INTERNATIONAL MONETARY FUND

Shifting Advantages: Do Subsidies Shape Cross-Border Investment?

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WP/25/80

2025
APR

WORKING PAPER

 WP/25/80

IMF Working Paper
Strategy, Policy & Review

Shifting Advantages: Do Subsidies Shape Cross-Border Investment?
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Authorized for distribution by Martin Sommer
April 2025

ABSTRACT: Industrial policies have been on the rise with subsidies provided to firms accounting for the lion's share of interventions. The effects of these measures on productivity, trade, investment and other economic and non-economic variables are largely an open question. This paper examines empirically the link between subsidies and inward cross-border investment using data on greenfield investments across a large sample of advanced and emerging economies between 2010 and 2020. Employing a difference-in-difference approach, we find that—while the average effect of all subsidies is zero—financial subsidies, such as loans and loan guarantees, increase new cross-border investment projects by an average of 7%. These effects are primarily driven by capital-intensive sectors in capital-abundant countries, suggesting that subsidies can affect foreign direct investment—but they reinforce (rather than reshape) countries' comparative advantage.

RECOMMENDED CITATION: Ruta, Michele and Monika Sztajerowska. (2025) "Shifting Advantages: Do Subsidies Shape Cross-Border Investment?" IMF Working Papers WP/25/80.

JEL Classification Numbers:	F130, F210, F230
Keywords:	Foreign Direct Investment; Industrial Policy; Subsidies
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* The authors would like to thank Maggie Chen, Anne-Célia Disdier, Lionel Fontagné, Lindsay Oldenski, Marcelo Olarreaga, Samuel Pienknagura, Lorenzo Rotunno and Martin Sommer for useful discussions and suggestions on early drafts and to seminar participants at the IMF and reviewers for helpful comments and discussion. All the remaining errors and omissions are ours.

WORKING PAPERS

Shifting Advantages: Do Subsidies Shape Cross-Border Investment?

Michele Ruta and Monika Sztajerowska[1]

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1. Introduction

Industrial policies (IP) are on the rise (Evenett et al., 2024, Juhász et al., 2022). They aim to achieve a variety of public-policy goals, ranging from boosting competitiveness to improving resilience of supply chains and reducing geopolitical risks.[1] Subsidies provided to firms account for the lion's share of such policies: representing 61% of all potentially discriminatory policies implemented in 2023-24 (up from 42% in 2010-11).[2] The rollout of several flagship subsidy programs by large economies in recent years, including the Inflation Reduction Act and the CHIPS Act, the European Green Deal, and Made in China 2025, have further fueled the policy debate about both the effects of subsidies on the economy of the implementing jurisdictions and their cross-border spillover effects through trade, investment and other channels.

This new-generation IP differs from the traditional policy in at least two important respects. First, unlike earlier industrial policies, subsidies and other tools do not aim at import substitution but are often outward-oriented, aiming at developing and expanding the export sector (Evenett et al., 2024; Juhász et al., 2022). Second, unlike policies targeting foreign direct investment (FDI) (e.g., Harding and Javorcik, 2011), subsidies are, *a priori*, accessible to both foreign-owned and domestic-owned firms, aiming to support investment in general. Indeed, 42% of firms awarded subsidies under the CHIPS Act are, in fact, foreign-owned.[3]

In theory, the effect of such subsidies on FDI is *ex ante* ambiguous as there are

[1] As shown in Evenett et al. (2024), competitiveness concerns have been the stated objective of governments in 2023 for over a third of measures where information on motives is available. Motivations related to climate change, geopolitics, and supply chain resilience account for 28, 20 and 15 percent, respectively.

[2] This number is obtained by dividing the count of measures that fall under the category of subsidies in the U.N. classification of non-tariff measures (i.e., "L") by the count of all measures falling into red or amber category (i.e., discriminatory) implemented in a given year according to the Global Trade Alert (GTA) data.

[3] This figure comes from matching the list of firms with final agreements released by the U.S. Department of Commerce (as of November 2024) with ORBIS ownership data to identify firms' global ultimate owners.

opposing forces at play. On the one hand, subsidies may reduce firms' fixed costs of entering a foreign market for example through direct financing of initial capital expenditures.[4] In the presence of such a *financing effect*, subsidies could make previously unprofitable projects profitable, inducing entry of new projects (extensive margin). On the other hand, if all or some foreign-owned firms have limited access to the subsidy relative to their local rivals (either domestic or already established foreign-owned firms), the latter may expand with the subsidy, potentially crowding out new FDI (*competition effect*). These contrasting effects could result in a positive, neutral or even negative relationship between subsidies and investment by foreign-owned firms, all else being equal.

Given these opposing forces, the impact of subsidies on FDI remains an empirical question that—to the best of our knowledge—has not yet been addressed in the literature. If a positive relationship between the presence of subsidies and FDI is observed, it would suggest that the *financing effect* dominates; and a negative relationship that the *competition* effect does. Furthermore, there may be important heterogeneous effects of subsidies. As certain subsidies may be more effective in reducing frictions faced by multinational firms—and the more so in certain sectors or countries—the effects may vary by type of subsidy as well as by sector and country characteristics.

In this paper, we explore these issues by examining empirically the link between the presence of subsidies and FDI by employing a difference-in-difference methodology, and accounting for relevant factors through rich set of fixed effects and controls, including for other IP measures. We focus on greenfield investments, rather than mergers and acquisitions (M&A), in recognition that governments often exclude M&A transactions from subsidy and other support programs (e.g., OECD,

[4] The importance of fixed costs for FDI decisions is well-documented in the literature (e.g., Oldenski, 2012, Ramondo, 2014, Ramondo and Rodriguez-Clare, 2013, Tintelnot, 2017, Antràs et al., 2017, Arkolakis et al., 2018).

2019), and as they tend to be perceived by policymakers as more beneficial to the local economy (UNCTAD, 2000, OECD, 2022).[5]

For this purpose, we combine data from the Global Trade Alert (GTA) on the sector-country presence of subsidies and other industrial policies across a wide sample of countries with the data on cross-border greenfield investment projects from fDi Markets for a large sample of advanced and emerging economies over the period 2010-2020.[6] We also complement these data with information on relevant sector and country characteristics – in particular, sector factor intensities and country factor endowments – from standard data sources to study the interaction between subsidies and fundamental forces of comparative advantage.

We find that, on average, subsidies in general have a zero effect on cross-border investment, suggesting that the *competition* and the *financing* effects may be offsetting each other. Yet, financial subsidies (e.g., loans and loan guarantees) are associated with a rise in the number of greenfield investment projects (by 7% in the baseline), suggesting that they may be more effective in addressing frictions faced by foreign-owned firms. The results remain robust to alternative specifications and other robustness checks, including an event study approach that builds on the latest advances in staggered design in non-linear settings (e.g., Nagengast and Yotov, 2025, Wooldridge, 2023). We also differentiate the effect depending on the weight of multinational firms in value-added in a sector to proxy for the extent of their access to the measures, obtaining results that align with intuition. We also control for indirect subsidies through supplier and buyer links, as captured in Inter-Country Input-Output data, the support by sub-national bodies, the high-intensity support; and test more stringent specifications and additional controls.

[5] Some studies find stronger effects of greenfield FDI on local labor markets (e.g., Davies and Desbordes, 2015), per-capita GDP growth (e.g., Harms and Méon, 2014) and capital formation (e.g., Calderon et al., 2004).

[6] According to Davies et al. (2018), greenfield investment projects outnumber M&As by nearly two to one; and account for nearly 30% of FDI value.

To dig further into the relationship between subsidies and FDI, we also exploit the sectoral and country differences in the data. Capital-intensive sectors tend to have higher fixed costs of entry – due to large initial capital expenditure requirements and other intrinsic technological characteristics (e.g., indivisibilities, high installation costs) – making FDI in those sectors potentially more responsive to subsidies. Multinational enterprises (MNEs) also tend to self-select into capital-intensive sectors more than other firms and are more capital-intensive (e.g., Sun, 2020, Antràs and Yeaple, 2014), making them more exposed to these costs. Subsidies could, therefore, have a stronger positive effect on FDI in those sectors. There may also be some interaction with the level of countries' capital endowments. If subsidies complement countries' existing advantages, they could have larger effects in capital-intensive sectors in capital abundant countries. Conversely, if subsidies are more effective in overcoming capital market imperfections, their impact would be stronger in capital-intensive sectors in non-capital abundant countries.

We find that the effects are strongest in capital-intensive sectors, consistent with higher fixed costs and exposure of multinational firms in these industries. The effect is clearly positive in capital abundant countries but overall sector characteristics dominate: within capital-intensive sectors, the difference between countries with high and low capital endowment is not statistically significant. The magnitude of the effects varies substantially across specifications, depending on sector characteristics, country conditions, and sector-country factors. These findings thus show that the forces of comparative advantage play a critical role in influencing subsidy effectiveness. Put differently, subsidies appear—under some conditions—to reinforce, but not to reshape, countries' comparative advantage.

Related literature: This paper contributes to three strands of prior literature. First, there is a wide and growing literature on the effects of IP in general, and subsidies in particular, on different economic outcomes, including productivity, innovation and trade (Kalouptsidi, 2017, Criscuolo et al., 2019, Bartelme et al., 2019, Lane, 2021, Goldberg et al., 2024).[7] Recent papers also make advances in regards to measurement of IP across countries (Juhász et al., 2023, Evenett et al., 2024). There is also important parallel literature on subsidy competition.[8]

Second, there is a wide literature on factors that influence MP and patterns of foreign direct investment.[9] In traditional models, multinational firms arise to exploit factor price differences across countries (e.g., Helpman, 1984, Yeaple, 2003, Antràs and Yeaple, 2014), and are more productive than other firms (e.g., Helpman et al., 2004). Multinational firms also display sharp selection patterns: they tend to have higher contribution to economic activity is higher in capital- and R&D intensive sectors, and are concentrated in capital-abundant countries (Antràs and Yeaple, 2014). As such, MP interacts with forces of comparative advantage (e.g., Yeaple, 2003, Alviarez, 2019).[10] Several papers specifically study the effects of specific policies on FDI or multinational firms' location, including FDI incentives (Chor, 2009), investment promotion programs (Harding and Javorcik, 2011), tax policy (Hines and Rice, 1994), and treaties (e.g., Chen, 2009, Blonigen et al., 2014b).[11]

Third, a related literature studies changing patterns of cross-border trade and investment in response to recent geopolitical shifts and specific trade policies.[12] Most recent studies focus on the role of increased tariffs or broader geopolitical shifts, especially the effects of rising trade tensions post-2018, on trade flows (e.g., Fajgelbaum et al., 2020a, Alfaro and Chor, 2023, Freund et al., 2024, Fajgelbaum et al., 2024) and FDI (Aiyar et al., 2024, Graziano et al., 2024, Xue, 2024) and broader

[7] For earlier studies see e.g., Blonigen (2015) and a review by Harrison and Rodríguez-Clare (2010). Several recent studies focus on trade effects (e.g. Rotunno and Ruta, 2024a, Barattieri et al., 2024, Ju et al., 2024).

[8] See, e.g., Bagwell and Staiger (2004), Ferrari and Ossa (2023), Slattery and Zidar (2020).

[9] e.g., Helpman et al. (2004), Chen and Moore (2010), Oldenski (2012), Ramondo and Rodriguez-Clare (2013), Alfaro and Chen (2014), Ramondo et al. (2015), Tintelnot (2017), Alviarez (2019), Garetto et al. (2019)

[10] There is also a wider literature studying the nature of countries' comparative advantage and its determinants (e.g., Redding, 1999, Chor, 2010, Levchenko, 2007, Manova, 2013).

[11] Others also study the role of different determinants by FDI mode (e.g., Nocke and Yeaple, 2008, Blonigen et al., 2014a, Davies et al., 2018).

[12] Gopinath et al. (2025), Aiyar et al. (2023), Fernández-Villaverde et al. (2024).

economic activity (e.g., Amiti et al., 2019, 2020, Fajgelbaum et al., 2020b, Flaaen et al., 2020, Javorcik et al., 2022, Grossman et al., 2024).[13] To the best of our knowledge, there has not yet been a cross-country analysis on whether subsidies have also affected the patterns of cross-border investment during this period.[14]

The paper is structured as follows. Section 2 describes the data. Section 3 presents our baseline empirical approach and the results on the average effect of subsidies. Section 4 presents the event study and other robustness checks. Section 5 analyzes the interaction between subsidies and wider forces of comparative advantage, and Section 6 concludes.

2. Data

We combine three main types of data: new cross-border greenfield investments projects, subsidy incidence at the country-sector-year level and additional data sources for a large sample of developed and developing countries:

Subsidies: The main source of data on subsidies is the Global Trade Alert (GTA) maintained by the University of St. Gallen which has been used in prior studies on the effects of subsidies and other industrial policy instruments on trade and investment.[15] The data contains information on different trade and related industrial policy interventions, including subsidies, tracked since 2009. Each intervention includes information on the implementing country, 6-digit HS product covered, the date of announcement, implementation and removal, type of policy, and the level of implementing government.[16] The version as of April 2024 covered 179 countries

[13] See Fajgelbaum and Khandelwal (2022) for a review of this literature. Some studies also consider the effects of sanctions (e.g., Corsetti et al., 2024)

[14] Studies tend to consider the role of tariff changes and general geopolitical realignment.

[15] e.g., Disdier et al. (2021), Juhász et al. (2022), Aiyar et al. (2023), Sztajerowska (2023), Rotunno and Ruta (2024a), Barattieri et al. (2024)

[16] The data does not include information on the value of the subsidy, providing count measures instead.

and 85 4-digit NAICS sectors. Using intervention-level data, we construct variables on the count and presence of a subsidy of a given type and other IP measures in a given sector, country and year.[17] We also exploit the information on the type of subsidy (e.g., financial subsidies). In supplementary analysis, we also take advantage of the newly available data on the size of subsidy for a subset of measures from the New Industrial Policy Observatory and calculate country-sector pairs indirect exposure to subsidies using the OECD Inter-Country Input Output tables.

Cross-border Investment: The main source of data on cross-border investment in this study is the fDi Markets database by the Financial Times.[18] It contains information on announcements of cross-border greenfield projects, which involve the creation of new (or expansion of) facilities abroad.[19] It includes the information on the project's destination country, sector, origin of investor and project type. It covers 323,159 announcements between January 2003 and December 2023, involving 200 destination countries and 181 origin countries.[20] Data on value of investment and number of jobs is also provided but is mostly estimated. We, thus, follow earlier studies (e.g., Breinlich et al., 2020, Davies et al., 2018) and rely on the counts of projects in our baseline estimation. The data have been used extensively in prior studies on FDI (e.g., Davies et al., 2018, Breinlich et al., 2020, Blanchard et al., 2021, Toews and Vézina, 2022, Aiyar et al., 2023, Sztajerowska, 2023, Aiyar et al., 2024) and has been shown to strongly correlate with the official FDI statistics.[21] The advantage of the data is that it allows study of patterns of investment in manufacturing that would not be possible with the official FDI statistics.[22]

[17] We convert GTA data, available at 6-digit HS level to NAICS 4-digit using data from Pierce and Schott (2012).

[18] fDi Markets obtains data on new greenfield transactions by searching over 8,000 information sources (newspapers, magazines, industry associations, company websites) in 23 languages on a daily basis.

[19] We focus on new projects, rather than expansions of existing facilities, to capture the effect on brand new investments and as those two decisions respond to different factors (see e.g., Carballo et al., 2021).

[20] Of those projects 266,935 are new investments rather than expansions and about one third in manufacturing.

[21] Toews and Vézina (2022) and Aiyar et al. (2024) show that country-year-level FDI metrics constructed using the fDi Markets are strongly correlated with gross FDI inflows from balance of payment statistics.

[22] 4-digit NAICS sectors permit differentiating between 3341 (Computer and Peripheral Equipment) and 3361

Sector and Country Characteristics: We also combine data on different sector- and country-level characteristics related to determinants of comparative advantage and other factors. To construct the sectoral metrics on capital and skill intensity, we rely on the NBER-CES Manufacturing Database (Becker et al., 2021).[23] We use the data for the U.S. to obtain a more exogenous metrics of sectoral factor intensities that reflect sector's technological needs, following others (e.g., Chor, 2010). The data on countries' physical capital and human capital factor endowments comes from the Penn World Tables (Feenstra et al., 2015) and Barro and Lee (2013).[24] All sector and country characteristics are time-invariant and represent an average for the pre-sample period 2000-2009, unless unavailable. We also use the data on countries' GDP and GDP per capita come from the IMF World Economic Outlook. Recognizing the important role of financial centers in MNE location decisions (e.g., Gumpert et al., 2016), we also obtain lists of low-tax jurisdictions – from Tørsløv et al. (2022) and Hines (2010) – and use them to check robustness. The data on the share of foreign-owned firms in domestic value-added by sector comes from the OECD Activities of Multinational Enterprises (AMNE) database (OECD, 2024)). For additional checks we also exploit other measures used in the literature.[25]

Combined Dataset: The combined balanced panel dataset contains information on the number of new announced cross-border greenfield projects and subsidies in a given country-sector-year for 243 countries, 93 4-digit NAICS manufacturing sectors for years 2010-2020, which results in 22,599 unique country-sector pairs and

(Motor Vehicles), for example; while official FDI statistics report data for manufacturing as a whole.

[23] Capital intensity is defined as a ratio of capital stock to total workers in a sector and skill intensity is the ratio of non-production workers to total workers. The data is available for 364 6-digit NAICS 2012 manufacturing industries. To aggregate the data to 4-digit level, we take a mean per sector.

[24] We define the former as capital stock at current PPPs (in million 2012 USD) per number of persons engaged (in million) and the latter as percentage of population above 25 years old with tertiary education.

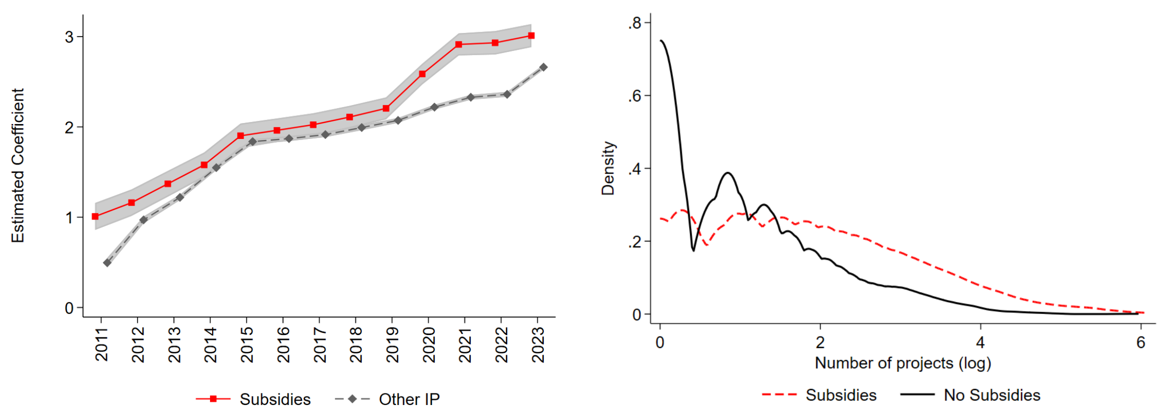
[25] For example, we enrich this data with information on sectoral dependence on external finance and the level of development of local financial markets. The former is calculated at the sector level to capture technological finance requirements, following Rajan and Zingales (1998), and is obtained from Bilir et al. (2019). The data on the level of financial markets development comes from IMF (2024).

248,589 observations (243x93x11).[26] The data includes information on all countries on countries both with and without cross-border investment projects or subsidies in a given sector during the sample period (i.e., including all possible zeros).[27] The mean number of new cross-border greenfield investment projects in our sample is 0.2 projects while the median is 0. Thus, new cross-border greenfield investments are rare events at the country-sector level (see Table A1.1 for summary statistics).

Figure 1: The Rise of Subsidies and Number of Investment Projects

(a): Rise in Subsidies and IP

(b): Investment Projects by Subsidy Status



Note: Figure 1(a) on the left shows the estimated coefficient on year dummies from a Poisson Pseudo-Maximum-Likelihood regression where the dependent variable is the number of subsidy measures and other discriminatory policies in a country and sector in a year as recorded in Global Trade Alert (GTA), controlling for country-sector fixed effect. Figure 1(b) shows the distribution of the number of new cross-border investment projects in 2011-2020 (expressed in logs), comparing sectors with and without subsidies. A sector is classified as subsidized if it received at least one subsidy measure during the years 2011-2020. A Kolmogorov-Smirnov test rejects the equality of distributions (p<0.001).

The data allows us to document a pronounced rise in the use of IP measures in general, and subsidies in particular, in the last decade, even after controlling for country-sector fixed effects (see Figure 1(a)). There is also suggestive evidence on

[26] We restrict the sample to this period as GTA data only started being gathered in 2009, and may be subject to more measurement error at the start. We also wish to abstract from the drop in investment during COVID-19.

[27] We also test an alternative retaining only country-sector pairs that coincide in both databases, i.e. 160 countries and 73 manufacturing sectors, and obtain virtually identical results, see Table A1.3.

the link between the presence of subsidies and the number of cross-border investment projects: Figure 1(b) shows an unconditional relationship between those two variables. The number of new investment projects created during the sample period is higher in country-sector pairs covered by subsidies than those without them (confirmed by a Kolmogorov-Smirnov test on equality of distributions).

3. The Impact of Subsidies on Inward FDI

To study how the incidence of subsidies in a country-sector affects inward cross-border greenfield investment, we adopt the following baseline Poisson Pseudo-Maximum-Likelihood (PPML) specification:

$$FDI_{imt} = \exp\left\{\beta^S \mathbb{1}(S_{imt-1}) + \theta \mathbb{1}(IP_{imt-1}) + \alpha_{im} + \gamma_{it} + \mu_{mt}\right\} + \varepsilon_{imt} \tag{3.1}$$

where the dependent variable (FDI_{imt}) refers to inward FDI into a host country i in a sector m in time t, as measured in terms of the count of new announced cross-border greenfield investment projects. Sectors are at the 4-digit NAICS sector level. In the baseline, the subsidy measure ($\mathbb{1}(S_{imt-1})$) is a binary indicator that takes a value of 1 if there is at least one subsidy in place in a given country-sector at time $t-1$, and 0 otherwise.[28] Here β^S is the main coefficient of interest. Specifically, if $\beta^S > 0$, then the presence of subsidies is associated with higher inward FDI, *ceteris paribus*.

The remaining terms are controls and fixed effects that account for observed and unobserved sources of heterogeneity. Namely, $\mathbb{1}(IP_{imt-1})$ is a binary indicator that takes a value of 1 if at least one other IP measure is in place in the sector and country in the previous year. We consider any measure belonging to the following broad

[28] A one year lag helps attenuate simultaneity bias concerns and reflects a delay in investment decisions.

categories: FDI restrictions, import restrictions, export restrictions, trade-related investment measures (such as local content requirements), and other IP measures recorded in the GTA database (e.g., government procurement).[29] Jointly, the subsidy measure ($\mathbb{1}(S_{imt-1})$) and the other IP measure ($\mathbb{1}(IP_{imt-1})$) capture all the IP in our model. We also include α_{im} – a host-country-sector fixed effect; γ_{it} – a host-country-time fixed effect; μ_{mt} – a sector-time fixed effect, and ε_{imt} is the error term. Here α_{im} is the panel fixed effect and controls for time-invariant host-country and sector characteristics that may influence simultaneously cross-border investment and subsidy decisions, such as geographic location or language. The term γ_{it} accounts for any time-variant host-country characteristics, such as the level of development, market size, or national-level policies (e.g., general investment promotion or facilitation schemes). The term μ_{mt} captures market and policy factors that vary at the sector-time level, such as competition or growth in the sector. Robust standard errors are clustered at the host-country-sector pair level.

As is standard in the literature studying the patterns of trade and investment, we estimate the model using the PPML estimator of Silva and Tenreyro (2006) to account for the presence of zeros and heteroskedasticity in the data. This is particularly appropriate in our setting where investment projects are a relatively infrequent phenomenon across all sectors and economies.

Table 1 reports the results of the baseline estimation from Equation 3.1. For completeness, Columns 1-2 first report the coefficient on the overall IP measures (i.e., when either $\mathbb{1}(S_{imt-1})$ or $\mathbb{1}(IP_{imt-1})$ equal 1), first controlling for country-sector and country-year fixed effects (Column 1) and then additionally sector-year fixed effects (Column 2). The coefficient is not statistically significant at conventional significance levels (p=0.558 and p=0.411). We then proceed to differentiate the effect of

[29] We identify them using UNCTAD (2019) MAST policy classification and the corresponding GTA classification. Those measures are also identified in Juhász et al. (2022) as associated with IP.

subsidies and the other IP measures (Columns 3-4), including sequentially the same sets of fixed effects. The coefficient remains not statistically significant (p=0.518 and p=0.727). To account for potential heterogeneous effects by subsidy type, we adapt our baseline specification in Equation 3.1 in the following manner:

$$FDI_{imt} = \exp\left\{\beta^{SF}\mathbb{1}(S^{F}_{imt-1}) + \sum_{v}\eta_v\mathbb{1}(S^{O,v}_{imt-1}) + \theta\mathbb{1}(IP_{imt-1}) + \alpha_{im} + \gamma_{it} + \mu_{mt}\right\} + \varepsilon_{imt} \tag{3.2}$$

where $\mathbb{1}(S^{F}_{imt-1})$ takes a value of 1 if financial subsidies (i.e., state loans, interest payment subsidies and loan guarantees) are in place in a sector-country pair in the previous period and the term $\mathbb{1}(S^{O,v}_{imt-1})$ controls for the presence of other subsidies (i.e., production and tax relief subsidies, grants and state-aid subsidies, export subsidies, and other subsidies) where v refers to a given subsidy type.[30] The coefficient of interest β^{SF} captures the effect of financial subsidies on inward FDI.[31]

Columns 5-7 in Table 1 present results. Columns 5-6 report coefficients on all subsidy types for the two different combinations of fixed effects as done before, while Column 7 aggregates the results of all subsidy types into one (i.e., v here is any other subsidy). The coefficient on financial subsidies is positive and statistically significant at 5% level in all three specifications. Specifically, the baseline estimate in Column 7 suggests that the presence of subsidies is associated with a 7.0% increase in the number of new greenfield investment projects.[32] Meanwhile, none of the coefficients on other subsidy types is statistically significant at conventional levels.[33]

[30] To identify subsidy types we rely on detailed information in GTA. Grants and other state-aid refers to financial grants, in-kind grants, state aid (nes and unspecified) and capital injections such as bailouts as they refer to subsidies that involve transfer of resources to firms without a need for repayment. Production and tax relief subsidies include production subsidies, tax or social insurance relief, price stabilization, and import incentives. Export subsidies refer to any subsidies for exports (see Table A1.1 for summary statistics).

[31] The subsidy indicator in Equation 3.1 is defined as: $\mathbb{1}(S_{imt-1}) = \max\{\mathbb{1}(S^{F}_{imt-1}), \mathbb{1}(S^{O,v}_{imt-1})\}$

[32] The percent change is calculated as $[(exp(0.68) - 1)100]\%$, where 0.68 is the estimated coefficient.

[33] The presence of subsidies may also affect the willingness of domestic firms to invest abroad. While this issue lies outside of the scope of this paper, we test this possibility by changing the dependent variable in Equation 3.1 (FDI_{imt}) to refer to the number of cross-border greenfield projects abroad by firms from a country i and

There could be several reasons why financial subsidies have a stronger effect on cross-border investments than other types of subsidies. For example, for a firm to obtain a subsidized loan or another financial subsidy, it usually needs to approach a local bank or other financial intermediary, which (upon assessment of mostly financial criteria) applies the support instrument on eligible projects. For most grants and production subsidies, firms apply directly to government agencies with detailed proposals and demonstrate eligibility based on specific policy criteria (e.g., local content).[34] Besides potentially reducing the risk of discrimination or state capture, seeking subsidies through local financial intermediaries may also permit firms to interact with global banks.[35] In addition, financing subsidies offer renewable funding and tend to have flexible repayment schedules, which may cumulatively give access to a large pool of resources. Meanwhile, although grants do not require repayment, they may be subject to more limited availability, fixed payment schedules and claw-back provisions if the conditions are not met. The combined effect of lesser scope for state capture, lower administrative burden, intermediation by financial institutions that may be connected to global banks, and the access to renewable and flexible resources can help effectively reduce frictions faced by MNEs.

As $\beta^{SF} > 0$, suggesting that financial subsidies are associated with more investment projects,[36] we focus on these subsidies for the remainder of the paper.

sector m. The coefficient on financial subsidies is negative and statistically significant at 10% level. This suggests that domestic firms may reduce their foreign investment when receiving subsidies at home. This aligns with a prediction that subsidized firms may substitute domestic for foreign investment.

[34] The difference can be illustrated by the InvestEU Fund and Horizon Europe. For the former, firms are encouraged to contact local banks to access covered financial products. For the latter, the European Commission publishes calls for proposals and applicants meeting requirements predefined by the EC can compete.

[35] Studies document globalization of banks and show that MNEs use local branches of foreign banks (Gianetti and Ongena (2012) and that foreign bank expansion increases (non-financial) FDI (Poelhekke, 2015). For example, several global banks are on a list of intermediaries for InvestEU Fund.

[36] We cannot exclude the possibility that other subsidies also have an effect. We merely observe that the estimated coefficient suggests that, on average, the positive financing effect on the number of projects dominates for financial subsidies. Results may also differ for intensive margin of investment. In that case, production and other subsidies that mainly reduce firms' variable costs could have a stronger effect.

Table 1: Baseline Results: The Role of Subsidies and Other Industrial Policies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
The Role of IP in General and Subsidies							
Overall IP	-0.021	-0.029					
	(0.035)	(0.035)					
Subsidies			0.020	0.010			
			(0.031)	(0.028)			
Other IP			0.024	-0.001	0.024	-0.001	-0.000
			(0.032)	(0.032)	(0.032)	(0.032)	(0.031)
Subsidy Type							
Financial Subsidy					0.090**	0.069**	0.068**
					(0.037)	(0.030)	(0.030)
Grants and State-Aid Subsidy					0.026	-0.017	
					(0.033)	(0.031)	
Production and Tax Relief Subsidy					-0.005	-0.016	
					(0.054)	(0.042)	
Export Subsidy					-0.011	-0.003	
					(0.068)	(0.052)	
Other Subsidy							-0.014
							(0.038)
Fixed Effects:							
Country-Sector	✓	✓	✓	✓	✓	✓	✓
Country-Year	✓	✓	✓	✓	✓	✓	✓
Sector-Year	✗	✓	✗	✓	✗	✓	✓
Observations	56216	56216	56216	56216	56216	56216	56216
Pseudo R^2	0.55	0.56	0.55	0.56	0.55	0.56	0.56

Note: Table 1 shows the results of the baseline regression from Equations 3.1 and 3.2 where the dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. IP refers to any type of industrial policy, including subsidies, FDI restrictions, import restrictions, export restrictions, and other measures. In the baseline, subsidy refers to the presence of at least one subsidy measure in place in a given host country and sector in the previous year. Financial Subsidies refer to state loans, interest payment subsidies, and loan guarantees. Grants and State-Aid Subsidies refer to grants (in-kind and financial), state aid (unspecified or not elsewhere classified) and capital injection and equity stakes. Production and Tax Relief Subsidies refer to production subsidies, tax and social insurance relief, price stabilization and import incentives. Export Subsidies refer to subsidies for exports. Other Subsidy category used in the estimation reported in Column 6 refers to all categories other than financial subsidies (i.e., grants and state-aid subsidies, production and tax relief subsidies and export subsidies). Standard errors clustered by country-sector are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4. Robustness Analysis

4.1. *Testing for Pre-Trends and Treatment Effect Dynamics*

To assess the robustness of our baseline estimate, we undertake an event study. For this purpose, we build on the latest innovations in the difference-in-difference (DiD) designs with staggered treatment adoption – i.e., when multiple units are treated at different times –to implement a specification that is robust to possible treatment heterogeneity across groups or over time.[37] Specifically, we rely on the extension by Wooldridge (2023) of an extended two-way fixed effect estimator to non-linear models; and its implementation by Nagengast and Yotov (2025). We adapt our prior Equation 3.2 in the following way:

$$FDI_{imt} = \exp\left\{ \sum_{g=-q}^{T} \sum_{r=g}^{T} \beta_{gr}^{SF} S_{gr}^{F} + \sum_{v} \eta_v \mathbb{1}(S_{imt-1}^{O,v}) + \theta \mathbb{1}(IP_{imt-1}) + \alpha_{im} + \zeta_t \right\} + \varepsilon_{imt} \tag{4.1}$$

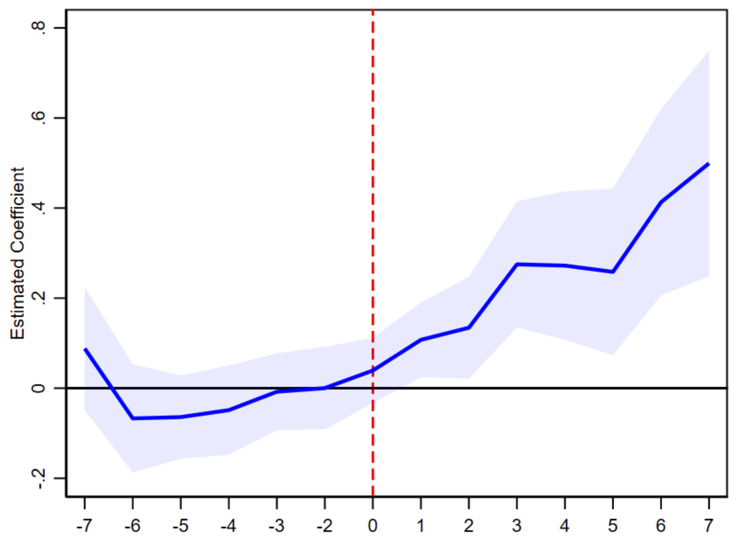
where the term $\sum_{g=-q}^{T} \sum_{r=g}^{T} \beta_{gr} S_{gr}^{F}$ replaces the single indicator variable for the presence of a subsidy in a country-sector pair, following Nagengast and Yotov (2025). A country-sector pair belongs to treatment cohort g if the subsidy onset was in year g, q is the first year of the treatment of cohort g, T is the last year of the panel and r is the relative time period. Now, S_{gr}^{F} is a varying treatment indicator equal to 1 for cohort g for $r = t$ in post-treatment years with a financial subsidy and 0 otherwise, and β_{gr} captures the cohort-year specific treatment effects. The rest of the terms are the same as in Equation 3.2 and α_{im} is the panel fixed effect and ζ_t is the time fixed effect.[38] Once estimated, event-time-specific treatment effects can

[37] See de Chaisemartin and D'Haultfœuille (2020), Sun and Abraham (2021), Wooldridge (2023), and Borusyak et al. (2024). In particular, recent studies demonstrate that two-way fixed effects (TWFE) estimates combine group-specific and time-varying average treatment effects on the treated (ATTs) using weights that can take negative values and fail to represent a meaningful average of the underlying treatment effects.

[38] We use the same specification as in Wooldridge (2023), i.e., by including only the panel and year fixed effects. The control group are never-treated units following Sun and Abraham (2021) and t-1 is the omitted category. In line with standard assumptions of absorbing treatment, i.e., that once a unit is treated, it remains treated,

be calculated following Nagengast and Yotov (2025) as: $\hat{\beta}_r = \sum_{g=q}^{r} \frac{N_{gr}}{N_{.r}} \hat{\beta}_{gr}$ (where $N_{.r} = \sum_{g=q}^{r} N_{gr}$ is the total number of treated observations in period r), which are akin to a heterogeneity-robust event-study estimates.

Figure 2: Event Study: The Role of Financial Subsidies Over Time



Note: Figure 2 plots the estimated event-time-specific treatment effects from an event-study estimation corresponding to Equation 4.1 and following the method suggested by Wooldridge (2023) and Nagengast and Yotov (2025). Table A1.4 reports the results.

Figure 2 plots the event-time-specific treatment effects from Equation 4.1 (Table A1.4 in the Annex reports the results). None of the coefficients in the pre-treatment period are statistically significant. A joint test of the pre-treatment coefficients fails to reject the null hypothesis that these coefficients are simultaneously equal to zero ($\chi^2(9) = 11.60$, p = 0.237), providing support for the parallel trends assumption underlying our research design. In addition, the difference between coefficients further apart in time (e.g., between t+2 and t+7) is statistically significant at the 5% level, indicating a gradual strengthening of the effect. Yet, due to the less stringent

we exclude country-sector pairs subject to non-absorbing treatment (i.e., 0.98% of observations).

fixed effects that we can include, we retain Equation 3.1 as our preferred specification.

4.2. Addressing Confounding Factors

We also perform a series of additional robustness tests on our baseline estimation (summarized in Table 2). First, we want to test if our estimate may indeed provide a lower bound of the effect of financial subsidies on FDI projects, recognizing that the effects of a subsidy depend on the ability of foreign-owned firms to gain access to the subsidy. We do not observe *ex-ante* eligibility of firms to apply for specific subsidies. However, building on the findings from the literature that the organization of multinational firms matters for policy formulation (e.g., Blanchard and Matschke, 2015), we posit that high contribution of MNEs in a sector can provide an indication of their ability to influence policies, including access to subsidies. We allow the estimated coefficient from Equation 3.2 on the financial subsidy dummy to vary depending on whether a sector has above- or below-the-median share of foreign-owned firms' contribution to the sector's total value-added using the OECD AMNE data. The results are reported in Column 1 of Table 2. The estimated coefficient on financial subsidy provided to sectors with high average share of MNEs in value-added (Financial Subsidy^{H}_{MNE}) is positive and statistically significant at 1% level[39], while the effect in other sectors is negative. This could capture cases where foreign-firms have more limited access to the subsidy than their domestic-owned rivals, and may experience reduced business opportunities.

Second, based on proximity-concentration trade-off theory of FDI (e.g., Brainard, 1997, Blonigen and Feenstra, 1997, Blonigen, 2002), we could expect inward FDI to increase with rises in import tariffs. In the baseline estimation we control for a time-varying incidence of import tariffs in the sector and country in the previous

[39] In such sectors, the presence of subsidies is associated with a 10.2% higher number of new FDI projects.

Table 2: Robustness Check: Controlling for Other Factors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	MNE Access	**Tariff Increases**	**Subsidy Intensity**	**Subnational Subsidies**	**Indirect Subsidies**	**Other Factors**	**Same Sample**
Financial Subsidy$^H_{MNE}$	0.097***						
	(0.032)						
Financial Subsidy$^L_{MNE}$	-0.131**						
	(0.066)						
Financial Subsidy^H_T		0.330***					
		(0.102)					
Financial Subsidy^L_T		0.061**					
		(0.030)					
Financial Subsidy^H_I			0.167**				
			(0.068)				
Financial Subsidy^L_I			0.067**				
			(0.030)				
Financial Subsidy$_{NAT}$				0.064**			
				(0.029)			
Financial Subsidy$_{SUB}$				0.159**			
				(0.062)			
Financial Subsidy					0.064**	0.065**	0.068**
					(0.030)	(0.028)	(0.030)
Financial Subsidy^H_T					-0.090		
					(0.120)		
Fixed Effects:							
Country-Sector	✓	✓	✓	✓	✓	✓	✓
Country-Year	✓	✓	✓	✓	✓	✓	✓
Sector-Year	✓	✓	✓	✓	✓	✓	✓
Other Subsidy Controls	✓	✓	✓	✓	✓	✓	✓
Other IP Controls	✓	✓	✓	✓	✓	✓	✓
Income-Sector′-Year	✗	✗	✗	✗	✓	✓	✓
Observations	56216	56216	56216	56216	56174	56174	56174
Pseudo R^2	0.56	0.56	0.56	0.56	0.57	0.56	0.56

Note: Table 2 shows results of alternative estimations accounting for additional factors. Column 1 reports the coefficient of interest for sectors in which an average country has an above- and below-median contribution of MNEs to value-added using the OECD AMNE data for the pre-sample period (2008-2009). Column 2 reports the coefficient of interest for country-sector pairs that experienced tariff increases in a given year (i.e., where there has been a switch from a binary variable indicating the presence of subsidies from 0 to 1) and those that did not according to the GTA data. Column 3 additionally controls for the presence of subsidies provided by subnational bodies as reported in the GTA database. Column 4 reports the results when indirect subsidies are controlled for. Indirect subsidies are calculated by multiplying the total linkage measure of sector k in country i to sector j (i.e. a geometric mean of both cost and sales relationships) in the pre-sample period (2006-2009) and the count of subsidies in sector j in year t. The cost and sales relationships are calculated using the OECD ICIO data and the counts of subsidies come from the GTA data. Once the counts of subsidies are obtained, the country-sector dyads that obtain above the 75th percentile number of indirect subsidies are identified as those highly exposed to indirect subsidies (Financial Subsidy^H_T). Table A1.7 in the Annex provides results using upstream and downstream measures instead. Column 5 reports the results when income-group-broad-sector-year fixed effects are controlled with income group referring to the World Bank pre-sample classification (2009) and broad sector groups: Food, Beverage, and Tobacco; Textile, Apparel, and Leather; Wood and Paper; Petroleum, Chemical, and Plastics; Non-metallic Mineral Products; Primary and Fabricated Metals; Machinery; Electronics and Electrical Equipment; Transportation Equipment; Furniture and Miscellaneous Manufacturing. Standard errors clustered by country-sector are reported in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

period. Now, we also allow the coefficient to differ depending on whether country-sector pairs were subject to tariff increases during the sample period according to the GTA data. Should changes in tariffs overlap with those of subsidies and drive our result, the coefficient on country-sector pairs without tariff increases should not be distinguishable from zero. The estimated coefficient for country-sector pairs affected by tariff increases is statistically significantly higher than in other country-sector combinations (p=0.040); but the latter is positive, statistically significant and close to our baseline estimate. Building on the growing literature on changes in trade and FDI following tariff hikes (e.g., Fajgelbaum et al., 2020a, 2024, Alfaro and Chor, 2023, Freund et al., 2024, Graziano et al., 2024), we also remove the entire period after the rise in trade tensions post-2018, and the results are robust (reported in Column 1 of Table A1.5 in the Annex).

The effect of subsidies can also be influenced by the subsidy size. Systematic cross-country information on subsidy size for the sample period are not readily available. However, building on the data that we have available for 2023 from the NIPO database, in a set of auxiliary regressions, we establish that even after controlling for subsidy size, the count of measures is associated with higher number of new FDI projects, *ceteris paribus* (see Table A1.6). In fact, the coefficient on the count of measures is statistically significantly higher than the subsidy size per measure. As such, we exploit the information on counts as a possible proxy for intensity of support and divide countries into bins depending on whether they offered above 75th percentile number of subsidies or not, conditional on a presence of a subsidy. The results are reported in Column 3 in Table 2. In such countries, the presence of subsidies is associated with 18.2% increase in the number of FDI projects while the effect for other sectors is similar to the baseline.[40]

[40] Of course, ideally we would dispose of the data on subsidy rates and other information across countries to explore the role of intensity of support per unit of output. Yet, reliable data of this kind is not available. We therefore rely on the insights from Rotunno et al. (2025) that document a log-linear relationship between subsidy counts and values using the NIPO data to construct our proxy of support intensity above.

Third, given that subsidies can be provided in different forms, including through support at the sub-national level and indirect subsidies provided through other (supplying or buying) sectors, our baseline estimates could suffer from omitted variable bias. As such, we additionally control for the presence of sub-national subsidies (Column 4) and indirect subsidies (Column 5). To obtain the data on sub-national subsidies, we exploit the GTA data by level of implementation. To obtain the information on indirect subsidies, we first calculate the exposure of each sector to other subsidized sectors using the OECD ICIO tables.[41] Once we obtain indirect exposure measures by country and sector, we identify countries that provide above 75th percentile level of support as those with high levels of indirect subsidies, and include them as a control. In Column 5 in Table 2 we report the coefficients on the summary measure using the total linkage (Financial Subsidy^H_T) and Table A1.7 reports full results for all measures. Our coefficient of interest remains robust to the inclusion of those controls.

Our fixed effects control for different sources of observed and unobserved heterogeneity. We are also concerned about other potential confounding factors that we may not be controlling for in our baseline specification, in particular those that vary at the level of the treatment. In that respect, we also conduct additional tests. We include income-group-broad-sector-time fixed effects to account for any factors that are common to countries at similar level of development and that can vary at broader sector level over time.[42] This could include broad time-variant exposure to sector-specific technological shocks, for example. We first report the results of

[41] Specifically, we follow Rotunno and Ruta (2024b) to calculate the level of exposure to subsidized industries upstream as each industry's j share in the total cost of industry k ($\sum_{j \neq k} cost_{k,j} S^F_{i,j,t}$), i.e., how much industry k relies on inputs from other industries. Analogously, exposure to subsidized industries downstream is captured by each industry j's share in the total sales of industry k ($\sum_{j \neq k} sales_{j,k} S^F_{i,j,t}$), i.e., how much k provides inputs to other industries. Due to high level of correlation between those two measures, we also calculate a total linkage measure as a geometric mean of both relationships ($\sum_{j \neq k} \{ \sqrt{cost_{k,j} \times sales_{j,k}} \} (S^F_{i,j,t})$.

[42] We use ten broad sectors, listed in the note of Table 2.

the regression with those additional fixed effects in Column 6 and then the estimation of the baseline regression for the same sample in Column 7 (changed due to more stringent fixed effects). The results remain robust. We also test the inclusion of region-broad-sector-time fixed effects and obtain very similar results (not reported). We also run specifications including sector-specific time trends and country-specific time-trends, controlling for additional factors that change linearly over time (e.g., countries' overall trade and investment policy or the sector-specific gradual technological changes) and the results remain virtually unchanged (not reported).[43] Table A1.5 also checks for robustness to compositional effects, and results remain robust.

5. How Are Subsidies Interacting with Forces of Comparative Advantage?

Beyond capturing the average relationship between the presence of subsidies and cross-border investment, we are interested in understanding how such policies may interact with countries' sources of comparative advantage. We first consider the role of the forces shaping comparative advantage in the spirit of Heckscher-Ohlin, i.e., sector-level factor intensities and country-level factor endowments. For this purpose, we adapt our Equation (3.2) in the following manner:

$$FDI_{imt} = \exp\left\{ \sum_{\kappa=0}^{1} \beta_{\kappa}^{SF} \mathbb{1}\left(S_{imt-1}^{F} = 1, U_m = \kappa \right) + \mathbf{CT} \right\} + \varepsilon_{imt} \tag{5.1}$$

where S_{imt-1}^{F} is the same indicator for the presence of financial subsidies in a country and sector in the previous year as before; U_m is factor intensity of a given sector m, i.e., $U_m = \{k_m^H, l_m^H\}$, where k_m is (physical) capital intensity (defined as capital to labor ratio), l_m is human capital intensity (defined as skilled labor to labor ratio) and H= high intensity in use of a given factor of production.[44] The

[43] The estimates are available from the authors upon request.

[44] The list of sectors and their corresponding categories is listed in Table A1.12.)

term **CT** stands for controls and fixed effects that remain the same as in Equation 3.2 (i.e., $\mathbf{CT} = \sum_v \eta_v \mathbb{1}(S^{O,v}_{imt-1}) + \theta \mathbb{1}(IP_{imt-1}) + \alpha_{im} + \gamma_{it} + \mu_{mt}$).

In the second step, we control for high intensity of use of either factor of production for a given sector m by further adapting the equation:

$$FDI_{imt} = \exp\left\{ \sum_{U'_m = k^H_m, l^H_m, C_m}^{1} \beta^{SF}_{U'_m} \mathbb{1}\left(S^F_{imt-1} = 1, U'_m = 1\right) + \mathbf{CT} \right\} + \varepsilon_{imt} \tag{5.2}$$

where S^F_{imt-1} is the same as above while U' identifies sectors that have high physical capital intensity (k^H_m), high human capital intensity (l^H_m) and the remaining sectors ($C_m = (k^H_m = 0, l^H_m = 0)$) and **CT** is the same as above in Equation 5.1.

Table 3 presents results of those estimations. In particular, Columns 1 and 2 correspond to Equation 5.1, reporting coefficients for sectors with high and low physical capital intensity (Column 1) and high- and low human capital intensity (Column 2), respectively. Column 3 corresponds to Equation 5.2 and presents coefficients for sectors with high physical capital intensity, those with high human capital intensity and the remaining sectors (i.e., k^H_m, l^H_m and C_m, respectively). The positive effect of financial subsidies on inward FDI is fully explained by the effect of subsidies provided to capital-intensive sectors. While the estimated coefficient for those sectors is positive and statistically significant at 1% level, the effect for other sectors is not distinguishable from zero. Subsidies in capital-intensive sectors are associated with 16.8% increase in the number of cross-border projects and the difference relative to other sectors is statistically significant. Meanwhile, once capital intensity is controlled for, the effect does not appear to differ with human capital intensity of the sector, all else being equal. [45]

[45] When we allow the coefficient on the presence of other subsidies to vary depending on sector factor as well, none of those is statistically significant (see Table 3 in the Annex).

Table 3: The Role of Sector Factor Intensities

	(1)	(2)	(3)
Physical Capital			
Financial Subsidy - k_m^H=1	0.155***		0.151***
	(0.043)		(0.046)
Financial Subsidy - k_m^H=0	-0.044		
	(0.034)		
Human Capital			
Financial Subsidy - l_m^H=1		0.100**	0.013
		(0.051)	(0.053)
Financial Subsidy - l_m^H=0		0.057	
		(0.035)	
Financial Subsidy - C_m=1			-0.064*
			(0.039)
Fixed Effects:			
Country-Sector	✓	✓	✓
Country-Year	✓	✓	✓
Sector-Year	✓	✓	✓
Other Subsidy Controls	✓	✓	✓
Other IP Controls	✓	✓	✓
Observations	56216	56216	56216
Pseudo R^2	0.56	0.56	0.56

Note: Table 3 shows results of an estimation corresponding to Equation 5.1 (Column 1-2) and Equation 5.2 (Column 3), where the dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. k_m^H=1 when sector m has high capital intensity; l_m^H =1 when sector m has high human capital intensity; and $C_m = (k_m^H = 0, l_m^H = 0)$. For the list of sectors in each category, see Table A1.12 in the Annex. Standard errors clustered by country-sector are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

To test whether these results are not driven by other factors that may be correlated with capital intensity but capture other dimensions, such as external financial dependence, we also undertake an additional check. Specifically, we follow the tradition in the spirit of Rajan and Zingales (1998) used extensively in studies on trade and FDI (e.g., Manova, 2013) to identify sectors with high external financial dependence (EFD), defined as a share of capital expenditures not financed with internal cash flows from operations (see Table A1.11).[46] After conditioning for sector's external financing needs and its capital and human capital intensity, we observe that results are only statistically significant for capital-intensive sectors and there is no discernible difference in the sensitivity to subsidies within those sectors depending on the level of external financial dependence (i.e., coefficients are not statistically significantly different) and coefficients on sector with high financial dependence but low capital intensity are not statistically significant (Columns 4-6).

As a next step, we explore the role of country factor endowments in combination with sectoral factor intensities in influencing the effectiveness of subsidies. For this purpose, we further adapt our earlier equation:

$$FDI_{imt} = \exp\left\{ \sum_{\kappa=0}^{1} \sum_{\iota=0}^{1} \beta_{\kappa,\iota}^{SF} \mathbb{1}\left(S_{imt-1}^{F} = 1, U_m = \kappa, E_i = \iota \right) + \mathbf{CT} \right\} + \varepsilon_{imt} \tag{5.3}$$

where S_{imt-1}^{F} and $U_m = \{k_m^H, l_m^H\}$ are the same as in Equation 5.1 above and E_i refers to country factor endowments $E_i = \{k_i^H, l_i^H\}$ with k_i^H referring to country's i (physical) capital endowment and l_i^H to country's i human capital endowment. This equation allows us to control, in turn, for the interaction between the intensity of use of a given factor of production of a sector and the country's respective endowment.

[46] The measure is calculated as the share of capital expenditures not financed with internal cash flows from operations using data on all publicly-listed U.S. companies in sector s from Compustat North America to capture technological characteristics of sectors operating in a market with most developed financial markets.

CT is the same as in Equations 3.2, 5.1, and 5.2. Similarly to the analysis above, we then consider these forces together by adapting the equation further:

$$FDI_{imt} = \exp\left\{ \sum_{Ei=k^H,l^H}^{1} \sum_{\iota=0}^{1} \beta^{SF}_{E_i,\iota} \mathbb{1}\left(S^F_{imt-1} = 1, U_{m(E)} = 1, E_i = \iota\right) + \right. \\ \left. +\beta^{SF}_{C_m} \mathbb{1}\left(S^F_{imt-1} = 1, C_m = 1\right) + \mathbf{CT} \right\} + \varepsilon_{imt} \quad (5.4)$$

where S^F_{imt-1} is the same as earlier, E_i refers to country factor endowments as defined in Equation 5.3 and $U_m(E)$ is the factor intensity of the sector that corresponds to the endowments being considered. **CT** remains unchanged.

Table 4 presents the results. Columns 1 and 2 show estimated coefficients corresponding to Equation 5.3 and Column 3 to Equation 5.4, respectively. We find that most of the effect of financial subsidies on inward FDI projects can be attributed to capital-intensive sectors (k^H_m) and countries with high capital endowments (k^H_i). Specifically, as shown in Column 3, when both physical capital- and human capital factor intensities and endowments are controlled for, the coefficient on that combination of sectors and countries is the only one that is positive and statistically significant at 1% level. From that perspective, financial subsidies are clearly effective in capital-intensive sectors in capital-abundant countries (in line with comparative advantage).[47] Yet, while the coefficients on provision of financial subsidies to sectors with high capital intensity are statistically significantly higher than those in other sectors; within those sectors, the difference between countries with high

[47] We also test this idea using more general measures of revealed comparative advantage (RCA). First, we adopt a standard RCA measure by Balassa (1965) and identify country-sector pairs with RCA using exports data from the BACI database (Gaulier and Zignago, 2010), converted into NAICS 3-digit level sector, for the same pre-sample period as other country and sector characteristics (2000-2009). The results are reported in Table A1.9 in the Annex and support our earlier findings: subsidies are effective where comparative advantage exists. We also follow Costinot et al. (2011) to obtain the predicted country-sector-year fixed effects from $\ln X^m_{ij} = \delta_{ij} + \delta^m_j + \delta^m_i + \varepsilon^m_{ij}$ using the same export data, and identify country-sector pairs above the median as those with RCA. The results go in the same direction but are less statistically significant (at 10% level).

Table 4: The Role of Sector Factor Intensities and Country Factor Endowments

	(1)	(2)	(3)
Physical Capital			
Financial Subsidy - k_m^H=1, k_i^H=1	0.151***		
	(0.042)		
Financial Subsidy - k_m^H=1, k_i^H=0	0.194		
	(0.160)		
Financial Subsidy - k_m^H=1, k_i^H=1	-0.027		
	(0.037)		
Financial Subsidy - k_m^H=1, k_i^H=0	-0.150*		
	(0.078)		
Human Capital			
Financial Subsidy - l_m^H=1, l_i^H=1		0.115**	
		(0.057)	
Financial Subsidy - l_m^H=1, l_i^H=0		0.015	
		(0.106)	
Financial Subsidy - l_m^H=1, l_i^H=0		0.052	
		(0.036)	
Financial Subsidy - l_m^H=1, l_i^H=0		0.078	
		(0.098)	
Physical and Human Capital			
Financial Subsidy - k_m^H=1, k_i^H=1			0.142***
			(0.045)
Financial Subsidy - k_m^H=1, k_i^H=0			0.202
			(0.160)
Financial Subsidy - l_m^H=1, l_i^H=1			0.028
			(0.060)
Financial Subsidy - l_m^H=1, l_i^H=0			-0.054
			(0.103)
Financial Subsidy - C_m=1			-0.065*
			(0.039)
Fixed Effects:			
Country-Sector	✓	✓	✓
Country-Year	✓	✓	✓
Sector-Year	✓	✓	✓
Other Subsidy Controls	✓	✓	✓
Other IP Controls	✓	✓	✓
Observations	56216	56216	56216
Pseudo R^2	0.56	0.56	0.56

Note: Table 4 shows results of an estimation corresponding to Equation 5.3 (Columns 1-2) and to Equation 5.4 (Column 3), where the dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. k_m^H=1 when sector m has high capital intensity; l_m^H =1 when sector m has high human capital intensity; and $C_m = (k_m^H = 0, l_m^H = 0)$. k_i^H refers to a country i with high (physical) capital endowment and l_i^H to a country i with high human capital endowment. For the list of sectors in each category, see Table A1.12 and for the list of countries see Table A1.13 in the Annex. Standard errors clustered by country-sector are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

and low capital endowment is not statistically significant at conventional levels. In other words, financial subsidies appear to be associated with higher levels of FDI in capital-intensive sectors and country capital endowments play a relatively less important role.

We finally undertake additional checks to ensure that our results on the role of sector factor intensities and country factor endowments are not driven by other sector- and country-specific characteristics. In particular, the level of development of local financial markets (e.g., Alfaro et al., 2004) and the quality of domestic institutions (e.g., Levchenko, 2007, Nunn, 2007) are found to play an important role in shaping countries' comparative advantage in the literature. While we control for country-time-variant and sector-time-variant characteristics through our fixed effects, to the extent that the effect of subsidies provided in sectors with high financial dependence or high contractual intensity could differ across countries with high/low quality of domestic financial markets and institutions, not controlling for these aspects could bias our results. We find that our results remain robust when we include these variables as controls (see Table A1.10 in the Annex).[48]

We then also investigate further the possible interplay of local financial markets' development and financial abundance with high sector-level capital intensity and financial dependence. Specifically, we allow the coefficient on the provision of financial subsidies to vary by sector-level capital intensity and external financial dependence as well as country-level capital abundance and local financial development (see Columns 5-6 in Table A1.11 in the Annex). We confirm that the sensitivity of investments in countries with high and low capital endowment continues to not be statistically significantly different from each other even after accounting for the

[48] We construct country-sector-time-variant measures by considering the presence of financial subsidies in a country and year in combination with: a) sector-level external financial dependence, as before, and country-level measure of financial markets development from IMF (2024); and b) sector-level measure of contractual intensity from Nunn (2007) and country-level measure of rule of law from Kaufmann et al. (2010).

degree of sector financial dependence. We also detect a further possible mitigating role of financial markets: subsidies have a particularly strong effect in countries with high capital abundance but less developed financial markets, potentially compensating their weakness.[49] Results remain not statistically significant for countries lacking comparative advantage.

6. Conclusion

In this paper, we study empirically the link between subsidies – which *a priori* neither target nor exclude foreign-owned firms – and cross-border greenfield investment. Employing a difference-in-difference approach and a rich set of fixed effects to control for observed and unobserved sources of heterogeneity, we find that the presence of financial subsidies is associated with a 7% increase in the number of new cross-border investment projects, while other subsidies have no statistically significant effects. We also investigate the conditions under which subsidies have a positive impact on FDI and find that estimates vary substantially depending on the underlying sector and country characteristics. The provision of financial subsidies to capital-intensive sectors – where fixed costs tend to be highest – is associated with an increase in inward investment, particularly in capital abundant economies.

These findings have relevant policy implications. First, the fact that only financial subsidies are found to impact FDI suggests that the design of subsidy programs matters. Second, the presence of such effects also points to the potential relevance of cross-border spillover effects of subsidies through changes in FDI patterns. As the ability to provide subsidies greatly varies across countries, these industrial policy measures impact the allocation of resources in a way that may not improve efficiency at the country and global level. Third, while some subsidies may alter

[49] The estimated coefficient (0.482) are statistically significant at 5% level. In those countries, presence of subsidies is associated with 61.94% higher number of new cross-border investment projects.

the pattern of FDI, they interact with forces shaping comparative advantage: they are found to be effective in capital-intensive sectors in capital-abundant countries. This suggests that subsidies can complement, but do not alter, forces of comparative advantage.

This paper contributes to the growing literature on industrial policy, but much more work is needed. Whether increased FDI in presence of subsidies is an efficient outcome—an issue that we do not address here—will depend on a number of factors, including the market distortions that led to government intervention in the first place. Subsidies in one country may also reduce the attractiveness of other countries for FDI, possibly leading to a misallocation of investment across countries and fueling competition between countries. Through redistribution of resources across certain types of activities (e.g., capital-intensive sectors) and firms, subsidies may have wider implications on income distribution, competition, and political economy outcomes, among others. Future studies could usefully shed light on these important questions to help inform policies. In addition, more detailed information on the design and size of subsidies and project characteristics – more readily available for specific countries or regions, could provide complementary policy-relevant insights.

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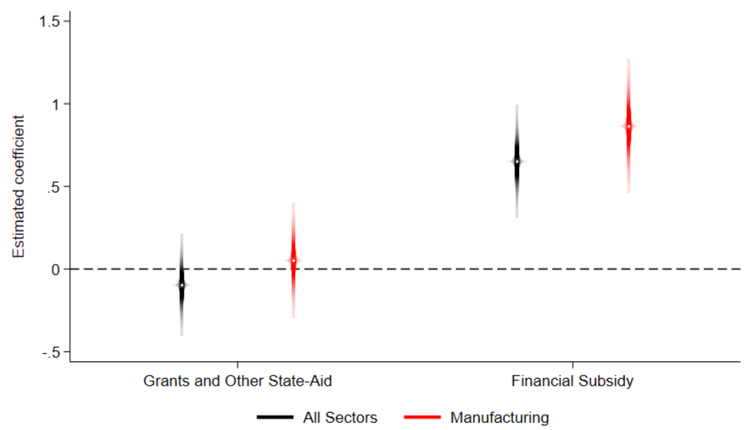
ANNEX
Additional Tables and Figures

Figure A1.1: Differences in Subsidy Size Across Types of Subsidies and Sectors

(a): By Type



(b): By Type and Sector

Note: Figure A1.1 shows the estimates coefficients from a set of auxiliary regressions. Figure 1(a) plots the estimated coefficient on subsidy type (where production subsidies are the omitted category) from a regression where the dependent variable is subsidy size in a country sector (in logs), controlling for country and sector fixed effects in a cross-section based on the data for the subset of GTA measures as recorded in New Industrial Policy Observatory. No information on size of export subsidies is available in the data. The black coefficient is estimated for all sectors and the red for manufacturing only. Figure 1(b), in turn, reports the coefficient on the interaction of subsidy type with a dummy variable for a capital-intensive sector.

Table A1.1: Summary Statistics

Variable	Mean	SD	Max	Median	Min
Number of Investment Projects	0.20	1.28	68.00	0.00	0.00
Subsidy (Any Type)	0.17	0.42	2.00	0.00	0.00
Financing Subsidy	0.02	0.15	1.00	0.00	0.00
Other Subsidy	0.14	0.35	1.00	0.00	0.00
Grants and State-Aid Subsidy	0.05	0.22	1.00	0.00	0.00
Production and Tax Relief Subsidy	0.11	0.32	1.00	0.00	0.00
Export Subsidy	0.03	0.18	1.00	0.00	0.00
Other IP	0.32	0.47	1.00	0.00	0.00
k_m^H	0.49	0.50	1.00	0.00	0.00
l_m^H	0.52	0.50	1.00	1.00	0.00
k_i^H	0.37	0.48	1.00	0.00	0.00
l_i^H	0.30	0.46	1.00	0.00	0.00
Manufacturing Industries					
Food	0.10	0.30	1.00	0.00	0.00
Beverage and Tobacco Products	0.02	0.15	1.00	0.00	0.00
Textile Mills	0.03	0.18	1.00	0.00	0.00
Textile Products	0.03	0.18	1.00	0.00	0.00
Apparel	0.03	0.18	1.00	0.00	0.00
Leather and Allied Products	0.03	0.18	1.00	0.00	0.00
Wood Products	0.04	0.20	1.00	0.00	0.00
Paper	0.03	0.18	1.00	0.00	0.00
Printing and Related Support Activities	0.02	0.15	1.00	0.00	0.00
Petroleum and Coal Products	0.01	0.10	1.00	0.00	0.00
Chemical	0.08	0.26	1.00	0.00	0.00
Plastics and Rubber Products	0.02	0.15	1.00	0.00	0.00
Nonmetallic Mineral Products	0.06	0.25	1.00	0.00	0.00
Primary Metal	0.05	0.23	1.00	0.00	0.00
Fabricated Metal Products	0.10	0.30	1.00	0.00	0.00
Machinery	0.08	0.26	1.00	0.00	0.00
Computer and Electronic Products	0.08	0.26	1.00	0.00	0.00
Electrical Equipment, Appliance, and Components	0.04	0.20	1.00	0.00	0.00
Transportation Equipment	0.08	0.26	1.00	0.00	0.00
Furniture and Related Products	0.04	0.20	1.00	0.00	0.00
Miscellaneous	0.02	0.15	1.00	0.00	0.00

Note: Table A1.1 shows summary statistics. Investment Projects refer to the number of new cross-border greenfield investment projects in a given country and sector (at 4-digit NAICS level) in a given year. Subsidy refers to a binary variable that takes a value of 1 if at least one subsidy measures is in place in a given country-sector pair in the previous period. Financial Subsidy refers to state loans, interest payment subsidies and loan guarantees). Other Subsidy refers to subsidies other than financial subsidies (i.e., grants and state-aid subsidies, production and tax relief subsidies and export subsidies). Other IP includes the following categories (other than subsidies) reported in the bottom panel: FDI restrictions, import restrictions, export restrictions, trade-related investment measures (such as local content requirements) and other IP measures (e.g., government procurement) recorded in the GTA database. k_m^H refers to a sector with high capital-intensity; l_m^H refers to a sector with high human capital intensity; k_i^H refers to a country with high capital endowment and l_m^H refers to a country with a high human capital endowment. Manufacturing industries listed correspond to 3-digit NAICS sectors.

Table A1.2: Baseline Results: The Role of Other IP Measures

	(1)	(2)	(3)
The Role of Subsidies			
Subsidies	0.010		0.016
	(0.027)		(0.039)
Financial Subsidy		0.066**	0.064**
		(0.029)	(0.030)
Grants and Other State-Aid Subsidy		-0.011	
		(0.031)	
Production and Tax Relief Subsidy		-0.022	
		(0.041)	
Export Subsidy		-0.005	
		(0.051)	
Other Subsidy			-0.031
			(0.053)
The Role of Other IP Measures			
FDI Restrictions	-0.100*	-0.103*	-0.104*
	(0.056)	(0.056)	(0.056)
Import Restrictions	-0.015	-0.014	-0.014
	(0.030)	(0.031)	(0.031)
Export Restrictions	-0.088**	-0.086**	-0.086**
	(0.041)	(0.041)	(0.041)
Trade-Related Investment Measures	0.028	0.030	0.027
	(0.048)	(0.048)	(0.048)
Other IP	0.034	0.032	0.030
	(0.033)	(0.032)	(0.033)
Fixed Effects:			
Country-Sector	✓	✓	✓
Country-Year	✓	✓	✓
Sector-Year	✓	✓	✓
Observations	56216	56216	56216
Pseudo R^2	0.56	0.56	0.56

Note: Table A1.2 shows the results of the baseline regression from Equations 3.1 and 3.2 where the dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. It corresponds to the results in Table 1 while including controls and reporting all the individual coefficients for all other IP measures (instead of an aggregate control for any type of IP). Other IP includes the following categories (other than subsidies) reported in the bottom panel: FDI restrictions, import restrictions, export restrictions, trade-related investment measures (such as local content requirements) and other IP measures (e.g., government procurement) recorded in the GTA database. All the other categories are the same as in Table 1. Other Subsidy category in Column 3 refers to subsidies other than financial subsidies (i.e., grants and state-aid subsidies, production and tax relief subsidies and export subsidies).

Table A1.3: Robustness to Treatment of Missing Observations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IP	-0.027	-0.035					
	(0.037)	(0.037)					
Subsidy			0.025	0.009			
			(0.032)	(0.028)			
Other IP			0.027	-0.002	0.028	-0.001	-0.001
			(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Financing Subsidy					0.086**	0.065**	0.064**
					(0.039)	(0.031)	(0.031)
Grants and State-Aid Subsidy					0.029	-0.018	
					(0.035)	(0.032)	
Production Subsidy					0.001	-0.025	
					(0.056)	(0.043)	
Export Subsidy					0.001	-0.001	
					(0.070)	(0.052)	
Other Subsidy							-0.010
							(0.039)
Fixed Effects:							
Country-Sector	✓	✓	✓	✓	✓	✓	✓
Country-Year	✓	✓	✓	✓	✓	✓	✓
Sector-Year	✗	✓	✗	✓	✗	✓	✓
Observations	43093	43093	43093	43093	43093	43093	43093
Pseudo R^2	0.56	0.57	0.56	0.57	0.56	0.57	0.57

Note: Table A1.3 shows the results of the baseline regression from Equation 3.1 and 3.2 where the dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. It corresponds to the results in Table 1 while restricting the sample to country and sector pairs that are present in both GTA and fDi Markets data. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A1.4: Event Study Analysis

Time from Treatment	**Estimated Coefficient**
r-7	-0.089
	(0.083)
r-6	-0.067
	(0.073)
r-5	-0.064
	(0.056)
r-4	-0.049
	(0.060)
r-3	-0.007
	(0.052)
r-2	0.003
	(0.056)
r-1	(Omitted)
r=0	-0.039
	(0.044)
r+1	0.108**
	(0.050)
r+2	0.134*
	(0.069)
r+3	0.275***
	(0.085)
r+4	0.272***
	(0.100)
r+5	0.259**
	(0.112)
r+6	0.413***
	(0.126)
r+7	0.499***
	(0.153)

Note: Table A1.4 reports coefficients from an event study in Equation 4.1 and corresponding to Figure 2, estimated following the method suggested by Wooldridge (2023) and Nagengast and Yotov (2025). The period t-1 is the omitted period. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A1.5: Robustness Check: Compositional Effects

	(1)	(2)	(3)	(4)	(5)	(6)
	w/o Post-2018 Period	**w/o Tax Havens**	**w/o Tax Havens′**	**w/o <1 mln Population**	**w/o <p50 GDP**	**w/o <p50 GDP pc**
Financial Subsidies	0.078**	0.067**	0.074**	0.067**	0.069**	0.069**
	(0.040)	(0.030)	(0.031)	(0.034)	(0.030)	(0.030)
Fixed Effects:						
Country-Sector	✓	✓	✓	✓	✓	✓
Country-Year	✓	✓	✓	✓	✓	✓
Sector-Year	✓	✓	✓	✓	✓	✓
Other Subsidy Controls	✓	✓	✓	✓	✓	✓
Other IP Controls	✓	✓	✓	✓	✓	✓
Observations	37207	51820	50671	51229	55365	55365
Pseudo R^2	0.56	0.57	0.58	0.56	0.57	0.57

Note: Table A1.5 shows the results of the baseline regression from Equation 3.2 where the dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. It corresponds to the results reported in the last Colum of Table 1 while restricting the sample by excluding: the period after 2018 (Column 1); host countries that are low-tax jurisdictions according to Hines (2010) (Column 2) or according to Tørsløv et al. (2022) (Column 3); countries with population below 1 million (Column 4); and countries with GDP below the median in the sample (Column 5). Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Table A1.6: The Role of Subsidy Size

	(1)	(2)	(3)	(4)
Panel A. Controlling for Country Factors				
Subsidy Size	0.109***			
	(0.017)			
Subsidy Count		0.591***		0.547***
		(0.129)		(0.115)
Subsidy Size per Measure			0.136***	0.105***
			(0.049)	(0.040)
Fixed Effects:				
Country	✓	✓	✓	✓
Sector	×	×	×	×
Country-Sector Controls	✓	✓	✓	✓
Pseudo R^2	0.30	0.30	0.30	0.30
Panel B. Controlling for Country and Sector Factors				
Subsidy Size	0.068***			
	(0.014)			
Subsidy Count		0.383***		0.342***
		(0.114)		(0.105)
Subsidy Size per Measure			0.112**	0.080**
			(0.045)	(0.035)
Fixed Effects:				
Country	✓	✓	✓	✓
Sector	✓	✓	✓	✓
Country-Sector Controls	✓	✓	✓	✓
Observations	6137	6137	6137	6137
Pseudo R^2	0.40	0.40	0.40	0.40

Note: Table A1.6 shows the results of an auxiliary cross-sectional regression where the dependent variable is the number of new cross-border greenfield investment projects in manufacturing in a given sector and country in 2023 and the variable of interest is the total subsidy size (in bln USD), the total count of subsidy measures or the size of subsidy per measure in a given sector and country. The top panel includes country fixed effects and the bottom panel country and sector fixed effects (at 3-digit NAICS level). Standard errors are clustered at the country-sector level. The data on cross-border investment projects are from fDi Markets, the data on the counts and size of subsidies from the New Industrial Policy Observatory and the data on the presence of subsidy measures detected regardless of the size of the subsidy from the GTA database.

Table A1.7: Robustness Check: Controlling for Indirect Subsidies

	(1)	(2)	(3)	(4)	(5)
Panel A: Full Sample					
Direct Subsidies					
Financing Subsidy	0.068**	0.068**	0.069**	0.068**	0.068**
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Indirect Subsidies					
Financing Subsidy$_U^H$		0.003		-0.016	
		(0.062)		(0.084)	
Other Subsidy$_U^H$		0.002		-0.009	
		(0.046)		(0.046)	
Other IP$_U^H$		-0.042		-0.042	
		(0.042)		(0.042)	
Financing Subsidy$_D^H$			0.024	0.036	
			(0.068)	(0.094)	
Other Subsidy$_D^H$			0.076*	0.076*	
			(0.044)	(0.045)	
Other IP$_D^H$			-0.006	-0.002	
			(0.037)	(0.038)	
Financing Subsidy$_T^H$					-0.090
					(0.120)
Other Subsidy$_T^H$					0.007
					(0.045)
Other IP$_T^H$					0.011
					(0.039)
Fixed Effects:					
Country-Sector	✓	✓	✓	✓	✓
Country-Year	✓	✓	✓	✓	✓
Sector-Year	✓	✓	✓	✓	✓
Other Subsidy	✓	✓	✓	✓	✓
Other IP	✓	✓	✓	✓	✓
Observations	56216	56216	56216	56216	56216
Pseudo R^2	0.56	0.56	0.56	0.56	0.56

Robustness Check: Controlling for Indirect Subsidies (ctd.)

	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: TiVA Sample						
Direct Subsidies						
Financing	0.068**	0.064**	0.064**	0.065**	0.064**	0.064**
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Indirect Subsidies						
Financing Subsidy_U^H			0.003		-0.018	
			(0.063)		(0.087)	
Other Subsidy_U^H			0.031		0.022	
			(0.047)		(0.048)	
Other IP_U^H			-0.065		-0.065	
			(0.044)		(0.044)	
Financing Subsidy_D^H				0.026	0.039	
				(0.068)	(0.097)	
Other Subsidy_D^H				0.069	0.065	
				(0.046)	(0.046)	
Other IP_D^H				-0.004	0.002	
				(0.038)	(0.039)	
Financing Subsidy_T^H						-0.093
						(0.120)
Other Subsidy_T^H						0.010
						(0.048)
Other IP_T^H						0.017
						(0.042)
Fixed Effects:						
Country-Sector	✓	✓	✓	✓	✓	✓
Country-Year	✓	✓	✓	✓	✓	✓
Sector-Year	✓	✓	✓	✓	✓	✓
Other Subsidy	✓	✓	✓	✓	✓	✓
Other IP	✓	✓	✓	✓	✓	✓
Observations	56216	41411	41411	41411	41411	41411
Pseudo R^2	0.56	0.58	0.58	0.58	0.58	0.58

Note: Table A1.7 shows the results of the baseline regression from Equation 3.2 where the dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. Panel A presents results of the estimation on the full sample of countries while Panel B restricts the analysis to countries covered by the OECD Trade in Value-Added (TiVA) database. We follow Rotunno and Ruta (2024b) to calculate the level of exposure to subsidized industries upstream as each industry's j share in the total cost of industry k ($\sum_{j\neq k} cost_{k,j} S^F_{i,j,t}$), i.e., how much industry k relies on inputs from other industries. Analogously, exposure to subsidized industries downstream is captured by each industry j's share in the total sales of industry k ($\sum_{j\neq k} sales_{j,k} S^F_{i,j,t}$), i.e., how much k provides inputs to other industries. Due to high level of correlation between those two measures, we also calculate a total linkage measure as a geometric mean of both relationships ($\sum_{j\neq k} \left\{\sqrt{cost_{k,j} \times sales_{j,k}}\right\}(S^F_{i,j,t})$. Once we obtain indirect exposure measures by country and sector, we identify countries that provide above 75th percentile level of support as those with high levels of indirect subsidies. Subscript T denotes total indirect subsidies, U denotes upstream subsidies, and D denotes downstream subsidies. Superscript H denotes high levels of indirect subsidies (T, U or D, respectively).

Table A1.8: The Role of Sector Factor Intensities Including for Other Subsidies

	(1)	(2)	(3)
Physical Capital			
Financial Subsidy - k_m^H=1	0.155***		0.151***
	(0.043)		(0.046)
Financial Subsidy - k_m^H=0	-0.041		
	(0.034)		
Other Subsidy - k_m^H=1	-0.054		-0.058
	(0.047)		(0.047)
Other Subsidy - k_m^H=0	0.033		
	(0.047)		
Human Capital			
Financial Subsidy - l_m^H=1		0.100**	0.014
		(0.051)	(0.053)
Financial Subsidy - l_m^H=0		0.057	
		(0.035)	
Other Subsidy - l_m^H=1		-0.029	-0.006
		(0.056)	(0.055)
Other Subsidy - l_m^H=0		-0.005	
		(0.043)	
Other			
Financial Subsidy - C_m=1			-0.061
			(0.039)
Other Subsidy - C_m=1			0.013
			(0.059)
Fixed Effects:			
Country-Sector	✓	✓	✓
Country-Year	✓	✓	✓
Sector-Year	✓	✓	✓
Other Subsidy Controls	✓	✓	✓
Other IP Controls	✓	✓	✓
Observations	56216	56216	56216
Pseudo R^2	0.56	0.56	0.56

Note: Table A1.8 shows results of an estimation that corresponds to the results presented in Table 3 while allowing the coefficient on the indicator on the presence of other subsidies to also vary by the type of sector. The dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. k_m^H=1 when sector m has high capital intensity; l_m^H =1 when sector m has high human capital intensity; and $C_m = (k_m^H = 0, l_m^H = 0)$. For the list of sectors in each category, see Table A1.12 in the Annex. Standard errors clustered by country-sector are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A1.9: The Role of Revealed Comparative Advantage (RCA)

	(1)	(2)
Financial Subsidy - Ω_{mi}^{RCA}=1	0.094**	0.094**
	(0.040)	(0.040)
Financial Subsidy - Ω_{mi}^{RCA}=0	0.031	0.031
	(0.040)	(0.039)
Other Subsidy	-0.012	
	(0.038)	
Other Subsidy - Ω_{mi}^{RCA}=1		0.008
		(0.045)
Other Subsidy - Ω_{mi}^{RCA}=0		-0.026
		(0.046)
Fixed Effects:		
Country-Sector	✓	✓
Country-Year	✓	✓
Sector-Year	✓	✓
Other Subsidy Controls	✓	✓
Other IP Controls	✓	✓
Observations	56216	56216
Pseudo R^2	0.56	0.56

Note: Table A1.9 shows results of estimations corresponding to Equation 5.3 and 5.4 where two separate terms referring to sector-level factor intensity ($U_{m(E)}$) and country factor endowment (E_i) are replaced with one sector-country specific term (Ω_{mi}^{RCA}) that takes a value of 1 when a country i has a revealed comparative advantage (RCA) in sector m, calculated following Balassa (1965). The dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. Standard errors clustered by country-sector are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A1.10: Controlling for the Quality of Institutions and Financial Markets

	(1)	(2)
	Financial Development	**Quality of Institutions**
Physical and Human Capital		
Financial Subsidy - k_m^H=1, k_i^H=1	0.184**	0.194**
	(0.092)	(0.077)
Financial Subsidy - k_m^H=1, k_i^H=0	0.257	0.218
	(0.176)	(0.158)
Financial Subsidy - l_m^H=1, l_i^H=1	0.052	0.049
	(0.086)	(0.074)
Financial Subsidy - l_m^H=1, l_i^H=0	-0.039	-0.036
	(0.125)	(0.121)
Financial Subsidy - C_m=1	-0.021	-0.014
	(0.107)	(0.089)
Fixed Effects:		
Country-Sector	✓	✓
Country-Year	✓	✓
Sector-Year	✓	✓
Other Subsidy Controls	✓	✓
Other IP Controls	✓	✓
Observations	56216	56216
Pseudo R^2	0.565	0.565

Note: Table A1.10 shows results of an estimation corresponding to Equation 5.4, where the dependent variable is the number of new cross-border greenfield investment projects in a given host country, sector and year. It corresponds to the results presented in Table 4, and includes additional controls. Column 1 reports the results controlling for the presence of financial subsidies in sectors with high or low level of external financial dependence (i.e., above/below the median) and other, using the data from Bilir et al. (2019), and in countries with high or low level of development of local financial markets (i.e., above/below the median) or other, using the data from IMF (2024). Column 1 reports the results controlling for the presence of financial subsidies in sectors with high or low level of contractual intensity (i.e., above/below the median), using the data from Nunn (2007), and in countries with high or low quality of local institutions (i.e., above/below the median) or other, using the data on the rule of law from Kaufmann et al. (2010). k_m^H=1 when sector m has high capital intensity; l_m^H =1 when sector m has high human capital intensity; and $C_m = (k_m^H = 0, l_m^H = 0)$. k_i^H refers to a country i with high (physical) capital endowment and l_i^H to a country i with high human capital endowment. For the list of sectors in each category, see Table A1.12 and for the list of countries see Table A1.13 in the Annex. Standard errors clustered by country-sector are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A1.11: The Role of Financial Dependence and Financial Markets

	(1)	(2)	(3)	(4)	(5)	(6)
Sector External Financial Dependence						
Financial Subsidy - EFD_m^H=1	0.078**	-0.047	-0.019			
	(0.039)	(0.041)	(0.051)			
Financial Subsidy - EFD_m^H=1	0.049					
	(0.039)					
Financial Subsidy - k_m^H=1		0.193***	0.165***			
		(0.047)	(0.051)			
Financial Subsidy - l_m^H=1			0.015	0.019	0.022	0.021
			(0.054)	(0.055)	(0.055)	(0.055)
Sector External Financial Dependence and Sector Factor Intensities						
Financial Subsidy - k_m^H=1 & EFD_m^H=1				0.149***		
				(0.054)		
Financial Subsidy - k_m^H=1 & EFD_m^H=0				0.148**	0.146**	0.146**
				(0.068)	(0.067)	(0.067)
Financial Subsidy - k_m^H=0 & EFD_m^H=1				-0.037	-0.038	-0.038
				(0.064)	(0.064)	(0.064)
Sector External Financial Dependence, Sector Factor Intensities and Country Characteristics						
Financial Subsidy - k_m^H=1 & EFD_m^H=1 & k_i^H=1					0.138***	
					(0.053)	
Financial Subsidy - k_m^H=1 & EFD_m^H=1 & k_i^H=0					0.236	0.235
					(0.195)	(0.195)
Financial Subsidy - k_m^H=1 & EFD_m^H=1 & k_i^H=1 & FM_i^H=1						0.133**
						(0.053)
Financial Subsidy - k_m^H=1 & EFD_m^H=1 & k_i^H=1 & FM_i^H=0						0.482**
						(0.201)
Financial Subsidy - C_m=1			-0.054	-0.043	-0.043	-0.044
			(0.048)	(0.052)	(0.052)	(0.052)
Fixed Effects:						
Country-Sector	✓	✓	✓	✓	✓	✓
Country-Year	✓	✓	✓	✓	✓	✓
Sector-Year	✓	✓	✓	✓	✓	✓
Other Subsidy Controls	✓	✓	✓	✓	✓	✓
Other IP Controls	✓	✓	✓	✓	✓	✓
Observations	56216	56216	56216	56216	56216	56216
Pseudo R^2	0.56	0.56	0.56	0.56	0.56	0.56

Note: Table **??** shows the results of an estimation corresponding to Equations k_m^H=1 when sector m has high capital intensity; l_m^H =1 when sector m has high human capital intensity; and $C_m = (k_m^H = 0, l_m^H = 0)$. k_i^H refers to a country i with high (physical) capital endowment and l_i^H to a country i with high human capital endowment. For the list of sectors in each category, see Table A1.12 and for the list of countries see Table A1.13 in the Annex. Standard errors clustered by country-sector are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table A1.12: List of Sectors by Type

NAICS	Sector Name	NAICS	Sector Name
3111*	Animal Food Manuf.	3279*	Other Nonmetallic Mineral Product Manuf.
3112*‡	Grain and Oilseed Milling	3311*‡	Iron and Steel Mills and Ferroalloy Manuf.
3113*‡	Sugar and Confectionery Product Manuf.	3312*‡	Steel Product Manuf. from Purchased Steel
3114*‡	Fruit and Vegetable Preserving and Specialty Food Manuf.	3313*‡	Alumina and Aluminum Production and Processing
3115*	Dairy Product Manuf.	3314*	Nonferrous Metal (except Aluminum) Production and Processing
3116‡	Animal Slaughtering and Processing	3315‡	Foundries
3117‡	Seafood Product Preparation and Packaging	3321‡	Forging and Stamping
3118	Bakeries and Tortilla Manuf.	3322*	Cutlery and Handtool Manuf.
3119*	Other Food Manuf.	3323	Architectural and Structural Metals Manuf.
3121*	Beverage Manuf.	3324*‡	Boiler, Tank, and Shipping Container Manuf.
3122*	Tobacco Manuf.	3325‡	Hardware Manuf.
3131*‡	Fiber, Yarn, and Thread Mills	3326‡	Spring and Wire Product Manuf.
3132*‡	Fabric Mills	3327‡	Machine Shops; Turned Product; and Screw, Nut, and Bolt Manuf.
3133*‡	Textile and Fabric Finishing and Fabric Coating Mills	3328‡	Coating, Engraving, Heat Treating, and Allied Activities
314‡	Textile Product Mills	3329	Other Fabricated Metal Product Manuf.
3141‡	Textile Furnishings Mills	3331	Agriculture, Construction, and Mining Machinery Manuf.
3149‡	Other Textile Product Mills	3332	Industrial Machinery Manuf.
3151*‡	Apparel Knitting Mills	3333*	Commercial and Service Industry Machinery Manuf.
3152‡	Cut and Sew Apparel Manuf.	3334	Ventilation, Heating, Air-Conditioning, and Commercial Refrigeration Equipment Manuf.
3159‡	Apparel Accessories and Other Apparel Manuf.	3335	Metalworking Machinery Manuf.
3161‡	Leather and Hide Tanning and Finishing	3336*	Engine, Turbine, and Power Transmission Equipment Manuf.
3162‡	Footwear Manuf.	3339	Other General Purpose Machinery Manuf.
3169‡	Other Leather and Allied Product Manuf.	334*	Computer and Electronic Product Manuf.

Note: Table A1.12 presents a list of 4-digit NAICS sectors included in the analysis. Capital-intensive sectors are identified with * and skill-intensive sectors with ‡. Capital intensity is defined as a ratio of capital stock to total workers in a sector and skill intensity is the ratio of non-production workers to total workers. The data is available for 364 6-digit NAICS 2012 manufacturing industries in the NBER-CES Manufacturing Database (Becker et al. (2021)). To aggregate the data to 4-digit NAICS level, we take a mean per sector. We obtain a time-invariant measure of sector intensity by taking a median for the years 2000-2009 (pre-sample). We then divide sectors into bins: those with above-median value of capital-intensity ($k_m^H = 1$) and other sectors ($k_m^H = 0$); those with above-median value of human capital-intensity ($l_m^H = 1$) and other sectors ($l_m^H = 0$).

Table A1.13: List of Countries by Type

i	k_i^H	WB	l_i^H	i	k_i^H	WB	l_i^H	i	k_i^H	WB	l_i^H	i	k_i^H	WB	l_i^H	i	k_i^H	WB	l_i^H
AW	1	H	0	CR	0	UM	0	IQ	0	LM	0	MU	1	UM	1	SK	1	H	1
AF	0	L	0	CU	0	UM	1	IS	1	H	1	MW	0	L	0	SI	1	H	1
AO	0	LM	0	CW	0	H	0	IL	1	H	1	MY	1	UM	1	SE	1	H	1
AL	0	UM	1	KY	1	H	0	IT	1	H	1	NA	0	UM	0	SZ	1	LM	0
AD	0	H	0	CY	1	H	1	JM	0	UM	1	NC	0	H	0	SC	1	UM	0
AE	1	H	1	CZ	1	H	1	JO	1	LM	1	NE	0	L	0	SY	0	LM	0
AR	1	UM	1	DE	1	H	1	JP	1	H	1	NG	0	LM	0	TC	0	H	0
AM	0	LM	1	DJ	0	LM	0	KZ	1	UM	1	NI	0	LM	0	TD	0	L	0
AS	0	UM	0	DM	0	UM	0	KE	0	L	0	NL	1	H	1	TG	0	L	0
AG	1	UM	0	DK	1	H	1	KG	0	L	1	NO	1	H	1	TH	0	LM	0
AU	1	H	1	DO	0	UM	0	KH	0	L	0	NP	0	L	0	TJ	0	L	1
AT	1	H	1	DZ	1	UM	0	KI	0	LM	0	NZ	1	H	1	TM	1	LM	0
AZ	0	UM	0	EC	1	LM	1	KN	1	UM	0	OM	1	H	0	TL	0	LM	0
BI	0	L	0	EG	0	LM	0	KR	1	H	1	PK	0	LM	0	TO	0	LM	1
BE	1	H	1	ER	0	L	0	KW	1	H	1	PA	0	UM	1	TT	1	H	0
BJ	0	L	0	ES	1	H	1	LA	0	L	0	PE	0	UM	1	TN	1	LM	0
BF	0	L	0	EE	1	H	1	LB	1	UM	0	PH	0	LM	1	TR	1	UM	0
BD	0	L	0	ET	0	L	0	LR	0	L	0	PW	0	UM	0	TV	0	LM	0
BG	0	UM	1	FI	1	H	1	LY	0	UM	0	PG	0	LM	0	TW	1	H	1
BH	1	H	1	FJ	0	UM	0	LC	0	UM	0	PL	1	H	0	TZ	0	L	0
BS	1	H	0	FR	1	H	1	LI	0	H	0	PR	0	H	0	UG	0	L	0
BA	0	UM	0	FO	0	H	0	LK	0	LM	1	KP	0	L	0	UA	1	LM	1
BY	1	UM	0	FM	0	LM	0	LS	0	LM	0	PT	1	H	0	UY	1	UM	1
BZ	0	LM	0	GA	1	UM	0	LT	1	UM	1	PY	0	LM	0	US	1	H	1
BM	1	H	0	GB	1	H	1	LU	1	H	1	PS	1	LM	0	UZ	0	LM	0
BO	0	LM	1	GE	0	LM	0	LV	1	H	1	PF	0	H	0	VC	0	UM	0
BR	0	UM	0	GH	0	L	1	MO	1	H	0	QA	1	H	1	VE	1	UM	0
BB	0	H	1	GI	0	H	0	MA	0	LM	0	RO	0	UM	1	VN	0	LM	0
BN	1	H	1	GN	0	L	0	MC	0	H	0	RU	1	UM	1	VU	0	LM	0
BT	1	LM	0	GM	0	L	0	MD	0	LM	0	RW	0	L	0	WS	0	LM	0
BW	1	UM	0	GW	0	L	0	MG	0	L	0	SA	1	H	0	YE	0	LM	0
CF	0	L	0	GQ	0	H	0	MV	0	LM	1	SD	0	LM	0	ZA	1	UM	0
CA	1	H	1	GR	1	H	1	MX	1	UM	1	SN	0	LM	0	ZM	0	L	0
CH	1	H	1	GD	0	UM	0	MH	0	LM	0	SG	1	H	1	ZW	0	L	0
CL	1	UM	1	GL	0	H	0	MK	1	UM	0	SB	0	L	0				
CN	0	LM	0	GT	0	LM	0	ML	0	L	0	SL	0	L	0				
CI	0	LM	0	GU	0	H	0	MT	1	H	1	SV	0	LM	0				
CM	0	LM	0	GY	0	LM	1	MM	0	L	0	SM	0	H	0				
CD	0	L	0	HK	1	H	1	ME	1	UM	0	SO	0	L	0				
CG	0	LM	1	HN	0	LM	0	MN	1	LM	1	RS	1	UM	0				
CO	1	UM	0	HR	1	H	0	MP	0	H	0	SS	0	LM	0				
KM	1	L	0	HT	0	L	0	MZ	0	L	0	ST	0	LM	0				
CV	0	LM	0	HU	1	H	0	MR	0	L	0	SR	1	UM	0				

Note: Table A1.13 presents a list of countries (i) included in the analysis. The term k/l_i^H refers to capital abundant country. WB refers to the World Bank's income classification as of 2009 (i.e., pre-sample), where H=high-income, UM=upper-middle income, LM=low-middle income and L=low income. We define countries' capital endowment as capital stock at current PPPs (in million 2012 USD) per number of persons engaged (in million) and skill endowment as percentage of population above 25 years old with tertiary education. The data on countries' physical capital endowments comes from the Penn World Tables (Feenstra et al. (2015)) and on human capital from Barro and Lee (2013). We obtain a time-invariant measure of capital abundance by taking a median per country for the years 2000-2009 (pre-sample). We then divide countries into bins: those with the above-median value of (physical) capital-abundance ($k_i^H = 1$) and other countries ($k_i^H = 0$); and those with the above-median value of human capital-abundance ($l_i^H = 1$) and other countries ($l_i^H = 0$).