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# The market implications of industrial subsidies

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## Key messages

- Quantifying implications of subsidies for market outcomes has often proven difficult due to a lack of comparable data across sectors or countries. Using the new OECD MAGIC database, this report contributes to a rapidly growing literature and policy debate about the effects of government subsidies on firm behaviour and competition. It provides unique econometric evidence on the causal impacts of government subsidies on firm performance indicators.
- The econometric analysis undertaken in this paper shows that total subsidies, on average across the largest manufacturing firms from various sectors and countries:
  - increase market shares, implying likely negative spillovers to competitors. This impact is economically sizeable relative to observed small annual changes in market shares, with an increase of one percentage point in subsidies relative to revenue corresponding to between the 27$^{th}$ and 51$^{st}$ percentile of the observed distribution of annual absolute market share changes, depending on the estimation method.
  - do not seem to affect firms' investment relative to the size of their existing capital stock (i.e. the investment rate) but appear to increase nominal spending on investment. This implies that the nominal boost is small and total subsidies do not make firms invest a larger share of their existing capital.
  - seem to have no or a negative effect on real productivity growth, in line with most frequent findings in the literature.
  - have no significant contemporaneous impact on profitability. This suggests that generally firms are not translating subsidies into simple windfall profits.
- Given that overall subsidies appear to have no or a negative impact on the investment rate and productivity, the finding that subsidies are associated with increases in market shares does not seem to be explained by efficiency gains. Instead, this relationship could result from the ability of firms receiving subsidies to lower their prices or deter competitors from making investments.
- The effects of subsides tend to vary by type, with tax concessions having generally positive effects. This suggests that the nature and design of government support can shape its outcomes.
- Subsidies also seem to affect firms differently depending on some of their characteristics. For instance, the impact of below-market borrowings on productivity and profitability is less negative for China-based firms. This may reflect China's greater reliance on below-market borrowings to provide systemic government support to companies. In contrast, other jurisdictions tend to use this type of government support more selectively, often to assist distressed companies – which could explain their negative effects on productivity and profitability.
- Identifying impacts of subsidies on firm performance indicators differs from assessing the desirability of those impacts. While potentially beneficial to individual firms, government support may not be desirable from the perspective of other companies or countries, aggregate economic performance and well-functioning global markets.
- While this report has improved our knowledge about market implications of subsidies, it is important to continue efforts to improve transparency and measurement of government support and to improve evidence and broaden the scope of possible subsidy effects.

# The market implications of industrial subsidies

1. Considerable progress has been made in recent years to improve the availability of data on industrial subsidies and remedy governments' general lack of transparency about the support they provide to manufacturers. The OECD has played an important part in these efforts, notably through the creation of the OECD MAnufacturing Groups and Industrial Corporations (MAGIC) database. This dataset provides unique firm-level information about the scope and scale of industrial subsidies (Box 1, OECD (2023[1]), OECD (2025[2])). The greater availability of data opens new avenues for quantitative assessments of industrial subsidies effects on markets and competition.

2. A better understanding of how industrial subsidies affect markets becomes especially important at a time when governments are increasingly adopting industrial policies and other measures to support their industries (OECD, 2023[1]; Millot and Rawdanowicz, 2024[3]). Governments' growing use of subsidies makes it necessary to not only track and quantify the support measures introduced, but also to shed light on which subsidies are benign for well-functioning global markets and which ought to be considered a priority for reform. The limited analytical evidence available to date can complicate in this regard consideration of which subsidy design is best to boost effectiveness and minimise market distortions.

3. Against this background, this report presents quantitative evidence about the impact of government subsidies on the performance of the largest global manufacturing firms in selected sectors to help inform policy discussions. Key questions relate to the impact of subsidies on business performance and impacts on competing firms (including from abroad). This report is the first to conduct econometric analysis using firm-level data from the OECD MAGIC database, covering the largest manufacturers in many sectors and countries. While it does not address how the WTO Agreement on Subsidies and Countervailing Measures and discussions in related cases treat the trade effects of subsidies, these aspects could be addressed in future work.

4. The first section sets out the possible effects of subsidies on firm performance, while the second section reviews related empirical literature. The third section summarises key findings from econometric work on the impacts of subsidies on changes in market shares, investment, productivity growth and profitability. Technical details of estimations are discussed in Annex A and detailed tables with estimations results are reported in Annex B. The fourth section outlines possible avenues for future research. The final section concludes.

### Box 1. Key facts about the OECD MAGIC database

This box provides basic facts about the OECD MAnufacturing Groups and Industrial Corporations (MAGIC) database (for more information see OECD (2025[2])).

Version 1.0 of the OECD MAGIC database covers 482 of the largest industrial firms (listed and non-listed) in 14 manufacturing sectors producing either durable goods or industrial raw materials over the period 2005-22 (the names of all sectors are displayed in Figure 1). These firms – selected for their size – collectively account for at least two-thirds of global sales or capacity in their respective sectors.

Based on the location of these firms' headquarters or their main place of business, around 55% of them are from OECD countries (of which roughly one-third from the European Union and slightly less from the United States) and around one-third from the People's Republic of China (hereafter "China"). Many of these companies are large multinationals and the subsidies they report often combine amounts obtained in the multiple jurisdictions in which they operate. Consequently, the headquarter country should not be assumed to be the country providing all subsidies received by a given firm. Companies based in China are a notable exception. They tend to produce mainly in China and obtain most of their subsidies from Chinese authorities.

The database contains basic financial and economic data (including revenue, employment, labour costs and assets) and estimates of three types of government subsidies:

- *Grants*: as obtained from publicly available corporate documents or government websites.
- *Corporate income tax concessions*: estimates of the tax savings of companies due to particular provisions of the tax code. They are estimated primarily based on corporate disclosures but in some cases are subject to adjustments and estimations by the OECD.
- *Below-market borrowings*: estimated by the OECD by comparing actual interest rates that firms are charged on their borrowings against hypothetical benchmark interest rates that would normally prevail in the market given borrowers' financial profile.

Notably, the database does not yet contain estimates of government subsidies provided through below-market equity, and therefore likely understates the true level of subsidisation in certain markets, particularly for companies based in China.

## What are possible effects of subsidies on firm performance?

5. Subsidies can, in theory, influence firm performance in several ways. By reducing firms' cost of capital, they can increase *investment* in key areas such as machines and buildings, innovation, and product quality and marketing.[1] These fixed capital investments can in turn allow firms to expand production capacity, enabling them to produce and sell larger quantities. When production is characterised by large economies of scale, such expansion could ultimately lower marginal costs of production. Purchasing new machines can also increase productivity.

6. Positive effects of subsidies on *productivity* can also materialise in other ways, with subsidies supporting innovation, for example through expenditure on research and development (R&D). This, in turn, can benefit multifactor productivity by improving product quality and increasing efficiency of the production

[1] The reduction in the cost of capital can be direct, via provided subsidies, or indirect by improving creditworthiness of companies and lowering their external borrowing costs from private financial institutions (OECD, 2021[43]).

process. By enabling firms to enhance product differentiation and marketing efforts, subsidies can also stimulate demand for their products and lower the price elasticity of demand for their products.

7. Subsidies can also be used directly to cover part of firms' production costs. This, in turn, can either help boost *profitability* or lower the price of goods sold. Subsidy-induced improvements in firms' competitiveness, either via productivity enhancements or subsidised production costs, can allow firms to gain *market share* as, all other things being equal, they are able to undercut their competitors.[2]

8. A positive impact of subsidies on market shares could be associated with higher investment, stronger productivity growth, and possibly higher profitability. However, alternative outcomes are also possible. For instance, subsidies could finance investment that firms would undertake in any case. For multinational firms, subsidies obtained from one government could simply affect the geographic location of investments but not necessarily their level. Investment stimulated by subsidies could also be wasteful, making little difference for longer-term productivity and market shares. Overly generous government subsidies, coupled with other protectionist measures, could also reduce incentives for firms to innovate and remain competitive, ultimately undermining their position in international markets or allowing distressed firms to keep operating. Such negative outcomes are more likely when subsidies are granted to unviable firms that have political connections or engage in rent-seeking activities – a risk frequently highlighted in the political economy literature. In addition, firm's performance, especially its market position, can also be affected by the government support provided to firms competing within the same market.[3] Ultimately the impact of subsidies on firm performance, and on market shares in particular, is ambiguous in theory, and should be tested empirically.

9. The impacts of government subsidies on market outcomes can be expected to vary over time, and they could materialise with a significant delay. For instance, market share gains can be larger in the longer term, if significant differences in production costs lead to sustained losses for competitors and ultimately their exit from the market. Fierce price competition may also limit new entries. This is most likely in industries with homogenous goods subject to large economies of scale. However, in most of the sectors included in the OECD MAGIC database, there are no signs of growing industry concentration as measured by the Herfindahl-Hirschman index (HHI) (Figure 1), despite sizeable shifts in market leaders among main regions in many sectors (see below and OECD (2025[2])).[4] The only exceptions are shipbuilding, where concentration increased significantly, and to a lesser extent rolling stock, wind turbines, and solar photovoltaic panels.[5]

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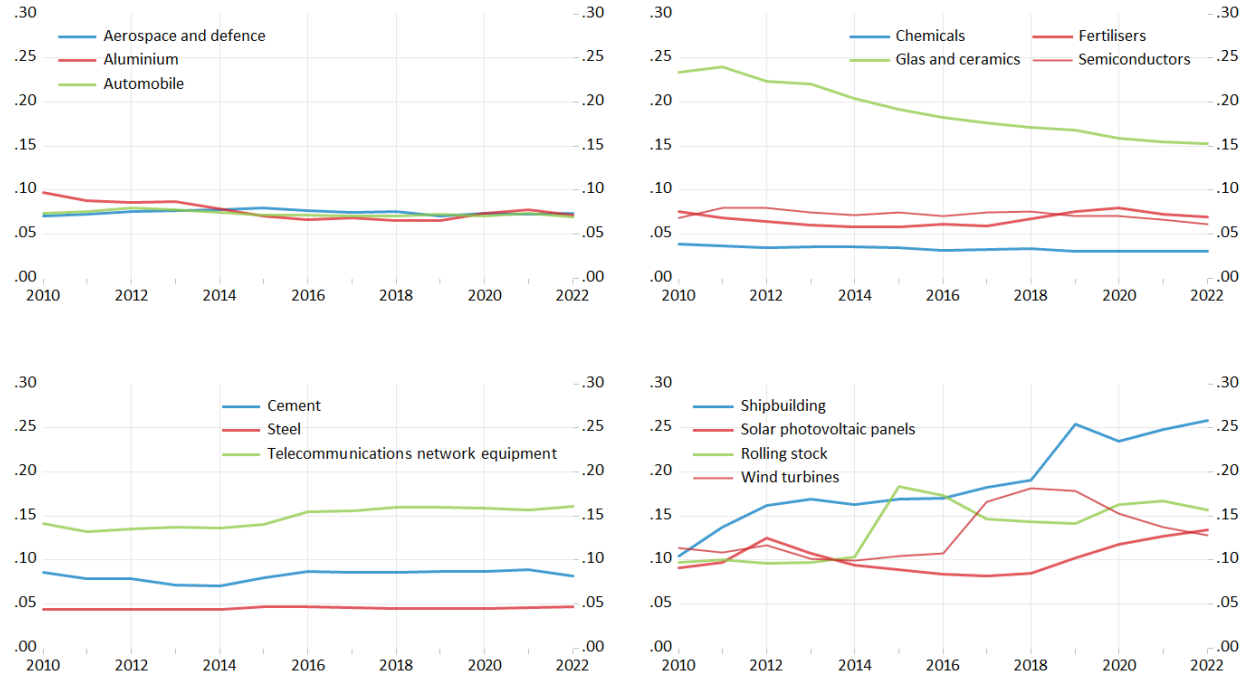
[2] The extent of such gains depends on firm-specific characteristics and broader market structures. For instance, the larger the price elasticity of demand, the larger gains in market shares for a given reduction in prices. The elasticity is generally higher for commodities or goods that are more homogenous (e.g. batteries or solar panels) than for more differentiated products (e.g. aircraft or advanced semiconductors). With a low price elasticity of demand, subsidies that are used to cover company's operating costs would need to be substantial and persistent to boost its market position durably.

[3] Subsidies are not the only government policy that may impact firms' market shares. Trade costs, including those stemming from tariffs and non-tariff measures may have a substantial impact. The range of measures potentially affecting market access is wide, and could include discriminatory government procurement (OECD, 2023[45]), forced joint ventures with local firms (often coupled with mandatory technology transfers; see Andrenelli et al. (2019[44])), or local-content requirements (Stone, Messent and Flaig, 2015[46]). Such barriers could be particularly important where market growth, and ultimately market size, vary significantly between various economies. Firms operating in fast growing markets with market access restrictions can be expected to gain market shares.

[4] The findings hold when looking at the cumulative share of the four firms with the largest market shares. In general, China-based companies have experienced more frequent longer-term gains at the loss of firms based in other jurisdictions, mainly in OECD countries (see below and OECD (2025[2])).

[5] In the first three sectors, mergers and acquisitions partly explain observed increases in concentration, notably in cases involving the consolidation of large state actors (e.g. the 2019 merger of CSIC and CSSC in shipbuilding and the 2015 merger of CNR and CSR in rolling stock).

## Figure 1. The concentration of sales has not increased in most sectors




Note: The chart shows the Herfindahl-Hirschman Index (HHI), which is calculated as the sum of the squared market shares of each firm in a given sector, is used to measure the level of concentration in the market. The index would equal one in the case of a monopoly and converge to 0 with a large number of firms having small and equal market shares. Thus, the closer the index is to zero, the lower the concentration is. Values for the HHI should not be compared across sectors but over time for each sector. The HHI value with equal shares depends on the number of firms, which differ across sectors covered in the OECD MAGIC database.
Source: OECD calculations based on the OECD MAGIC database.

10. The effect of subsidies on firm performance could also vary because subsidies can be granted for different purposes and be conditional on specific criteria. For instance, R&D tax concessions may boost spending on R&D but not investment in fixed capital; grants for reducing greenhouse gas emissions may boost investment but not productivity; and subsidies targeted at employment may reduce labour productivity. Similarly, one-off support to distressed companies during crises is likely to have a different impact on firm performance than ongoing subsidies disbursed in the context of prolonged industrial policy strategies.

11. Identifying impacts of subsidies on firm performance differs from assessing the desirability of those impacts. That is, finding positive effects of government subsidies on firms could indicate that subsidies are achieving their purpose of boosting their performance. However, such government stimulation of private investment may not be desirable from the perspective of other firms or countries, aggregate economic performance and well-functioning global markets. For instance, when governments subsidise poorly performing firms (in terms of productivity, innovation, and profitability), this can lead to a reallocation of resources from leading firms to laggards, with negative implications for the whole sector performance, including in relation to innovation. Subsidies can also lead to a competitive advantage over other firms, especially in the international context, undermining the global level playing field. This may result in subsidised firms gaining market share at the expense of competitors for reasons other than innovation, product quality, and lower (undistorted) costs (Brander and Spencer, 1985[4]). Where the dominant firms supported by governments are also less productive and less innovative or more polluting, this can have important implications not only for the functioning of markets but also for achieving other policy objectives.

## The empirical literature suggests mixed impacts of subsidies

12. Most of the relevant empirical literature focuses on the impact of subsidies on firms' main performance indicators, such as investment, productivity, employment and profitability, with mixed results.[6] In many cases, empirical studies are conducted based on data for one jurisdiction or one sector only. For instance, using a firm-level dataset covering Chinese firms between 1998 and 2007, Aghion et al. (2015[5]) demonstrated that industrial policies allocated to competitive sectors increased productivity growth. In contrast, using more recent data but only looking at government grants for listed companies in China, Branstetter and Li (2022[6]) and Branstetter, Li and Ren (2023[7]) identified a negative or the lack of a positive relationship between subsidies and performance indicators such as firm-level productivity, patenting and profitability. Criscuolo et al. (2019[8]) found that investment subsidies under the UK Regional Selective Assistance programme raised employment and investment locally, particularly among small establishments, but did not increase productivity. Rotemberg (2019[9]) noted that small-firm subsidies in India crowded out competitors but increased productivity overall. Using firm-level data for a selection of EU Member States between 2016 and 2023, Brandão-Marques and Toprak (2024[10]) estimated that state aid provided to non-financial listed firms had increased their employment and revenue but not their investment or labour productivity. The study also found some support for adverse spillover effects on competing firms. Similarly, Bearzotti, Polanec and Bartolj (2023[11]) demonstrated that subsidies given to Slovenian firms between 2001 and 2017 and targeted at boosting investment had no impact on capital and productivity.

13. While industrial subsidies are widely discussed among trade experts, the empirical literature on the trade impacts of these subsidies remains disconcertingly thin. This stems largely from the lack of adequate data. Most empirical studies of subsidies written over the past 10-15 years have addressed trade impacts only tangentially, if at all. Ambaw and Thangavelu (2022[12]) found that Chinese subsidies in the base metals sector, as measured in the Global Trade Alert (GTA) database, decreased exports in other major economies.[7] Juhász et al. (2022[13]) applied machine-learning techniques to textual information in the GTA database, and demonstrated a positive correlation between industrial policy and countries' revealed comparative advantages. More recently, research using the New Industrial Policy Observatory (NIPO) dataset, also based on the GTA, provided evidence that new subsidies were correlated with the past use of measures by other governments in the same sector (Evenett et al., 2024[14]). A follow-up study concluded that Chinese subsidies not only promoted China's exports but also constrained imports, with the effects amplified by supply-chain linkages (Rotunno and Ruta, 2024[15]). Analysis of the steel industry found modest effects of foreign subsidies on excess capacity between the 1970s and 1990s (Blonigen and Wilson, 2010[16]), but harmful effects of domestic export subsidies and government ownership on downstream export competitiveness (Blonigen, 2016[17]).

14. Due to the lack of comparable data across sectors and countries, other researchers have opted to analyse subsidies using calibrated models for selected industries. For example, model-based analysis of the shipbuilding industry between 2006-12 suggested that Chinese subsidies "led to substantial reallocation of ship production across the world, with Japan, in particular, losing significant market share"

[6] The goal of this subsection is not to provide a comprehensive review of the literature but rather to highlight recent examples relevant for the discussion in this report. For overviews of the literature on the impacts of subsidies on firm-level outcomes, see, for example, Criscuolo et al. (2022[25]) and Bearzotti, Polanec and Bartolj (2023[11]).

[7] The GTA is, to date, the only source of publicly available data on the number of existing subsidies covering most countries, years, and a number of subsidy types. This has led several researchers to use this database in empirical analysis. That said, the GTA database only provides a count of occurrences of subsidies for which information is available in the public domain but does not quantify the support thus provided (hence giving equal weighting to very large and very small support programmes). The coverage of China's use of subsidy instruments is also largely limited to government grants reported by publicly listed companies in China (Chimits, 2023[39]).

(Kalouptsidi, 2018[18]; Barwick, Kalouptsidi and Zahur, 2019[19]). Recent analysis for the semiconductor industry modelled industrial policies in the sector and demonstrated that indeed most large producing jurisdictions provided support to their producers, with the largest estimates for Japan, Malaysia, and Singapore (Goldberg et al., 2024[20]).

## Main empirical findings

15. The econometric evidence about the causal impact of subsidies on firm performance presented in this section uses the OECD MAGIC database, which to date is the only available data source quantifying firm-level subsidies across several manufacturing sectors. Key information about the econometric analysis is summarised in Box 2, while detailed information on the econometric approaches and equation specifications are provided in Annex A. The regression results are reported in Annex B.

### Box 2. Key information about the econometric analysis

Most of the estimations are performed on unbalanced panel data, covering 482 firms over the 2005-22 period (at annual frequency). The exact sample varies across specifications and estimation methods. Given data limitations, estimations start in 2010 for the shipbuilding and aluminium sectors. The number of firms vary across time, reflecting normal market exit and entry events as well as mergers and acquisitions.

The main explanatory variable is total government subsidies. Total subsidies are the most comprehensive estimate of government help and thus are the preferred explanatory variable. This is based on the idea that the received subsidies are largely fungible, and firms can use them freely, as well as the fact that the OECD MAGIC database is not structured to distinguish between subsidies based on their policy objectives or characteristics such as eligibility criteria. However, to verify potential differences across subsidy types, separate estimations are also carried out for grants, tax concessions and below-market borrowings. This distinction is important because different type of subsidies may be deployed for different purposes and may have different effects. For instance, below-market borrowings have been used at times to help firms in distress, while tax concessions are frequently used to incentivise investment (OECD, 2025[2]). The subsidy variables are trimmed to exclude outliers (i.e. the top and bottom percentiles).

Subsidies are not randomly allocated to firms. Governments may be intentional in how they target subsidies, for example seeking to support firms that are already successful, to boost small firms with the potential for greater growth, or to rescue struggling firms. These considerations may be based on or correlated with firm performance indicators such as investment, productivity, profitability and market shares. If this is the case, any observed empirical relationship between firm-level outcomes and measures of subsidisation may arise not from the actual impact of subsidies, but from the selection process determining which firms receive them then.

Such problems, known as reverse causality, are common in empirical economic studies. This paper employs two methods to address this challenge: the traditional instrumental variable (IV) approach, and a more recent approach known as generalised propensity scores-based inverse probability of treatment weighting (GPS IPTW). All details on the specification and use of these methods are explained in Annex A.

In the baseline estimations, IV estimations generally include firm and year fixed effects, while the GPS IPTW uses firm and region-industry-year fixed effects. These fixed effects are added to remove the impact of unobserved characteristics that are constant over respective dimensions of the sample, but

robustness checks excluding firm fixed effects are also tried. In addition, a few direct controls (specific to each performance indicator), such as firm size, are added to the estimations.

While investigation of lagged and cumulative effects of subsidies is desirable, baseline estimations focus on contemporaneous effects. This is motivated by the relatively small sample of firms (482) as compared with other firm-level studies, which is the consequence of having detailed firm-level information in the OECD MAGIC database, in particular on the quantities of subsidies received. In the case of investment, contemporaneous effects are also preferred as disbursement of some subsidies is conditional on the completion of investment. Using a longer lag structure for dependent and explanatory variables reduces the effective estimation sample considerably. Still, one robustness check is performed by using 2 and 3-year moving averages for the dependent and explanatory variables.

The number of firms, their characteristics (as measured by mean values of key performance indicators and subsidies), and sector-specific measurement challenges differ importantly across sectors.[1] Thus, additional robustness check involves alternative estimations of models excluding one sector at a time.

1. The maximum number of firms per sector ranges from 10 in the telecommunications network equipment to 72 in chemicals.

### *Subsidies tend to increase market shares*

16. The share of a firm in global markets (including domestic sales) for a given product can serve as a summary indicator of its performance relative to competitors. In this context, finding a positive impact of government subsidies on market shares could suggest econometric evidence for the presence of distorting government practices on an international scale.

17. In this paper, market shares are defined by dividing the segment-specific revenue of a firm by the sum of segment-specific revenue of all firms operating in the same sector (OECD (2025[2]), Annex A).[8] Revenue refers to global sales, without making a distinction between domestic and foreign sales. As it is not possible to cover all firms operating within each sector, levels and evolution of the calculated market shares may differ from the true market shares.[9] However, since the largest manufacturers in each sector are covered in the OECD MAGIC database, these differences are not likely to be large, particularly in light of what is known of the typical distribution of firm size (Gabaix, 2016[21]).

18. Annual changes in market shares for the firms covered in the OECD MAGIC database tend to be small for most of the firms (OECD, 2025[2]). The median absolute change in market shares is 0.123 percentage point. However, there are cases of large shifts in market position over longer periods.[10] China-based companies have experienced more frequent longer-term gains than losses in market share and generally account for most of the firms with the largest market share gains. The opposite is true for firms based in other jurisdictions, mainly in OECD countries (OECD, 2025[2]). The longer-term gains in market position of China-based firms are also visible at the sectoral level. The largest gains are observed

[8] Segment-specific revenue refers to sales of manufacturing goods from a given sector for firms that produce goods in more than one sector (OECD, 2025[2]). While this better approximates true market shares, this choice creates inconsistency with the measure of subsidies for which the sector-specific share cannot be distinguished in the OECD MAGIC database.

[9] In principle, total market shares could be calculated based on sectoral aggregates from national accounts. However, national accounts databases, like the OECD Structural Analysis (STAN) database, do not have sufficiently disaggregated data to match the manufacturing sectors of the OECD MAGIC database.

[10] The longer-term changes in market shares refer to changes for the maximum possible period for each firm given data availability, which are not shorter than five years.

in solar photovoltaic cells and modules, shipbuilding, telecommunications network equipment, and aluminium. These increases are mostly related to gains in home markets, as China-based companies sell mainly domestically. Notable exceptions are solar panels, shipbuilding, semiconductors and – to a lesser extent – telecommunications network equipment, where sales abroad are more important.

19. Testing the impact of subsidies on market shares is more complicated than for other firm performance indicators (like investment, productivity and profitability – see below). As market share is a relative performance indicator, the explanatory variables should not only include subsidies for a given firm but also for its competitors. This creates a challenge for the econometric assessment, notably the IV approach adopted in the paper, but also for the GPS IPTW approach. Solutions to these challenges are discussed in Annex A.

20. The estimations indicate that total government subsidies increase market shares. In all estimations (IV, GPS IPTW and OLS with lagged subsidies), the coefficient on the difference between subsidies received by each firm (scaled by revenues or the cost of goods sold) and average subsidies received by its competitors (also scaled by the same variables) is significant and positive (Table A B.1).[11] This implies that when a firm's subsidies, relative to its revenue and the cost of goods sold, are larger on average than subsidies of its competitors, the firm gains market share and vice versa. When the subsidies received by the company and by its competitors enter the regressions separately, instead of their difference, usually only a firm's own subsidies turn out to be significant and positive. In equations for the three types of subsidies estimated separately, the subsidy coefficient was predominantly insignificant, especially for the IV method (Table A B.2).[12]

21. The above baseline results, especially for the effect of own subsidies, are robust to a series of alternative specifications (Table A B.3 and Table A B.4).[13]

22. To gain a sense of the economic magnitude of these findings regarding the impact of subsidies on market shares, their predicted effect can be compared to observed shifts in market shares more generally. Depending on the estimation method, the estimated effect of a one percentage point increase in subsidies as a share of revenue is between 0.04 and 0.13 percentage point in market share.[14] While this may appear modest, generally across the observed firms shifts in market shares are rare and small (see above and OECD (2025[2])). These predicted impacts correspond to the 27$^{th}$ and 51$^{st}$ percentile respectively of the observed distribution of annual absolute market share changes, suggesting that subsidies can be associated with sizeable movements in market shares given their overall stability.

23. Additional estimations with interactions of selected characteristics of firms (discussed in Annex A) indicate possible heterogeneity in some effects (Table A B.5):

[11] This finding is robust to the inclusion of controls such as the difference between average wages of a given firm and average wages for its competitors, as well as for the difference in multi factor productivity (these alternative estimations are not reported in the paper).

[12] For the GPS IPTW estimator, exceptions are for grants, where grants of competitors reduce market shares (robust to only some checks), and for tax concessions, where the subsidies received by firms turn out to increase market shares (robust to most checks) (Table A B.3 and Table A B.4). For the OLS estimator, only the coefficients for grants are significant and positive (both for the subsidies received by firms and as a difference in subsidies received compared with competitors).

[13] This includes alternative normalisation of subsidies, dropping firm fixed effects and, for most sectors, dropping one sector at a time. For the own subsidies, the findings are also robust to using 2 and 3-year moving averages, to account for possible delayed effects of subsidies.

[14] One per cent of revenue received in subsidies corresponds to the 57$^{th}$ percentile of the overall distribution of total subsidies over revenue across the firms and years observed.

- According to the OLS estimator and in some cases also for the GPS IPTW estimator, the impact of total subsidies on changes in market shares is larger for big companies (in terms of revenue and employment).[15] This could reflect several advantages from being a large company. For instance, larger firms can benefit from the economies of scale to a greater extent. They spread fixed costs such as spending on R&D and production infrastructure over greater output, making subsidies more effective in reducing unit costs. Larger firms also frequently enjoy greater financial capacity to leverage subsidies by easier and cheaper access to financing, allowing them to co-finance projects that require matching funds from both public and private sources. In addition, they could have a stronger market position and better brand recognition, facilitating expansion in new markets. Finally, larger firms often have closer relationships with policymakers, giving them an advantage in shaping subsidy programmes to their benefit, or receiving other forms of government support on top of subsidies.
- Changes in market shares for China-based companies seem to be affected to a smaller extent by total subsidies received by competitors, again both according to the GPS IPTW and OLS estimators. This may reflect the fact that market gains in most sectors were achieved by expanding domestic sales, which could have been helped by barriers to the entry of foreign firms into Chinese markets (see above). While there is no evidence that the marginal impact of total subsidies on market shares is larger for China-based companies, the fact that they received larger subsidies than firms based in other jurisdictions could partly explain their bigger market share gains over the longer term.

24. In short, these findings broadly support the idea that subsidies enable firms to expand their market share. This raises questions about the mechanisms through which these market share gains are realised. They may stem from the possibility that subsidies allow firms to increase their investments, improve their productivity, or stay profitable even after having lowered prices. These three potential channels are investigated empirically below.

### *Subsidies have at most small effects on investment*

25. Appropriate investment in fixed assets is essential for sustaining and improving manufacturing firm performance, as it lays the foundation for increased productivity, profitability, and gains in market share. Investment directly influences a company's productive capacity, operational efficiency, and competitiveness. Fixed assets, such as machinery, buildings, and technology infrastructure, form the backbone of a manufacturing firm's physical capital, enabling the production of goods at scale. By investing in these assets, firms can enhance their ability to meet market demand, reduce per-unit costs through economies of scale, and improve product quality. Furthermore, fixed asset investments often lead to innovation and technological advancement, which can provide firms with a competitive edge in dynamic markets. In this context, testing the impact of government subsidies on private investment is essential.

26. Investment equations, for all estimation methods, have nominal investment or the investment rate as the dependent variable. The latter is a ratio of nominal investment to the previous year's fixed tangible assets. It is the most frequently used indicator of investment activity in firm-level empirical studies. In line with the standard approach in the firm-level empirical studies, investment in fixed tangible assets (property, plant and equipment) is measured as the first difference in the book value of fixed tangible assets plus depreciation charge. Thus, it corresponds to gross investment. The drawback of this standard method is that investment rates can have extreme values, including negative ones, and be volatile (Figure 2, Panel

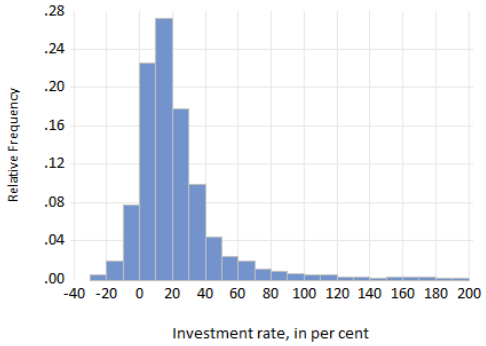
[15] Tests for other forms of heterogeneity (including the state firm status, capital intensity, concentration of revenue, size of subsidies, profitability and productivity) did not indicate any statistically significant effects.

A).[16] This can stem from capital stock valuation issues, including changes in prices of existing capital stock and in exchange rates. Thus, the sample is truncated to exclude the top and bottom percentiles of the investment rate distribution over the entire sample. All details of investment equations are described in Annex A.

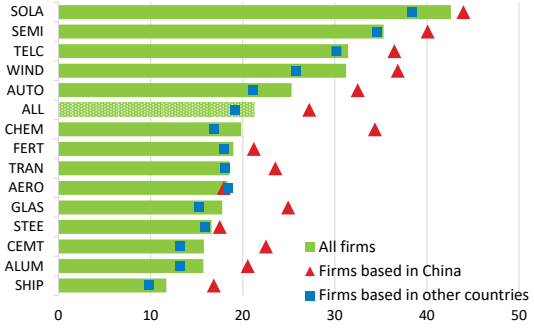
27. It is also worth noting that investment rates vary significantly across sectors: the highest investment rates (in solar photovoltaic panels, semiconductors, telecommunications network equipment and wind turbines) were on average around three times higher than in shipbuilding – the sector with the lowest average investment rate (Figure 2, Panel B). There are also important cross regions differences, with rates being higher for China-based firms than firms based in other countries in all but one sector (Figure 2, Panel B).

## Figure 2. Characteristics of investment rates

A. Distribution of investment rates over the entire sample




B. Average investment rates across sectors and regions




Note: The investment rate is measured as a ratio of tangible assets (property, plant and equipment; calculated as the annual change in the book value of fixed tangible assets plus the depreciation charge) to the lagged level of fixed tangible assets. Excluding outliers (the bottom and top percentiles of the distribution). See Annex A for more details. See full names of the sectors in Figure 1 (ALL stands for all sectors aggregated).
Source: OECD calculations based on the OECD MAGIC database.

28. No significant relationship between the investment rate, the most economically informative investment indicator, and total subsidies relative to revenue or the cost of goods sold is found. This is in line with empirical evidence for European companies (Bearzotti, Polanec and Bartolj, 2023[11]; Brandão-Marques and Toprak, 2024[10]). This result is confirmed with different estimators and various robustness checks (Table A B.6 and Table A B.9). The results suggest that total subsides do not appear to encourage firms to invest proportionally more relative to their existing capital stock.[17] The only exception is the significant and positive coefficient for tax concessions based on the IV estimator (both for the baseline and alternative instruments; Table A B.7). However, the effect of tax concessions on the investment rate seems to be lower for firms obtaining very large subsidies of this type in relation to their revenue (Table A B.5). This suggests that overly generous subsides may be ineffective in boosting investment rates.

29. In contrast, when considering the relationship between the nominal levels of investment and of subsidies, there is some evidence about a positive impact of subsidies on investment. This is confirmed

[16] Given this method of calculating investment, around 10% of observations for all the entire panel sample (i.e. before excluding outliers) have negative values.

[17] Exceptions are only the IV approach with the baseline instrument for subsidies scaled by the cost of goods sold and the IV approach with the alternative instrument for subsidies scaled by revenue.

by the GPS IPTW method and the IV approach with the alternative instrument (Table A B.6).[18] However, the IV method for the baseline instrument implies no significant relationship. All these findings are robust to alternative specifications (Table A B.8).

30. Looking at individual subsidy types, the results on nominal investment are mixed. Tax concessions seem to have mostly a significant and positive effect on nominal investment, whereas the relationship is mostly insignificant for grants and below-market borrowings (Table A B.7). These findings are stable across different estimators, the alternative instrument for the IV approach, and various robustness checks (Table A B.8).

31. The impact of subsidies on R&D spending was also tested. However, the signs and significance of coefficients varied across estimators and different specifications related to scaling dependent and explanatory variables. Consequently, it was difficult to provide a sensible economic explanation of the results and thus they are not reported in the paper. The variation in the results may reflect measurement issues with R&D expenditure as there is no standardised way to report such expenditure across different firms and jurisdictions.

### *Subsidies do not have a positive impact on productivity*

32. Productivity growth is essential for firm performance as it directly enhances a firm's ability to produce more output with the same or fewer inputs, leading to increased efficiency and profitability. Higher productivity allows firms to reduce costs, improve product quality, and offer competitive prices, thereby strengthening their market position.

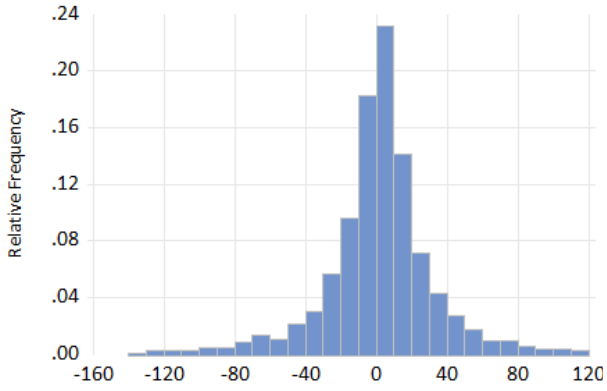
33. The analysis of the impact of subsidies on firm productivity growth is based on estimated real multifactor productivity (MFP), where within-firm yearly MFP growth is regressed on government subsidies. All details of the productivity equations are described in Annex A. MFP measures the overall efficiency with which labour and capital inputs are used together in the production process (Annex A). State-of-the-art techniques are used to estimate MFP (Wooldridge, 2009[22]). Their drawback is that, in some cases, the estimated MFP growth rates have extreme values, necessitating removing outliers by trimming one percentile from the top and bottom of their distribution.

34. Even after the removal of outliers, the distribution of productivity growth is quite symmetric with similar number of observations of negative and positive annual percent changes (Figure 3, Panel A). There are also important differences across sectors and regions (Figure 3, Panel B). Average productivity growth over the entire sample was the highest in semiconductors, automobiles, and glass and ceramics, while it was the lowest and negative in solar photovoltaic panels and shipbuilding, and positive but not too different from zero in wind turbines and rolling stock. These differences may partly reflect the extent to which different sectors rely on skilled labour. Such a distinction could affect measured productivity but data on the skill composition of individual firms' labour force are not available.

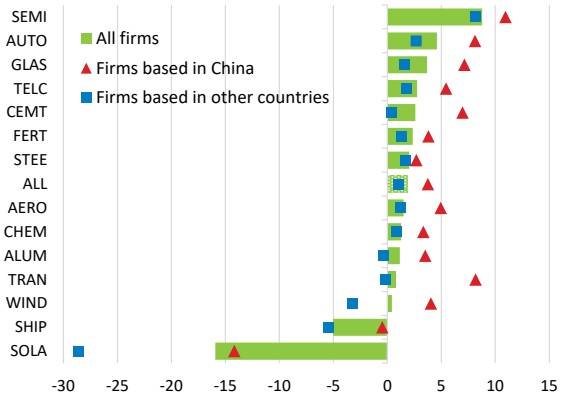
[18] See 0 for the description of the alternative instrument for the IV approach. Additional estimates, not shown in the paper, with the stock of fixed capital as the dependent variable, point also to a significant and positive relationship with total subsidies.

## Figure 3. Characteristics of real multifactor productivity growth

A. Distribution of real yearly multifactor productivity growth




B. Cross sectoral and regional differences (average growth)




Note: See Annex A for more details about estimation of multifactor productivity. Excluding outliers (the bottom and top percentiles of the distribution).
Source: OECD calculations based on the OECD MAGIC database.

35. The estimation results suggest that there is no positive impact of overall subsidies on real MFP growth. Depending on estimations, the effect is insignificant or negative (Table A B.10). However, significance and signs vary across estimation methods and specifications. This is likely to reflect measurement errors as well as a considerably smaller sample than for other firm performance indicators (Annex A).

- According to the IV estimator, total subsidies and below-market borrowings scaled by revenue and the cost of goods sold have a negative impact on productivity growth (Table A B.10). However, the coefficient becomes insignificant when using moving averages (Table A B.11). The finding for below-market borrowings could reflect the frequent use of this type of subsidies for rescuing distressed firms or supporting zombie companies, which could underperform for an extended period and survive only thanks to government financial help (OECD, 2025[2]). However, the negative impact of below-market borrowings is less negative for China-based firms (Table A B.5). This is probably because, in contrast to other countries, they are likely to be a systemic rather than an emergency type of government support to companies (see also results for profitability below). For subsidy types currently captured in the OECD MAGIC database, below-market borrowings are by far the largest type of subsidies in China, and government ownership in China's banking sector is more conducive to such type of government support (OECD, 2025[2]; OECD, 2024[23]).[19] The coefficients are not significant for grants and tax concessions.
- In contrast, according to the GPS IPTW approach, there is no significant relationship between MFP growth and total subsidies, as well as grants and below-market borrowings (Table A B.10). This is in line with evidence for European and Chinese companies (Bearzotti, Polanec and Bartolj, 2023[11]; Branstetter, Li and Ren, 2023[7]; Brandão-Marques and Toprak, 2024[10]). Only for tax concessions is the relationship significant and positive (Table A B.10). The positive effect of tax concessions on productivity could be explained by the use of R&D tax incentives, especially as such incentives have been found to have a positive impact on firm R&D expenditure and innovation (Appelt et al., 2016[24]; Criscuolo et al., 2022[25]). Surprisingly, the positive effect of tax concessions is significantly

[19] The same heterogeneity is found for state enterprises, but not reported here. These firms largely overlap with China-based firms given that state ownership is more prevalent in China than in other countries (OECD, 2025[2]).

lower for highly profitable firms, possibly implying that, in the short term, such firms simply pocket these subsidies rather than spending them on productivity-increasing measures (Table A B.5). All these findings are stable across various robustness checks (Table A B.11).

36. The findings with null or negative impact of subsidies on productivity growth are in line with empirical evidence in the related literature (Branstetter and Li, 2022[6]; Bearzotti, Polanec and Bartolj, 2023[11]; Branstetter, Li and Ren, 2023[7]; Brandão-Marques and Toprak, 2024[10])). This raises concerns over potential misallocation of resources given some evidence that government subsidies increase chances of firm survival (Koski and Pajarinen, 2014[26]). This issue is investigated next.

*Allocative efficiency*

37. Beyond their effect on within-firm productivity growth, subsidies may affect aggregate productivity positively through reallocation of resources towards the most productive firms, i.e. improve the so-called allocative efficiency. The opposite effect can also be observed, whereby subsidies reallocate resources toward less productive firms.

38. Possible effects of subsidies on allocative efficiency are investigated building on a standard model of dynamic allocative efficiency (Foster, Grim and Haltiwanger, 2016[27]; Decker et al., 2020[28]). The idea is to test whether employment and capital growth is higher in firms that are more productive (which is usually the case), and if this effect is weaker for firms that are more subsidised. Employment and asset growth are regressed on the lagged level of productivity and the interaction of productivity and scaled subsidies (Annex A). The coefficient of lagged productivity is expected to be positive in the presence of positive reallocation effects towards more productive firms. The main coefficient of interest is the coefficient of the interaction variable between lagged productivity and subsidies, which is expected to be negative if subsidies weaken this positive reallocation.

39. IV estimations suggest that there is indeed some evidence of subsidies negatively affecting allocative efficiency at the global level. For asset growth, the interaction term is significant and negative for two measures of scaled total subsidies for the IV approach (Table A B.12). For employment growth, it is also significant and negative but only for total subsidies scaled by the cost of goods sold. In contrast, the interaction terms are not significant for GPS IPTW estimations for both employment and asset growth.[20]

## *Subsidies have no significant contemporaneous impact on profitability*

40. Even if subsidies fail to boost investment and productivity, they may still have a short-term positive impact on profitability by effectively reducing the costs of production. This cost reduction could also stimulate demand if firms pass on the savings through lower prices and if demand is highly price elastic. This subsection investigates this possibility.

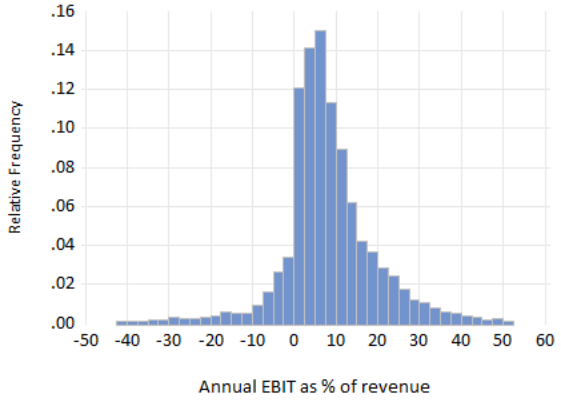
41. Two main measures of profitability are tested. One is the ratio of earnings before interests and taxes (EBIT) to revenue and the other one is return on assets before taxes (i.e. the ratio of income before tax to total average assets). Both measures are highly and positively correlated. There is also a significant variation across sectors and regions (Figure 4). Average profitability was the highest for cement; semiconductors and fertilisers, exceeding 10%. In contrast, profitability was the lowest in shipbuilding, but also in wind turbines, auto, and solar photovoltaic panels, with three of these sectors being also laggards in terms of productivity growth (Figure 3). Profitability has been generally lower for firms based in China

[20] As most of the firms in the OECD MAGIC database are capital intensive, finding evidence about global allocative efficiency for asset growth is more likely than for employment growth. The insignificant coefficients are also obtained for individual subsidy types. These results are not reported in the paper but are available upon request.

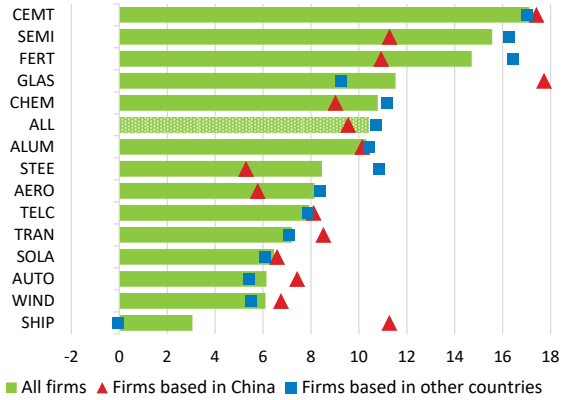
than for firms based in other countries (in eight out of 14 sectors and for all sectors together), with significant exceptions for shipbuilding, as well as glass and ceramics.

## Figure 4. Characteristics of firms' profitability

A. Distribution of profitability




B. Cross sectoral and regional differences




Note: Profitability is measured as a ratio of earnings before interests and taxes (EBIT) to revenue. Excluding outliers (the bottom and top percentiles of the distribution).
Source: OECD calculations based on the OECD MAGIC database.

42. Both estimation methods render generally consistent results. Total subsidies have no significant contemporaneous impact on profitability, independent on the definition of the latter, the scaling of subsidies, and the estimator (Table A B.13 and Table A B.14).[21] This is in line with empirical evidence for Chinese companies (Branstetter and Li, 2022[6]). At the level of individual subsidy types, the results differ. According to both estimators, tax concessions (scaled both by revenue and the cost of goods sold) have a positive effect on profitability. In contrast, below-market borrowings lower profitability, while grants have no significant effect.[22] The findings for total subsidies and individual types of subsidies are robust to various alternative specifications (Table A B.15 and Table A B.16).

43. The diverse findings for individual subsidy types can be explained by the fact that tax concessions are associated with higher profit before taxes, and they directly affect profitability after tax.[23] In contrast, grants and below-market borrowings are frequently linked to specific expenditure and may not boost profitability in the short term. Moreover, as mentioned before, below-market borrowings, at times, have been used to rescue in financial difficulties companies and a negative contemporaneous effect is not surprising (OECD, 2025[2]). The opposing effects of the three types of subsidies can explain no significant impact of total subsidies on profitability.

44. The GPS IPTW approach shows that the impact of subsidies on profitability differ across firms depending on their overall performance in terms of profitability. In fact, for total subsidies the impact becomes significant and positive but is reduced for firms with low profitability (the bottom 25$^{th}$ percentile

[21] The exception is with subsidies scaled by the cost of goods sold for the GPS IPTW estimator, where the coefficient is significant and positive. This finding is robust to various alternative specifications (Table A B.15 and Table A B.16).

[22] For the GPS IPWT approach, the coefficient for below-market borrowings is negative and significant only for subsidies scaled by revenue.

[23] Estimations for this measure of profitability was also tested, but not reported here, and indeed it confirms a positive impact of tax concessions.

for various measures of profitability).[24] This may imply that in these cases subsidies have more of a rescue nature, having a limited positive impact on profitability. The negative impact of below-market borrowings is significantly reduced for firms based in China. As in the case of productivity growth above, they are likely to be a systemic rather than emergency support of companies. The heterogenous finding for China-based firms is also confirmed by the IV approach.

## Possible avenues for future research

45. This report has undertaken thorough econometric testing of the causal impacts of government subsidies on several firm performance indicators. This analysis could be expanded in the future by focusing on more comprehensive measures of government help, once the data become available, and by investigating additional firm performance indicators.

46. Existing data on government support to companies do not measure all possible ways in which governments can subsidise industrial companies (OECD, 2023[1]). In the future, if and when such data become available, analytical work could in addition test for the impact of differential treatment in relation to regulatory measures, support resulting from export restrictions on upstream inputs, production inputs (like energy or land) received by industrial producers at below-market prices, and support resulting from the provision of below-market equity. Not accounting for such forms of support may lead to an underestimation of the role that subsidies play in certain business decisions and market outcomes, particularly in jurisdictions that provide greater support through these types of policies such as China. Moreover, the inter-relations between different forms of support and their cumulative effects may lead to larger market impacts than with individual support measures.

47. It would be also interesting to investigate the effects of complex ecosystems of government aid in which support flows across companies and production stages (Figure 5; OECD (2024[23])). One of the challenges in understanding whether a firm's market position results from government support or other factors is the need to unpack the extent and impact of a complex array of support at all stages of the value chain. For instance, when subsidies upstream benefit producers downstream, it becomes complicated to attribute market outcomes to subsidies at the level of individual firms or sectors. An illustration of such challenges is when the impact of subsidies received by shipyards on their performance is analysed separately from the subsidies benefitting the steel sector (a crucial input into shipbuilding). So far, estimates for such cross-sector subsidisation are generally not available, as capturing the full effect of subsidies along a supply chain would require detailed information on input-output linkages at the firm level.[25]

48. Future research could also test for the direct impact of subsidisation on international trade. Unfortunately, not all jurisdictions (including in the OECD) make import and export data of individual firms operating in their territory available to researchers.[26] Moreover, in the OECD MAGIC database, information is generally not available on the location of production and sales by geographical regions as these data

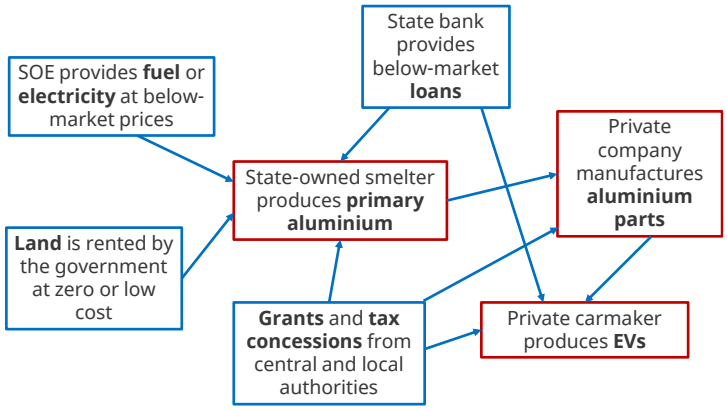
[24] In many specifications, not only the coefficient on the interacted subsidy measure and the dummy for low-profitability firms is significant and negative, but also the coefficient on subsidies for all firms become positive and significant.

[25] Liu (2019[38]) investigated this issue by developing a theoretical model and testing some of its predictions using data for Korea in the 1970s and for modern-day China. The findings suggest that upstream subsidies have had important aggregate effects in both countries.

[26] Even if access to such data were possible for a large enough group of countries (including all OECD as well as major emerging economies), significant challenges would remain. These data would need to be harmonised and matched with consolidated, group-level information on subsidies such as that found in the OECD MAGIC database.

are not reported systematically and consistently by companies in their annual reports.[27] Thus, so far, the best available proxy for a company's performance relative to its competitors remains the share of a firm's revenue (from both domestic and foreign sales) in total sales for each sector, i.e. the global market share as done in this report. Unfortunately, as with other firm-level databases covering firms from different countries and focusing on narrowly defined sectors, it was not possible to distinguish between domestic market shares and foreign market shares, as data for total sectoral consumption in each jurisdiction are not available.

## Figure 5. Subsidies are part of a complex ecosystem in which support flows across companies and production stages




Note: This figure is for illustrative purposes only and it is not meant to depict any particular company or jurisdiction. SOE stands for state-owned enterprises. EVs stands for electric vehicles.
Source: OECD.

49. Another outcome of interest that should be investigated is excess capacity driven by non-market policies and practices, which can result in a decline in both prices and profits in the affected sector.[28] As measurement of such non-market excess capacity is complex, and comparable data on capacity utilisation rates and prices for many sectors are generally not available, this paper does not investigate this potential source of distortion caused by government subsidies.[29] Commercial misjudgements are a different policy

[27] The jurisdiction of a company is assigned based on the headquarters' location or the location of its main place of business when the location of its headquarters corresponds to inexistent or insignificant volumes of manufacturing activity (e.g. measured by tangible assets or employees) (OECD, 2025[2]).

[28] There has been significant debate over the existence of, or how to define, excess capacity. For example, it has been suggested that, rather than a single test or condition to identify overcapacity, there are three different sets of indicators, which together or on their own could signal the existence of overcapacity, namely (i) an increase in capacity expansion inconsistent with even the most ambitious demand projections; (ii) the widespread presence of lossmaking and inefficient firms along with rising investment and production; and (iii) low or sharply declining capacity utilisation rates (Shambaugh, 2024[47]).

[29] In the context of discussions about recent industrial policies, anecdotal evidence and official government declarations have indicated the presence of excess capacity resulting from state interventions, particularly in sectors such as aluminium, steel, shipbuilding, solar panels, basic chemical, memory semiconductors and electric vehicles (OECD, 2021[43]). However, defining excessive capacity is not straightforward (some level of spare capacity, which varies across sectors and business cycle, is normal for firms), and comparable indicators of excess capacity are not easily available over time, countries, industries and firms. That said, the source of the capacity investment matters – whether at firm level excess capacity is due to a negative demand shock or due to overinvestment, including because

problem from capacity expansion based on artificially low (or no) cost of capital for certain firms. This gap calls for further work to address this important channel of market distortions.

## Conclusions

50. This report contributes to a rapidly growing literature and policy discussions about the implications of government subsidies for firm behaviour and competition. It builds on the OECD MAGIC database, a unique dataset containing detailed information about the level of subsidies for individual large manufacturing firms operating in 14 different sectors, across numerous OECD and non-OECD economies over the 2005-22 period (OECD, 2025[2]). The report undertakes thorough econometric testing of the causal impacts of government subsidies on several firm performance indicators. It uses two econometric techniques to deal with potential reverse causality, controlling for various unobserved and observed characteristics, and performs numerous robustness checks.

51. The econometric evidence thus obtained indicates that on average across the largest manufacturing firms operating in various sectors and countries, total government subsidies:

- increase market shares. This impact is economically sizeable, relative to observed small annual changes in market shares, with an increase of one percentage point in subsidies relative to revenue corresponding to between the 27$^{th}$ and 51$^{st}$ percentile of the observed distribution of annual absolute market share changes, depending on the estimation method. While there is no evidence that the marginal impact is larger for China-based companies, the fact that they received larger subsidies than firms based in other jurisdictions could partly explain their bigger market share gains over the longer term.
- do not seem to have an impact on firms' investment relative to the size of their existing capital stock (i.e. the investment rate) but appear to increase nominal spending on investment. This implies that the nominal boost is small and total subsidies do not make firms invest a larger share of their existing capital stock.
- have no or a negative effect on real productivity growth, in line with most frequent findings in the literature. The results are sensitive to estimation methods and specifications, likely reflecting challenges with estimating real productivity growth as well as a significantly smaller sample than for other investigated firm performance indicators.
- appear to negatively affect allocative efficiency at the global level, as the expected positive relationship between asset growth and productivity levels is weaker for firms that are more subsidised.
- have no significant contemporaneous impact on various measures of profitability. This suggests that firms generally do not translate subsidies into simple windfall profits.

52. Most of the above findings are robust to different ways of scaling subsidies, and various robustness checks, involving using moving averages (to account for possible lagged effects of subsides), estimations without firm fixed effects, and exclusion of one sector at a time.

53. Given that overall subsidies appear to have no or negative impact on the investment rate and productivity, the finding that subsidies are associated with increases in market shares does not seem to be explained by efficiency gains. Instead, this relationship could result from the ability of firms receiving

of an artificially low cost of capital. Subsidy estimates for the steel sector drawn from the OECD MAGIC database indicate, for example, that below-market borrowings (as a percentage of revenue) peaked in 2015 – a time when capacity utilisation was declining, and steel prices reached a record low.

subsidies to cover part of their operating costs and lower their prices. This narrative is consistent with evidence that subsidies do not boost profitability.

54. For several performance indicators, effects of subsidies differ across their types, with most frequent and consistent findings for tax concessions.

- Several specifications point to a positive impact of tax concessions on investment levels and rates, productivity and profitability. These positive effects of tax concessions can stem from their perceived predictability, especially if they are part of the tax code, as compared to other forms of subsidies that are often contingent on budget constraints. Moreover, they generally allow firms to make independent decisions, unlike those grants that are tied to individual projects. Thus, tax incentives could be more conducive to investment and productivity improvements, especially where they are related to R&D spending (Appelt et al., 2016[24]; Criscuolo et al., 2022[25]). Overall, the use of tax concessions may reduce the risk of resource misallocation or firms engaging in activities solely to qualify for subsidies rather than for efficiency or profitability gains.
- In contrast, there is some evidence that below-market borrowings lower real productivity growth and profitability. This can reflect the fact that below-market borrowings at times have been used to support distressed firms. In such circumstances, they are less likely to have positive contemporaneous effects on productivity and profitability. Below-market borrowings may just help firms to survive in the market that would not otherwise have done so without seeking to increase their productivity.
- Effects of grants are mostly insignificant.

55. These heterogenous results for individual subsidy types suggest that the effects of government support can differ significantly depending on the nature and design of individual support measures. Where the effects of different subsidy types run in opposite directions, this can also explain challenges with finding significant results for total subsidies. However, the findings for the impact of overall subsidies need not be a simple sum of the component parts. This is because of econometric reasons (e.g. differences in data availability and statistical power) and substantive reasons (e.g. possible additive effects of receiving multiple forms of subsidies concurrently).

56. There is also some tentative evidence about differentiated effects of subsidies across various characteristics of firms. Some of them relate to China-based companies. For instance, changes in their market shares seem to be affected to a smaller extent by the total subsidies received by competitors. This could reflect the fact that other policy measures may have limited access of foreign firms to Chinese markets, hindering possible positive effects of subsides that these foreign firms received. This aligns also with the observation that, in most sectors, the market gains of China-based firms reflect primarily growing domestic sales. Moreover, the negative impact of below-market borrowings on productivity and profitability is less negative for China-based firms. This is probably because, in contrast to other countries, below-market borrowings are a systemic rather than an emergency type of government support to companies. Below-market borrowings are by far the largest form of government subsidies in China currently captured in the database, and government ownership in China's banking sector is more conducive to such type of government support (OECD, 2025[2]; OECD, 2024[23]).

57. The stylised facts about government subsidies for the largest manufacturing companies shown in a companion paper (OECD, 2025[2]), together with the evidence presented in this report about their effects on firm performance, have improved our knowledge about the size and nature of subsidies and their market implications. However, this knowledge is still incomplete. In this regard, these findings are without prejudice to any reviews that may be conducted by investigating authorities or under the WTO dispute settlement procedures on subsidies and countervailing measures.

58. In this context, efforts to improve transparency and measurement of government support, including at the OECD, should continue. It is also essential to pursue further studies using a variety of methodologies

and approaches to improve evidence and broaden the scope of possible subsidy effects. This will be important to enable comprehensive cost-benefit analysis of subsidies provided to companies, both at the company level and in terms of their impact on competition and domestic and global markets.

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# Annex A. Econometric approach

## Empirical framework

### *General econometric approach*

1. The empirical framework to explore the market implications of subsidies received by firms generally consists of estimating an equation of the following form:

$$Y_{f,t} = \beta \cdot Subsidies_{f,t} + \gamma \cdot X_{f,t} + \sum_{f} \delta_f + \sum_{r,i,t} \delta_{r,i,t} + \epsilon_{f,t}$$

where $Y_{f,t}$ corresponds to different indicators of firm performance (market share, investment, productivity and profitability) in year *t* for firm *f* based in geographical region *r* and operating in industry *i*; $Subsidies_{f,t}$ is a measure of subsidies received by the firm in a given year, $X_{f,t}$ is a set of firm-specific and time-varying controls, and $\delta_f$ and $\delta_{r,i,t}$ are firm and region-industry-year fixed effects.

2. Fixed effects are customarily used to control for unobserved characteristics that are fixed over a specific dimension of the sample. The intention behind adding dummy variables is to remove the impact of these characteristics from the error term. Two distinct sets of fixed effects are used:

- Firm fixed effects: these are intended to account for all time-invariant characteristics of firms that may affect a given firm performance indicator on top of the regressors used. In principle, there is a trade-off between controlling for unobserved characteristics of the firm, which may affect the outcome and whose effects would be good to isolate from the effect of subsidies, and exploiting cross-firm variation in the level of subsidies and outcomes. With firm fixed effects it is less likely that the observed effects are driven by other characteristics of the firm (e.g. political connections, quality of management, government ownership, or access to natural resources and other production factors). However, such estimations rely only on within-firm variation of subsidies and outcomes over time. They may also obscure how some of these characteristics interact with subsidies in generating business decision or market outcomes. In view of this trade-off, robustness checks excluding firm fixed effects are also tried.
- Industry-time fixed effects: these capture specific events in a given industry that may vary over time. For instance, they could reflect government support to badly affected industries during a crisis (e.g. the car sector during the global financial crisis or the steel industry in China in 2015) or governments' preferences to support a given industry, for instance via industrial policy strategy, in a specific period. These industry-year changes may differ by region. The analysis here uses a region-industry-time fixed effect, distinguishing only two regions: China and other countries.[1]

Given the use of firm and time fixed effects, the identification of the subsidies effect on firm performance relies on within firm variation (not across firms), purged from any region-industry-time specific characteristics influencing firm performance.

3. The main explanatory variable of interest is the amount of subsidies received by firm in a given year, either in level or as a ratio to total revenue (or other proxy of firm size such as the cost of goods sold).

[1] In some specifications, in particular in the instrumental variables approach, only time fixed effects instead of region-industry-time fixed effects are used, as explained below.

Regressions are generally run with subsidies both in level and scaled by revenue to verify that the effect is not driven by a size effect, larger firms being both more performant and receiving larger subsidies. The regressions test for the effect of different types of subsidies separately (grants, tax concessions and below-market borrowings) as well as for the effect of total subsidies, i.e. summing up over all types of subsidies.

4. Data availability differs across grants, tax concessions and below-market borrowings, complicating the calculation of total subsidies. On the one hand, summing observations when only three types of subsidies are available shortens the panel sample. On the other hand, defining total subsidies even if only one type is available may lead to big annual changes when the availability of data improves. Thus, to strike a balance between these opposing factors, total subsidies in the main specifications are defined as when at least two types of subsidies are non-missing.

### *Reverse causality*

5. Subsidies are generally not assigned randomly to firms, and their attribution can be based on criteria linked to the performance of the firm such as productivity, investment, profitability or market share. This can create a correlation between firm performance and subsidies, not because subsidies directly impact performance, but due to the selection process of who receives them – the so-called reverse causality. As a result, using ordinary least squares (OLS) to analyse the effects of subsidies may lead to biased and inconsistent estimates. To address this, two different methods are employed in our empirical analysis. The first is a standard instrumental variable (IV) approach where subsidy allocation is instrumented with external variables not directly affecting firm performance. The other one is a novel generalised propensity score-based method adjusting for differences between firms receiving different levels of subsidies. These two methods are described in detail below.

#### *Instrumental variable approach*

6. The IV approach is commonly used in the literature to isolate the causal effect of a treatment, using an external variable that influences the treatment but not the outcome, except through the treatment itself. In the context of this paper, the treatment is subsidies received by the firm, and the outcome corresponds to various firm performance indicators.

7. For the analysis of investment, profitability and productivity effects, the level of firm subsidies or the ratio of subsidies to revenue in year *t* is instrumented by the average level of subsidies or the average subsidies to revenue ratio received by all other firms operating in the same sector in the same year (i.e. competitors). This variable is likely a valid instrument, as firm's subsidy levels are typically correlated with the broader sector trend over time, while this trend should not be directly affected by the firm's individual performance. As the use of this instrument would be redundant with the introduction of industry-time fixed effects, regressions using the average level of subsidies in the sector as instrument only include firm and time fixed effects.

8. As an additional robustness check for investment and profitability, a more complex version of this instrument is also used. Instead of a simple average of the subsidies received by other firms in the same sector, the average is weighted by its pre-sample exposure to different world regions. A firm's distribution across regions of operation is calculated based on its patent filings,[2] drawing on data obtained from PATSTAT as in Hémous et al. (2025[29]), which can function as a proxy for which markets firms are active in. The intuition is that the subsidies a firm receives are more likely to be similar to those of other firms in

[2] Regional weights are determined by each region's share in the firm's patent stock as of 2004. Five regions are considered: China, Europe, North America, Asia Pacific and other countries. The patent stock is calculated using the annual number of patents filed across different countries, with a depreciation rate of 15%. For firms that entered the sample after 2004, regional shares are based on their patent stock in the first year they appear in the database.

the same geographic markets, as they are likely to be eligible for subsidies from the same sets of governments. This alternative instrument is not used for productivity growth as it would imply reducing the sample further given missing data for some firms.[3]

9. For the analysis of market share effects, the above instruments are not appropriate since market shares are a relative measure of firm performance, which itself depends on the outcomes of other firms in the sector and is therefore likely to be directly affected by the average level of subsidies in the sector. Thus, the level of firm subsidies in these regressions is instrumented by its 2-year lag. The current level of subsidies is indeed likely to be correlated with its past values, given the high persistence of this variable, while past values should in principle not be affected by the current level of firm performance, making it a plausibly valid instrument.[4]

10. The regression results tables below report the Cragg-Donald F-statistic for weak instruments for all IV regressions. A statistic above 10 is generally considered as acceptable as a rule of thumb to rule out weak instruments, though the precise threshold depends on the level of tolerance for bias and size distortions. The other usual test for instrument validity is the overidentification test of all instruments (Hansen J statistic). It is not reported here as the estimation rely on only one instrument, so by definition the model is not overidentified.

### *GPS IPTW approach*

11. Propensity score methods were developed to encapsulate all the unit features that can predict the expected probability of treatment into a single number (Rosenbaum and Rubin, 1983[30]). An extension of this approach, generalised propensity scores (GPS) capture the same information but for cases of continuous rather than binary treatment, as is the case for subsidies (Hirano and Imbens, 2004[31]).

12. After estimating GPS, the information contained in these scores can be used for inference in a number of different ways, including as covariate correction, for matching, or for weighting. Here, inverse probability of treatment weighting (IPTW) was employed, as it is most suitable for relatively small data samples (Desai and Franklin, 2019[32]). In this approach, observations are reweighted to increase the influence on the estimation of firms that received large subsidies despite their observable characteristics suggesting they would receive small subsidies, and vice versa. This means that the total sample moves closer to resembling a distribution that would be expected in the case of random treatment assignment (Austin and Stuart, 2015[33]).

13. One advantage of the GPS IPTW approach is that it clearly separates the design and inference stages of the analysis. The extent to which the weighted dataset is indeed balanced on relevant variables can be assessed empirically using distribution distance metrics (Wu et al., 2024[34]). This allows for data-driven model selection based on covariate balance that stands independent from the results of subsequent regression analyses. To estimate the GPS, an ensemble of machine learning methods was employed using the Causal GPS package in R (Khoshnevis, Wu and Braun, 2023[35]). A kernel smoother approach was used to avoid making parametric assumptions about the conditional density function.

14. The main decision in GPS estimation that needs to be made by the researcher is the set of variables to include in predicting the propensity scores. Here, the main aim is to include variables that are correlated with both the treatment (subsidies) and outcome (market shares, investment, productivity, or

[3] The calculation of the alternative instrument reduces the number of observations by approximately 20%. This is because not all firms can be matched with patent weights, and for some sector-region-year observations data are not available.

[4] Lagged explanatory variables are commonly used as instrument to avoid a simultaneity bias. For this to be an effective strategy, the lagged values should not themselves belong to the estimated equation and they should be sufficiently correlated with the simultaneously determined explanatory variable (Reed, 2015[36]).

profitability) of interest. The set of firm characteristics selected were: sector and region dummy variables, the share of the firm that is state-owned, whether it is a multi-product firm, the firm's revenue, staff, fixed tangible assets (i.e. net property, plant and equipment), cost of goods sold, and total assets, and the firm's interest coverage ratio, average effective interest rate, debt-asset ratio, the EBIT-revenue ratio, return on assets , and sales growth. Collectively, these variables capture a wide range of aspects about a firm's size and performance that may feed into its likelihood of receiving subsidies.

15. In order to ensure that the information used to predict subsidisation precedes any subsequent impact of these subsidies, all predictor variables were lagged by one year. To reduce the impact of outliers on estimation, first the levels of subsidy and then subsequently the estimated GPS were trimmed at the 1st and 99th percentiles. These two choices, as well as the fact that information on all predictor variables needs to be available, translate into slightly smaller sample sizes for the estimations using GPS IPTW than for the IV method described above.

## Detailed specifications and variable definitions

### *Market share estimations*

16. Testing the impact of subsidies on market shares is more complicated than for other firm performance indicators (like investment, productivity and profitability – see below). As market share is a relative performance indicator, the explanatory variables should not only include subsidies for a given firm but also for its competitors. This creates a challenge for the IV approach adopted in the paper (including the alternative instrument based on the weighted subsidies of competitors), as the instrument for firm's subsidies is indeed competitors' average subsidies. Similarly, the GPS IPTW approach faces issues: reweighting can only address imbalance across one treatment variable, not multiple explanatory variables at once.[5]

17. In view of the above challenges, a few attempts to address them are tried here to shed some light on possible implications of government subsidies on market shares.

- As done for other performance indicators below, regressions are run aiming at estimating the impact of subsidies received by firms on market shares. The explanatory variable is subsidies scaled by revenue, to make sure the correlation between market share and subsidies does not simply result from a size effect. However, market shares and subsidies scaled by revenue are negatively correlated (the numerator of the former being the denominator of the latter). To reduce the potential impact of this negative correlation and to avoid problems with non-stationary variables, a change in market share is used as the dependent variable.[6]
- IV estimations are conducted using lagged values as an alternative instrument for subsidy-related variables. For this to be an effective strategy, the lagged values should be sufficiently correlated with the main explanatory variable and they should not themselves belong to the estimated equation (Reed, 2015[36]). The first condition is likely to be fulfilled for subsidies given their high

[5] A potential additional issue is that while a firm's own subsidies can be predicted based on its own observable characteristics, predicting its relative subsidisation would be more accurate when also taking into account the features of all other firms in the sector.

[6] Autoregressive coefficients for market shares are close to one in the panel of analysed firms. In estimations with the market shares in levels and scaled subsidies (not reported in this paper), the coefficient for subsidies is indeed significant and negative, suggesting that this negative correlation plays an important role.

persistence (OECD, 2025[2]). In addition, the IV estimations rely on the 2-year lag as instrument, for which the second condition is more likely to be met.[7]

- The role of subsidies for other firms is modelled in two ways: as the difference between the firm's subsidisation and the average subsidisation of other firms in the sector, and with separate variables for the firm's subsidy and the sector average (excluding the firm in question). The former addresses the issue with the GPS IPTW approach whereby only one treatment can be targeted for balance. When using the latter specification, the firm's own subsidies are chosen as the relevant treatment variable for the calculation of the GPS.
- OLS panel estimations are also run using lagged subsidy variables to reduce the potential problem of reverse causality. Such estimation loses information about the contemporaneous impact of subsidies on market shares. However, the use of lags can be relevant given that market shares may react with a delay to subsidies. This could reflect the delayed effects of investment or a prolonged reduction in prices of goods sold stemming from a sustained stream of subsidies (as discussed above).

18. To explore the link between market shares and subsidies, the following equation is estimated:

$$\Delta marketshare_{f,t} = \beta \cdot \left(Subsidies_{f,t} - \overline{Subsidies_{f',t}}_{\{f' \in i, f' \neq f\}}\right) + \sum_{f} \delta_f + \sum_{r,i,t} \delta_{r,i,t} + \epsilon_{f,t}$$

where:

- $\Delta marketshare_{f,t}$ is the annual change in market share. The latter is defined as the ratio of firm segment-specific revenue to the sum of segment-specific revenue for all firms operating in the same sector. The dependent variable is truncated to exclude the top and bottom percentiles of the distribution of market share changes over the entire sample.
- $\left(Subsidies_{f,t} - \overline{Subsidies_{f',t}}_{\{f' \in i, f' \neq f\}}\right)$ is the relative level of subsidies received by the firm compared to its competitors, measured as the differential between the firm's own ratio of subsidies to revenue and the average level of this ratio for other firms operating in the same sector.
- $\delta_f$ and $\delta_{r,i,t}$ are fixed effects defined as in the previous subsections.

19. A second equation is also estimated, looking separately at the effect of firm own subsidies and of subsidies received by its competitors:

$$\Delta marketshare_{f,t} = \beta \cdot Subsidies_{f,t} + \gamma \cdot \overline{Subsidies_{f',t}}_{\{f' \in i, f' \neq f\}} + \sum_{f} \delta_f + \sum_{r,i,t} \delta_{r,i,t} + \epsilon_{f,t}$$

Both equations are estimated using three alternative approaches OLS, IV and GPS IPTW.

### *Investment estimations*

20. The estimated equation to explore the link between firm investment and subsidies they receive is given by:

$$i_{f,t} = \beta \cdot Subsidies_{f,t} + \gamma_1 \cdot Salesgrowth_{f,t-1} + \gamma_2 \cdot Employees_{f,t-1} + \gamma_3 \cdot roa_{f,t-1} + \gamma_4 \cdot leverage_{f,t-1} + \gamma_5 \cdot profitability_{f,t-1} + \gamma_6 \cdot icr_{f,t-1} + \sum_{f} \delta_f + \sum_{r,i,t} \delta_{r,i,t} + \epsilon_{f,t}$$

[7] As noted below, market shares may react with a delay to subsidies. This is less likely after two years than after one year, which is why the 2-year lag is favoured as an instrument. However, it cannot be totally excluded that subsidies continue to affect market shares after two years, implying that the 2-year lag is still probably an imperfect instrument in this setting.

where variables are defined as follows:

- $i_{f,t}$ is nominal investment level or an investment rate of firm *f* in year *t*. Investment is measured as the change in fixed tangible assets (property, plant and equipment) corrected for depreciation (both measured at book values). The investment rate is investment divided by the lagged value of fixed tangible assets.
- $Salesgrowth_{f,t-1}$ corresponds to the firm's sales growth, which is included to control for demand factors.
- $Employees_{f,t-1}$ corresponds to the number of employees of the firm, used as a control for firm size.
- $roa_{f,t-1}$ is the firm's return on assets ratio, $leverage_{f,t-1}$ is the ratio of debt to total assets, $profitability_{f,t-1}$ is the ratio of earnings before interest, taxes (EBIT) to revenue, and $icr_{f,t-1}$ is the interest coverage ratio (defined as EBIT divided by interest expenses). All these variables control for firm financial performance and risks, which are key factors in investment decision.
- $Subsidies_{f,t}$ is the amount of subsidies received by the firm in level or scaled by revenue or the cost of goods sold, and $\delta_f$ and $\delta_{r,i,t}$ are firm and region-industry-time fixed effects as detailed above.

21. The estimated equation does not include the lagged dependent variable, which is commonly included in investment models such as accelerator-type. This is in order to avoid the so-called Nickell bias, which arises when including both firm fixed effects and the lagged dependent variable in ordinary least squares estimations (Nickell, 1981[37]). As a robustness check, the equation is also estimated including the lagged investment rate among explanatory variables, and the results are not substantially different from the baseline specification.

### *Productivity estimations*

#### *Within-firm productivity growth*

22. The analysis of the impact of subsidies on firm productivity focuses on multifactor productivity (MFP), reflecting the overall efficiency with which labour and capital inputs are used together in the production process.[8] The MFP measure relies on a value-added-based production function estimation with the number of employees and real capital as inputs, using the IV estimation method proposed by Wooldridge (2009[22]). This approach mitigates the endogeneity problem of input choices by using material inputs as proxy variables for unobserved productivity and lagged values of labour as instruments. The production function is estimated separately for each 2-digit industry but pooled across all countries, controlling for country and year fixed effects. This allows for inherent technological differences across industries, while at the same time ensures comparability of MFP levels across countries and over time by having a uniform labour and capital coefficient along these dimensions. To increase the number of observations and the robustness of the industry-specific estimations, they are run on the MAGIC sample supplemented with a large harmonised cross-country firm-level dataset, where the underlying data are sourced from ORBIS, a commercial database by Moody's.[9]

[8] Results on the impact of subsidies on productivity are broadly robust if MFP is replaced by a measure of labour productivity (ratio of value added to number of employees) as a sensitivity check.

[9] ORBIS is the largest cross-country firm-level database that is available and accessible for economic and financial research. However, since the information is primarily collected for use in the private sector typically with the aim of financial benchmarking, a number of data manipulations were undertaken to use the data for economic analysis. They closely follow suggestions by Kalemli-Ozcan, et al. (2015[41]) and previous OECD experience (Gal, 2013[42]). Data are cleaned and benchmarked using a number of common procedures such as keeping accounts that refer to entire calendar year, using harmonised consolidation level of accounts, dropping observations with missing information on key variables as well as outliers identified as implausible changes or ratios. Monetary variables are moreover deflated using 2-digit industry deflators from OECD STAN and national accounts, and prices are expressed in industry

23. MFP is measured in real terms. Main variables used to estimate the production function (value added, output, materials and investments) are deflated using country-industry-specific deflators (as firm-level deflators are not available), and converted to industry-level PPPs, in order to ensure comparability across countries and over time.

24. Nevertheless, a number of issues that commonly affect productivity measurement should be kept in mind, including: i) differences in the quality and utilisation of inputs cannot be accounted for as the capital stock is measured in book value; ii) firm-level prices cannot be observed, so firm-level differences in measured productivity may also reflect differences in market power; and iii) measuring outputs and inputs in internationally comparable price levels remains an important challenge.

25. The estimated equation to explore the link between firm productivity performance and subsidies they receive is given by:

$$\Delta MFP_{f,t} = \beta \cdot Subsidies_{f,t} + \gamma \cdot SizeControls_{f,t} + \sum_{f} \delta_f + \sum_{r,i,t} \delta_{r,i,t} + \epsilon_{f,t}$$

where:

- $\Delta MFP_{f,t}$ is firm MFP growth (approximated by the first difference as MFP is expressed in log terms and for small values of $x$ log(1+x)≈x). Productivity growth outliers are removed by excluding one percentile from the top and bottom of its distribution;
- $SizeControls_{f,t}$ correspond to deciles of the firm size (measured by the number of employees) distribution;
- $Subsidies_{f,t}$ is the amount of subsidies received by the firm scaled by revenue or the cost of goods sold, and $\delta_f$ and$\delta_{r,i,t}$ are firm and region-industry-time fixed effects as detailed above. Subsides exclude outliers.

### *Allocative efficiency*

26. The analysis also investigates effects of subsidies on allocative efficiency, using a dynamic allocative efficiency model (Foster, Grim and Haltiwanger, 2016[27]; Decker et al., 2020[28]). Firm employment growth or asset growth is regressed on lagged firm productivity and lagged productivity interacted with scaled subsidies:

$$Firmgrowth_{f,t} = \beta \cdot MFP_{f,t-1} + \gamma \cdot MFP_{f,t-1} * Subsidies_{f,t} + \theta \cdot Subsidies_{f,t} + \lambda \cdot Controls_{f,t} + \sum_{i,t} \delta_{r,i,t} + \epsilon_{f,t}$$

purchasing power parities (PPPs) (see Appendix E of Andrews, Criscuolo and Gal (2016[40]) for more details on the ORBIS dataset and the methodology used for MFP estimation).

where:

- $Firmgrowth_{f,t}$ corresponds either to employment growth or total asset growth;
- $Controls_{f,t}$ captures deciles in the distribution of firm staff, return on assets, and leverage (the ratio of a firm's debt to total assets);
- $\delta_{r,i,t}$ as previously defined are region-industry-year fixed effects used for GPS IPTW, while separate industry and year fixed effects were used for the IV estimations;
- $Subsidies_{f,t}$ and $MFP_{f,t-1}$ are as previously defined.

27. The coefficient of lagged productivity ($\beta$) is expected to be positive in presence of positive reallocation effects towards more productive firms. The main coefficient of interest is the coefficient of the interaction variable ($\gamma$). If it is negative, subsidies weaken the positive reallocation.

### *Profitability estimations*

28. The estimated equation to explore the link between firm profitability and subsidies they receive is given by:

$$Profitability_{f,t} = \beta \cdot Subsidies_{f,t} + \gamma \cdot SizeControls_{f,t} + \sum_{f} \delta_f + \sum_{r,i,t} \delta_{r,i,t} + \epsilon_{f,t}$$

where:

- $Profitability_{f,t}$ is firm profitability, measured either by the ratio of firm's earnings before interest and taxes (EBIT) to revenue, or by return on assets, i.e. the ratio of income before tax to total average assets. Profitability outliers are removed by excluding firms with profitability ratios above one in absolute value;
- $SizeControls_{f,t}$ correspond to deciles of the firm size (measured by the number of employees) distribution;
- $Subsidies_{f,t}$ is the amount of subsidies received by the firm scaled by revenue or cost of goods sold, and $\delta_f$ and $\delta_{r,i,t}$ are firm and region-industry-time fixed effects as detailed above. Subsides exclude outliers.

### *Estimations with interactions of various firm heterogeneity characteristics*

29. To assess heterogeneity in the impact of subsidies on all the outcome variables considered, interaction effects are used throughout. For ease of interpretation, binary variables are constructed for the interactions, which split the sample of firms into two groups, for example firms that are inside or outside China, or firms above or below a given threshold for a specific variable. Several different firm characteristics were tried, including the localisation of headquarters by region, the size of firms and subsidies, concentration of industries, profitability, R&D and capital intensity, productivity level, and the share of state ownership. Only selected significant results are reported in the paper (Table A B.5). Generally, the category "high" refers to firms above the 75$^{th}$ percentile in a distribution, while "low" refers to below the 25$^{th}$ percentile.[10] These classifications of firms are done relative to other firms within the same sector and on average across the whole period to ensure results are not a function of firms moving above and below the threshold. Estimations are carried out for both the IV and GPS IPTW approaches.

[10] The two exceptions to this are firm size measured in terms of staff and high profitability for the equations on productivity, where the median is used to define high values. Generally, the direction of the interaction effect is consistent regardless of the precise threshold used, but the statistical significance of the coefficients varied in some cases.

30. The general form of the estimation equation when using interaction effects is:

$$Outcome_{f,t} = \beta \cdot Subsidies_{f,t} + \gamma \cdot Subsidies_{f,t} * Interaction_f + \theta \cdot Controls_{f,t} + \sum_f \delta_f + \sum_{r,i,t} \delta_{r,i,t} + \epsilon_{f,t}$$

where:

- $Outcome_{f,t}$ is the relevant outcome variable, as defined above;
- $Subsidies_{f,t}$ is the amount of subsidies received by the firm, where the scaling depends on the equation as described above;
- $Interaction_f$ is the binary variable defining which category a firm is in, depending on the particular firm characteristic under investigation;
- $Controls_{f,t}$ are the relevant control variables depending on the outcome of interest, as described above, and $\delta_f$ and $\delta_{r,i,t}$ are firm and region-industry-time fixed effects as detailed above.

31. In terms of interpretation, in models with the interaction effect, the main coefficient on subsidies $\beta$ can be read as the effect of subsidies for firms who do not fall in the relevant group for the interaction, e.g. firms that are not in China. The coefficient on the interaction $\gamma$ is the difference from this main effect for the relevant group; therefore, the effect of subsidies for this group, e.g. Chinese firms, is $\beta + \gamma$.

# Annex B. Econometric results

## Table A B.1. Regression results: Change in market shares

| Outcome: | Change in market shares | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Method: | IV | GPS IPTW | OLS | IV | GPS IPTW | OLS | IV | GPS IPTW | OLS | IV | GPS IPTW | OLS |
| | | | | | | | | | | | | |
| Difference own vs average subsidy / revenue | 0.1494* | 0.0296** | 0.0118* | | | | | | | | | |
| | (0.0766) | (0.0125) | (0.0069) | | | | | | | | | |
| Difference own vs average subsidy / COGS | | | | 0.1329* | 0.0249** | 0.0107* | | | | | | |
| | | | | (0.0685) | (0.0099) | (0.0055) | | | | | | |
| Own subsidy / revenue | | | | | | | 0.1334* | 0.0453** | 0.0143** | | | |
| | | | | | | | (0.0680) | (0.0228) | (0.0069) | | | |
| Average subsidy / revenue | | | | | | | 0.0021 | 0.0006 | 0.0397 | | | |
| | | | | | | | (0.0442) | (0.0032) | (0.0343) | | | |
| Own subsidy / COGS | | | | | | | | | | 0.1190* | 0.0463* | 0.0120** |
| | | | | | | | | | | (0.0617) | (0.0261) | (0.0052) |
| Average subsidy / COGS | | | | | | | | | | -0.0092 | -1.37e-5 | 0.0139 |
| | | | | | | | | | | (0.0366) | (0.0035) | (0.0302) |
| | | | | | | | | | | | | |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 5,400 | 4,056 | 5,950 | 5,388 | 4,050 | 5,929 | 5,400 | 4,057 | 5,950 | 5,388 | 4,052 | 5,929 |
| R2 | 0.070 | 0.215 | 0.127 | 0.043 | 0.176 | 0.127 | 0.085 | 0.211 | 0.128 | 0.063 | 0.213 | 0.127 |
| Cragg-Donald | 81.734 | | | 99.681 | | | 94.972 | | | 117.986 | | |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. COGS stands for the cost of goods sold.
Source: OECD calculations based on the MAGIC database.

## Table A B.2. Regression results: Change in market share by subsidy type

| Outcome: | Change in market share | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Method: | IV | GPS IPTW | OLS | IV | GPS IPTW | OLS | IV | GPS IPTW | OLS |
| Subsidy type: | Tax concessions | | | Grants | | | Below-market borrowing | | |
| | | | | | | | | | |
| Difference own vs average subsidy / revenue | 0.0550 | 0.0142 | 0.0312 | -0.1303 | 0.0723 | 0.0624* | 0.2515 | 0.0041 | 0.0003 |
| | (0.1175) | (0.0120) | (0.0289) | (0.1897) | (0.1227) | (0.0337) | (0.1567) | (0.0229) | (0.0096) |
| | | | | | | | | | |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,828 | 3,723 | 5,369 | 5,173 | 3,823 | 5,711 | 5,408 | 4,210 | 5,943 |
| R2 | 0.142 | 0.227 | 0.128 | 0.140 | 0.324 | 0.132 | 0.024 | 0.226 | 0.123 |
| Cragg-Donald | 376.766 | | | 171.406 | | | 49.255 | | |
| Outcome: | Change in market share | | | | | | | | |
| Method: | IV | GPS IPTW | OLS | IV | GPS IPTW | OLS | IV | GPS IPTW | OLS |
| Subsidy type: | Tax concessions | | | Grants | | | Below-market borrowing | | |
| | | | | | | | | | |
| Own subsidy / revenue | 0.0285 | 0.2064*** | 0.0371 | -0.1290 | -0.0853 | 0.0601* | 0.2270 | 0.0737* | 0.0010 |
| | (0.1064) | (0.0727) | (0.0229) | (0.1943) | (0.1010) | (0.0316) | (0.1394) | (0.0396) | (0.0097) |
| Average subsidy / revenue | 0.1286 | -0.0021 | 0.0440 | 0.1762 | -0.1392*** | -0.1115 | -0.0769 | -0.2092 | 0.0191 |
| | (0.1543) | (0.0037) | (0.1574) | (0.2915) | (0.0460) | (0.1628) | (0.0929) | (0.1371) | (0.0418) |
| | | | | | | | | | |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 4,828 | 3,724 | 5,369 | 5,173 | 3,834 | 5,711 | 5,408 | 4,205 | 5,943 |
| R2 | 0.143 | 0.187 | 0.128 | 0.140 | 0.229 | 0.132 | 0.044 | 0.421 | 0.123 |
| Cragg-Donald | 483.673 | | | 170.183 | | | 57.525 | | |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1.
Source: OECD calculations based on the MAGIC database.

## Table A B.3. Robustness checks: Change in market shares – difference own vs average subsidy

| | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total subsidy | | | | Tax concessions | | | | Grants | | | | Below-market borrowing | | | |
| Baseline | | 0.149 | * | 0.03 | ** | 0.055 | | 0.014 | | -0.13 | | 0.072 | | 0.252 | | 0.004 | |
| Drop firm FE | | 0.025 | * | 0.041 | *** | 0.023 | | 0.018 | | -0.009 | | 0.117 | * | 0.034 | | 0.036 | * |
| Moving average | 2 years | 0.14 | * | 0.015 | | 0.1 | | 0.034 | | 0.167 | | 0.071 | | 0.184 | | -0.021 | |
| | 3 years | 0.074 | ** | 0.019 | | 0.135 | | 0.064 | | 0.153 | | 0.115 | | 0.03 | | 0.011 | |
| Drop sector | AERO | 0.14 | * | 0.035 | ** | 0.044 | | 0.013 | | -0.144 | | 0.074 | | 0.23 | | -0.005 | |
| | ALUM | 0.127 | * | 0.022 | | 0.046 | | 0.017 | * | -0.131 | | 0.038 | | 0.232 | | -0.009 | |
| | AUTO | 0.152 | ** | 0.043 | ** | 0.055 | | 0.137 | * | -0.148 | | 0.129 | | 0.238 | | -0.016 | |
| | CEMT | 0.148 | | 0.019 | | 0.049 | | 0.015 | | -0.269 | | 0.052 | | 0.277 | | -0.01 | |
| | CHEM | 0.178 | * | 0.035 | ** | 0.058 | | 0.014 | | -0.133 | | 0.04 | | 0.285 | | 0.015 | |
| | FERT | 0.133 | | 0.026 | * | 0.06 | | 0.014 | | -0.142 | | 0.024 | | 0.194 | | -0.035 | |
| | GLAS | 0.165 | * | 0.016 | | 0.059 | | 0.006 | | -0.144 | | 0.039 | | 0.282 | | -0.014 | |
| | SEMI | 0.228 | ** | 0.025 | * | 0.16 | | 0.022 | * | -0.148 | | -0.02 | | 0.275 | | -0.007 | |
| | SHIP | 0.165 | ** | 0.027 | ** | 0.066 | | 0.007 | | -0.062 | | 0.079 | | 0.272 | * | -0.002 | |
| | SOLA | 0.074 | | 0.023 | ** | 0.018 | | 0.02 | * | 0.027 | | 0.088 | | 0.247 | * | -0.027 | |
| | STEE | 0.17 | ** | 0.024 | * | 0.045 | | 0.013 | | -0.127 | | 0.116 | | 0.297 | | -0.031 | |
| | TELC | 0.138 | * | 0.015 | | 0.036 | | 0.018 | | -0.157 | | 0.081 | | 0.248 | | -0.003 | |
| | TRAN | 0.13 | * | 0.022 | * | 0.041 | | 0.017 | * | -0.136 | | 0.133 | | 0.228 | | 0.001 | |
| | WIND | 0.162 | ** | 0.023 | * | 0.059 | | 0.008 | | -0.145 | | 0.016 | | 0.237 | | 0.007 | |

Note: Numbers indicated are the main coefficients of interest in the relevant models. *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. For full sector names, see Figure 1 in the main text.
Source: OECD calculations based on the MAGIC database.

## Table A B.4. Robustness checks: Changes in market shares – own subsidy

| | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total subsidy | | | | Tax concessions | | | | Grants | | | | Below-market borrowing | | | |
| Baseline | | 0.133 | * | 0.045 | ** | 0.029 | | 0.206 | *** | -0.129 | | -0.085 | | 0.227 | | 0.074 | * |
| Drop firm FE | | 0.026 | * | 0.08 | *** | 0.022 | | 0.176 | *** | -0.004 | | 0.076 | | 0.034 | | 0.029 | |
| Moving average | 2 years | 0.128 | * | 0.055 | *** | 0.102 | | 0.149 | * | 0.175 | | 0.155 | | 0.169 | | -0.02 | |
| | 3 years | 0.073 | ** | 0.084 | *** | 0.138 | * | 0.203 | ** | 0.155 | | -0.045 | | 0.036 | | 0.037 | |
| Drop sector | AERO | 0.123 | * | 0.067 | ** | 0.019 | | 0.163 | ** | -0.143 | | -0.102 | | 0.203 | | 0.027 | |
| | ALUM | 0.112 | * | 0.099 | * | 0.019 | | 0.08 | | -0.13 | | -0.15 | * | 0.204 | | 0.045 | |
| | AUTO | 0.137 | ** | 0.074 | ** | 0.027 | | 0.123 | ** | -0.147 | | -0.138 | | 0.216 | * | 0.037 | |
| | CEMT | 0.145 | | 0.068 | ** | 0.019 | | 0.12 | * | -0.277 | | -0.07 | | 0.28 | | 0.026 | |
| | CHEM | 0.158 | * | 0.06 | ** | 0.03 | | 0.128 | | -0.132 | | -0.112 | | 0.258 | | 0.046 | * |
| | FERT | 0.117 | | 0.042 | | 0.032 | | 0.078 | | -0.142 | | 0.025 | | 0.171 | | 0.037 | |
| | GLAS | 0.146 | * | 0.063 | ** | 0.03 | | 0.151 | * | -0.143 | | -0.124 | | 0.253 | | 0.043 | |
| | SEMI | 0.2 | ** | 0.07 | ** | 0.118 | | 0.183 | ** | -0.148 | | 0.102 | | 0.248 | * | 0.062 | |
| | SHIP | 0.146 | ** | 0.061 | ** | 0.041 | | 0.215 | ** | -0.055 | | -0.137 | | 0.246 | * | 0.061 | |
| | SOLA | 0.066 | | 0.059 | ** | 0.024 | | 0.071 | | 0.029 | | -0.032 | | 0.227 | * | 0.129 | * |
| | STEE | 0.149 | ** | 0.059 | ** | 0.019 | | 0.173 | | -0.126 | | -0.132 | | 0.261 | * | 0.065 | |
| | TELC | 0.123 | * | 0.035 | * | 0.005 | | 0.17 | | -0.157 | | -0.155 | | 0.224 | | 0.06 | |
| | TRAN | 0.118 | * | 0.049 | * | 0.013 | | 0.118 | ** | -0.134 | | -0.224 | ** | 0.207 | | 0.074 | * |
| | WIND | 0.144 | ** | 0.052 | ** | 0.025 | | 0.123 | * | -0.146 | | -0.071 | | 0.215 | * | 0.204 | ** |

Note: Numbers indicated are the main coefficients of interest in the relevant models. *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. For full sector names, see Figure 1 in the main text.
Source: OECD calculations based on the MAGIC database.

## Table A B.5. Regression results: Interactions for various firm performance indicators

| Outcome: | Change in market share | | | | | | Inv rate | ΔMFP | | Profitability | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Method: | GPS | OLS | GPS | OLS | GPS | OLS | IV | IV | GPS | GPS | GPS | IV |
| Subsidy type: | Total subsidies | | | | | | Tax | BMB | Tax | Total | BMB | |
| Subsidy / revenue | | 0.0017 | | 0.0030 | 0.0377 | 0.0138* | 33.24*** | -25.02* | 10.88*** | 0.4931 | -2.914*** | -14.52** |
| | | (0.0056) | | (0.0058) | (0.0316) | (0.0078) | (12.73) | (14.11) | (3.134) | (0.3863) | (0.9981) | (6.802) |
| Difference own vs average subs / rev | 0.0139 | | -0.0029 | | | | | | | | | |
| | (0.0143) | | (0.0180) | | | | | | | | | |
| Difference X High revenue | 0.0592* | | | | | | | | | | | |
| | (0.0316) | | | | | | | | | | | |
| Subsidy / revenue X High revenue | | 0.0708** | | | | | | | | | | |
| | | (0.0352) | | | | | | | | | | |
| Difference X High staff | | | 0.0618** | | | | | | | | | |
| | | | (0.0247) | | | | | | | | | |
| Subsidy / revenue X High staff | | | | 0.0294* | | | | | | | | |
| | | | | (0.0170) | | | | | | | | |
| Average subsidy / revenue | | | | | -0.0002 | -0.0047 | | | | | | |
| | | | | | (0.0035) | (0.0367) | | | | | | |
| Subsidy / revenue X China | | | | | 0.0223 | -0.0075 | | 19.70* | | | 2.000* | 12.18** |
| | | | | | (0.0364) | (0.0134) | | (11.94) | | | (1.044) | (6.029) |
| Average subsidy / revenue X China | | | | | 0.0077** | 0.1373** | | | | | | |
| | | | | | (0.0038) | (0.0543) | | | | | | |
| Subsidy / revenue X High subsidy | | | | | | | -23.41* | | | | | |
| | | | | | | | (13.86) | | | | | |
| Subsidy / revenue X High profitability | | | | | | | | | -8.718** | | | |
| | | | | | | | | | (4.154) | | | |
| Subsidy / revenue X Low profitability | | | | | | | | | | -1.694** | | |
| | | | | | | | | | | (0.8146) | | |
| Size controls | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | No | No | No | Yes |
| Region-sector-year FE | No | No | No | No | No | No | No | No | Yes | Yes | Yes | No |
| Observations | 4,056 | 5,950 | 4,056 | 5,775 | 4,057 | 5,950 | 4,560 | 3,861 | 2,551 | 4,785 | 4,946 | 5,828 |
| R2 | 0.216 | 0.129 | 0.216 | 0.118 | 0.211 | 0.129 | 0.142 | -0.029 | 0.506 | 0.672 | 0.790 | 0.136 |
| Cragg-Donald | | | | | | | 36.609 | 15.200 | | | | 13.945 |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. MFP stands for multifactor productivity. BMB stands for below-market borrowings. Profitability is measured as the ratio of the ratio of earnings before interests and taxes to revenue. See 0 for more details about definitions of interactions.
Source: OECD calculations based on the MAGIC database.

## Table A B.6. Regression results: Investment indicators

| Outcome: | Investment | | Investment rate | | | |
|---|---|---|---|---|---|---|
| Method: | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW |
| | | | | | | |
| Subsidies | 6.476 | 2.106*** | | | | |
| | (4.855) | (0.7616) | | | | |
| Subsidies / revenue | | | 2.415 | -0.0651 | | |
| | | | (1.708) | (0.5002) | | |
| Subsidies / COGS | | | | | 2.441* | -0.2044 |
| | | | | | (1.330) | (0.3658) |
| Lag staff | 0.0012 | -0.0032 | -8.31e-7*** | -9.96e-7*** | -8.67e-7*** | -8.45e-7*** |
| | (0.0103) | (0.0050) | (1.97e-7) | (2.42e-7) | (2e-7) | (1.86e-7) |
| Lag sales growth | 52.69 | 154.6*** | 0.0372*** | 0.0523*** | 0.0349*** | 0.0486*** |
| | (70.59) | (49.89) | (0.0115) | (0.0171) | (0.0122) | (0.0185) |
| Lag return on assets | 936.4 | 1,239.6** | 0.6087*** | 0.8858*** | 0.6105*** | 0.8461*** |
| | (716.7) | (548.2) | (0.1124) | (0.1743) | (0.1197) | (0.1472) |
| Lag debt-asset ratio | -777.6 | -74.61 | -0.1451* | -0.1365** | -0.1703** | -0.1088** |
| | (531.3) | (162.1) | (0.0758) | (0.0568) | (0.0772) | (0.0536) |
| Lag profitability | 951.7 | -65.53 | 0.0161 | -0.2388* | -0.0061 | -0.2037* |
| | (723.0) | (439.6) | (0.0758) | (0.1318) | (0.0807) | (0.1112) |
| Lag interest coverage ratio | -0.0005 | -0.0002 | -3.62e-7* | -2.11e-6 | -3.58e-7* | -4.25e-7*** |
| | (0.0016) | (0.0004) | (1.89e-7) | (2.51e-6) | (1.88e-7) | (1.17e-7) |
| | | | | | | |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | No | Yes | No | Yes | No |
| Region-sector-year FE | No | Yes | No | Yes | No | Yes |
| Observations | 4,943 | 4,723 | 4,941 | 4,722 | 4,937 | 4,723 |
| R2 | 0.568 | 0.560 | 0.334 | 0.474 | 0.311 | 0.453 |
| Cragg-Donald | 19.644 | | 79.119 | | 69.702 | |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. COGS stands for the cost of goods sold.
Source: OECD calculations based on the MAGIC database.

## Table A B.7. Regression results: Investment indicators by subsidy type

| Outcome: | Investment | | | | | | Investment rate | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Method: | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW |
| Subsidy type: | Tax concessions | | Grants | | Below-market borrowing | | Tax concessions | | Grants | | Below-market borrowing | |
| | | | | | | | | | | | | |
| Subsidy | 10.76** | 4.083*** | 7.828 | 4.563 | -1.507 | -2.010 | | | | | | |
| | (4.618) | (1.429) | (12.40) | (3.257) | (9.399) | (1.744) | | | | | | |
| Subsidy / revenue | | | | | | | 25.67*** | 0.4130 | -33.57 | -1.177 | 2.500 | -1.667 |
| | | | | | | | (9.168) | (1.718) | (30.20) | (1.803) | (1.944) | (1.432) |
| Lag staff | 0.0046 | -0.0115* | 0.0160* | 0.0140* | 0.0192*** | 0.0107** | -7.59e-7*** | -1.15e-6*** | -8e-7** | -1.07e-6*** | -8.79e-7*** | -7.21e-7*** |
| | (0.0043) | (0.0059) | (0.0092) | (0.0079) | (0.0068) | (0.0048) | (2.8e-7) | (2.96e-7) | (3.39e-7) | (2.29e-7) | (2.06e-7) | (2.68e-7) |
| Lag sales growth | 30.81 | 73.64 | 129.3* | 63.44 | 115.3 | 231.7 | 0.0243* | 0.0488*** | 0.0335** | 0.0222 | 0.0381*** | 0.0628** |
| | (67.60) | (74.58) | (78.40) | (65.98) | (80.21) | (168.3) | (0.0145) | (0.0170) | (0.0143) | (0.0173) | (0.0114) | (0.0253) |
| Lag return on assets | 846.6 | 943.8 | 781.4 | 1,452.6* | 420.4 | 191.6 | 0.5657*** | 0.7358*** | 0.6463*** | 0.9744*** | 0.6550*** | 0.9325*** |
| | (579.3) | (621.8) | (723.8) | (774.9) | (620.9) | (1,265.0) | (0.1379) | (0.1444) | (0.1186) | (0.1402) | (0.1060) | (0.1553) |
| Lag debt-asset ratio | 12.89 | -321.9* | -303.2 | -96.55 | 47.19 | 389.3 | -0.0288 | -0.1144** | 0.0386 | -0.0522 | -0.1293* | -0.0914 |
| | (271.9) | (194.0) | (344.3) | (341.3) | (977.7) | (412.2) | (0.0714) | (0.0500) | (0.1003) | (0.0502) | (0.0727) | (0.0683) |
| Lag profitability | 479.2 | 16.99 | 1,705.8*** | 461.1 | 1,837.7*** | 1,364.6 | -0.0918 | -0.1308 | 0.0076 | -0.2146** | 0.0045 | -0.2138** |
| | (493.5) | (456.9) | (587.6) | (673.8) | (589.0) | (911.5) | (0.1103) | (0.1117) | (0.0945) | (0.1045) | (0.0732) | (0.0951) |
| Lag interest coverage ratio | 6.56e-5 | -0.0006* | -0.0009 | -0.0003 | -0.0011 | 0.0008 | -5.8e-7** | -2.63e-6 | -4.27e-7* | -5.74e-7*** | -3.74e-7* | -3.21e-7** |
| | (0.0011) | (0.0003) | (0.0014) | (0.0005) | (0.0014) | (0.0009) | (2.84e-7) | (1.79e-6) | (2.35e-7) | (1.27e-7) | (1.92e-7) | (1.46e-7) |
| | | | | | | | | | | | | |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Region-sector-year FE | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 4,544 | 4,367 | 4,673 | 4,483 | 5,125 | 4,879 | 4,560 | 4,367 | 4,695 | 4,485 | 5,119 | 4,883 |
| R2 | 0.570 | 0.561 | 0.667 | 0.895 | 0.672 | 0.773 | 0.030 | 0.498 | -0.047 | 0.541 | 0.341 | 0.602 |
| Cragg-Donald | 46.778 | | 24.687 | | 6.071 | | 52.915 | | 5.005 | | 111.464 | |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1.
Source: OECD calculations based on the MAGIC database.

## Table A B.8. Robustness checks: Nominal investment

| | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total subsidy | | | | Tax concessions | | | | Grants | | | | Below-market borrowing | | | |
| Baseline | | 6.476 | | 2.106 | *** | 10.756 | ** | 4.083 | *** | 7.828 | | 4.563 | | -1.507 | | -2.01 | |
| Drop firm FE | | 2.156 | | 2.619 | *** | 3.055 | | 4.659 | *** | -5.92 | | -7.715 | | -1.26 | | 0.447 | |
| Moving average | 2 years | 5.759 | | 1.921 | *** | 11.073 | ** | 3.033 | * | -0.698 | | 7.743 | | 4.815 | | -5.187 | |
| | 3 years | 7.058 | | 1.78 | ** | 9.383 | ** | 3.094 | * | 0.04 | | 3.567 | | 13.661 | | -2.559 | |
| Drop sector | AERO | 8.412 | | 2.219 | *** | 10.353 | ** | 3.913 | ** | 12.995 | | 5.567 | | 1.491 | | -0.905 | |
| | ALUM | 7.459 | | 2.386 | *** | 9.881 | ** | 4.251 | *** | 7.757 | | 5.427 | * | 2.622 | | -1.397 | |
| | AUTO | 12.47 | | 1.625 | *** | 20.187 | *** | 5.994 | *** | 32.724 | | 8.21 | | -5.7 | | -0.581 | |
| | CEMT | 6.852 | | 2.511 | *** | 10.907 | ** | 4.532 | *** | 6.162 | | 4.796 | | -2.96 | | 1.127 | |
| | CHEM | 5.802 | | 2.11 | *** | 10.599 | ** | 3.998 | ** | 7.507 | | 5.091 | | -2.234 | | -0.953 | |
| | FERT | 6.171 | | 2.02 | *** | 11.449 | ** | 3.641 | ** | 6.316 | | 5.526 | | -4.28 | | -0.882 | |
| | GLAS | 6.616 | | 1.89 | ** | 11.011 | ** | 4.729 | *** | 5.557 | | 3.497 | | -0.043 | | -1.269 | |
| | SEMI | -2.346 | | 2.086 | *** | 4.222 | | 3.655 | ** | -11.31 | | -1.452 | | -2.632 | | -1.634 | * |
| | SHIP | 6.753 | | 2.103 | *** | 10.961 | ** | 3.814 | *** | 6.047 | | 3.865 | | -2.348 | | -2.627 | |
| | SOLA | 6.18 | | 1.827 | *** | 10.272 | ** | 4.096 | *** | 6.553 | | 3.46 | | -1.406 | | -0.445 | |
| | STEE | 5.587 | | 1.836 | *** | 9.707 | ** | 3.014 | ** | 12.542 | | 4.005 | | -16.835 | | 4.789 | |
| | TELC | 6.737 | * | 2.106 | *** | 10.297 | ** | 4.088 | *** | 10.011 | | 3.812 | | -1.449 | | -0.27 | |
| | TRAN | 6.725 | | 2.014 | *** | 11.345 | ** | 3.792 | ** | 7.485 | | 3.459 | | -0.486 | | -1.769 | |
| | WIND | 6.968 | | 1.97 | *** | 12.147 | ** | 3.501 | *** | 7.488 | | 4.684 | | -0.915 | | -0.709 | |
| Alternative instrument | | 3.144 | ** | | | 9.694 | *** | | | 0.155 | | | | -2.157 | | | |

Note: Numbers indicated are the main coefficients of interest in the relevant models. *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. For full sector names, see Figure 1 in the main text.
Source: OECD calculations based on the MAGIC database.

## Table A B.9. Robustness checks: Investment rate

| | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total subsidy | | | | Tax concessions | | | | Grants | | | | Below-market borrowing | | | |
| Baseline | | 2.415 | | -0.065 | | 25.675 | *** | 0.413 | | -33.572 | | -1.177 | | 2.5 | | -1.667 | |
| Drop firm FE | | 6.963 | | 0.242 | | -146.893 | | 3.027 | ** | 9.715 | | -0.283 | | 4.194 | | -1.821 | |
| Moving average | 2 years | 3.349 | * | -1.142 | ** | 33.231 | *** | 1.823 | | -755.704 | | -4.673 | ** | 2.845 | | -2.69 | * |
| | 3 years | 3.901 | | -1.052 | | 38.632 | *** | 1.404 | | 8.249 | | -0.204 | | 4.909 | * | -4.014 | ** |
| Drop sector | AERO | 3.52 | | -0.192 | | 27.517 | *** | 2.044 | | -74.139 | | -0.037 | | 3.151 | | -2.884 | ** |
| | ALUM | 2.022 | | 0.171 | | 26.626 | *** | 1.869 | | -60.946 | | -1.946 | | 1.206 | | -0.256 | |
| | AUTO | 1.98 | | -0.66 | | 27.319 | *** | 2.282 | * | -32.576 | | -1.16 | | 2.353 | | -2.307 | |
| | CEMT | 0.095 | | -0.293 | | 26.401 | *** | 1.059 | | -135.014 | | -1.261 | | -0.41 | | 0.394 | |
| | CHEM | 2.286 | | -0.32 | | 27.555 | *** | 1.722 | | -24.282 | | -0.847 | | 1.755 | | -0.166 | |
| | FERT | 1.782 | | -0.31 | | 28.383 | ** | 1.451 | | -42.07 | | 0.529 | | 1.993 | | 0.068 | |
| | GLAS | 2.713 | | -0.262 | | 25.365 | *** | 1.965 | | -28.387 | | -0.784 | | 2.846 | | -0.534 | |
| | SEMI | 2.075 | | 0.051 | | 14.114 | * | 1.876 | | -27.745 | * | 0.115 | | 2.593 | | -0.979 | |
| | SHIP | 2.571 | | -0.48 | | 27.442 | *** | 0.401 | | -36.132 | | 0.609 | | 2.465 | | -0.201 | |
| | SOLA | 3.16 | * | -0.648 | | 25.417 | ** | 1.917 | | -12.595 | | -0.516 | | 4.324 | ** | 1.073 | |
| | STEE | 2.56 | | -0.215 | | 24.771 | *** | 2.746 | ** | -28.079 | | -0.831 | | 2.609 | | -1.315 | |
| | TELC | 2.541 | | 0.051 | | 24.618 | *** | 2.615 | * | -27.588 | | 0.972 | | 2.945 | | -2.407 | ** |
| | TRAN | 2.196 | | -0.043 | | 26.871 | *** | 1.823 | | -32.285 | | 0.661 | | 2.25 | | -0.541 | |
| | WIND | 3.655 | ** | -0.004 | | 25.288 | *** | 0.99 | | -18.916 | | 1.64 | | 4.013 | ** | -2.08 | |
| Alternative instrument | | 2.08 | *** | | | 8.509 | *** | | | 1.289 | | | | 2.238 | *** | | |

Note: Numbers indicated are the main coefficients of interest in the relevant models. *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. The baseline corresponds to investment rate regressed on subsidies scaled by revenue variable. For full sector names, see Figure 1 in the main text.
Source: OECD calculations based on the MAGIC database.

## Table A B.10. Regression results: Real productivity growth

| Outcome: | Log change in MFP | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Method: | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW |
| Subsidy type: | Total subsidy | | | | Tax concessions | | Grants | | Below-market borrowing | |
| | | | | | | | | | | |
| Subsidy / revenue | -10.82** | 0.6950 | | | 0.2443 | 12.29*** | -29.23 | -2.873 | -7.282** | -1.006 |
| | (4.478) | (1.053) | | | (8.948) | (2.918) | (28.40) | (3.623) | (3.643) | (2.421) |
| Subsidy / COGS | | | -6.319** | 1.146 | | | | | | |
| | | | (2.847) | (0.7927) | | | | | | |
| | | | | | | | | | | |
| Size controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Region-sector-year FE | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 3,738 | 3,344 | 3,724 | 3,350 | 3,416 | 3,089 | 3,547 | 3,188 | 3,861 | 3,449 |
| R2 | 0.003 | 0.448 | 0.043 | 0.417 | 0.149 | 0.488 | 0.068 | 0.508 | 0.107 | 0.531 |
| Cragg-Donald | 69.512 | | 71.618 | | 61.295 | | 11.850 | | 132.755 | |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. MFP stands for multifactor productivity. COGS stands for the cost of goods sold.
Source: OECD calculations based on the MAGIC database.

## Table A B.11. Robustness checks: Real productivity growth

| | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total subsidy | | | | Tax concessions | | | | Grants | | | | Below-market borrowing | | | |
| Baseline | | -10.823 | ** | 0.695 | | 0.244 | | 12.294 | *** | -29.229 | | -2.873 | | -7.282 | ** | -1.006 | |
| Drop firm FE | | -16.093 | ** | 0.287 | | -3.943 | | 6.65 | *** | 16.732 | | -2.273 | | -10.502 | ** | -1.816 | |
| Moving average | 2 years | -4.316 | | -0.274 | | -22.045 | * | -1.43 | | -17.585 | | -3.981 | | -0.311 | | 2.785 | |
| | 3 years | -1.051 | | 3.191 | ** | -5.048 | | -3.641 | | -267.174 | | 7.648 | * | 2.431 | | 5.219 | *** |
| Drop sector | AERO | -9.682 | * | 1.685 | | 5.924 | | 11.836 | *** | -1.991 | | -1.476 | | -7.121 | * | -2.567 | |
| | ALUM | -11.688 | *** | 1.506 | | -4.406 | | 9.436 | *** | -77.223 | * | 3.356 | | -8.907 | ** | -1.412 | |
| | AUTO | -10.303 | ** | 0.443 | | 0.93 | | 13.013 | *** | -28.292 | | -0.373 | | -6.966 | * | -3.574 | ** |
| | CEMT | -23.584 | ** | 1.867 | * | 0.296 | | 12.659 | *** | -82.243 | | -2.426 | | -13.832 | ** | -0.895 | |
| | CHEM | -10.954 | ** | 0.262 | | -0.709 | | 10.625 | *** | -30.655 | | -2.081 | | -6.588 | * | -1.4 | |
| | FERT | -11.193 | ** | 0.359 | | -6.127 | | 8.84 | *** | -8.504 | | -0.506 | | -7.071 | ** | -1.287 | |
| | GLAS | -10.995 | ** | 0.992 | | -0.006 | | 12.215 | *** | -28.758 | | -0.873 | | -7.285 | * | 1.488 | |
| | SEMI | -10.661 | ** | 1.525 | | 2.431 | | 13.986 | *** | -24.114 | | 2.689 | | -7.026 | * | -1.195 | |
| | SHIP | -10.165 | ** | 0.386 | | 1.318 | | 9.086 | *** | -19.792 | | -0.486 | | -7.209 | * | -2.13 | |
| | SOLA | -7.18 | ** | 0.405 | | 5.373 | | 13.196 | *** | -22.775 | | -1.933 | | -3.589 | | -2.502 | |
| | STEE | -9.485 | ** | 1.506 | | -0.058 | | 5.954 | ** | -57.865 | | -1.14 | | -6.649 | * | -0.241 | |
| | TELC | -10.584 | ** | 1.137 | | 1.226 | | 14.43 | *** | -25.296 | | -5.428 | | -7.484 | ** | -1.723 | |
| | TRAN | -11.969 | ** | 0.225 | | 0.653 | | 14.932 | *** | -33.867 | | -0.098 | | -7.941 | ** | -2.212 | |
| | WIND | -10.528 | ** | 1.291 | | -1.281 | | 8.569 | *** | -10.403 | | -1.094 | | -6.922 | * | -4.258 | * |

Note: Numbers indicated are the main coefficients of interest in the relevant models. *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. The baseline corresponds to productivity growth regressed on subsidies scaled by revenue variable. For full sector names, see Figure 1 in the main text.
Source: OECD calculations based on the MAGIC database.

## Table A B.12. Regression results: Allocative efficiency

| Outcome: | Employment growth | | | | Asset growth | | | |
|---|---|---|---|---|---|---|---|---|
| Method: | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW |
| | | | | | | | | |
| MFP | 0.0148 | 2.371 | -0.0185 | 1.153 | -0.0790 | 9.012** | -0.0787 | 5.581** |
| | (0.0600) | (1.538) | (0.0733) | (1.255) | (0.0999) | (4.063) | (0.0974) | (2.562) |
| Subsidy / revenue | 25.97** | 21.79 | | | 28.71** | 92.98 | | |
| | (11.59) | (114.9) | | | (11.91) | (286.6) | | |
| Subsidy / revenue X MFP | -2.266 | -5.451 | | | -3.161* | -18.75 | | |
| | (1.426) | (9.816) | | | (1.731) | (23.15) | | |
| Subsidy / COGS | | | 25.23** | 4.987 | | | 25.94** | 72.86 |
| | | | (12.24) | (73.23) | | | (10.95) | (162.3) |
| Subsidy / COGS X MFP | | | -2.480* | -2.916 | | | -2.806** | -12.00 |
| | | | (1.374) | (6.721) | | | (1.388) | (16.10) |
| | | | | | | | | |
| Size controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| ROA controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Leverage controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sector FE | Yes | No | Yes | No | Yes | No | Yes | No |
| Year FE | Yes | No | Yes | No | Yes | No | Yes | No |
| Region-sector year FE | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 3,783 | 2,692 | 3,767 | 2,692 | 3,784 | 2,914 | 3,768 | 2,913 |
| R2 | -0.111 | 0.330 | -0.549 | 0.299 | -0.357 | 0.203 | -0.521 | 0.143 |
| Cragg-Donald | 2.517 | | 2.569 | | 2.521 | | 2.573 | |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. MFP stands for multifactor productivity. COGS stands for the cost of goods sold.
Source: OECD calculations based on the MAGIC database.

## Table A B.13. Regression results: Profitability – the ratio of EBIT to revenue

| Outcome: | EBIT/revenue | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Method: | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW |
| Subsidy type: | Total subsidy | | | | Tax concessions | | Grants | | Below-market borrowing | |
| | | | | | | | | | | |
| Subsidy / revenue | -1.306 | 0.1140 | | | 21.28*** | 4.657*** | -27.41 | -1.454 | -3.792*** | -2.224*** |
| | (1.211) | (0.3383) | | | (4.853) | (0.6574) | (19.36) | (1.178) | (1.217) | (0.6827) |
| Subsidy / COGS | | | 0.4528 | 0.5214** | | | | | | |
| | | | (0.8868) | (0.2349) | | | | | | |
| | | | | | | | | | | |
| Size controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Region-sector-year FE | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 5,802 | 4,785 | 5,781 | 4,781 | 5,371 | 4,425 | 5,523 | 4,540 | 5,828 | 4,946 |
| R2 | 0.496 | 0.672 | 0.495 | 0.682 | -0.044 | 0.724 | -0.088 | 0.769 | 0.467 | 0.790 |
| Cragg-Donald | 71.857 | | 73.065 | | 134.001 | | 6.119 | | 149.409 | |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. EBIT stands for earnings before interest and taxes. COGS stands for the cost of goods sold.
Source: OECD calculations based on the MAGIC database.

## Table A B.14. Regression results: Profitability – return on assets

| Outcome: | Return on assets before tax | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Method: | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW | IV | GPS IPTW |
| Subsidy type: | Total subsidy | | | | Tax concessions | | Grants | | Below-market borrowing | |
| | | | | | | | | | | |
| Subsidy / revenue | -1.718* | -0.1325 | | | 17.16*** | 3.492*** | -6.531 | -2.317** | -3.588*** | -1.588*** |
| | (0.9522) | (0.2746) | | | (4.170) | (0.5361) | (9.760) | (1.134) | (1.095) | (0.5102) |
| Subsidy / COGS | | | 0.1596 | 0.1186 | | | | | | |
| | | | (0.6843) | (0.2011) | | | | | | |
| | | | | | | | | | | |
| Size controls | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | No | Yes | No | Yes | No | Yes | No | Yes | No |
| Region-sector-year FE | No | Yes | No | Yes | No | Yes | No | Yes | No | Yes |
| Observations | 5,701 | 4,792 | 5,682 | 4,788 | 5,254 | 4,431 | 5,416 | 4,548 | 5,846 | 4,953 |
| R2 | 0.412 | 0.635 | 0.440 | 0.631 | -0.327 | 0.718 | 0.389 | 0.721 | 0.365 | 0.759 |
| Cragg-Donald | 78.739 | | 79.630 | | 117.419 | | 6.807 | | 149.014 | |

Note: Robust standard errors are in parentheses (clustered by firm). *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. COGS stands for the cost of goods sold.
Source: OECD calculations based on the MAGIC database.

## Table A B.15. Robustness checks: Profitability – the ratio of EBIT to revenue

| | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total subsidy | | | | Tax concessions | | | | Grants | | | | Below-market borrowing | | | |
| Baseline | | -1.306 | | 0.114 | | 21.281 | *** | 4.657 | *** | -27.408 | | -1.454 | | -3.792 | *** | -2.224 | *** |
| Drop firm FE | | -2.975 | | 0.993 | *** | 35.207 | * | 3.984 | *** | 8.018 | | -5.045 | *** | -4.43 | ** | -1.619 | * |
| Moving average | 2 years | -0.34 | | -0.12 | | 21.63 | *** | 4.381 | *** | -178.932 | | -2.349 | * | -1.643 | | -0.682 | |
| | 3 years | 1.477 | | 0.153 | | 20.762 | *** | 3.614 | *** | 37.104 | | -1.096 | | 0.794 | | -0.884 | |
| Drop sector | AERO | -0.501 | | 0.265 | | 22.341 | *** | 4.711 | *** | -24.092 | | -0.97 | | -3.685 | *** | -1.171 | |
| | ALUM | -1.016 | | 0.222 | | 21.558 | *** | 3.644 | *** | -41.312 | | -0.487 | | -3.871 | *** | -0.794 | * |
| | AUTO | -1.359 | | 0.118 | | 21.54 | *** | 3.691 | *** | -23.071 | | -1.131 | | -3.914 | *** | -1.648 | *** |
| | CEMT | -3.594 | | 0.474 | | 20.578 | *** | 4.726 | *** | -76.835 | | 0.938 | | -7.983 | *** | -0.687 | |
| | CHEM | -1.522 | | 0.297 | | 21.502 | *** | 4.406 | *** | -28.726 | | -0.115 | | -3.832 | *** | -0.646 | |
| | FERT | -1.468 | | 0.249 | | 21.054 | *** | 3.814 | *** | -22.219 | | -0.321 | | -3.553 | *** | -0.542 | |
| | GLAS | -1.198 | | 0.156 | | 21.805 | *** | 4.3 | *** | -32.622 | | -0.801 | | -3.834 | *** | -0.643 | |
| | SEMI | -1.581 | | 0.797 | ** | 21.976 | *** | 4.377 | *** | -24.193 | ** | -0.435 | | -3.636 | *** | -0.147 | |
| | SHIP | -1.672 | | 0.161 | | 20.589 | *** | 4.589 | *** | -35.494 | | -0.278 | | -3.871 | *** | -2.442 | ** |
| | SOLA | -2.646 | ** | 0.215 | | 22.636 | *** | 4.363 | *** | 2.484 | | 0.667 | | -3.673 | *** | -1.591 | * |
| | STEE | -0.201 | | 0.246 | | 20.71 | *** | 3.629 | *** | -46.031 | | 0.038 | | -2.424 | ** | -1.632 | ** |
| | TELC | -1.189 | | 0.18 | | 21.505 | *** | 4.391 | *** | -22.222 | | -1.791 | * | -3.872 | *** | -0.664 | |
| | TRAN | -1.2 | | 0.244 | | 21.483 | *** | 4.447 | *** | -26.945 | | 0.671 | | -3.799 | *** | -1.183 | ** |
| | WIND | -0.351 | | 0.252 | | 21.531 | *** | 3.49 | *** | -22.207 | | -0.584 | | -2.952 | ** | -1.336 | * |
| Alternative instrument | | -0.615 | | | | 7.889 | *** | | | -1.122 | | | | -1.379 | *** | | |

Note: Numbers indicated are the main coefficients of interest in the relevant models. *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. The baseline corresponds to profitability regressed on subsidies scaled by revenue variable. For full sector names, see Figure 1 in the main text. EBIT stands for earnings before interest and taxes.
Source: OECD calculations based on the MAGIC database.

## Table A B.16. Robustness checks: Profitability – return on assets

| | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | | IV | | GPS IPTW | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Total subsidy | | | | Tax concessions | | | | Grants | | | | Below-market borrowing | | | |
| Baseline | | -1.718 | * | -0.132 | | 17.156 | *** | 3.492 | *** | -6.531 | | -2.317 | ** | -3.588 | *** | -1.588 | *** |
| Drop firm FE | | -3.198 | | 0.186 | | 35.68 | | 3.388 | *** | -0.143 | | -2.676 | *** | -4.36 | ** | -1.864 | *** |
| Moving average | 2 years | -0.634 | | -0.472 | | 14.635 | *** | 3.641 | *** | -57.526 | | -2.578 | ** | -2.091 | ** | -0.572 | |
| | 3 years | 0.555 | | -0.502 | | 14.114 | *** | 2.973 | *** | 15.026 | | -2.112 | * | -0.556 | | -0.853 | |
| Drop sector | AERO | -1.555 | | -0.064 | | 17.47 | *** | 3.942 | *** | 3.386 | | -1.321 | | -3.624 | *** | -0.994 | * |
| | ALUM | -1.464 | | -0.114 | | 17.419 | *** | 3.015 | *** | -5.837 | | -1.503 | * | -3.69 | *** | -0.637 | * |
| | AUTO | -1.797 | * | -0.262 | | 17.179 | *** | 3.027 | *** | -5.848 | | -1.786 | * | -3.691 | *** | -1.179 | *** |
| | CEMT | -4.096 | ** | 0.015 | | 16.779 | *** | 3.494 | *** | -25.503 | | -0.085 | | -7.542 | *** | -0.778 | ** |
| | CHEM | -1.566 | | 0.047 | | 17.511 | *** | 3.358 | *** | -7.463 | | -1.341 | | -3.357 | *** | -0.645 | * |
| | FERT | -2.117 | ** | -0.099 | | 15.513 | *** | 3.001 | *** | 0.498 | | -0.806 | | -3.359 | *** | -0.612 | |
| | GLAS | -1.457 | | -0.175 | | 17.777 | *** | 3.276 | *** | -10.62 | | -1.529 | | -3.491 | *** | -0.589 | |
| | SEMI | -1.773 | * | 0.27 | | 19.033 | *** | 3.336 | *** | -7.039 | | -1.639 | * | -3.477 | *** | -0.181 | |
| | SHIP | -2.013 | ** | -0.165 | | 16.587 | *** | 3.636 | *** | -11.752 | | -0.99 | | -3.698 | *** | -1.974 | ** |
| | SOLA | -2.383 | ** | -0.081 | | 19.548 | *** | 3.028 | *** | 5.741 | | -1.516 | | -3.763 | *** | -1.125 | * |
| | STEE | -0.728 | | -0.138 | | 16.373 | *** | 2.859 | *** | -21.702 | | -1.425 | | -2.045 | ** | -1.345 | ** |
| | TELC | -1.683 | * | -0.075 | | 17.295 | *** | 3.693 | *** | -6.244 | | -2.287 | ** | -3.656 | *** | -0.54 | |
| | TRAN | -1.531 | | -0.03 | | 17.303 | *** | 3.499 | *** | -3.902 | | -0.643 | | -3.475 | *** | -1.117 | ** |
| | WIND | -1.127 | | -0.032 | | 17.504 | *** | 3.219 | *** | -2.111 | | -1.113 | | -3.086 | *** | -1.275 | ** |
| Alternative instrument | | -0.631 | *** | | | 4.935 | *** | | | -1.62 | * | | | -1.239 | *** | | |

Note: Numbers indicated are the main coefficients of interest in the relevant models. *** p-value < 0.01, ** p-value < 0.05, * p-value < 0.1. For full sector names see Figure 1 in the main text.
Source: OECD calculations based on the MAGIC database.