anecdotal evidence suggesting that such subsidies may be significant.

Subsidy intensities are tenfold higher in partner economies than in OECD countries in terms of cash transfers

- Per unit of crude steel production capacity, steel firms located in partner economies received on average 10.7 times more subsidies through cash grants, cash awards and cost refunds than steel firms in OECD countries over the 2008 to 2020 period.

...and the evolution of subsidisation is diverging further

- Subsidies provided through cash grants and cost refunds in OECD countries have decreased continuously from 2011 to 2017, falling 80% from their 2011 peak. Their amounts stayed constant in 2018 before rising slightly in 2019 and 2020, but are still 72% lower than in 2011.
- Subsidies provided through cash grants and cost refunds in non-OECD have increased 219%, in total amounts terms, from 2008 to 2014, before stabilising at elevated levels, albeit in a volatile way. The concentration of subsidy recipients in partner economies also seems to have increased, suggesting the potential diversion of subsidies towards fewer “national champions”. The average amount received by a steel firm in 2020 is three times more than in 2008.
- Tax credits, tax rebates and tax refunds recorded seem on an overall upward trend in both OECD countries and partner economies, while subsidised loans, equity infusions and debt-to-equity swaps do not seem to have increased in OECD countries but increased in partner economies during the 2014-2020 period compared to the 2008-2013 period.

The national context affects the extent and pervasiveness of subsidies in the steel sector

- The propensity to subsidise steel firms and the transparency surrounding subsidies benefiting steel firms depend strongly on the national context, which varies markedly across economies.
- Economies with production targets such as the People’s Republic of China (hereafter “China”) seem more likely to subsidise their steel sector. Governments set targets that can differ across firms depending on steel plants location and characteristics, and those targets change over time due to changing over-arching priorities.
- National context and domestic policymakers’ priorities can prove very impervious to global steel markets context and international pressures, like the Iranian steel industry which benefited from continuous large government support once it was singled out as a national priority, in spite of simultaneous efforts to privatise the economy.
- Support to steel is provided to climb up the value chain, reduce import dependence, or for other specific reasons such as diversifying away from oil revenues, as in Saudi Arabia.

Complex institutional settings and financial schemes hamper the transparency of subsidy schemes, particularly in partner economies

- Complex relationships between different government-affiliated agencies can make it very challenging to work out the provider and recipient of a subsidy. This is the case, for example, in Iran, where the debts of some government-related agencies towards the Iranian government were cancelled as an incentive for those agencies to provide financing to a government-related bank, which in turn, is providing subsidies to Iranian steel firms.
- The use of subsidies by different levels of government can also sharply affect the transparency and efficiency of subsidy distributions.
- Transparency is also hampered by the complexity of financial instruments used to support steel firms.

Upstream and downstream sectors play an important role in supporting the steel sector

- Raw material export restrictions, the securing of raw material sources, and demand-side instruments such as procurement rules that favour domestic steel firms, are instruments which are often used to increase domestic steel firms' profit margins and support the domestic steel industry, as well as (increasingly) their decarbonisation.

1. Introduction

Subsidies and government support measures (henceforth, subsidies²) are a pervasive part of some economies' industrial policies, including for their domestic steel sector. Governments' attitudes towards steel subsidies have diverged across economies, probably due to the different assumed effects of such subsidies, which would depend on their types, scopes and purposes, as well as on the institutional setting in which they are provided. In fact, little consensus exists on the effectiveness of interventions and industrial policy. Building on a newly developed framework for assessing industrial policies (Criscuolo and Lalanne, 2022^[1]), Criscuolo et al. found, through extensive literature reviews, that well-designed R&D tax credits and subsidies are effective in stimulating R&D and innovation, while skill and knowledge transfer policies are key complementary instruments (Criscuolo and Lalanne, 2022^[2]). Nevertheless, the literature shows very limited evidence on the effectiveness of targeted grants and subsidies in general. The scarce evidence suggests that those instruments are mostly impactful for young and small firms and for R&D and investment.

Subsidies directed towards the steel industry could help address some market failures on the environmental front by supporting investment and innovation in green technologies that counter the negative externalities arising from pollution and intensive energy consumption. Moreover, they can help support the critical infrastructure required for a timely steel decarbonisation. Nevertheless, even those subsidies, when substantial, may have a market-distorting impact, hence both the efficiency in reaching their stated environmental purposes and avoiding market distortions should be considered to design such subsidies.

Yet subsidies directed towards the steel sector may also contribute to global excess capacity in the steel sector, and generate significant market and trade distortions, which invariably creates frictions and trade disputes between long-standing trade partners. For example, steel subsidies may incentivise steel producers to keep running production at high levels even when market conditions are weak, and may discourage the exit of inefficient capacity from the market. Furthermore, subsidies to steel firms are believed to lead to higher levels of investment and capacity expansion that do not seem justified by current and future market demand, thus exacerbating the problem of global excess capacity, as pointed out by the Global Forum on Excess Capacity (GFSEC, 2017^[3]).

This paper provides an overview of the state of play and evolution of subsidies to the steel industry.³ Sections 3 and 4 present key insights that can be obtained from the data collected at the aggregate level. Section 5 puts the quantitative data highlighted into context by showing examples of how a economy's specific context matters for the subsidisation of its steel sector. Section 6 concludes, highlighting that national context surrounding the provision of subsidies have a significant impact on both a economy's propensity to subsidise its steel industry and the transparency surrounding the provision of subsidies to its steel firms, and that subsidisation does not appear to have abated in spite of the current excess capacity context, especially in non-OECD economies.

2. Subsidisation of steel industries

The OECD has collected significant information on subsidies provided in a number of sectors and highlighted the importance of subsidisation in some sectors (Box 1).

Data collection on subsidies at the OECD, both for the Steel Committee and the Trade Committee, increases transparency and awareness concerning the provision of subsidies. While the Trade Committee focuses on firms from a number of sectors to try to compare their degree of subsidisation (Box 1, Section 2.1), the approach of the Steel Committee has been focused on the steel sector, with the ambition to capture all subsidies whenever possible⁴. The approach of the Steel Committee also provides an inventory of subsidy programmes for each covered economy, on top of the recipient level data.

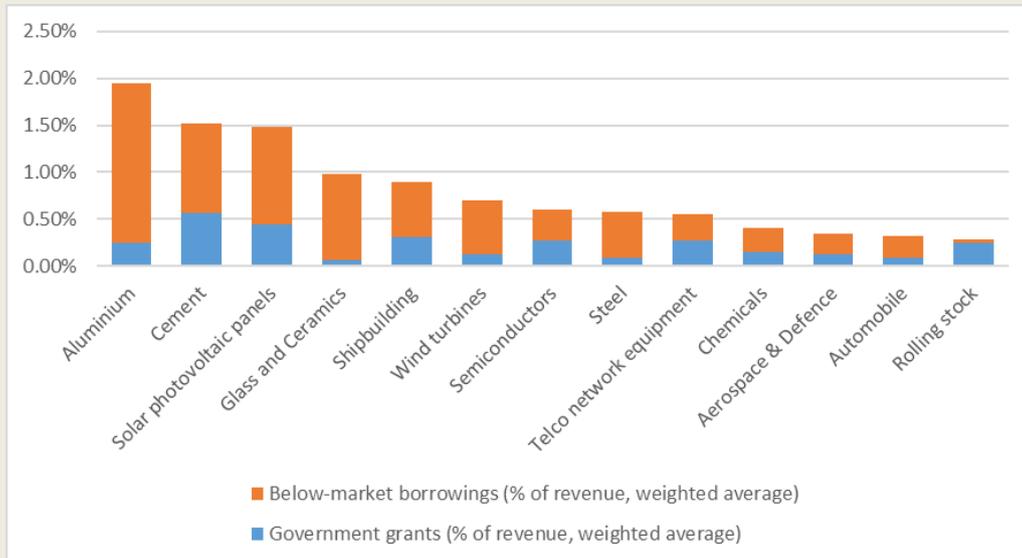
The OECD Steel Secretariat has focused on subsidies benefiting steel firms, that is, firms producing steel products, and has collected this information to increase transparency and to be in a position to perform analysis on the effects of subsidies at the firm level. Some highlights of the data can already be presented at the aggregate level. This section describes the rich data collected and provides some of the facts that can already be distinguished at a broad, aggregate level.

Box 1. Data collection and cross-sector subsidies estimation by the OECD Trade Committee

The OECD Trade Committee started to look at government support in industrial sectors in 2017, mainly in response to OECD Members' concerns over the trade and competition effects that government support can cause. This began with a study of government support in the aluminium value chain, which was published in early 2019 (OECD, 2019^[4]), and a second study, published later in the year, that considered government support along the semiconductor value chain (OECD, 2019^[5]). The reports ended up highlighting the sizable contribution that below-market borrowings and below-market equity make to overall support in those sectors.

This prompted the Trade Committee to carry out a horizontal study of below-market finance across 13 key industrial sectors (OECD, 2021^[6]) across a large number of economies⁵ (OECD, 2021^[6]). The sectors covered included steel, for which detailed financial information on 21 of the largest steel companies worldwide were collected. Over the period 2014-18, the support identified for steel amounted to USD 17 billion (nominal), including USD 4 billion in the form of grants, USD 2 billion in the form of tax concessions, and USD 11 billion in the form of below-market borrowings. These figures show the relevance of below-market borrowings, which had to be estimated using financial data and assumptions about what a "reasonable" market rate of interest would be for companies of a given credit rating, financial performance, and size. (OECD, 2021^[6]) highlights that steel is not the only sector benefitting from government grants and below-market borrowing, which appear to be even more present in the aluminium and cement sectors.

Figure 1. The OECD Trade Committee has found industrial subsidies to be widespread and significant in 13 key industries



Note: Data are expressed relative to the sales revenue of the firms covered in the 2021 study over the period 2005-19. The graph above does not include tax concessions since these are less comparable across countries and sectors than other forms of support. Below-market equity returns are not included either since their estimates are less precise and only concern certain specific sectors (e.g. semiconductors and aerospace & defence).

Source: (OECD, 2021^[6]).

Currently, the OECD Trade Committee is estimating: (i) subsidies and government support taking the form of below-market energy inputs in energy-intensive industries, which includes steel; and (ii) government support for the manufacturing of rolling stock. In the context of the forthcoming 2023-24 PWB, the Trade Committee plans to further its contribution on estimating and analysing government support across industrial sectors. This will also involve a joint report with the OECD Directorate for Financial and Enterprise Affairs (DAF) on government support, state enterprises, and competitive neutrality, as well as a sector study looking at government support for the production of solar photovoltaic modules and wind turbines.

2.1. Scope of the data collection for the Steel Committee

2.1.1. Geographical and historical breath scope

The OECD Steel Secretariat has collected extensive data on subsidies benefitting steel firms in the 16 largest steel-producing economies, as well as in three additional economies that have experienced rapidly expanding steel production capacity and are thus expected to join the group of the world's major steel-producing economies in the near future. The time period covers subsidies provided during January 2008 -September 2021⁶ (henceforth, the "period under study")⁷, in order to gather a sufficiently long time series to show the evolution of government support and enable analytical studies. Significantly more resources have been invested in the data collection for the least transparent economies compared to the most transparent ones, in order to mitigate the transparency gap to some extent. Annex B presents the way the data were collected and describes the sources used.

The top 16 largest steel-producing economies investigated are:

- The People’s Republic of China (hereafter “China”);
- The European Union⁸;
- India;
- Japan;
- The United States;
- the Russian Federation
- Korea;
- Germany;
- The Republic of Türkiye;
- Brazil;
- Italy;
- Chinese Taipei;
- Ukraine;
- The Islamic Republic of Iran (hereafter “Iran”);
- Mexico; and
- France.

Three additional economies that have experienced rapidly expanding steel production capacity that were investigated are:

- Indonesia;
- Viet Nam; and
- Saudi Arabia.

2.1.2. Instruments in the scope of data collection

There are many ways, or “instruments”, by which government or government-related agencies can channel support to steel firms. The approach from the Steel Committee was to consider all possible instruments through which subsidies and government support could be channelled to steel firms. In this regard, the approach is to provide a comprehensive picture of subsidies and government support measures that goes beyond those regulated by the World Trade Organization (WTO).

Cash grants, awards and costs refunds

By distributing grants and awards, either directly or through financial funds or research projects set up for that purpose, governments can provide money directly to a steel firm. A grant can be tied to assets purchased with the grant, or to a specific project (renovation, transformation, technological upgrading, etc.). It can also be given to the company without any condition attached. Governments can use awards to distinguish companies that have excelled in a particular domain. Costs refunds are cash injections provided by the government to compensate for specific costs already paid by the steel company. For example, cost refunds can cover a given percentage of a steel company’s investment in research and development.

Preferential loans

Governments can provide loans below market rates, either directly or indirectly; through a state-controlled bank or other public financial institutions. Preferential loans are difficult to identify as the contractual rates of interest are rarely disclosed to the public. Banks are not willing to share this type of information and can even be forbidden by statutory or regulatory requirements to disclose it.

Debt instruments placement

Debt of the company is sold to the government or other public financial institutions in the form of tradable financial market instruments such as bonds or convertible bonds. This debt placement represents government support insofar as the company would not have been able to place such instruments to private investors at similarly advantageous conditions.

Equity infusions and conversions

Governments can provide cash injection or debt relief in exchange for equity. In equity infusions, new company shares are created and sold to the government. In conversions, such as debt-for-equity swaps, the debt contracted by the company towards the government is transformed into equity shares. If the company benefits from terms and conditions that it could not have obtained from private market participants absent government support, then equity infusions and conversions constitute a form of government support.

Guarantees and other transfers of liabilities

Governments can guarantee the repayment of a company's loan, promising to repay the lender in case the company cannot comply with its obligations. Governments and other public institutions can similarly guarantee companies' bonds. In addition, it is also not uncommon to transfer a company's liability to a state-owned enterprise or bank.

Debt forgiveness or restructuring

Governments can forego revenues by writing-off a fraction or the totality of a loan they had provided to a steel company, or by restructuring a company's debt in a way that advantages the borrower (e.g. extending maturity while keeping the same rate of interest).

Tax benefits

Other forms of targeted government support are tax exemptions, reductions, and credits, when directed specifically at the steel industry or at specific steel firms. Tax benefits can be given in the form of tax credits, tied to the purchase of some equipment (domestically-produced or not), to the completion of a project, or even given to the steel firm as a reward for a specific contribution. Tax benefits can be on inputs (e.g. reduced tax for fuel) or on outputs (e.g. reduced VAT, reduced sale tax). Moreover, rebates can also be provided at the level of the corporate income tax, of the property tax of the factories, on export tariffs and on the firm's contribution to workers' social security schemes, etc.

Government approach to mergers and acquisitions

Governments usually take into consideration a host of distinct policy objectives when facilitating mergers and acquisitions. This potentially makes the terms of government-steered mergers and acquisitions different from those that private individual profit-seeking companies would have sought. Insofar that this difference provides some of the steel companies involved with a better situation than they would have experienced absent government interventions, this represents a form of government support. Governments also provide financial resources, in the form of direct or indirect financial assistance, to facilitate or allow the merger to take place.

Lower than market price fixing

In lower than market price fixing, the government helps or mandates the provision of inputs to the steel companies at prices that are much lower than market prices, or required that

other companies do so. This can be by way of controlling the input price for the whole economy or by designing specific purchase prices for the steel companies. Lower than market price fixing can be related to utilities, including energy, water and road services, to land, land-use rights and infrastructure, or to steel raw materials.

Restrictions and bans on exports of raw materials for steel

Quotas to export raw material inputs used by steel companies usually result in lower domestic prices and a more abundant domestic supply. High export tariffs can also play a similar role and increase the availability of raw material for domestic steel firms to the detriment of foreign firms. Nevertheless, data on export tariffs was not used for this exercise, but data is collected by the OECD⁹.

Output support and government support through procurement

Government support can also happen at the level of the steel firm's output. Subsidies can be provided based on export performances (export subsidies), tariffs can be placed on imports in order to create price support for domestic firms' output (tariffs on imports), and subsidies can be given to steel consumers on the condition that they use domestic steel. Public purchases and procurement policies may include clauses based on the location of the provider company or requiring the sourcing of materials domestically, the so-called "local content requirements".

Export subsidies

Export subsidies are monetary amounts provided by the government to the steel firm based on the firm export performances. This form of subsidy is rare as it is explicitly forbidden in WTO rules. It is important to notice that those "export subsidies" are different from subsidies whose provision is not linked to a firm's export performances, but which are provided with the explicitly stated purpose to favour exports. Those latter are more numerous in the data collected.

Local content support to consumers or downstream industries

Consumer or downstream industries government support, when they require domestic content, increases the demand for domestic steel and thus constitutes another form of support. Hence broad forms of other support measures not geared directly towards the steel industry can be instruments for steel producer support.

Lax enforcement of regulation

Compliance with the country's regulations, in particular its environmental regulation, incurs a non-negligible cost to steel companies. Hence, companies that do not comply and yet are not properly penalised by the relevant authorities are in effect being supported. A similar example is the lax enforcement of companies' bankruptcy laws, which constitutes a form of government support to steel companies or to the whole steel industry.

2.2. Summary of data collection efforts

The data collection exercise initiated by the Steel Committee has resulted in 1 804 programmes that benefitted recipient firms in the steel sector at some point during the 2008-2021 period whose overwhelming majority are formulated as non-steel specific programmes yet were collected because they had the potential to significantly benefit the steel sector.¹⁰ Many of those programmes can be grouped under the "umbrella" of larger

and higher-level government programmes which are defined in even broader terms. Often, programmes collected are the various regional transcriptions of federal or central government programmes.

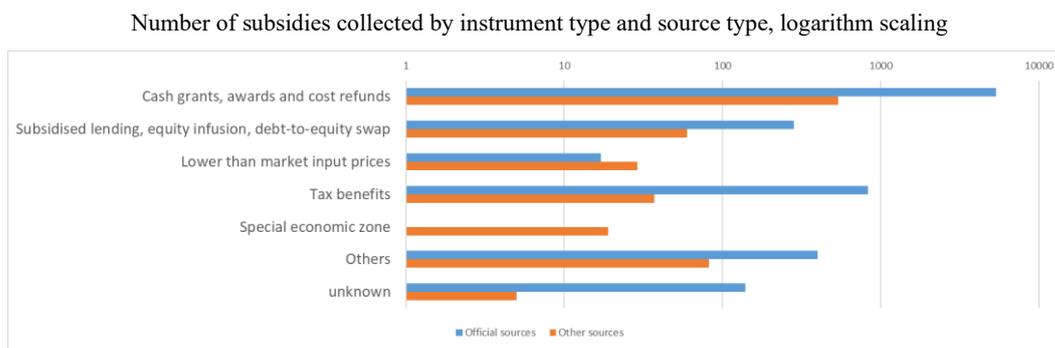
Furthermore, the exercise collected 7 968 specific subsidies and amounts received by named steel firms, many subsidies being registered for the same steel firm in the same given years.¹¹ Overall, there are 845 distinct steel company names in the recipient level table.¹²

2.2.1. Instrument types collected

The data collected show that in terms of pure numbers of individual subsidies to steel firms, “cash grants, awards and cost refunds” dominate (76% of instruments collected at the recipient level), followed by the “tax benefits” category (11%) and the “subsidised lending, equity infusions and debt-to-equity swaps” category (4%): this is shown in Figure 2, which uses an exponential scale to compare the numbers across instruments. Admittedly, this result should be interpreted with care, since cash grants, awards and cost refunds are the instruments for which information is the more readily available across economies, with some economies’ accounting standards even making their reporting mandatory.

The data show fewer subsidies provided through lower input and energy costs, despite anecdotal evidence suggesting that such subsidies may be significant for steel firms. A reason is that steel firms may indeed get part of their energy at a lower price than what the market would have priced, without such support being named at the level of official programmes nor recorded in the annual accounts of the companies (e.g. in the case when it does not involve cash flows). Although companies’ annual accounts can mention the grants provided by governments with the purpose to refund part of the company’s energy costs, most sources will not single out instances of lower-than-market energy costs resulting from government interventions, which means that a systematic, sample-biased assessment may be necessary to properly ascertain the presence of those subsidies.¹³

Figure 2. Data collected by instrument type and source type



Note: Subsidies for which it was not clear which instrument is reported as “unknown”. Often, this corresponds to subsidies for which insufficient information was indicated in the annual or financial reports of the company, or to subsidy programmes whose name was the only information mentioned with no clear purpose expressed. For example, “project finance special funds” could refer to either a subsidised loan, a cash grant or a cost refund, and without a clearer mention of the programme associated with the grant, no further checks can be performed at the programme level. Official sources include official government websites, and audited financial reports of steel firms, whereas “other sources” include media sources as well as WTO countervailing duty investigations. Source: Secretariat data collection.

Overall, cash grants, cash awards, and cost refunds form the bulk of the data collected, which illustrates their prevalence, but also the fact that those instruments tend to be the most transparent ones.

2.2.2. *Stated purpose of recorded subsidies*

The “Purpose” reports the *stated* purpose, when available, of a given subsidy. It is important to note that stated purposes may be inconsistent with the actual use of a subsidy, but provides insights into the intentions behind the subsidisation of a given steel firm. When the name of a programme is mentioned, the purpose is inferred from it. Purposes are then grouped into larger categories to facilitate the reading of graphs and account for the diversity of sources

Figure 3 below illustrates a strong prevalence of subsidies whose purpose is for capacity extension, new investment, and capital equipment (40%), technological development and research, including some projects related to protecting the environment (28%) and environment, such as the physical installation of CO₂ filters, etc. (13%). Raw materials, land and energy (8%), export support (6%) and social (5%) only account for smaller shares of the declared purposes.¹⁴

Figure 3 highlights a number of salient facts on the intended purposes of specific subsidies received by steel firms across economies.

First, purposes such as “capacity extension”, “new investment”, and “capital equipment”, when lumped together, appear to be prevalent reasons mentioned in the data collected (40%). This could reflect the decision of some policymakers to develop their domestic steel markets without taking into account the challenging issue of excess capacity that the steel market is experiencing. Although some of those purposes are not flagged as “export support”, in some instances there is anecdotal evidence that export is the focus and justification for upgrading and upscaling the domestic steel industry. Scaling up the domestic base would in any case lead both to export substitution and an increase in net steel products’ exports. Some purposes of the category such as “transformation” and “capital equipment” could be a replacement of older assets, whose expected effects should thus not be an increase in the total steel production capacity of the recipient’s firms.

Second, although environment purposes such as energy-efficiency related upgrades of steel plants and the installation of air filters or water saving devices, are frequently mentioned, environmental purposes are far from being the dominant ones. Both capacity extension and other related purposes and the research and technology purpose are mentioned much more often¹⁵. Because environment and greening seem more justifiable, due to the societal challenge they are thought to address, than other types of purposes such as capacity extension, they figure more prominently in media, companies’ websites and digital platforms. Yet, systematic data collection shows that the purpose only accounts for 13% of all purposes stated in the data collected.

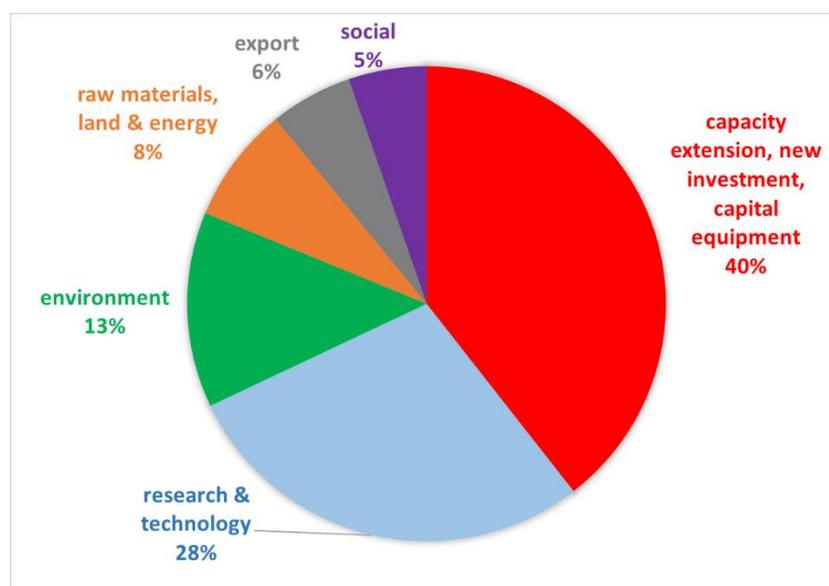
Third, subsidies for social reasons seem to have a much reduced part of the total of intended purposes stated. Admittedly, social cohesion and workforce re-training can be supported by subsidies not going through steel firms’ accounts and thus not represented here.

Fourth, “export” is mentioned in a significant share of the purpose stated (6%), which seems to confirm the idea that subsidies are provided with an export-oriented view in some cases. Nevertheless, subsidies provided with this explicitly stated purpose would draw more international scrutiny in a context of trade frictions, hence it may not come as a surprise that the share of such “export” subsidies has consistently been falling since 2008 onwards, until becoming almost negligible in 2020 (Figure 4). This could represent a genuine trend towards a more “domestic” focus for subsidies, or a re-focusing of subsidies

on the quality of steel products and their production capacity, given that in a competitive environment such firms would in-fine manage to export more.

Figure 3. Stated purpose of subsidies provided to the steel sector

The graph depicts the relative share of the purposes stated in more than 1% of the lines collected



Note: This figure presents the share of purposes stated as a percentage of the total number of stated purposes. Unknown values for “purpose” (11.9% of the total number of distinct subsidies of the recipient level table) were not taken into account in the figure.

Source: OECD Secretariat data collection.

Figure 4 below shows the evolution over time of those most often stated purposes.

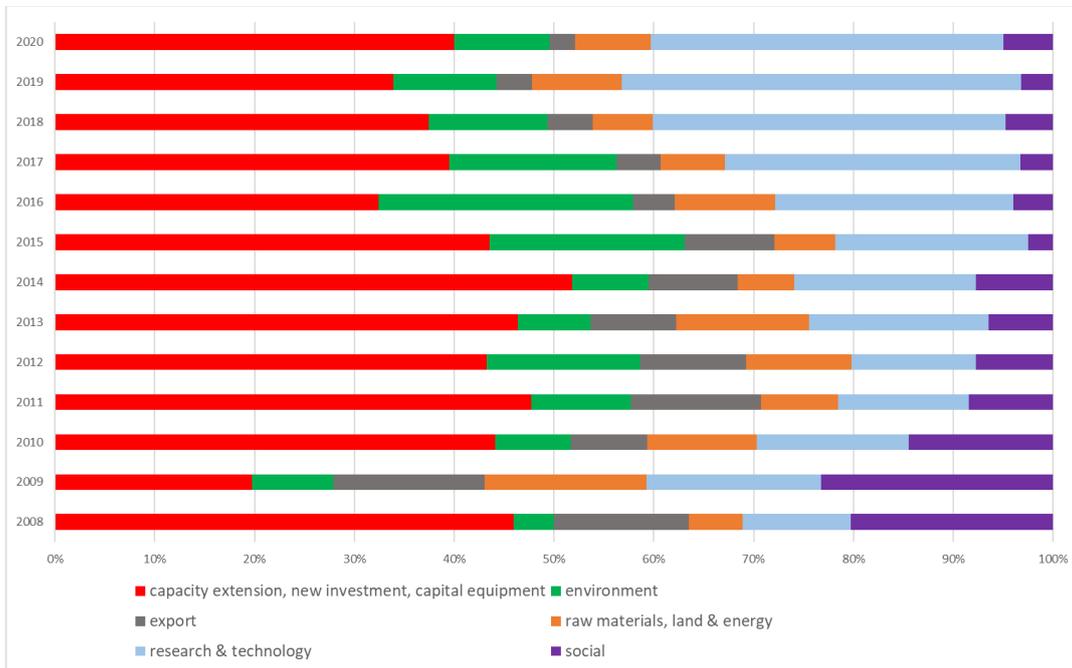
The purpose “capacity extension, new investment and capital equipment” has consistently made a large share of the total of mentioned purposes over all the 2008-2020 period, with the exception of the year 2009 when it fell and accounted for less than the purpose “social”. The year 2009 was the aftermath of the 2008 financial crisis and it is understandable that subsidies given for capacity extension, new investment and capital equipment were less numerous in that year, and replaced by subsidies given for social reasons, to limit the impact of the crisis of steel firms’ workers.

Subsidies for environmental purposes have increased fivefold from 2008 to 2016 as a share of total purpose stated, but have been decreasing continuously since then, resulting in an overall 136% increase over the 2008-2020 period.

The “export” purpose has seen its share as the percentage of total stated purposes of individual subsidies provided to steel firms decline significantly from 2008 to 2020. Subsidies provided to support export are the most likely to have a direct consequence on steel foreign markets shares, and thus to fall under the discipline of the WTO. Policymakers seem to have shifted the stated purpose of the government support away from exports to more domestically oriented and broader targets to sustain or improve the domestic steel production capacity, which could still affect foreign markets.¹⁶

Figure 4. Evolution of the main purposes stated in the provision of subsidies to the steel sector

The relative share of each of the most commonly stated purposes has changed significantly over the years



Note: This figure presents the share of purposes stated as a percentage of the total number of stated purposes. Source: OECD Secretariat data collection.

Overall, the shift in the stated purpose categories seems to be reflecting both a maturing industry, where subsidies focus less on export but more on research and technology, yet the consistent share of subsidies for capacity extension, new investment and capital equipment, coupled with a sharp decrease of other categories such as “social” is worrying.

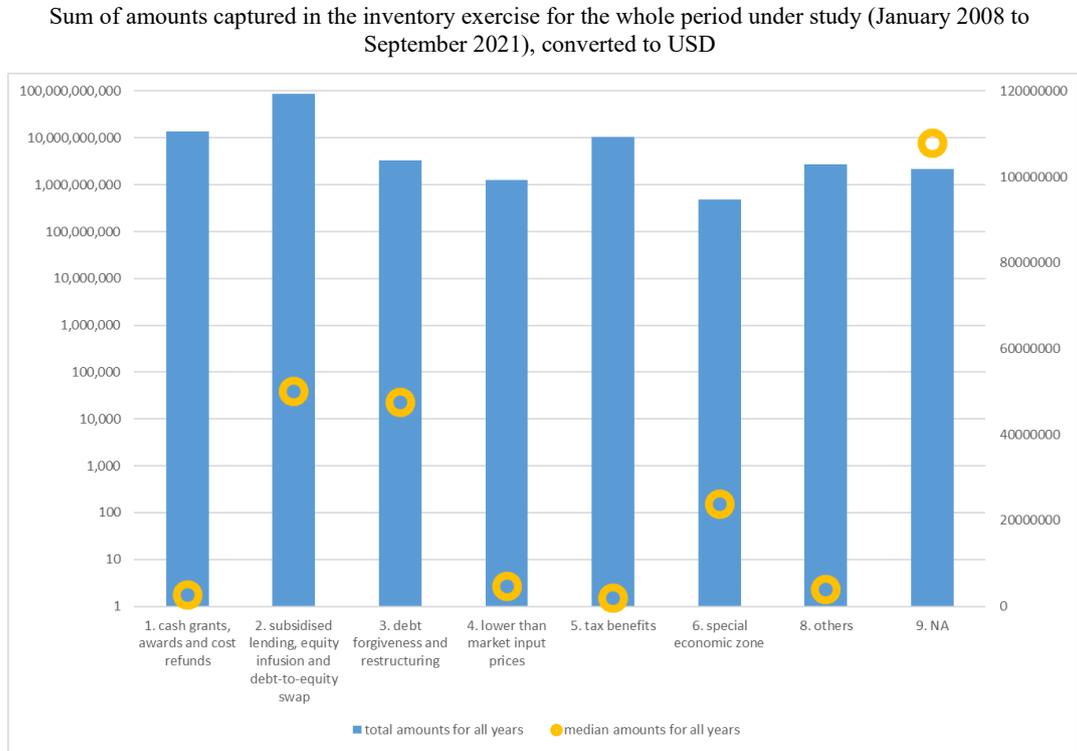
2.2.3. Amounts recorded

Not all data collected have valid amounts attached to them. Incomplete data online means that there were a number of instances where the Secretariat was aware of a subsidy provided to a given steel firm, and of the name of its recipient, but with no information on the money amount attached to it, even in the case of cash grants. Such information often comes from both official and unofficial sources. In those cases, the data are still recorded for the purpose of this exercise. Of the total 7 968 cases of subsidies recorded at the recipient level, 757 have no amount attached to them.¹⁷

Figure 5 below indicates the total amounts recorded for each instrument having an amount attached to it since 2008, and indicates a higher share for cash grants, cash awards and cost refunds, compared to other instruments. The over-representation of this category most likely comes from the greater transparency of the sources used for these instruments, due to some economies’ accounting standards mandating the reporting of the instrument, rather than a more frequent use of the instruments compared to other instruments. For example, although some data exist on subsidised lending, in the majority of cases the extent of lending by state-owned banks is unknown, as are the interest rates associated with such lending. As such, subsidised lending cannot be separated from the total aggregate lending to the firm except by making certain assumptions. Hence, such subsidised lending is currently not estimated consistently. Such an estimation could not be performed without

making assumptions about a firm’s term structure and credit quality, and focusing on a more restricted number of firms.

Figure 5. Amounts per instrument



Note: These amounts do not represent the totality of recorded amounts but excludes so-called “deferred amounts”, in order to avoid the double-counting of cash grants. The amounts reported for the category of subsidised lending, equity infusion and debt-to-equity swaps refer to nominal amounts, not estimated subsidisation, which would be much lower.
 Source: OECD Secretariat data collection.

We can see from Figure 5 that cash grants, cash awards, and cost refunds have a much lower median amount than subsidised lending, equity infusion and debt-to-equity swaps, as well as debt forgiveness and restructuring. Also note that although the nominal amount reported for subsidised lending, equity infusion and debt-to-equity swaps is higher than for cash grants, the amounts reported refer to the amount of the loan or of the equity infusion, etc. and thus that the subsidisation entailed is not directly comparable.

Figure 6 below represents the amounts recorded, per broad instrument type, over the study period¹⁸.

The first graph of Figure 6 shows that cash grants, cash awards and cost refunds are instruments that are still very much in use for subsidising steel firms, in spite of some decrease from 2018 to 2020. There has been a more than fivefold increase from 2008 to 2017 in the total amount recorded of cash grants, cash awards and cost refunds transfers to steel firms and the total amounts have since stayed very close to its 2017 high mark. Although the total amounts provided through cash grants, cash awards and cost refunds are much greater in 2020 than in 2008, the median of amounts provided through this instrument, defined as the amount such that half of the subsidies have greater amounts than

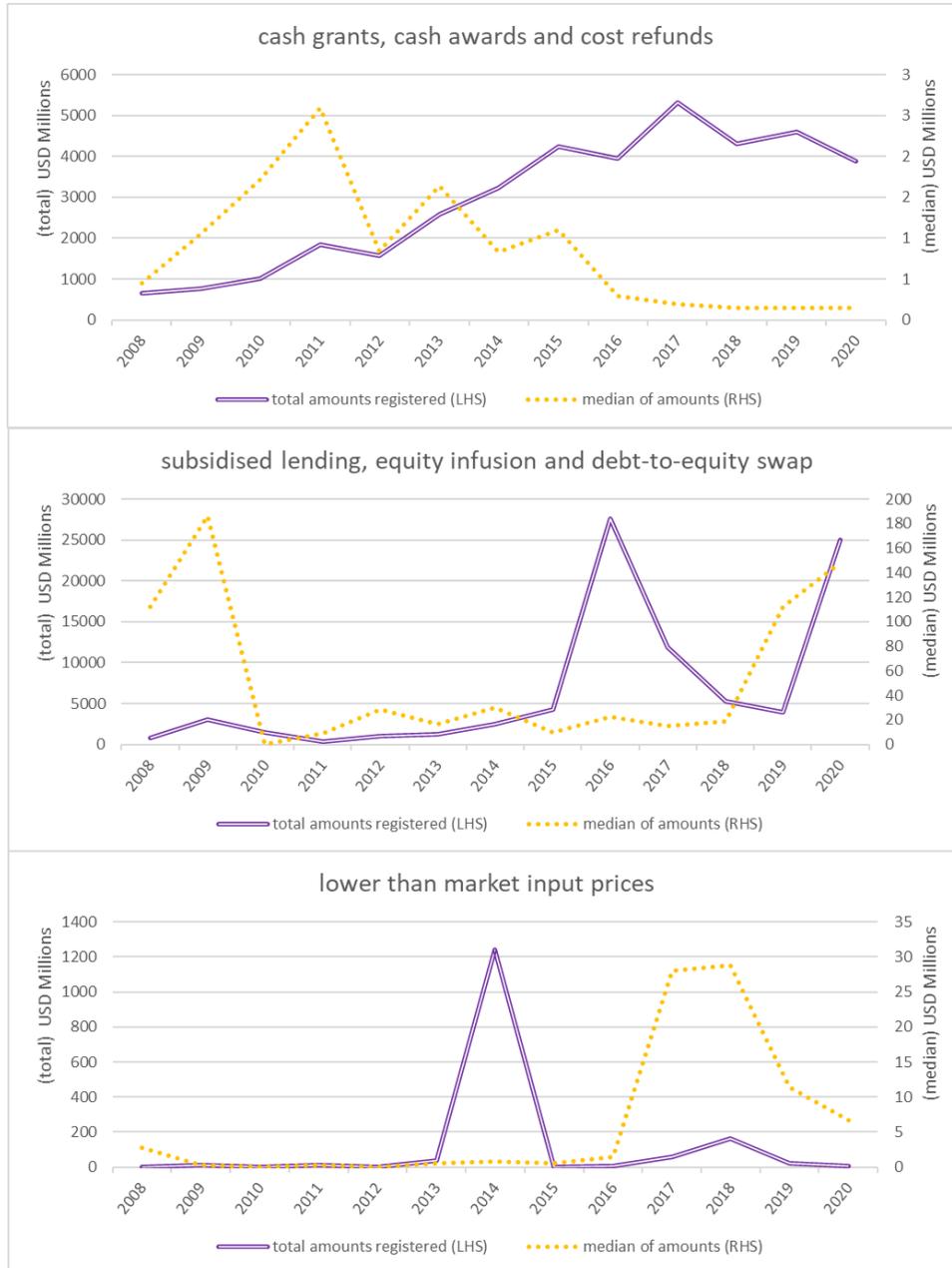
it and half have a lower amount than it, has fallen sharply, suggesting a greater dispersion of subsidies across many different programmes and recipients.

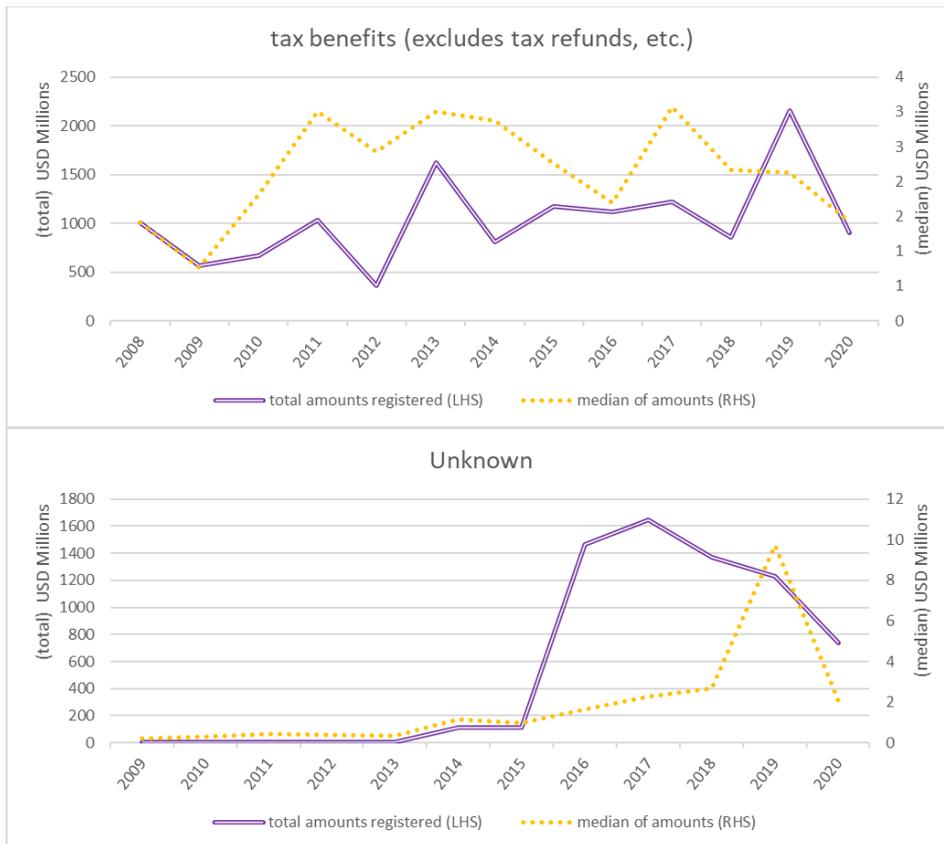
The second graph of Figure 6 shows that subsidised lending, equity infusions and (non-market) debt-to-equity swaps are instruments used in a more volatile way than cash grants, cash awards, and cost refunds. For example, very high total amounts in 2016 are attributed to the use of Chinese debt-to-equity swaps measures to convert debt of heavily indebted steel firms into equity sold to households and wealth funds (see Section 4.4). Nevertheless, subsidised lending was not assessed systematically based on steel firms' borrowing costs, hence the second graph of Figure 6 most likely represents only the extreme cases of subsidised lending, where some media or market intelligence reported the cases. Under market rate borrowing was assessed systematically for 21 steel firms by the OECD Trade Committee, and was proven to be significant for some economies more than others (OECD, 2021^[6]). Box 1 highlights the work of the OECD Trade Committee in that respect.

Similar remarks hold for the third graph of Figure 6, which shows recorded instances and amounts of below-market input prices. The entailed subsidisation can be large, in spite of no systematic examination of steel firms' input costs. Tax benefits, displayed in the fourth graph of Figure 6, seem a more constant and recurring instrument through which steel firms get governmental support; both their total amounts and their median amount are relatively stable over the 2008-2020 period compared to other instruments. Lastly, some instruments were used to subsidise steel firms, mostly during the 2016- 2019 period, but were not identified, in spite of having significant amounts attached to them, as indicated in the last graph of Figure 6.

Figure 6. Amounts of subsidies collected for each year

Total amounts recorded, and median amounts recorded, depending on instrument type and year of the record¹⁹





Note: Amounts in 2021 are fewer due to the September 2021 cut-off date, and to the usual lag for the reporting of data from some sources (e.g. annual reports). No extrapolation was included in those amounts, which represent only the sourced and reported amounts of data from the sources of information for the economies covered.

Source: OECD Secretariat data collection.

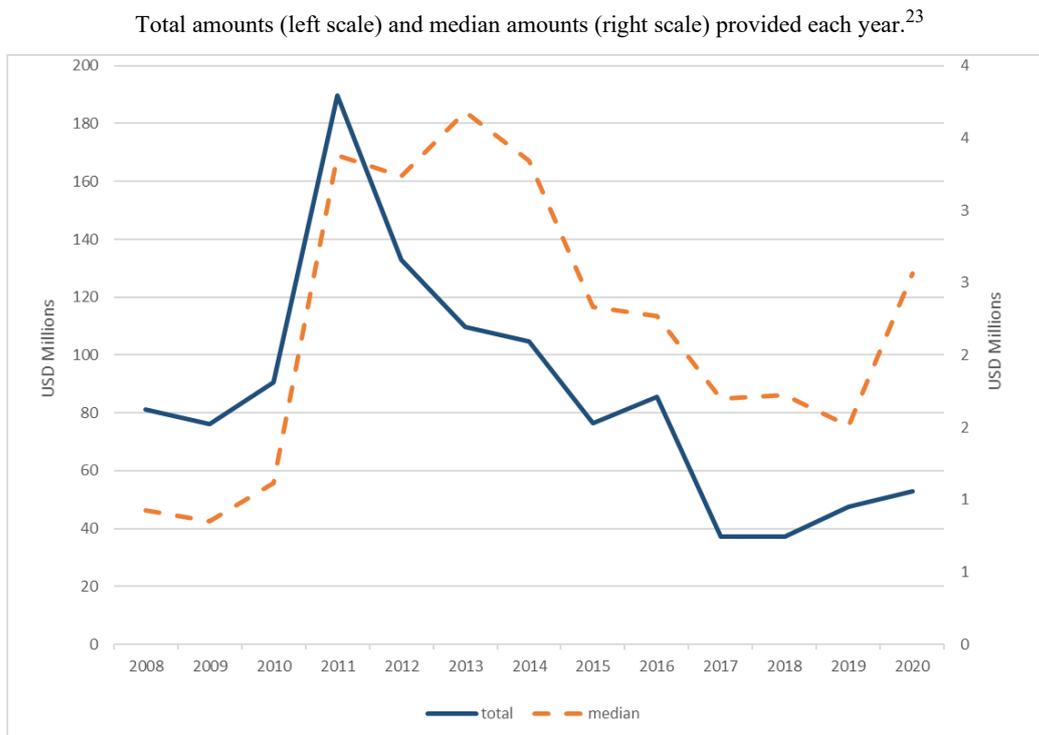
3. The evolution of subsidisation in the steel sector over time

3.1. Cash grants, awards and cost refunds subsidies are very widely used instruments

Computing the precise subsidy amounts actually received by a given steel firm during a particular year in the form of cash grants, cash transfers or cost refunds is not always straightforward.²⁰ The most insightful analysis, and an area for potential future work, would be to carry out econometric studies at the firm level. This requires computing the precise amounts received by each steel firm at any given time, which does not always correspond to the timing when the amounts are registered in their annual accounts. The aggregate results are presented in Figure 6.

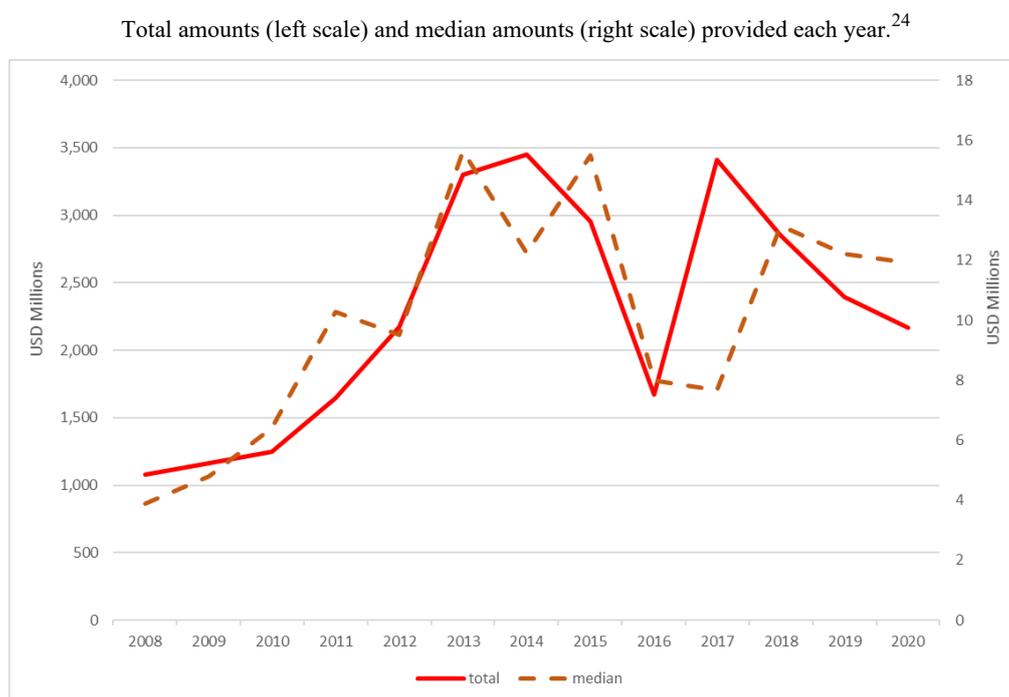
Because cash grants, cash transfers and cost refunds are the most transparent instruments across economies, were collected systematically for all economies covered and do not entail any estimation and assumptions to be quantified, comparisons are carried out in this section using only these instruments. Figure 7 and Figure 8 below depict the total amounts transferred through these instruments²¹ over time, both for the group of OECD and separately for the group of non-OECD countries in the scope of the exercise.²²

Figure 7. Cash grants, awards and cost refunds subsidies provided from 2008 to 2020 included



Note: the median represented the median of aggregate subsidy amount received by each steel firm, hence reflects subsidisation dispersion across recipients, but not across programmes.

Source: Secretariat data collection.

Figure 8. Cash grants, awards and cost refunds subsidies provided from 2008 to 2020 included

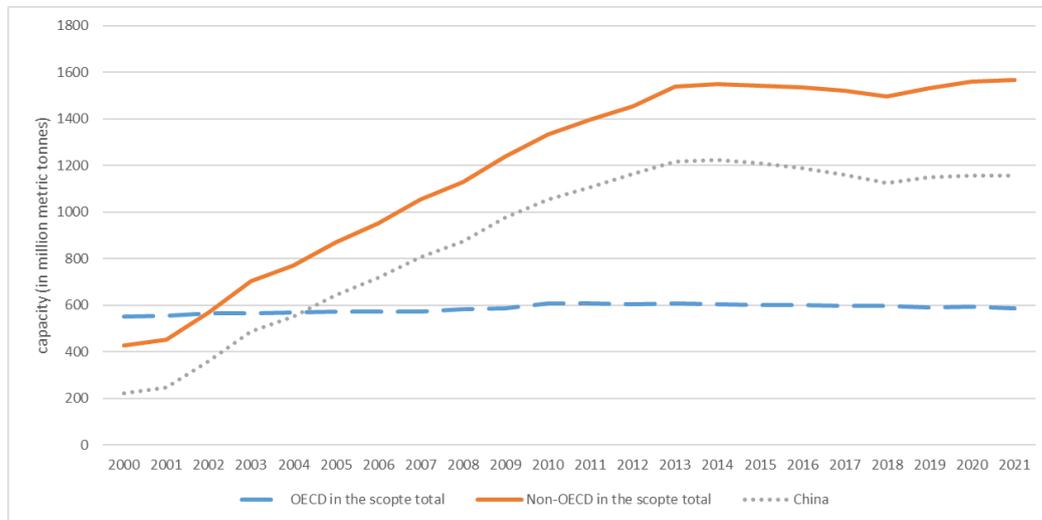
Note: Subsidies collected for the Chinese sample were extrapolated to the whole economy as explained in Annex B. The median represented the median of aggregate subsidy amount received by each steel firm, hence reflects subsidisation dispersion across recipients, but not across programmes.

Source: Secretariat data collection.

Subsidisation in the OECD countries covered (Figure 7) increased from 2008 to 2011, before decreasing continuously until 2018. After the year 2018, there seems to be an uptick in subsidies provided through cash grants, cash awards and cost refunds, with a deceleration of the increase from 2019 to 2020. The median of provided amounts followed a similar trend, suggesting that for the OECD countries concerned, subsidies have not become more concentrated to fewer recipients over time, with the exception of the year 2020 which shows an increase in the median and indicates a greater recipients' concentration in that year compared to previous years.

Subsidisation in non-OECD countries (Figure 8) followed a continuous increase in both total amounts and the median of amounts provided to individual steel firms from 2008 to 2014. Comparing it with the evolution of capacity (Figure 9 below) over the same 2008-2014 period highlights the simultaneous increase. Figure 8 further highlights a sharp decline in subsidisation through cash grants, cash awards and cost refunds from 2014 to 2016, followed by a new increase and decline. Noticeably, in 2020 the decline in total subsidies provided to the steel sector did not entail a similar decline in the median of amounts provided, suggesting a concentration of subsidies in the covered non-OECD countries towards key steel players in 2020. Indeed, although total amounts are lower than where they stood when at their peak in 2014, the median amount of subsidies provided are almost as high in 2020 as in 2014.

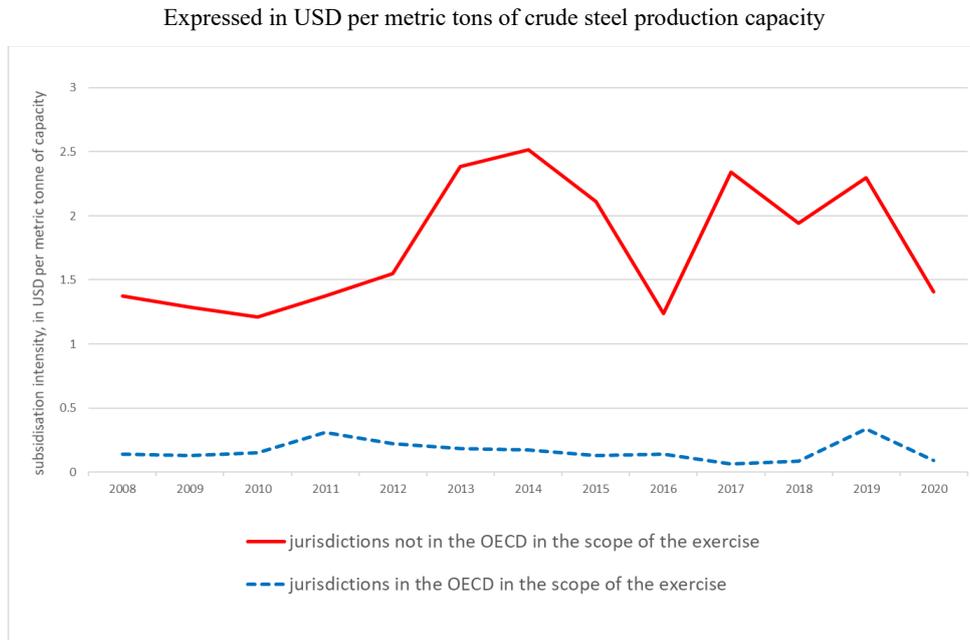
Figure 9. Capacity of OECD and non-OECD economies covered in the scope of the data collection exercise (in million metric tonnes)



Source: OECD Secretariat Capacity data.

Although the capacity of non-OECD countries covered in the scope of the exercise is no more than three times the capacity of OECD countries, their subsidisation levels are multiple times that amount. Also, in spite of the greater amounts of subsidies received by steel firms in OECD countries covered in the exercise during the years 2011 and 2012 compared to other years, there were no resulting capacity increases for those economies – in fact, a slight decrease in capacity was observed at that time. This suggests that in the OECD area, subsidisation is much lower and does not appear to be associated with new capacity growth because the support may be geared to other factors such as environmental purposes and to promote labour adjustment. Analysing subsidies’ characteristics’ impact on capacity growth such as the stated purpose of a subsidy would require a multidimensional firm-level study, to control for a number of factors as well as for the potential heterogeneity in the characteristics’ naming due to different sources of information used across economies.

To put in perspective capacity developments and subsidies amounts at the aggregate level for both OECD and non-OECD countries, “subsidisation intensity”, that is, the total subsidy amounts received by the steel sector in a given economy relative to its crude steel production capacity, can be used. This indicator is computed for cash grants, cash awards and cost refunds, and is presented in Figure 10 below.

Figure 10. Cash grants, awards and cost refunds subsidy intensity over capacity

Notes: 1. The ratio is expressed in USD per metric tonne of crude steel capacity, even if some firms in the data collected are not involved in the crude steel producing stage but are downstream steel firms transforming crude steel into finished steel products. 2. USD exchange rate is the yearly exchange rate prevalent during the year when the subsidy was received.

Source: OECD Secretariat data collection.

Figure 10 highlights the fact that, per unit of production capacity, subsidisation is multiple times higher for partner economies in the scope of the exercise than for OECD countries in the scope. Indeed, subsidisation intensity for non-OECD countries covered seems to hover around 1.77 USD per metric tonne of production capacity (every year) over the period, its average for the period, whereas for OECD countries covered the average is 0.16 USD, that is 10.7 times lower.

A second interesting fact highlighted by Figure 10 is the relative stability of subsidisation intensity through time for non-OECD countries covered. Contrary to non-OECD capacity increases and total subsidies amount increases over the years, there is no clear and distinctive trend in non-OECD countries' subsidisation intensities, which seem to be mean reverting over the years. This points towards a relative permanence of subsidies across time, when put in perspective relatively to crude steel production capacity. Programmes may come and go, and have different focuses, but the amounts received each year by the domestic steel sector and provided to steel firms remain very constant over time and dependent, first and foremost, on the current production capacity established.

A third interesting fact evidenced by Figure 10 is the decreasing trend in subsidisation intensity for the OECD countries covered in the study, from 2011 to 2018. The year 2019 seems to be an outlier, with the intensity for the year 2020 quickly falling back to 2018 lows. Greater scrutiny towards the provision of subsidies to the steel sector as well as frameworks for subsidies that result in more targeted subsidies or promote steel firms' competition for obtaining government support may partly explain this downward trend.

Important instruments of subsidisation are loans made below the market rate of interests, equity infusions and non-market debt-to-equity swaps. Although, as mentioned previously,

only the instances of such instruments quoted in the press are captured for those instruments, it could be informative to peer into the data collected, keeping in mind that due to a lack of systematic study the data may not be comparable and in no case exhaustive.

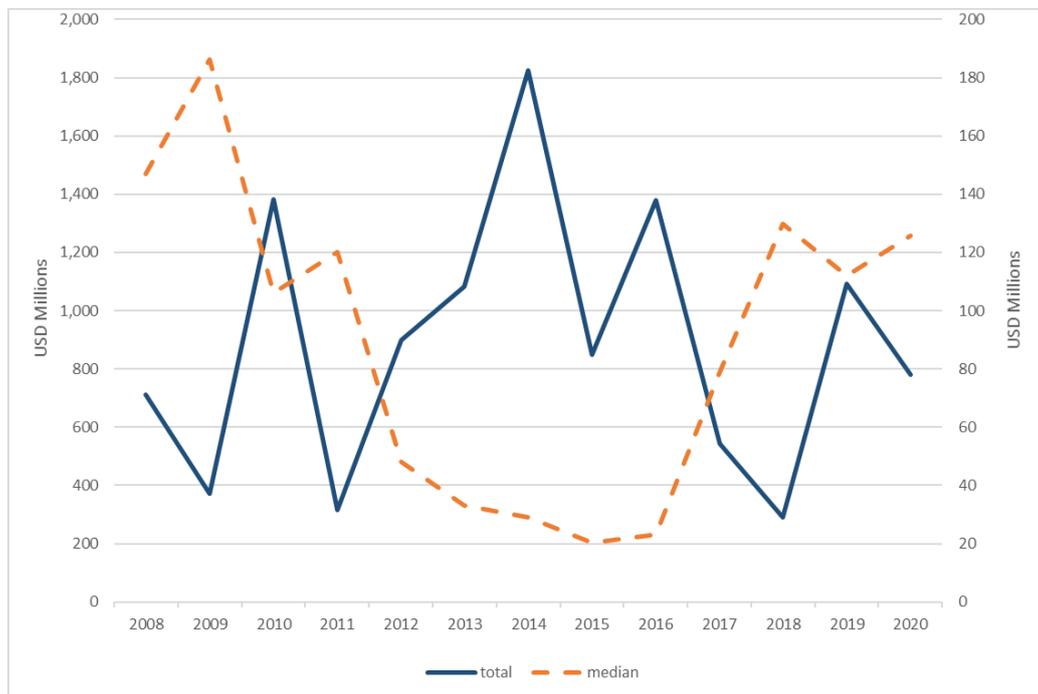
3.2. Subsidised loans, equity infusion and debt-to-equity swap play a consistent role in steel firms subsidisation over time

Figure 11 below depicts the nominal amounts of subsidised lending, equity infusion and debt-to-equity swap collected for OECD countries covered in the scope, while Figure 12 presents those amounts for partner economies. No extrapolation was carried out. Because in the vast majority of cases, interest rates of loans provided by government-related agencies are not in the public domain, it is not possible to verify from publicly available information that their interest rate is in line with market rates. Consequently, all loans suspected to have lower-than-market interest rates, such as loans provided by government-controlled agencies or banks, were collected. Exchanges with contact points in each economy covered in the scope may further refine the inventory by excluding loans that were provided in line with market conditions and prevailing market interest rates.

Figure 11 shows that, although volatile over the years, subsidised loans are rather permanent features of subsidisation in OECD countries. Although the amounts are multiple times those of cash grants, cash awards and cost refunds, it should be kept in mind that the subsidisation entailed by a loan of some given nominal amount is much less than from a cash grant of equivalent amount, as a loan needs to be paid back.

Interestingly, during the 2012 to 2016 period there seem to have been, for the OECD countries covered, a larger total of the aggregate amount of loans, but a lower median of amounts, which means that loans were more prevalent yet less concentrated on specific programmes and recipient over this period. In 2017 median nominal loan amounts returned to their 2010 levels.

Figure 11. Subsidised lending, equity infusions and debt-to-equity swaps in OECD countries from 2008 to 2020²⁵

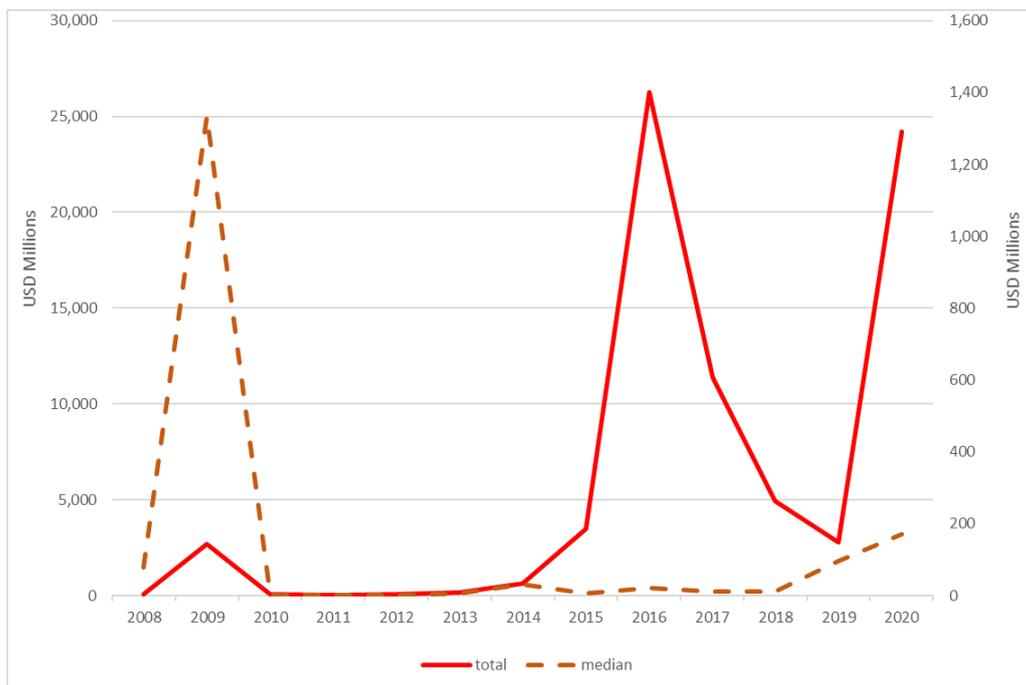


Source: Secretariat data collection.

Figure 12 shows that for partner economies, there seems to be a lack of data concerning those types of instruments for specific years. This may be due to only partial reporting in media sources for those years.

The large peak in total amounts of subsidised lending, equity infusion and debt-to-equity swap in the 2016 to 2018 period is largely due to 7 large debt-to-equity swaps in China. Those instruments are described in Section 6.5 to illustrate an example of a complex instrument and the desired deleveraging sought after by Chinese policymakers and regulators for the Chinese domestic steel industry.

Because as mentioned above, data on those instruments are only collected when a source of information mentions them, and not estimated through any systematic study, comparisons between the amounts provided in OECD and non-OECD countries should not be over-interpreted. (OECD, 2021^[6]) provides such systematic studies on a reduced sample of firms and highlights very different situations depending on the economy considered, with the highest interest rate differentials between subsidised loan interest rates and market interest rates for similar borrowers found in China. Nevertheless, there seems to be a significant increase in the use of these instruments for partner economies in the 2014-2020 period compared to the 2008-2013 period.

Figure 12. Subsidised lending, equity infusion and debt-to-equity swap from 2008 to 2020²⁶

Source: Secretariat data collection.

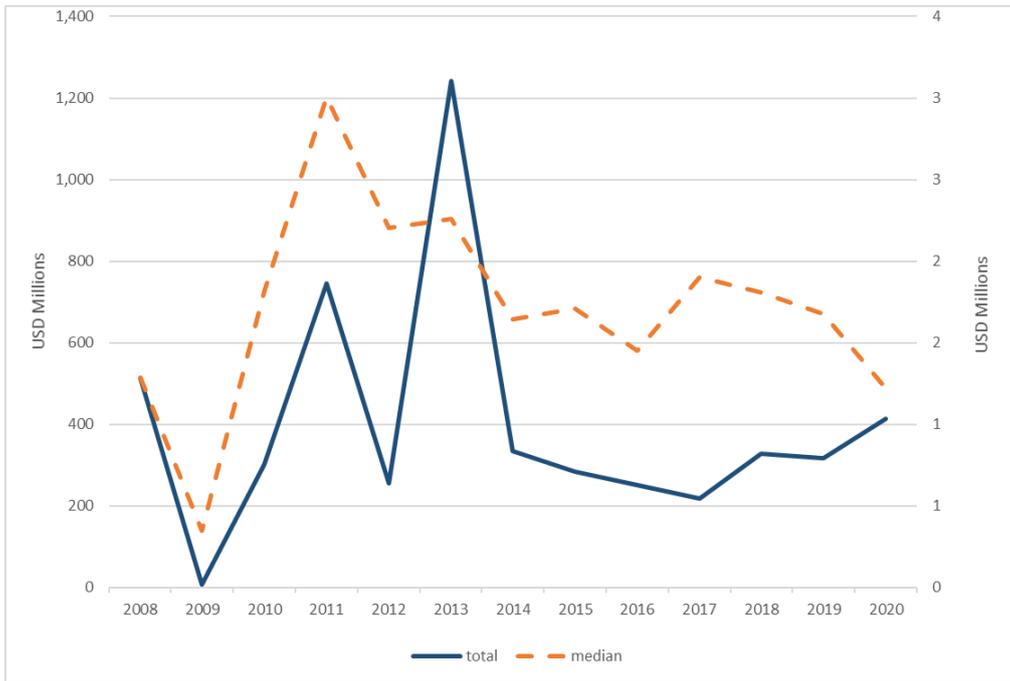
3.3. Tax credits, tax rebates and tax refunds have much larger median size in partner economies than in OECD countries

Figure 13 and Figure 14 depict amounts of tax credits, tax rebates and tax refunds benefitting steel firms that were collected. Similar to the case of subsidised loans, those instruments were only recorded when a source mentioned them explicitly and no attempt was made to compare the tax systems, for example, of different economies to locate potential loopholes that may benefit steel firms. Nevertheless, the data provide enough evidence to illustrate the importance of such instruments in channelling support to steel firms.

Subsidies through tax credits, tax rebates and tax refunds seem to have been relatively stable in OECD countries since 2014, with only a slight upward trend in total amounts which is simultaneous to a downtrend in median amounts and suggests that recipients of tax credits, tax rebates and tax refunds are becoming more diverse (Figure 13).

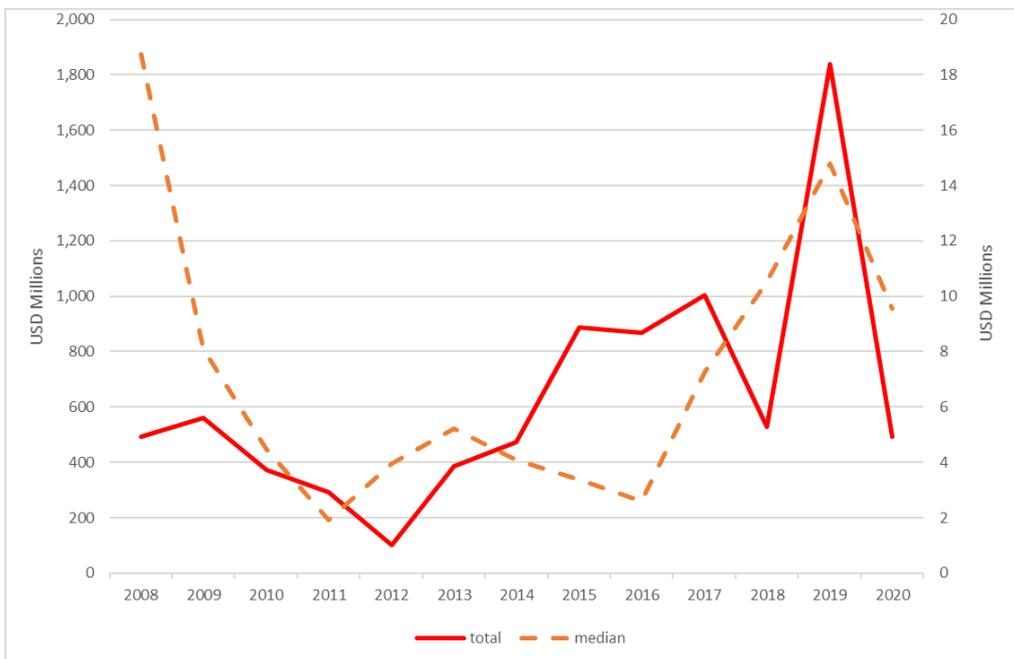
On the contrary, the data show a strong upward trend in the amount of tax credits, tax rebates and tax refunds directed towards steel firms in partner economies, simultaneous with a corresponding increase in the median amounts of such subsidies (Figure 14). The size of the median tax credits, tax rebates and tax refunds benefitting steel firms is also multiple times higher in non-OECD countries than for OECD countries.

Figure 13. Tax credits, tax rebates and tax refunds from 2008 to 2020²⁷



Source: Secretariat data collection.

Figure 14. Tax credits, tax rebates and tax refunds in partner economies from 2008 to 2020²⁸



Source: Secretariat data collection.

4. Putting subsidies in the national context

National and societal contexts, as well as political economy factors, affect both the extent of subsidisation towards the steel sector and the transparency surrounding it. Subsidies are never provided in a vacuum. Their form and pervasiveness depend in large part on national and local policymakers' priorities and goals, as well as on the ecosystem of its government-related institutions.

This section means to illustrate the importance of national context by providing some illustrative case studies in which context plays a different role and affects the provision of subsidies to the steel sector. This section does not attempt to be exhaustive, but uses selected examples of economy to illustrate the importance of context first and foremost.

4.1. Government-set targets and goals for the steel industry greatly affect the propensity of policymakers to subsidise the steel industry

A number of economies use explicit target setting to define their industrial development goals. Those targets are very often formulated without taking into account specific market conditions and global steel market excess capacity, and are often set only once for a number of years, typically 4 or 5 years. China, Iran, and Saudi Arabia are three examples of economies that consistently use target setting to steer the development of their steel industries, with China having switched from prior production volume targets to concentration targets, and that experiences significant capacity growth during the period

Target setting and government-led development strongly affect the propensity of the government to subsidise the steel sector to reach its desired outcome. One potential reason is that stringent target settings are indicative of a strong desire from policymakers to increase the size or concentration of their steel industries. Another potential reason could be that government-set targets may provide the domestic steel sector with increased bargaining power to obtain subsidies, especially in adverse market conditions.

4.1.1. Example of target setting in the Chinese economy

This example of the Chinese economy's programmes and plans is presented in this section to illustrate how target setting affects subsidisation, but also how target setting can differ depending on the location and characteristics of steel firms across a given economy, and can change over time due to evolving policy priorities.

In China, the government provides subsidies to companies in sectors deemed to be strategic by the government; this is the case of the steel sector, which became one of China's "pillar industries" around 2005 (GOV.cn, 2007^[7]). There are different objectives for providing governmental financial support based on the type, size and location of each steel company. For instance, large steel firms that not only seek private profit but also advance Chinese interests - the so-called "National Champions"- mostly benefit from subsidies aimed at reducing China's dependence on foreign steel-producing firms, advancing technological capabilities, and expanding their markets abroad. Steel companies located in developing provinces in the north-eastern and western parts of China often receive financial benefits that support companies' profits, workers, and local investments, while companies located in key economic areas such as the Pearl River Delta or Special Economic zones (SEZs) in the southern Chinese regions often receive subsidies to support their infrastructure system, capacity expansion, and innovation.

The objectives of government subsidisation change over time and usually reflect national needs and local developments in the regional steel sectors. Province, county, and city level governments all utilise the National Five-Year Plans as a blueprint to design their own subsidy programs aimed at improving innovation and transformation or addressing challenges and issues affecting their local steel sectors. The Five-Year Plans offer a glimpse of how the objectives of subsidisation changed from 2008 to 2021 based on national priorities.

The 11th Five-Year Plan (2006-2010) dedicated only a small section to steel. The plan highlighted the need to fulfil domestic steel demand, accelerate the elimination of outdated steelmaking processes and improve steel quality and energy efficiency. The plan mentioned the time the need to reduce steel excess capacity²⁹, which then became a pivotal theme in the year 2016. During the 11th Five-Year Plan (2006-2010), government subsidies programs for steel companies focused on supporting energy efficiency, technological innovation, and companies located in strategic areas (GOV.cn, 2006_[8]).

In its 12th Five-Year plan (2011-2015), the government released a complete strategy to transform the steel industry. The Industrial Transformation and Upgrading Plan (2011-2015) was designed to address the challenges and opportunities faced by the steel industry. The plan continued to encourage innovation and energy efficiency but it also emphasised the relocation of steel firms outside of urban areas, cross-regional mergers and reorganisations, investments abroad, and international trade. These national policies are reflected in the large amounts of subsidies aimed at improving energy efficiency R&D and transformation during those five years but also in the growing government support for steel trade and steel raw material mining abroad (GOV.cn, 2011_[9]). Between the 11th Five-Year plan and the 12th Five-Year plan, the government strategy to encourage innovation included a series of targets to increase the production of high-grade steel products (NDRC, 2017_[10]). For instance, in 2011 the production ratio of high-strength steel bars was set to increase to reach 80% of the total production of high-strength steel bars. By 2016, the production ratio of grade 3 steel bars reached 99.6% of the total production.

In 2015, steel prices hit a record low amid severe steel excess capacity. The 13th Five Year plan (2016-2020) placed the task of tackling excess capacity as a top priority for the steel industry. During this period, a large number of subsidies aimed at resolving excess capacity, restructuring, and upgrading the steel industry were provided by Chinese government authorities. To solve the structural steel excess capacity, various Ministries released eight special policy documents designed to support steel companies during this transaction period. The main measures highlighted in those documents include the establishment of a special fund for structural adjustment of industrial enterprises by the central government, with a total scale of 100 billion yuan; preferential tax policies to support exports, energy efficiency, restructuring and bankruptcy, land transfer, and construction funds (State Taxation Administration, 2017_[11]).

China's 14th Five-Year Plan (2021-2025) for the steel industry focuses on the green transition, digitalisation, raw material supply, steel production concentration, and high-quality steel. Is it likely that during this period provincial and city governments will provide subsidies related to these areas and focus less on the reduction of excess capacity (GOV.cn, 2022_[12]).

4.1.2. Example of the Iranian forced steel sector development

The Iranian steel sector development is a striking example of strongly government-led industrial development happening in an adverse market conditions and under international sanctions. The example illustrates how the development of the domestic steel sector, once prioritised by a government for industrial development and

resilience purposes, can happen even on the back of international sanctions and adverse steel market conditions, and how subsidisation is a pervasive tool used by some government to foster such development even when simultaneously embarking in privatisation initiatives.

The steel sector figures among the top priority sectors in the Iranian 6th Economic, Social and Cultural Development Plan (2017-2021) (Islamic Republic of Iran, 2017_[13]), as well as in the current 20-Year Vision document (2005-2025) (Islamic Republic of Iran, 2005_[14]). The latter has also been complemented by the Comprehensive Program for Steel, which targets annual production output of 55 million metric tonnes (mmt) by 2025.

The Iranian steel sector is heavily controlled by the government, which owns 90% of all mines and related large institutions. The most important such institution is the Iranian Mines and Mining Industries Development and Renovation Organization (IMIDRO), which was founded in 2001. IMIDRO is a state-owned holding company that owns eight major companies, including Mobarakeh Steel Company, Isfahan Steel Co. and the National Iranian Steel Co., and approximately 30 smaller subsidiaries. As a result of the privatisation efforts (article 44 of the Constitution) undertaken by the Islamic Republic of Iran, around 20 companies previously part of IMIDRO have been privatised in the last two decades (Industrial Development and Renovation Organization of Iran (IDRO), n.d._[15]).

The state-owned Industrial Development and Renovation Organization (IDRO), established in 1967, contributes to the development of the Iranian steel sector. Similar to IMIDRO, IDRO is a state-owned corporation that previously owned more than 150 companies. Due to privatisation efforts, it is now seeking to convert its role to that of an industrial development agency. IDRO's main achievements include the establishment of numerous industrial and manufacturing enterprises to complete the national industrial chain, the direction of some nationalised heavy industries, and the implementation of key governmental projects (Sedighikamal and Talebnia, 2014_[16]).

While advancing privatisation and the participation of the private sector (Sedighikamal and Talebnia, 2014_[16]), the Iranian government is trying to maintain the upward trend in steel production and industrialisation of the country notwithstanding international sanctions, which heavily impact the steel sector (United States Department of the Treasury, 2021_[17]). Iran also sets ambitious steel export targets. For example, in 2017 the government, following the 2015 nuclear deal, announced that it had increased its export target to 20 to 25 million tonnes of steel annually by 2025, up from a previously set target of 10 million tonnes prior to the deal (Reuters, 2022_[18]). Tehran is actively creating Special Economic Zones (Government of Iran, n.d._[19]), offering tax exemptions to steel firms (Iranian Mines and Mining Industries Development & Renovation Organization (IMIDRO), n.d._[20]) and setting up and developing new steel companies and plants through the Ministry of Industry and Mines (Iranian Ministry of Industry, 2020_[21]). This latter endeavour is part of the Plan for Creation and Development of industries, mines and mining infrastructure, and receives significant amounts from the government on an annual basis, according to the Iranian government's annual budget (Iranian Plan and Budget Organization, 2020_[22]). The program also provides grants to established firms to buy machinery and equipment and is responsible for the construction of entire industrial cities.³⁰

Another program providing support to the sector is the Iranian National Development Fund, a public agency providing financial facilities both in foreign currency and in Iranian rials to selected industries in the country, among which the steel sector is explicitly mentioned. The fund operates through a complex process that mainly involves an "agent" bank and the Central Bank of Iran (National Development Fund of Islamic Republic of Iran, n.d._[23]), which arguably makes it more independent from the central government than other institutions.

The steel sector is also among the main recipients of licenses for foreign investment as provided by the 2002 Foreign Investment Promotion and Protection Act (FIPPA). Indeed, projects with Foreign Direct Investment are subject to the approval of the Foreign Investment Board. The Foreign Investment Board has recently been accepting a growing number of licenses for projects in the mining, mineral and industrial sectors, with the registered number of licenses increasing by 189% between the 2019/2020 period and the 2020/2021 period (FarsNews Agency, 2021^[24]). Projects range from investment in new companies to funding for starting particular metal production in Iran that is then given to specific companies in Iran. Although not a subsidy per se, this underlines the desire from the Iranian government to increase and modernise its steel production capacity, with an emphasis on the steel sector above and beyond that given to other sectors of the economy.

4.1.3. Example of Saudi Arabia diversification from oil revenues

Saudi Arabia is an example of an economy of rapidly growing steel production capacity due to the government's desire to promote industrial development, to diversify its economy, and to reduce its dependency on oil revenues. Saudi Arabia follows government-led industrial plans and government-set targets, related in particular to its sectorial diversification policy, and has a number of government funds whose aim is to provide incentives and subsidies to its domestic industry. Those funds play an important role in the setting up of new plants and new capacity, as they target to a large extent Saudi Arabia's domestic steel companies. Some of those public funds even have as a pre-requisite for a firm to be at least partially owned by the government in order to be a potential recipient of their subsidies, which raises the question of a level-playing field even domestically due to the link between public ownership and better access to finance and subsidies. Transparency is poor at the level of Saudi Arabia's public funds, as they do not seem to publicly disclose their annual reports or the recipients of their investments. Transparency is also poor at the recipient level, as annual reports are often not available in an online format that could be readily assessed.

Steel sector subsidisation in Saudi Arabia has been taking place within a broader framework of Saudi Arabia's attempt to diversify its economy away from oil revenues to other sectors through various actions, including through industrial development as promoted by Saudi Arabia's government plan "Vision 2030" (Kingdom of Saudi Arabia, n.d.^[25]). Industrial development stands out prominently in the National Industrial Development and Logistics Program, one of Saudi Arabia's 13 so-called "realisation programs" that describe the practical steps and processes designed to achieve the Vision 2030's objectives (Kingdom of Saudi Arabia, n.d.^[26]). Those plans are adding to, revising and revisiting the Kingdom's legislative and regulatory framework, and entail creating new schemes to help companies' financial development, and to support the development and expansion of industrial land, such as the development of Special Economic Zones and investment in technical and industrial innovation (Kingdom of Saudi Arabia, n.d.^[27]).

Within the industrial sector, mining, metals and especially steel appear to be heavily subsidised. Overall, the industrialisation of the country seems inherently government-driven under the Vision 2030 plan. Through its desk research, the Secretariat identified six main structures, instruments and funds put in place to implement this government-mandated transition:³¹

The Saudi Industrial Development Fund (SIDF): the fund is supposed to target mainly privately-owned small and medium firms. Those firms can benefit from subsidised long-term loans, which can be restructured many times before reaching maturity (Saudi Industrial Development Fund, n.d.^[28]).

The Public Investment Fund (PIF): the PIF is a much larger fund than the SIDF and can use a variety of different tools, including debt-to-equity swaps, according to Secretariat’s desk research. It is geared towards subsidising large Saudi Arabian companies, which are required to have some degree of public ownership³² to benefit from the fund (Public Investment Fund, n.d.^[29]).

The Saudi Authority of Industrial Cities and Technology Zones (MODON) leads a program (which is also called MODON) aimed at developing the industrial cities of Saudi Arabia, through the provision of subsidised leases for land and plants. The Secretariat could ascertain that numerous steel plants have been built in all the major industrial cities (Jazan, Rabigh, Riyadh, Jubayl, and Jeddah) under this particular programme.

After lifting export bans on steel, the **Saudi Fund for Development (SFD)** has been taking on the management of the **Saudi Export Program (SEP)**, which aims at supporting Saudi exporters through lines of credit either on all transactions of their company or on a single transaction. The steel sector is one of the main recipients of the program (Saudi Fund for Development, 2019^[30]).

The **National Industrial Development Center (NIDC)** has been established under the supervision of the Ministry of Commerce and Investment and the former Ministry of Energy, Industry and Mineral Resources. It is an entity working alongside other agencies, such as MODON, to identify gaps and necessities within the industrial sector in the Kingdom and it offers investment incentives for investors. So far, it has identified 40 finished or semi-finished steel products that need to be domestically produced in the Kingdom through vertical and horizontal expansion of firms in order to achieve the Vision 2030’s diversification targets. The website of the NIDC contains an advertisement for an investment opportunity to build a steel plant with subsidised loans through the SIDF, an extension of the grace period for the repayment of the aforementioned loans by two years and many other benefits (Industrial Clusters, n.d.^[31]).

The **Ministry of Human Resources** is providing grants for increasing the “Saudisation” of the labour force. It applies to steel and all other industrial sectors.

4.2. National contexts are influenced by broader international contexts differently

There is evidence that international contexts also shape national policymakers’ perspectives and priorities. Two main international forces can shape a country’s perspective and national context: the tension between a country’s main developmental goals for its steel sector and the potential for its provision of subsidies to trigger steel trade disputes, on the one hand, and the adherence to coordinated efforts to face global societal challenges or to reduce the use of subsidies.

Some countries that try to strike a balance between subsidisation and potential WTO cases often do not have much incentive to be transparent about the subsidies they provide to their steel sector, and information sources for them are more geared towards trade and trade disputes. This seems to be the case of Indonesia, where most of the media sources that could be relevant for collecting information on subsidies seem related to trade and trade disputes. On such economies, the information that could be gathered concerning potential subsidies to their steel sector is very limited.

Other economies take a more open approach to the global steel context by participating in the international discussions impacting steel to better position themselves with respect to their trade partners and on relevant global challenges that could affect their domestic steel industries. Viet Nam is quite a remarkable example of international context impacting domestic steel industry, as this emerging economy positioned itself in the international

discussions related to environment and steel greening relatively early and its steel sector could benefit from subsidies from development agencies outside Viet Nam and from other foreign governments. Transparency is understandably greater for those subsidies provided internationally and linked to the greening agenda than for domestic ones.

4.2.1. Example of Indonesia's balancing act between building up capacity and potential WTO cases

Subsidies to steel firms in Indonesia essentially result from the government's desire to climb up the value-chain and the resulting government role in actively promoting and incentivising the development of its domestic steel industry through trade policies and infrastructure development programmes (Badan Pusat Statistik, 2020_[32]).

Indonesia's subsidy policy toward the steel sector is interwoven with measures that promote import substitution to protect its domestic metal industries. The idea is to substitute imports of high-value steel products for domestically produced steel using a mix of export restrictions for raw material that increase availability and decrease price of steel raw material for the domestic industry, re-directing mining from exports to domestic consumption, defensive trade measures, and more direct government support through subsidies. The example of Indonesia's 2017 WTO shows how international rules can at some time help decrease the use of such instruments when they affect international trades to such degree.

In November 2017, the Indonesian steel industry urged the Indonesian government to implement further anti-dumping duties on steel imports to shield its domestic steel producers from lower-priced imports (Kontan, 2017_[33]), (Industry.co.id, 2017_[34]). Although the government eventually implemented some protective measures, such as safeguard duties and tariff increases for steel products, including flat products, some measures were disputed by several countries. The disputes were mediated by the WTO Dispute Settlement Body (DSB). The WTO DSB recommended that Indonesia remove its safeguard measures (World Trade Organization, 2019_[35]), which Indonesia did in 2019. Indonesian steel associations nevertheless continue to seek protection from the government a subject that is often debated among Indonesia's steel sector stakeholders (Reuters News, 2019_[36]). Recently, Indonesia entered another trade dispute regarding its ban on the export of nickel ores and concentrates. The intended purpose of the ban, as noted in high-level political statements, was to promote the development of the stainless steel industry and other downstream industries.³³ WTO rules are necessary, as sometimes, like in this recent case, countries cannot find a mutually agreeable settlement bilaterally.

4.2.2. Example of Viet Nam insertion into the green agenda

The example of Viet Nam is provided to illustrate the case of an emerging economy that has known to quickly adopt a green agenda, restructuring its programme around greening and decarbonisation, and benefitting from international support from other economies' initiatives in greening.

In Viet Nam, political power remains very centralised at the central government level, with the Communist Party of Viet Nam having decisive influence over both the executive and legislative bodies. The National Assembly is responsible for approving and supervising the implementation of state plans (Nachmany et al., 2015_[37]), which are linked to the provision of subsidies towards the steel sector. Those plans have been geared towards over-arching environmental goals such as the greening of the economy, investments in energy-saving technologies, and so-called sustainable production.

As early as 2015, Viet Nam signed an updated version of the Nationally Determined Contributions (NDC) to reduce Green House Gas (GHG) emissions at the COP 21 in Paris. These NDCs explicitly list “industrial process” as a key area for which GHG targets have to be reached in order to mitigate the effects of and adapt to climate (Yurnaidia et al., 2021^[38]). Overall, the government has increasingly emphasised the industry’s need to comply with environmental standards (International Trade Administration, 2019^[39]). The development of general new technology makes, in theory, both domestic and foreign steel companies eligible for public support and subsidies (OECD, 2021^[40]).

The government issues so-called Sustainable Development Goals (SDGs), which are then translated into a number of State Plans and National Strategies related to the implementation of sustainable development (Switchasia, 2020^[41]). The OECD Steel Secretariat considers that the most relevant plans and strategies in terms of their potential for subsidising the steel sector are:

The National Strategy for Sustainable Development 2011-2020, of which the Ministry of Planning and Investment is responsible, and whose goal is to provide funding to companies through ministries, agencies, relevant organisations and localities to help them pursue sustainable development in the industrial sector. The strategy also intends to proactively prevent and handle industrial pollution, to develop “green industry”, and to speed up high-tech technological development in large cities.

The National Strategy on Green Growth, which sets carbon emissions reduction targets, and proposes a framework for monitoring, evaluation and reporting on carbon emissions, as well as the progressive move towards an emission trading system (ETS), which came into place in early 2022.

The Strategy on Cleaner Industrial Production, which aims to provide technical assistance, to facilitate the installation and operation of energy-saving technologies and the financing mechanism for green industrial production allowed by the strategy. The Strategy has been widely implemented across 63 provinces and municipalities, with more than 9,000 enterprises in the mining, steel manufacturing, food and beverage, chemical, and construction sectors benefiting from it.

The National Action Plan (NAP) on Sustainable Production and Consumption, which aims to inform implementing partners about proactive ways to stimulate sustainable production and consumption through eco-innovation.

Vision 2025 and 2050, whose goal is to help economic restructuring that reduces the carbon print of the most energy-intensive industries and develops energy-efficient processes.

The Viet Nam Steel Industry Development Plan for the period of 2007-2015, with a vision to 2025. The goal of this plan is to support the steel industry’s transition towards producing steel from domestic iron ore, increasing the self-sufficient steel production processes, improving steel quality, and reducing dependency on foreign raw materials.

In each of these long-term state plans, the steel industry stands out as one of the key beneficiaries of the subsidies entailed, sometimes alongside other sectors deemed strategic such as mining, food and beverage, and textiles. The steel industry is mostly being supported with the stated aim to transition to cleaner and more energy efficient and sustainable production processes, or to become more resilient in the long term.

In its efforts to reach those two aims, the government has mobilised vast amounts of state funding. Still, due to public finance constraints, the majority of financing seems to be actually sourced from official development assistance (ODA) by international bodies such as the World Bank, the Asian Development Bank (ADB), or the EU and country-level

donors such as Japan, Germany, Australia, the United States, France, Belgium and the Netherlands (ESMAP, 2017_[42]).³⁴

For the steel sector, the implementation of the various Strategies and Plans described above translates into the government of Viet Nam and ODA financially supporting: i) the transition to more efficient steel production processes; ii) the transition to greener energy sources for steel plants; as well as iii) implementation of emissions and wastewater treatment systems (Viet Nam News, 2020_[43]) (Tech Monitor, 2016_[44]). Steel firms that invest in solar and/or wind energy systems, or develop, buy and install technology favouring more efficient or sustainable production processes, often become eligible for government support. Government support can take a variety of forms, the most common being subsidised loans, grants, tax cuts/exemptions/deferrals, and reductions in land and water surface lease fees.³⁵ Furthermore, if a steel company is operating in a location with socio-economic difficulties, is located in a specifically designated industrial zone/park, provides material/products for an important infrastructure/manufacturing project, or produces high-quality/high-technology products, then it is eligible for tax incentives such as exemptions from or reductions in the corporate income tax (CIT) (KPMG, 2021_[45]). This raises concerns regarding the emergence of so-called “zombie firms” as well as issues related to maintaining potentially inefficient capacity in operation, thus contributing to global steel excess capacity.

4.3. Complex institutional setting of government-led agencies increase the propensity to subsidise steel firms and decrease transparency

The more complex the institutional setting and constellation of government-owned or government-related agencies, the less transparent and more likely the provision of subsidies to the steel sector. The effect of complexity in institutional settings can be seen with the interplay of different levels of governments, illustrated by the case of China, but even more importantly in the relationships of government-controlled agencies related to the provision of subsidised loans in the Iranian steel sector.

4.3.1. Different levels of government can sharply decrease transparency while affecting subsidy distributions

For example, in China the funds from the central government are usually allocated to provincial governments, which then distribute them to local authorities in their economies. This mechanism of subsidisation has often led to the misappropriation of subsidy funds. In the past, some of the funds meant for local governments were used for provincial government projects, leaving a smaller pool for city and county level authorities. To address this issue, in 2020 the Chinese central government released a plan to channel its stimulus funding directly to cities and counties, however, it has yet to reveal details of how the system will work or the criteria that will be used for distributing funding.

4.3.2. Complex institutional structure and ownership links decrease transparency

For example, Iran’s budget law highlights a continuous flow of cash injections to the Steel Workers’ Pension Fund, to support the distribution of pensions. However, because the Steel Workers’ Pension Fund happens to own steel firms, the capital provided could also be potentially aimed at rescuing those companies. Normally, the fund should derive its funding to pay for its liabilities from the steel firms it owns. In practice, the injections may be a way to maintain some steel firms afloat through their owner. Even if the funds injected into the Steel Workers’ Pension Fund are not passed directly to the steel firms owned by the fund,

they would allow the pension fund to be satisfied with a lower return from its ownership of the steel firms, which would also represent a subsidy from the point of view of the scope of the Secretariat's subsidy exercise – as it provides a benefit to steel firms that can keep a higher proportion of their profits instead of providing a higher return on equity to their owner.

Another example are Iranian state banks, which were given incentives to lend to steel firms at below market rates in return for having their debt towards the government cancelled. The Iranian Bank for Industry and Mines is a state-owned specialised bank offering financial services to companies in the steel sector through subsidised rates. The bank itself owns shares of some of the companies it subsidises (Bank for Industry and Mines, 2019^[46]). The debts of IMIDRO and IDRO, the two government agencies mentioned in Section 6.1.2 to the government were partially erased in exchange for their financing of the Bank for Industry and Mines. The debt forgiveness provided to IMIDRO and IDRO enabled the Bank for Industry and Mines to provide subsidised loans to Iranian steel firms.

4.4. Opaque financial schemes can lead to increased subsidisation without the public scrutiny

Governments, independently from their institutional settings, can be creative in designing instruments that are complex and opaque and have the potential of carrying vast amounts of subsidisation without the public knowing it.

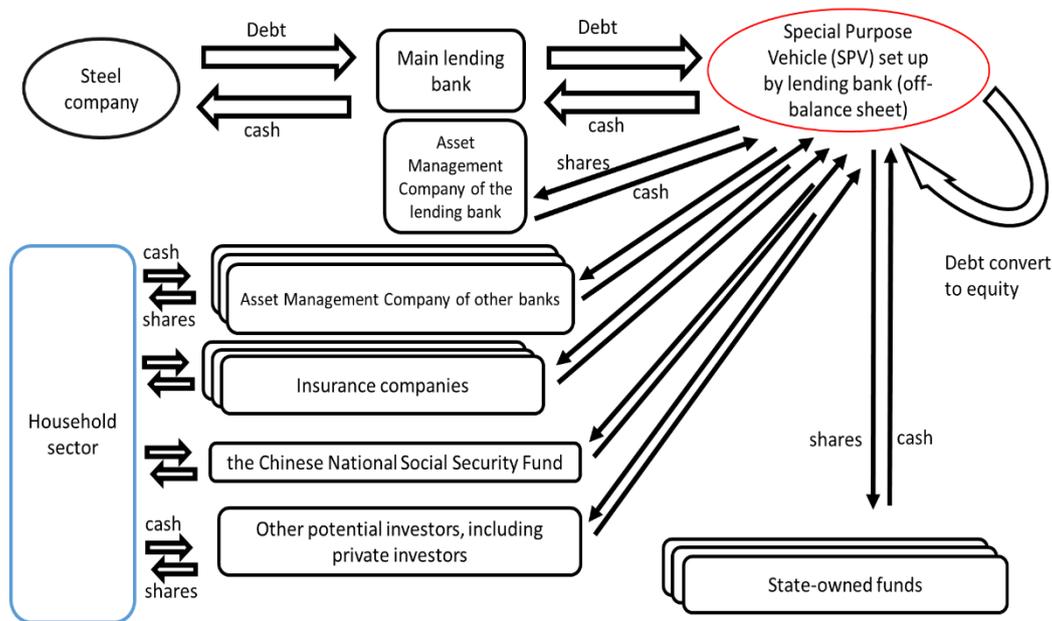
For example, debt-to-equity swaps can be market-based, for instance through the selling of convertible debt that becomes equity under some pre-determined conditions, but Chinese debt-to-equity swaps, favoured by regulators and policymakers in China, were used as an expedient policy tool to quickly deleverage heavily indebted companies, particularly in the steel sector.³⁶ The market scrutiny on the financial structured products created by those schemes is, to say the least, very limited.

Throughout the years, China's regulators issued a number of guidelines to establish a framework for debt for equity swaps (Wan, 2018^[47]). Those guidelines evolved over time with Chinese debt-to-equity swaps moving away from direct government intervention to help lending banks and SOEs (such as in the case of Sinosteel³⁷) and becoming more complex schemes qualified as “market-oriented” by the official guidelines. **Chinese debt-to-equity swaps have diffused the risks and losses of large lenders to steel firms both inside and outside the Chinese financial system without involving any direct government cash flow** (Pang and Herrero, 2016^[48]). Previously highly leveraged steel firms benefited from the scheme by possibly avoiding bankruptcy, or at least a significant restructuring, while continuing to receive financing from their same lenders without any business disruption.

According to Natixis, only RMB 165 billion (USD 24.4 billion) out of the RMB 884 billion (USD 130.7 billion) (15.7%) of announced debt-to-equity swaps have been implemented as of February 2018 (Herrero and Gary, 2018^[49]). OECD desk research found 7 instances of large debt-to-equity swaps from 2016 to 2017, totalling RMB 165 billion (USD 24.4 billion). In total major 3 banks were involved in the transaction, namely, China Development Bank, China Construction Bank and the Industrial and Commercial Bank of China. In some cases, minor banks also participated in the debt restructuring agreement. Sinosteel was the largest the steel firm that underwent debt restructuring through debt-to-equity swaps. In 2016, Sinosteel Group signed an agreement with 6 banks to carry out an overall debt-to-equity swap worth RMB 60 billion (USD 9.03 billion) (GOV.cn, 2016^[50])

The State Council issued a guideline on 22 September 2016 that forbids Chinese banks to hold equity stakes of corporates facing financial difficulties (Pang and Herrero, 2016^[48]). According to this guideline, to carry out a debt for equity swap, the banks owning distressed debt from steel firms would set up a Single Purpose Vehicle (SPV) entity, which will act as the “fund” or “implementing agency”, and sell their distressed debt to it. The debt thus leaves the balance sheet of the bank, since the SPV’s balance sheet does not consolidate at the bank level (off-balance sheet accounting). Future transactions between the fund and its final investors are also off-balance sheet from the point of view of the initiating bank. This entails significant capital relief for the bank since it does not have to provision its distressed debt. Conversion from debt to equity only occurs after the debt is sold to the SPV, and within the SPV.³⁸ As the SPV is set up by the bank itself, questions can arise about the independent character of the negotiation on the price of the defaulting bank debt the SPV is buying from the bank.

Figure 15. Debt-to-equity swaps were used to diffuse the default risk of steel companies throughout the economy, through state-owned funds and households welfare products



There is evidence that the SPV buys the debt at par value, rather than at a discount (Pang and Herrero, 2016^[48]), which implies the bank is not taking any monetary or accounting loss when selling the distressed debt to its own SPV. Future losses and financial risks are passed to end-investors further down the scheme below). That the price of the shares computed for the conversion is based on the market price for the stock or of similar prices for other companies if the company is not listed (China Business Intelligence, 2016^[51]) does not address the basic fact that the SPV bought the steel company’s distressed debt above market price (Pang and Herrero, 2016^[48]).³⁹

End-investors in the new Chinese debt-to-equity swaps are those who buy shares of the fund (figure below). In practice, they are:

- **The originating bank itself**, through its participation in its own fund/implementing agency. This participation is accounted for in the trading book of the bank through its Asset Management Company (AMC), rather than in its

lending book. Moreover, based on a number of individual deals, Natixis estimated that banks retained only a mere 4% of the total amount of debt-to-equity swaps through their own AMCs (Herrero and Gary, 2018^[49]). Hence, the scheme entails important capital reserve savings for banks, which do not need to provision risky loans and mostly off-load them to the fund and clean their balance sheet.

- **AMCs other than the originating bank** (34%). Those are mainly the three large AMCs created by China in the 1990s to clean up bad loans in its banking sector, namely, *China Huarong*, *Cinda*, and *Orient and Great Wall*.
- **Insurance companies** (30%); and
- **State-owned funds** (27%), in particular:
 - *The China Structural Reform Fund*; it is formed by 10 SOEs. The fund's aim is to allocate 80% of its assets to restructuring of SOEs directly with equity or through investment in funds, as well as to provide credit to SOEs.
 - *The China State-owned Capital Venture Investment Fund*, which has the largest involvement in debt-to-equity swaps. The key purpose of the fund is to support innovation and industrial upgrading.
 - *The Guohua Military and Civilian Integration of Industrial Development Fund*, whose aim is to support the strategic military industry and central SOEs, as part of the 13th Five-Year Plan.

Other potential investors, including **private investors**, **the National Security fund**, and **the targeted SOE itself** (Pang and Herrero, 2016^[48]).

Although under Regulation 82 of the China Banking Regulation Commission (CBRC), non-performing loans are not allowed to be sold directly or indirectly to households (Pang and Herrero, 2016^[48]), the regulation may be circumvented by the scheme as it is the fund (the SPV), and not the bank, which will transfer the risk to its end-investors (Pang and Herrero, 2016^[48]). Hence, the risk and potential future losses are diluted through the financial system and beyond it, with depositors and households bearing the ultimate risk. For example, the Postal Saving Bank of China has few non-performing loans (twice less than the sector average in Q3 2017) and a solid deposit base, but is the owner of 35% of the *China Structural Reform Fund* and the *China State-owned Capital Venture Investment Fund*, and hence an important end-investor in the debt-to-equity schemes (Herrero and Gary, 2018^[49]).

The beneficiaries of the scheme are:

- i) **the borrower** (the indebted steel company, usually an SOE), which avoids the difficulty of having to repay its debt while reducing its indebtedness at a very low cost; and
- ii) **the lender** (the bank, usually an SOE), which does not have to set aside capital for provisioning its distressed loans nor does it have to take any significant loss on the value of its loans.

The scheme does not seem to provide borrowers with the proper incentives to adopt a more prudent approach with respect to debt, nor does it seem to steer lenders towards more prudent credit-risk management practices. Hence, it fails to instil market discipline that would enforce long-term structural change and capital efficiency. On the contrary, it is the rest of the financial system, including the cash-rich banks, and ultimately, the households, which will bear the debt's market and default risks (Pang and Herrero, 2016^[48]). Within the company management, little change or re-organisation can be expected from the new

diluted and non-expert shareholders. The reduced debt-level of the company would enable it to obtain new loans from its main lenders, thus falling short of the deleveraging goal and perpetuating an over-reliance on debt. The newly obtained loans can be used to modernise equipment, expand capacity or even pay for operating costs during downturns.

Because of the complexity of the scheme, the lack of information concerning the bank sales to its SPV, and the absence of direct government intervention, it may not be obvious that Chinese debt-to-equity swaps are a form of subsidy to the steel firms. There are multiple benefits attached to debt-to-equity schemes for concerned steel firms. First, they are not forced to restructure, as its excessive debt simply gets converted into equity at the current price of its equity at a convenient price for the banks. Second, their usual lenders (i.e. banks) are relieved from their capital ratio requirements and do not need to provision the steel company's debt anymore, thus freeing more resources to provide steel firms with fresh loans. Third, participating steel firms avoid being indicated as a failing firm to the parties it has commercial relations with (raw material suppliers, downstream consuming industries, infrastructure procurements, etc.), which could have prompted other market players to re-negotiate contractual terms or some clauses of existing contracts to be activated.

4.5. Upstream and downstream sectors do impact steel subsidisation and its transparency

As any industry, the steel sector is impacted by what happens both at the level of the sectors that provides its inputs and energy, and by the downstream sectors which depend on it for their output. When subsidies can be passed on further the upstream sectors to steel firms, the sector is being subsidised in an indirect way that is more difficult to assess. Similarly, when demand is made exceptionally high by artificial means, steel firms can benefit from higher prices and higher demand for their product.

4.5.1. Governments can lower cost of the raw materials for steel

For example, in Indonesia between 2012 and 2014, the government gradually introduced an export ban on unprocessed metal ores as well as some anti-dumping and safeguard import duties on finished steel products. This had the effect of securing large supplies of metal resources for the domestic steel industry and encouraged miners to build smelters and move up the value-chain, i.e. shifting from exports of raw materials to higher value finished products (Kementerian Perdagangan Republik Indonesia, 2015^[52]).

In Iran, there has been a strong government involvement in reducing the input costs for steel firms and increasing the volume of mineral extraction. Indeed, insufficient mineral extraction has been identified as the main hindering factor for reaching the steel production goal set by the government for 2025 (55 mmt of steel production annually), making the development of the mining sector a government priority in the short-term. In particular, the government is now granting licenses for mineral exploration purposes to individual or legal persons for unexplored areas of the country, conditional on approval by the Ministry for Industry and Mines. Indeed, according to the Iranian Mine Law, the sovereignty of mines is vested by the aforementioned Ministry, which is also in charge of issuing exploration, and, subsequently, exploitation licenses. Economic incentives are also offered to sustain the exploration process, which is considered crucial for the country's development.

Subsidy reform stands out prominently among the latest endeavours of the country (Guillaume, Zytek and Farzin, 2011^[53]). For example, Iran used to subsidise both energy and food products for its citizens and industries. The Organization for Targeted Subsidies has been established to control the reform process, which, however, is being implemented

at a very slow pace. The industrial and mining sectors, to which the steel sector belongs, are among those sectors of the economy that are still allowed to receive subsidies to a certain extent, for instance subsidised water and lower-than-market energy prices, as provided by Article 39 of the 6th Development Plan.

4.5.2. Demand-side instruments can increase demand for domestic steel

Demand-side instruments, such as opaque rules for public procurement or public procurement that favour domestic steel in an unconditional manner, are national features that clearly benefit the domestic steel industry by increasing demand for its output, to the detriment of foreign competitors.

For example, public procurement in Viet Nam is a large and ever-expanding market, since the government has kept putting forward new construction projects for critical infrastructure such as roads, bridges, airports, schools and hospitals, all of which increase demand for steel (Jeon, 2019^[54]). Although the government indicates a particular emphasis on green public procurement, as described in 6.2.2, it seems that clear compulsory regulations and standards are still missing (Switchasia, 2020^[41]). More importantly regarding the provision of subsidies to the steel sector, Directive 494/CT-TTg (Government of Vietnam, 2010^[55]), which was issued in 2010 but appears to still be in force, states that authorities and state enterprises should only call for international tenders on publicly financed projects when domestic companies are not able to meet the qualifications to bid (The International Trade Administration, 2019^[56]). This creates a reserved procurement market for domestic firms and represents a subsidy from the viewpoint of the Secretariat's subsidy exercise, as it artificially boosts the demand for a domestic steel firm's output compared to foreign firms, thus conferring a benefit to that firm. According to the Secretariat's desk research, there is little transparency on specific procurement conditions and outcomes online.

5. Conclusion

This paper presents key highlights on the subsidisation to the steel sector and the contexts surrounding it. The OECD data collection exercise, in spite of an overall limited transparency concerning the provision of subsidies to steel firms in many economies, underlines levels of subsidisations multiple times higher in non-OECD countries than in OECD countries for instruments of comparable transparency such as cash grants, cash awards and cost refunds - even when considered relatively to the tonne of crude steel production capacity. Subsidised loans, equity infusions and debt-to-equity swaps are commonly used to channel subsidies towards steel firms.

Furthermore, trends in subsidisation do not appear to have abated in spite of the current excess capacity context. National context surrounding the provision of subsidies have a significant impact on both a economy's propensity to subsidise its steel industry, and the transparency surrounding such subsidisation. Some economies have prioritised the development of their domestic steel industry by setting hard targets for crude steel production, export or concentration, sometimes irrespectively of the overall international context. Other economies have participated in international coordination to tackle global societal challenges related to the greening agenda and decarbonisation of the steel industry, and better positioned their steel firms as recipients of green subsidies.

Going forward, the OECD Steel Committee will continue to work to improve transparency through data collection on the provision of subsidies, with the aim to provide a meaningful basis for policymakers to discuss subsidies and their interplay with market-based conditions, excess capacity, and societal challenges. Ultimately, this work can help further the Steel Committee's understanding of the impact that various forms of government support have on the health and competitiveness of the steel industry by carrying out multifactorial analysis on the impact of subsidisation on decarbonisation and excess capacity, using the rich panel data collected.

References

- Badan Pusat Statistik (2020), *Pendapatan Nasional Indonesia 2015-2019*, [32]
<https://www.bps.go.id/publication/2020/06/12/7fe8d749c43bad46b1601662/pendapatan-nasional-indonesia-2015-2019.html> (accessed on 21 June 2021).
- Bank for Industry and Mines (2019), *1398 Annual Report*. [46]
- China Business Intelligence (2016), “Guiding Opinions on the Conversion of Creditor’s Rights of Market-oriented Banks”, [51]
<https://www.askci.com/news/finance/20161010/16023968514.shtml>.
- Criscuolo, C. and G. Lalanne (2022), “An industrial policy framework for OECD countries: Old debates, new perspectives”, *OECD Science, Technology and Industry Policy Papers, No. 127*, OECD Publishing, Paris, <https://doi.org/10.1787/0002217c-en> (accessed on 26 July 2022). [1]
- Criscuolo, C. and G. Lalanne (2022), “Are industrial policy instruments effective? : A review of the evidence in OECD countries”, *OECD Science, Technology and Industry Policy Papers, No. 128*, OECD Publishing, Paris, <https://doi.org/10.1787/57b3dae2-en> (accessed on 26 July 2022). [2]
- ESMAP (2017), *Reforming Fossil Fuel Subsidies for a Cleaner Future*, [42]
<https://www.esmap.org/reforming-fossil-fuel-subsidies-for-a-cleaner-future> (accessed on 22 June 2021).
- FarsNews Agency (2021), *Iran’s FDI Shows Nearly 190% Growth*, FarsNews Agency, [24]
<https://www.farsnews.ir/en/news/14000317000262/Iran%E2%80%99s-FDI-Shws-Nearly-90-%D8%AF%D8%B1%D8%B5%D8%AF-Grwh> (accessed on 21 June 2021).
- GFSEC (2017), *Global Forum on Steel Excess Capacity Berlin Ministerial Report*, GFSEC, Berlin, https://www.bmwi.de/Redaktion/EN/Downloads/global-forum-on-steel-excess-capacity-report.pdf?__blob=publicationFile (accessed on 10 August 2020). [3]
- GOV.cn (2022), *钢铁业控量提质优结构_滚动新闻_中国政府网*, [12]
http://www.gov.cn/xinwen/2022-02/11/content_5673008.htm (accessed on 28 July 2022).
- GOV.cn (2016), *Sinosteel Group’s debt restructuring of more than 60 billion yuan settled_Rolling News_China Government Network*, http://www.gov.cn/xinwen/2016-12/09/content_5145790.htm (accessed on 29 July 2022). [50]
- GOV.cn (2011), *关于印发《钢铁工业“十二五”发展规划》的通知*, [9]
http://www.gov.cn/zwjk/2011-11/07/content_1987459.htm (accessed on 28 July 2022).
- GOV.cn (2007), *曾培炎：钢铁工业是节能减排潜力最大的行业之一*, [7]
http://www.gov.cn/wszb/zhibo55/content_599250.htm (accessed on 28 July 2022).

- GOV.cn (2006), *中华人民共和国国民经济和社会发展第十一个五年规划纲要_2006 年第 12 号国务院公报_中国政府网*, http://www.gov.cn/gongbao/content/2006/content_268766.htm (accessed on 28 July 2022). [8]
- Government of Iran (n.d.), *Free and Special Zones* | *برگه خدمات مناطق آزاد و ویژه ایران*, <https://freezones.ir/en/freezones> (accessed on 21 June 2021). [19]
- Government of Vietnam (2010), *Chỉ thị 494/CT-TTg sử dụng vật tư, hàng hóa sản xuất trong nước trong công tác đầu thầu các dự án đầu tư sử dụng vốn nhà nước*, <https://thuvienphapluat.vn/van-ban/Dau-tu/Chi-thi-494-CT-TTg-su-dung-vat-tu-hang-hoa-san-xuat-trong-nuoc-trong-cong-tac-dau-thau-cac-du-an-dau-tu-su-dung-von-nha-nuoc-104406.aspx> (accessed on 14 June 2021). [55]
- Guillaume, D., R. Zytek and M. Farzin (2011), *Iran – The Chronicles of the Subsidy Reform*, International Monetary Fund. [53]
- Herrero, A. and N. Gary (2018), *Debt-to-equity swaps: China’s ‘matryoshka’ strategy to clean up banks*, <http://www.research.natixis.com>. [49]
- IMF et al. (2022), *Joint report urges greater international cooperation on subsidies data, analysis, and reform*, <https://www.oecd.org/trade/international-cooperation-subsidies/> (accessed on 21 June 2022). [57]
- Industrial Clusters (n.d.), *Steel Plate* | *NIDC*, <https://www.ic.gov.sa/en/industries/minerals-metals/investment-opportunities/steel-plate/> (accessed on 21 June 2021). [31]
- Industrial Development and Renovation Organization of Iran (IDRO) (n.d.), *Industrial Development and Renovation Organization of Iran (IDRO)*, http://www.idro.ir/en-us/About/Pages/About_Us.aspx (accessed on 21 June 2021). [15]
- Industry.co.id (2017), *Pengusaha Desak Pemerintah Tinjau Kebijakan Impor Baja Ringan*, <https://www.industry.co.id/read/20963/pengusaha-desak-pemerintah-tinjau-kebijakan-impor-baja-ringan> (accessed on 21 June 2021). [34]
- International Trade Administration, U. (2019), *Environmental and Pollution Control Equipment and Services*, <https://www.trade.gov/knowledge-product/vietnam-environmental-and-pollution-control-equipment-and-services> (accessed on 22 June 2021). [39]
- Iranian Mines and Mining Industries Development & Renovation Organization (IMIDRO) (n.d.), *2nd Iran Mines and Mining Industries Summit*, http://imidro.gov.ir/parameters/imidro/modules/cdk/upload/content/general_content/216/14844805897047ber9qj6malrg2rb07lnbenom7.pdf (accessed on 21 June 2021). [20]
- Iranian Ministry of Industry, M. (2020), *1399 Annual Report*. [21]
- Iranian Plan and Budget Organization (2020), *1399 Budget Law*. [22]
- Islamic Republic of Iran (2017), *Law of the Sixth Economic, Social and Cultural Development Plan (1396-1400)*, <https://policy.asiapacificenergy.org/sites/default/files/Sixth%20Five-Year%20Development%20Plan%20%282016-2021%29%20%28FA%29.pdf> (accessed on 21 June 2021). [13]

- Islamic Republic of Iran (2005), *20 Year National Vision*, <https://irandataportal.syr.edu/20-year-national-vision> (accessed on 21 June 2021). [14]
- Jeon, K. (2019), *Vietnam's Steel Industry: Characteristics and steel demand forecast*, POSCO Research Institute, https://posri.re.kr/files/file_pdf/82/16022/82_16022_file_pdf_1567402545.pdf (accessed on 22 June 2021). [54]
- Kementerian Perdagangan Republik Indonesia (2015), *Analisis Kebijakan Pengamanan Perdagangan Produk Besi Baja Nasional*, http://bppp.kemendag.go.id/media_content/2017/08/Analisis_Kebijakan_Pengamanan_Perdagangan_Produk_Besi_Baja_Nasional.pdf (accessed on 21 June 2021). [52]
- Kingdom of Saudi Arabia (n.d.), *National Industrial Development and Logistics Program - Vision 2030*, <https://www.vision2030.gov.sa/v2030/vrps/nidlp/> (accessed on 21 June 2021). [27]
- Kingdom of Saudi Arabia (n.d.), *Vision 2030 Overview*, <https://www.vision2030.gov.sa/v2030/overview/> (accessed on 21 June 2021). [25]
- Kingdom of Saudi Arabia (n.d.), *Vision Realization Program - Vision 2030*, <https://www.vision2030.gov.sa/v2030/vrps/> (accessed on 21 June 2021). [26]
- Kontan (2017), *IISIA Minta Pemerintah Lindungi Industri Baja*, <https://industri.kontan.co.id/news/iisia-minta-pemerintah-lindungi-industri-baja> (accessed on 21 June 2021). [33]
- KPMG (2021), *Investing in Vietnam. Redrawing the horizon. 2021 and beyond*, <https://assets.kpmg/content/dam/kpmg/vn/pdf/publication/2021/Investing-in-Vietnam-2021.pdf#> (accessed on 14 June 2021). [45]
- Nachmany, M. et al. (2015), *CLIMATE CHANGE LEGISLATION IN VIETNAM. The 2015 Global Climate Legislation Study. A Review of Climate Change Legislation in 99 Countries*, Grantham Institute, <http://www.lse.ac.uk/GranthamInstitute/legislation/> (accessed on 22 June 2021). [37]
- National Development Fund of Islamic Republic of Iran (n.d.), *National Development Fund of Islamic Republic of Iran - Procedures*, <http://en.ndf.ir/Information-Center/Procedures> (accessed on 21 June 2021). [23]
- NDRC (2017), *【钢铁工业调整升级规划（2016-2020年）】-国家发展和改革委员会*, https://www.ndrc.gov.cn/fggz/fzzlgh/gjjzgh/201706/t20170621_1196816.html?code=&state=123 (accessed on 29 July 2022). [10]
- OECD (2021), *Measuring distortions in international markets: Below-market finance*, OECD Trade Policy Papers, No. 247, OECD Publishing, <https://doi.org/10.1787/a1a5aa8a-en> (accessed on 12 July 2022). [6]
- OECD (2021), *SME and Entrepreneurship Policy in Viet Nam*, OECD Studies on SMEs and Entrepreneurship, OECD Publishing, Paris, <https://dx.doi.org/10.1787/30c79519-en>. [40]
- OECD (2019), *Budgeting and Public Expenditures in OECD Countries 2019*, OECD Publishing, Paris, <https://doi.org/10.1787/9789264307957-en>. [60]

- OECD (2019), *Measuring distortions in international markets: the aluminium value chain*, OECD Trade Policy Papers, No. 218, OECD Publishing, OECD, Paris, <https://doi.org/10.1787/18166873> (accessed on 12 July 2022). [4]
- OECD (2019), *Measuring distortions in international markets: The semiconductor value chain*, OECD Trade Policy Papers, No. 234, OECD Publishing, <https://doi.org/10.1787/8fe4491d-en> (accessed on 12 July 2022). [5]
- OECD (2018), *OECD Business and Finance Outlook 2018*, OECD Publishing, Paris, <https://dx.doi.org/10.1787/9789264298828-en>. [58]
- OECD (2015), *OECD Recommendation on Public Procurement*, <https://www.oecd.org/gov/public-procurement/OECD-Recommendation-on-Public-Procurement.pdf> (accessed on 13 July 2022). [59]
- Pang, I. and A. Herrero (2016), “Who pays for the free lunch? The ultimate risk bearer of China’s debt-to-equity swaps”. [48]
- Public Investment Fund (n.d.), *About PIF*, <https://www.pif.gov.sa/en/Pages/About-PIF.aspx> (accessed on 21 June 2021). [29]
- Reuters (2022), “Iran aims for annual steel exports of 20-25 million tonnes by 2025”, <https://www.reuters.com/article/iran-steel/iran-aims-for-annual-steel-exports-of-20-25-million-tonnes-by-2025-idINL8N1FY3KV> (accessed on 19 August 2022). [18]
- Reuters News (2019), *Indonesia business urges govt to raise tariffs on China steel* | Reuters, <https://www.reuters.com/article/indonesia-steel-idUSL4N24D13J> (accessed on 21 June 2021). [36]
- Saudi Fund for Development (2019), *2019 Annual Report*. [30]
- Saudi Industrial Development Fund (n.d.), *About SIDF*, <https://www.sidf.gov.sa/en/AboutSIDF/Pages/AboutUs.aspx> (accessed on 21 June 2021). [28]
- Sedighikamal, L. and G. Talebnia (2014), “A Review of Privatization in Iran”, *International Journal of Management, Accounting and Economics*, Vol. 1/1, pp. 81-92, <http://www.ijmae.com> (accessed on 21 June 2021). [16]
- Shui5.cn (2003), *国办发[2003]103号国务院办公厅转发发展改革委等部门关于制止钢铁电解铝水泥行业盲目投资若干意见的通知[全文废止] 税屋——第一时间传递财税政策法规!*, <https://www.shui5.cn/article/06/131359.html> (accessed on 19 August 2022). [61]
- State Taxation Administration (2017), *关于做好2017年钢铁煤炭行业化解过剩产能实现脱困发展工作的意见*, <http://www.chinatax.gov.cn/n810341/n810755/c2665717/content.html> (accessed on 28 July 2022). [11]
- Switchasia (2020), *Vietnam > Southeast and East Asia* | SWITCH-Asia. SCP Context, <https://www.switch-asia.eu/countries/southeast-asia/vietnam/> (accessed on 22 June 2021). [41]
- Tech Monitor (2016), *Vietnam’s strategy on cleaner industrial production to 2020*, <http://www.unep.org/ecoinnovationproject/> (accessed on 22 June 2021). [44]

- The International Trade Administration, U. (2019), *Vietnam - Trade Barriers*, [56]
<https://www.trade.gov/knowledge-product/vietnam-trade-barriers> (accessed on 11 June 2021).
- United States Department of the Treasury (2021), *Treasury Sanctions Key Actors in Iran's Steel Sector* | U.S. Department of the Treasury, <https://home.treasury.gov/news/press-releases/sm1226> (accessed on 21 June 2021). [17]
- Viet Nam News (2020), *Technology transformation needed for cleaner production*, [43]
<https://vietnamnews.vn/environment/816233/technology-transformation-needed-for-cleaner-production.html> (accessed on 22 June 2021).
- Wan, F. (2018), *New Rules Aim to Boost Debt-to-Equity Swaps*, [47]
<https://www.caixinglobal.com/2018-07-02/new-rules-aim-to-boost-debt-to-equity-swaps-101289969.html>.
- World Trade Organization (2019), *DS496: Indonesia — Safeguard on Certain Iron or Steel Products*, https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds496_e.htm (accessed on 21 June 2021). [35]
- Yurnaidia, Z. et al. (2021), *ASEAN Climate Action: A Review of Nationally Determined Contributions Updated in 2020*, ASEAN Centre for Energy, [38]
<https://aseanenergy.sharepoint.com/PublicationLibrary/Forms/AllItems.aspx?id=%2FPublicationLibrary%2F2021%2FPolicy%20Brief%2FPB%202%2D21%2Epdf&parent=%2FPublicationLibrary%2F2021%2FPolicy%20Brief&p=true&originalPath=aHR0cHM6Ly9hc2VhbmVuZXJneS5zaGFyZXBvaW50LmNvbS86YjovZy9FZThCeTVZbVpPcEhuTmpneHVteDM4b0JRSWZXbXYyZzlpRzZMZjZxUlo3cTBBP3J0aW1lPWswYjQtMWcxMlVn> (accessed on 22 June 2021).

Annex A. Principles used to collect data

In order to build the inventory of subsidies, the OECD Secretariat focused on gathering as much information as possible, following the guiding principles outlined below, which are closely inspired by similar principles in the area of Agriculture.⁴⁰

- *Principle 1: generation of transfers (be they explicit monetary amounts or implicit forms of transfers) to steel producers, is the key criterion for inclusion of policy in the measurement of support.* Policy measures generate explicit or indirect transfers (e.g. loan guarantees, induced transfers, etc.) to supported individuals or groups. A policy measure is considered for measurement if steel firms, individually or collectively, are the only, or the principal, recipients of economic transfers generated by it, *in theory or in fact*. This is sufficient criterion for inclusion of any policy measure in inventory list. Subsidies for which it is not possible to reasonably ascertain that the steel sector does not disproportionately benefit from it are recorded in the by the Secretariat, in spite of their theoretical horizontality.⁴¹
- *Principle 2: there is no consideration of the nature, objectives or economic impacts of a policy measure beyond an “accounting” for transfers.* This principle complements Principle 1, in that the stated objectives or perceived economic impacts of a policy measure are not used as alternative or additional criteria to determine the inclusion or exclusion of a policy measure in the estimation of government support to the steel industry.
- *Principle 3: general policy measures would need to be listed in the inventory, if they affect the steel industry significantly compared to other sectors.* In those cases, these measures will temporarily be listed in the inventory, such that each delegation can either confirm that it should remain in the list, or not because the programme to which the measures relate provides funds to other sectors in a relatively balanced way. This principle further clarifies Principles 1.
- *Principle 4: transfers generated by government support are measured in gross terms.* Policy transfers can be defined in gross or net terms, i.e. as revenue for the steel firm (gross receipts) or net income of the steel firms (revenue less costs and taxes) generated by a policy measure. The phrase *gross transfers* in the definitions emphasises that no adjustment is made in the indicators for costs incurred by producers in order to receive the support, e.g. costs to meet compliance conditions attached to certain payments, or tax clawbacks.
- *Principle 5: Information on government support is to be collected both at the recipient and programme level.* Given lacunar information concerning government support programmes, a two-pronged approach would ensure a more comprehensive data collection process. This principle enhances the exhaustiveness of the data-collecting process.

Annex B. How data was gathered

In an attempt to mitigate the difference in the transparency across economies, and to improve the coverage of its data on subsidies, the OECD Steel Secretariat developed two complementary approaches to collect representative public data on subsidies provided to steel firms: a top-down approach and a bottom-up approach, each having different information sources.

The bottom-up approach

The **bottom-up approach** consists of searching through individual firms' annual and financial reports, as well as their websites, to extract firm-specific subsidy data. Therefore, it is a useful approach to the extent that such reports are complete and available. *Ad hoc* searches through media sources using specific company names complement this approach. Overall, the bottom-up approach is very time-consuming, hence will most likely be focused on a (representative) sample of firms. It also has limitations in that it can shed light only on some very specific types of subsidies that were provided to the surveyed steel firms (mostly cash grants and cost refunds). Data sources used for the bottom-up approach are as follows:

- Steel companies' audited periodic reports: for some economies that have more detailed accounting standards, this source type can provide ample information on subsidies.
- Media and market intelligence: these sources are useful as they often mention types of subsidies not reported in steel companies' periodic reports. This source type is used extensively for economies that do not have reporting standards that disentangle subsidies revenues from general profits.

The top-down approach

In economies where stringent disciplines regulate the provision of subsidies, information on subsidies is often more centralised. This can allow for the use of a **top-down approach** as an effective means to collect the relevant information compared to a bottom-up approach, whereby subsidy data are gathered at the programme or at the provider level. Data sources for the top-down approach are as follows:

- Official government websites (including all levels of government and any related entities).
- Notifications to the WTO Committee on Subsidies and Countervailing Measures.
- CVD cases started by WTO Members: Countervailing Duty notifications to the WTO often mention recipient names and programme names for the potential subsidies. However, CVDs seldom provide complete information on the programmes, nor a clear and exhaustive list of recipients.⁴² Nevertheless, these data were useful to complement the Secretariat's desk research and provide guidance on companies and programmes that the research should focus on.
- Counter-notifications to the WTO Committee on Subsidies and Countervailing Measures from other economies.

In the most transparent economies, a top-down approach may suffice, freeing time and resources to analyse less transparent and more complex economies. Overall, both approaches complement each other and both can be used jointly on the less transparent economies to reduce the discrepancy in data collected compared to the more transparent economies.

Data collection by the Secretariat still relies exclusively on publicly available data. It is thus clear that some limitations exist to the depth of information the Secretariat can acquire. Unlike trade administrations, for example, the Secretariat can only rely on surveys and answers from relevant companies to questionnaires regarding e.g. unfair trade practices, to the extent that this information has been subsequently published in government registers.

Furthermore, data collection covers government interventions at all levels, including at central/federal level as well as at sub-central/state/local levels. For example, data collected for China indicates that there are far fewer plans at the national level than at the provincial and local levels. Although in most cases the national plans are formulated in broad terms, they can set a target to reach, or an objective to achieve before a certain period. The real policy implementation happens at the provincial and local levels; this is the reason why collecting programmes at those levels is especially important for the Secretariat. It is at the provincial and local level that most of the funds are created and that the recipients of grants can be mentioned. This being said, there are also some national plans uniformly implemented in each province such as social insurances and most types of tax subsidies and some awards.

The Secretariat relies systematically on the best quality sources available, that is, official sources. Some data on subsidies already collected from other sources, which include media or steel association reports, have been corroborated with official sources, to ensure the highest quality standard for the data. The sources referred for those lines were thus changed from the “Other sources” category to the “Official sources” category. These efforts have resulted in more official sources than other sources being currently collected in the Secretariat’s inventory. Nevertheless, subsidy information obtained from non-official sources remains crucial, in particular to gather data on subsidies provided through very specific or complex instruments, or in economies with poor transparency with respect to official sources.

The approach used for collecting subsidies at the recipient level in China used a sample of the largest firms, whereby not all Chinese firms were investigated due to resource constraints and data availability. A sample approach was also used for Chinese Taipei. In order to be able to compare amounts per economy, amounts found for those economies should be extrapolated to the whole economy. To ascertain if our sample is sufficiently representative, the data were matched to the Capacity Database. It showed that 36.7% of the production capacity for the Chinese economy was linked – at some level of ownership – to a company or a group mentioned in the subsidy data collected.⁴³ However, a lower percentage of about 15% of the total number of crude steel-producing firms are covered in the Chinese sample, which indicates that large firms are over-represented in the sample compared to smaller ones. This is due to the better data availability of large firms compared to smaller ones (annual reports available through desk research, a better quality of disclosure and standards, etc.).⁴⁴ Extrapolation is carried out on the whole set of crude steel producing firms by assuming a similar subsidisation amount per metric tonne of capacity.⁴⁵ For Chinese Taipei, the sample studied covered 54.4% of the crude steel production capacity. Extrapolation is performed in a similar way.

Annex C. Computing the precise amounts provided to steel firms on each year from the accounting years of their annual and financial reports

Computing the precise subsidy amounts actually received by a company during a particular year in the form of cash grants and cash transfers is not entirely straightforward, as the year in which the money is received is not simply the year for which the amount is recorded in annual reports.⁴⁶

The data collected contains both the current and deferred amount of subsidies reported in steel firms' annual reports (when applicable). Those amounts are those reported as such in Section 2.1.2. Nevertheless, there is a difference between the record date and the precise time a subsidy actually entered steel firms' bank account due to accounting standards rules. To study potential impacts of subsidies on a firm's investments in capacity, for example, it would be important to know precisely when the money attached to subsidies allowing some capacity extension was actually received – the precise timing of the money flow being provided to the steel firms. The method used to compute those money flows is described below, and it results in the graphs depicted in Section 3.1.

Letters drawn in green in the figure below are those recorded in the collected data: the deferred amounts at the end of each period, *A* and *B*, and the current subsidies entering the the Profit and Loss account of the steel firms, named *C* below.

Deferred amounts are stocks of previously received subsidies that are linked to assets purchased by the firms that have not yet been completely amortised. Those subsidies amortised over the life of the assets they are linked to, and at the same rate (which depends on the economy and on the asset).

On each period the part of the subsidies that has amortised during that period, *F*, goes to the Current subsidies total of the Profit and Loss section total *C*, as well as subsidies received for the period that are not linked to the purchase of specific assets.

We can see from the flow depicted in the figure that, due to conservation of money flows:

$$A - B = D - F$$

and

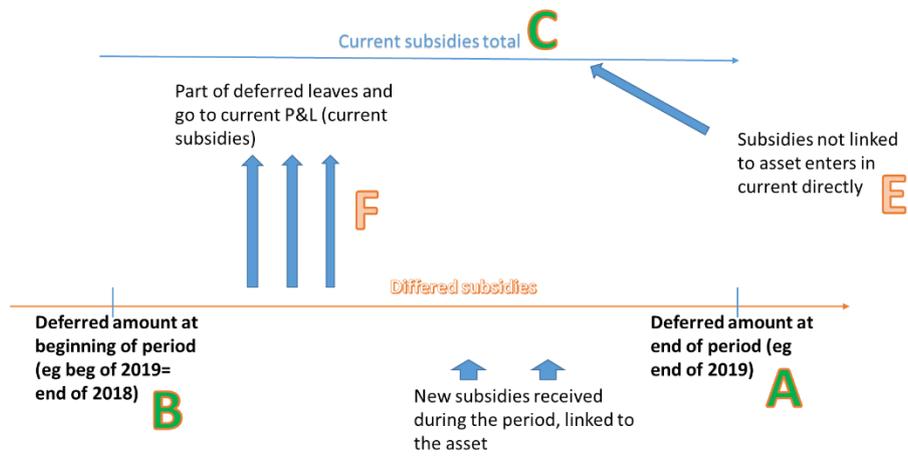
$$C = F + E$$

Summing up both equations on each side allows to eliminate the unknown *F* on the right hand sides and to find:

$$A - B + C = D + E$$

which represents all the money that has arrived during the period.

Figure A C.1. Actual money flow can be deduced from the data collected



Source: OECD Secretariat.

Footnotes

¹ Please note that those purposes are not fully exclusive, and R&D, new investments and capital equipment may have environmental purposes. Sources are not always sufficiently explicit in that respect.

² In this paper the term “subsidy” stands for the very broad notion of “subsidies and government support measures”, as defined in [DSTI/SC(2017)11/REV1]. This is consistent with the adoption of an approach toward subsidies and government support measures that is as holistic as possible [see DSTI/SC/M(2017)2].

³ This report and the data underlying it benefited from the most valuable contributions from Denise Morengi, Isabel Pham, Alina Poliakova, Ivan Mahardika, and BÜsra Ozturk during their internships at the OECD, who brought a variety of language skills necessary for retrieving subsidy information available only in local languages.

⁴ Some exceptions to this rule were made due to feasibility for example for the recipient level data of Chinese firms, where a sample approach was taken.

⁵ The sample’s geographical breakdown reflects economies’ respective weights in global manufacturing: China (23%); the EU-27 (19% of all firms); the United States (16%); Japan (9%); Korea (5%); India (4%); the United Kingdom, Russia, Southeast Asia, and countries of the Gulf Cooperation Council (3% each) (OECD, 2021^[6]). It hence provides a balanced cross-section of countries and sectors.

⁶ Although public data on subsidies was collected up to September 2021, the 2021 annual reports of steel firms, which are useful to obtain the annual amounts of subsidies received by some recipients in 2021, will only become available in 2022. Consequently, money amounts aggregates in the figures of Section 3 were only represented up to the year 2020 included.

⁷ Programmes that were terminated but were provided at any point during this period are still within the scope of the exercise. Programmes that are replaced by other newer programmes are gathered and recorded separately.

⁸ The coverage of the European Union entails only policy instruments where competence is at the supranational level. Coverage of individual European Union Member States entails those policy instruments at the national and regional/local level of the individual country in question.

⁹ <https://www.oecd.org/trade/topics/trade-in-raw-materials/> provides a link to access the inventory of such measures.

¹⁰ Pandemic-related subsidies are not collected in the data used for this report, as they are assumed to be of a very horizontal nature (i.e., including the service sector).

¹¹ Those numbers could increase in case of future updates, or decrease slightly due to the results of ongoing bilateral checks.

¹² Admittedly, this does not imply that the totality of the subsidies benefiting those 845 firms are gathered in the data collected, as some subsidies may have escaped the Secretariat’s scrutiny, or may not have been mentioned in the publicly available data that is accessible online.

¹³ In this respect, the Secretariat tried on a sub-sample of firms of the largest steel-producing economies to compare benchmark yearly coking coal prices to the prices paid by the company, but potentially due to the different timing of transactions and markets, the prices paid were sometimes lower, and sometimes higher, with no definitive absolute effect on the overall energy prices paid by

the firm. Hence, other approaches would need to be developed to tackle the potential subsidisation of steel firms through energy prices.

¹⁴ Some categories of “purpose” may not be mutually exclusive, for example, research and technology can focus on green technologies and could be counted as “environment” in some cases. Information from the sources rather than based on an ex-ante strict taxonomy is used to name the “purpose”, in order to retrieve the maximum information, as ex-ante taxonomy would have resulted in more unknown values for “purpose”. Details were often lacking in the sources hence the purpose could not be precisely ascertained. For example, the purpose “transformation” was often provided as a single word for some subsidies, with no detail concerning the particular transformation entailed (which could be, for example, transformation for greening and decarbonisation of a plant). Whenever it was possible to grasp a better sense of the end purpose, the corresponding category was used (e.g., environment for a transformation that entails the installation of fumes filters). In other cases, “transformation” was lumped into the group “capacity extension, new investment and capital equipment”.

¹⁵ Admittedly, and as mentioned previously, some R&D purposes may be linked to environment.

¹⁶ Admittedly, subsidies with other stated purposes are still subject to similar WTO disciplines, but their impact on foreign markets may be more challenging to demonstrate by foreign steel industries or trade administrations.

¹⁷ These 757 also include the recorded cases where the Secretariat is only aware of some upper or lower bound on the subsidy amount from the source of information the line was extracted. Complex instruments such as mandated mergers and acquisitions or lower-than-market input prices often lack the quantification of the subsidisation they entail. To perform such quantification would imply making stringent assumptions due to the lack of data.

¹⁸ It is important to note that the amounts for 2021 are only partly due to the joint effects of the cut-off date (September 2021) as well as to the usual lag in the publication of subsidies from some important sources of information, such as annual accounts of steel firms. For that reason, they are not reported in the graphs of Figure 6.

¹⁹ The amounts reported in the first graph of this figure are using the date of cash grants provided by the source of information, mainly accounting standards. It also includes amounts reported as “deferred amounts” of cash grants, cash awards and cost refunds.

²⁰ Deriving this amount from many annual reports makes use of an accounting equality highlighted in Annex F. Extrapolation of the amounts for the two jurisdictions (China and Chinese Taipei) for which the research had to be restricted to a sample of steel firms for practical purposes is explained in Annex B.

²¹ Subsidies provided through tax relief identified were included in the total when they entailed money-amount transfers (refunds).

²² Given that some bilateral checks are still ongoing, more disaggregated amounts (e.g. on jurisdiction level) would run the risk of being imprecise and are not presented here. Furthermore, the year 2021 is not included as the data collection exercise was momentarily halted in September 2021 and that the year 2021 would thus show lower amounts, irrespective of genuine trends.

²³ Year represents the year when the money amounts is actually provided to the steel firms, as opposed to the year when firms’ annual accounts recognises money amounts.

²⁴ Year represents the year when the money amounts is actually provided to the steel firms, as opposed to the year when firms’ annual accounts recognises money amounts.

²⁵ Data collected are dependent on sources explicitly mentioning such transfer and do not rely on estimations, and is hence not exhaustive.

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²⁸ Data collected are dependent on sources explicitly mentioning such transfer and do not rely on estimations, and is hence not exhaustive.

²⁹ Capacity reduction was mentioned before in other official documents. For instance in 2003, the State Council issued a Circular aimed at stopping indiscriminating investment in the steel, aluminum and cement industry in an effort to address excess capacity (Shui5.cn, 2003_[61])

³⁰ [DSTI/SC(2022)1] contains a special topic section that describes in some detail the role of procurement of productive capacity from China for the purpose of establishing new Iranian steel firms' plants. That content is not repeated in this current paper.

³¹ Besides the disclosure of their general purpose, none of those funds seem to provide proper disclosure of their annual activities, instruments available and recipients, hence the information listed below was complemented by a variety of sources, including recipient-level sources and media sources and inference from the Secretariat's desk research results.

³² The Secretariat was not able to determine the precise degree of public ownership requirement through its sources.

³³ See for example, https://ec.europa.eu/commission/presscorner/detail/en/IP_21_105

³⁴ Technical conditions/requirements governing many ODA projects dictate that many materials must be imported by the recipient (e.g., for water treatment facilities: water meters, valves, pumps, motors, water treatment chemicals, water filtration systems, water control and monitoring equipment), which makes this type of bilateral contracting attractive for countries like Japan and Australia

³⁵ Exemplary sources of government support: Viet Nam Environmental Protection Fund, National Action Plan on Sustainable Consumption and Production for the period of 2021-2030, Support Mechanisms for the Development of Solar Power Projects in Viet Nam, Implementation of eco-industrial park initiative for sustainable industrial zones in Viet Nam, Viet Nam Clean Production and Energy Efficiency Project, Clean Development Mechanism (CDM), National Target Program to Respond to Climate Change (2008-2015) (NTP-RCC).

³⁶ The Chinese government "Made in China 2025" strategy indicated the government's willingness to help deleverage some sectors of the economy, with credit to be redirected away from sectors experiencing significant excess capacity, such as the steel industry, towards sectors with higher potential market growth and higher profit margins such as information technologies, high-end digital control machine tools and robots, communication technologies or aerospace (OECD, 2018_[58]).

³⁷ The government has directly intervened to allow Sinosteel to convert RMB 27 billion of bank loans into convertible bonds. Swapping loans for convertible bonds instead of equity allowed obligor banks to avoid having to set aside the regulatory capital required for holding equity. The Chinese government also, through its welfare fund SASAC, took a direct participation of RMB 10 billion in the capital of Sinosteel, which represents a sixth of its total debt.

³⁸ The newest guideline related to debt-to-equity swaps, entitled "Guiding Opinions on the Conversion of Creditor's Rights of Market-oriented Banks", mentions that "*banks, enterprises and implementing agencies independently negotiate and determine the prices and conditions for the transfer of creditor's rights and the conversion of shares*" (China Business Intelligence, 2016_[51]).

³⁹ "*It is allowed to determine the conversion price of state-owned listed companies with reference to the transaction price of the secondary market for stocks, and to determine the conversion price of state-owned non-listed companies with reference to competitive market quotes or other fair prices*" (China Business Intelligence, 2016_[51]).

⁴⁰ For the list of the principles agreed by OECD countries in the field of agriculture, see the OECD's manual on "Producer support estimate and related indicators of agricultural support" (2016), page 20-21.

⁴¹ This is all the more important than most of the subsidies are horizontal in theory, for each of the jurisdictions in the scope.

⁴² National investigations often consider a sample of firms, usually the largest exporters of the specific product(s) towards the complainant jurisdiction.

⁴³ Due to the different possible levels of aggregation of the subsidy data, there is the need to work out the ownership structure of the various crude steel plants in the OECD Steel Capacity Database, and to check, at each level, if those owners are present in the samples of the data collected on subsidies. Those checks were performed at the level of the company that directly owns the plant, at the level of the direct owner of this company, at the level of the final ultimate owner of the company.

⁴⁴ Assuming large firms are more subsidised than smaller ones, this could lead to overstating the amount of subsidisation.

⁴⁵ Left out of those extrapolations are steel firms that are not crude steel producers but buy crude steel from other firms and/or transform semi-finished steel products. Although those firms could also be subsidised, due to the vertical integration of most Chinese firms those amounts are probably negligible compared to amounts going to crude producers.

⁴⁶ This is because in many annual accounts, the sum of subsidies linked to assets is reported for a given year as a stock, which is the amount of all subsidies linked to assets received during the previous years, minus the proportion of those subsidies that have already "amortised" since their inception, the amortisation period being used being generally the amortisation period of the asset they are linked to. Since those amortisation periods can be as long as eight years, reporting this changing level of stock for each year would be counting many times the same amounts and disregarding the precise period when the funds reached the company – the very period subsidies would have the biggest impact, enabling the purchase of assets, etc.