How do U.S. tax subsidies for foreign firms affect their U.S. peer firms?

Alan D. Sohn
Fisher School of Accounting
University of Florida
Alan.Sohn@warrington.ufl.edu

September 2025

Abstract:

Governments at all levels increasingly provide place-based tax incentives to attract foreign direct investment. I examine how the state and local tax subsidies granted to foreign-owned domestic corporations (FODCs) in the U.S. affect the economic performance of U.S. domestic peer firms. I find that these tax subsidies are associated with negative cumulative abnormal returns and reduced profitability for U.S. peers, consistent with subsidized FODCs gaining a competitive edge. While the subsidies raise regional income and may benefit U.S. firms, the overall effect is a negative competitive externality, especially for financially constrained firms. The negative externality is weaker for firms with greater product market power, in high-tech sectors, or located near the subsidized FODCs. I also find that U.S. firms respond to increased competition by reducing capital and acquisition spending. These findings highlight the unintended consequences of a place-based tax policy and contribute to research on the tax channel of competition.

I appreciate the helpful guidance and support from my committee: Michael Mayberry (chair), Gary McGill, Scott Rane, and David Sappington (external). I also thank Jenna El-Khalili, Justin Kim, Kyoungwon Kim, Jeremy Lee (discussant), Ruby Lee, Jeffery Piao, and participants at the University of Florida workshop and 2025 Illinois Tax Symposium Doctoral Consortium for their helpful comments. All errors are my own.

1. Introduction

Cross-border tax competition to attract businesses, investments, and employment from foreign multinational corporations (MNCs) takes place through various tax policies. One prevalent form of such incentives to stimulate foreign direct investment (FDI) is tax subsidies, which include tax credits, tax abatements, tax holidays, and special taxing districts. In the U.S., these tax incentives have tripled since the 1990s and exceeded $4 billion in 2017 alone (Bartik 2019b). While the stated intent by policymakers is to draw FDI and stimulate local economic growth, the tax subsidies provide financial relief to foreign-owned beneficiaries such that they potentially render local peer firms at a competitive disadvantage relative to the foreign-owned U.S. MNCs. I examine whether the state and local tax subsidies granted to foreign-owned U.S MNCs disturb the competitive environment of the U.S. market by investigating their impact on domestic peer firms' economic performance.[1]

Firm-specific tax subsidies are a form of government expenditure important to both the governments and recipients. From a firm's perspective, tax subsidies help relieve its tax burden, which potentially allows the firm to allocate tax savings to alternative business investments (Giroud and Rauh 2019). Likewise, governments attract jobs and investments by providing place-based tax incentives to firms from both inside and outside the local market (Slattery and Zidar 2020). In particular, state and local governments increasingly target foreign businesses with tax subsidies to lure investments not available in domestic or local markets. Governments pursue FDI through tax subsidies because foreign-owned firms provide direct economic benefits to the local market (Javorcik 2015; Setzler and Tintelnot 2021) as well as potentially positive spillover effects

[1] Throughout the manuscript, I define U.S. domestic product market peer firms as *all* U.S.-owned firms across the U.S. in the same product market as foreign-owned domestic corporations (FODCs). Appendix B provides details on the procedures used to identify FODCs' U.S. domestic product market peer firms based on the Hoberg and Phillips (2016) methodology.

on domestic firms (Haskel, Pereira, and Slaughter 2007; Keller and Yeaple 2009). Despite the mutually beneficial goals to governments and subsidy recipients, the efficacy of tax subsidies depends on multiple economic forces and, therefore, warrants a more comprehensive analysis that considers all parties (Scholes and Wolfson 1992; De Simone, Lester, and Raghunandan 2025). In particular, tax subsidies reduce the tax burden on recipient firms, which may enhance or diminish local product market competition.

On the one hand, tax subsidies granted to foreign-owned domestic corporations (FODCs) have the potential to impair the economic performance of U.S. domestic firms through several channels. First, by disproportionately reducing tax burdens and internal financing costs for FODCs, targeted tax subsidies lower the cost of competitive strategies exclusively for these firms, enabling them to potentially capture market share from their domestic peers (Kim, Nessa, and Wilson 2021; Donohoe, Jang, and Lisowsky 2022). Additionally, FODCs may intensify local labor demand, imposing upward pressure on wages and increasing operating costs for domestic firms (Setzler and Tintelnot 2021). Second, tax subsidies alleviate financial constraints FODCs face in host countries, functioning as a form of external capital that supports cross-border expansion (Manova 2013; Dyreng and Markle 2016). Specifically, a reduction in financial constraints via tax subsidies increases a foreign firm's financial means of making new, positive net present value investments to strengthen its market position in the U.S. (Mukherjee, Singh, and Zaldokas 2017; Giroud and Rauh 2019). Collectively, these mechanisms predict a negative association between tax subsidies and the economic performance of U.S. domestic competitors.

On the other hand, tax subsidies granted to FODCs may enhance U.S. domestic firms' economic performance through multiple channels. First, by attracting FDI, tax subsidies can increase local employment and wages, thereby augmenting household income and savings (Setzler

and Tintelnot 2021; De Simone et al. 2025). Higher disposable income should in turn boost local consumption and financially benefit all businesses in the area, including U.S. peer firms. Second, FDI induced by tax subsidies can generate positive externalities through technology transfers and productivity spillovers. Specifically, FDI enhances supplier productivity and reduces input costs via technology diffusion (Markusen and Venables 1999; Blalock and Gertler 2008), while also improving local firm performance through knowledge spillovers (Haskel et al. 2007; Keller and Yeaple 2009). In particular, MNCs bring proprietary knowledge assets, such as patents and trademarks, to their foreign affiliates, and the knowledge and information from these assets may spill over to local firms through interfirm interactions, including labor mobility (Bartik 2019b). Collectively, these mechanisms suggest that tax subsidies granted to FODCs may lower U.S. firms' costs and increase their profitability. Overall, the competitive externalities of such tax subsidies on U.S. firms' economic performance remain an empirical question.

I examine the research question using firm-level data on subsidies available from Good Jobs First (GJF).[2] GJF compiles Subsidy Tracker that keeps track of economic development subsidies and other forms of government financial assistance to businesses in the U.S. since 1966. The database contains information on subsidy recipients, parent companies, and most importantly, home countries of the parent companies, allowing me to identify whether the subsidies are furnished to foreign-owned firms in the U.S. For my study, I use a sample of tax-specific subsidies provided to firms with a foreign parent company.

I begin my analysis by first evaluating the stock market reactions of U.S. firms most likely to be affected by the tax subsidies provided to FODCs. Specifically, I collect the 10 largest tax

[2] GJF is a Washington, D.C.-based national policy resource center that promotes corporate and government accountability in economic development. For studies that use GJF data, please refer to Slattery and Zidar (2020), Drake, Hess, Wilde, and Williams (2022), Huang (2022), Dong, Raghunandan, and Rajgopal (2024), De Simone et al. (2025), and Raghunandan (2024).

subsidies with the requisite peer firm coverage between 2012 and 2021, and compute cumulative abnormal returns (CAR) of U.S. peer firms around the announcement dates of these tax subsidies. Of the 10 events, six report significant negative CAR and four report insignificant returns. This finding points to a negative shareholder perception and provides initial credence to tax subsidies negatively influencing competition faced by U.S. firms. By contrast, I also find evidence of improved economic activity following FODCs' receipt of tax subsidies, as reflected in increased aggregate income in the Metropolitan Statistical Areas (MSA) where the FODCs are located. The improvement in regional welfare following the subsidy receipt is consistent with tax subsidies attracting FDI to stimulate local economic activities that may indirectly benefit nearby U.S. domestic firms.

I address my primary research question by directly examining the impact of tax subsidies granted to FODCs on the economic performance of U.S. peer firms from 2000 to 2021. I find that tax subsidies are negatively associated with one- and two-year-ahead profit margins and gross margins of U.S. domestic peer firms in the same product market. In particular, a one-standard-deviation increase in tax subsidies to FODCs results in an 8.4 percentage point decrease in operating profit margin and a 2.5 percentage point decrease in gross margin of the U.S. product market peer firms (Hoberg and Phillips 2016).[3]

Next, I perform cross-sectional analyses to understand how tax subsidies affect the operating performance of U.S. domestic competitors. First, I expect the negative externality from tax subsidies granted to FODCs to be stronger when their U.S. competitors are more financially constrained relative to when their competitors are less financially constrained (Donohoe et al. 2022). I find results consistent with the expectation. Second, I explore the extent to which the

[3] The results persist across alternative classifications of peer firms, including the three-digit North American Industry Classification Systems (NAICS) and Standard Industrial Classification (SIC) codes.

negative competitive externality varies with firms' product market power. Product market power provides firms with comparative advantages through more persistent profitability and insulation from competitive threats (Peress 2010; Kubick, Lynch, Mayberry, and Omer 2015). Accordingly, I expect and find that the negative externality is weaker when U.S. competitors have greater product market power based on the industry-adjusted price-cost margin.

I also consider potential beneficiaries of the FODCs' tax subsidies. While FDI can generate negative externalities, prior research also highlights positive spillovers, particularly in high-tech sectors (Blalock and Gertler 2008; Keller and Yeaple 2009). Specifically, high-tech firms often cluster in regions characterized by high labor mobility, which facilitates knowledge diffusion from FDI (Bartik 2019b). Additionally, tax subsidies that improve local welfare can raise household income and enhance the economic performance of nearby U.S. firms (De Simone et al. 2025). Drawing on these insights, I predict and find that the negative externalities associated with the tax subsidies are attenuated among U.S. domestic firms in high-tech sectors and those located near the foreign tax subsidy recipients.

Finally, I triangulate my findings by examining the changes in investment and productivity by U.S. firms in response to the negative competitive externality. Specifically, I find that U.S. firms' one- and two-year-ahead capital expenditures and acquisition activities decrease after their foreign rivals in the U.S. receive tax subsidies.[4] These findings are consistent with U.S. domestic firms reducing their costs in response to increased competitive pressure.

My study makes several contributions. First, I shed light on the consequences of government tax subsidies in the U.S. from a competitive externality perspective. Prior literature shows that tax cuts to domestic firms and the declining tax rates of foreign firms negatively affect

[4] By contrast, R&D expenses and total factor productivity do not change.

their domestic rival firms' operating performance (Kim et al. 2021; Donohoe et al. 2022). My findings complement prior studies by showing that tax subsidies from U.S. governments to foreign MNCs are another tax channel of competition in the U.S. market. Furthermore, my study extends this literature by highlighting the nuanced role of geographic proximity in shaping the competitive externalities of tax relief.

Second, my study informs the debate on the efficacy of place-based incentives. While state and local business incentives, such as tax credits and firm-specific tax incentives, are increasingly prevalent forms of governmental expenditure to attract FDI (Chirinko and Wilson 2008; Bartik 2019b; Slattery and Zidar 2020; Slattery 2024a), the evidence on whether the place-based tax incentives induce positive FDI effects on host countries is mixed (Aitken and Harrison 1999; Keller and Yeaple 2009; Keller 2021). Anecdotal evidence also highlights suboptimal allocation of tax breaks and the resultant need to recalibrate the costs and benefits of firm-specific tax incentives (Markell 2017; Corasaniti and Haag 2019; Dyreng and Hoopes 2024). My findings are highly relevant to the contemporary debate on the state and local tax incentives in the U.S., as these incentives aimed at attracting FDI may come at the expense of domestic firms losing their market share.

Finally, I add to the growing accounting literature on government subsidies. The GJF Subsidy Tracker allows researchers to investigate various impacts of government subsidies, including local employment, firm disclosure, and future firm performance (Drake et al. 2022; Huang 2022; De Simone et al. 2025). I also use the GJF data to demonstrate how government subsidies to attract FDI negatively affect U.S. product market competition.

2. Background and hypothesis development

2.1 Foreign direct investment

Operating a subsidiary firm in the host country has emerged as a major FDI channel, with the inflow through this source increasing to $177 billion in 2022 (Department of Commerce 2024), thereby multiplying the presence of foreign-owned firms in the U.S. For example, FODCs in the U.S. held $16.2 trillion of assets and $6.6 trillion of receipts, while filing approximately 150,000 Form 1120 corporate income tax returns in 2021 alone.[5] Given their growing presence, it is important to consider the benefits as well as potential drawbacks of FDI, which has a wide range of economic effects, particularly in employment, productivity, and market competition. From an employment perspective, foreign MNCs spur local economic growth by creating jobs. Once established, FODCs transact with a variety of domestic stakeholders, creating a need to hire local workers. Prior research corroborates this increased demand for local labor following FDI. For instance, Javorcik (2015) finds that foreign-owned firms offer jobs that pay higher wages and provide more training than local firms. Similarly, Setzler and Tintelnot (2021) document an increase in employment and wages at local domestic-owned firms near foreign MNCs in the U.S.

Furthermore, FDI influences local productivity through knowledge spillover. Prior literature provides evidence of knowledge spillover from foreign MNCs to domestic firms (e.g., Das 1987; Javorcik 2004). By introducing new technology and expertise, FODCs can streamline production process and improve the quality of goods and services provided in the host country (Haskel et al. 2007; Keller and Yeaple 2009). Moreover, the technology diffusion induces entry and competition, lowering prices in the supply market. These changes then increase output and profits of firms in the buyer sector of the host country (Blalock and Gertler 2008).

[5] The data are from the Internal Revenue Service (IRS) Statistics of Income (SOI): https://www.irs.gov/statistics/soi-tax-stats-foreign-controlled-domestic-corporations.

Lastly, FDI exerts competitive pressure on domestic firms. To the extent that foreign firms provide superior goods and services, local firms risk losing market share to their foreign competitors. A few studies have examined the adverse effect of competition (e.g., Aitken and Harrison 1999; Lu, Tao, and Zhu 2017). For example, Caves (1974) uses a Canadian setting and finds that industries with a greater share of foreign subsidiaries are negatively associated with the profitability of Canadian firms, suggesting that foreign firms raise the level of competition in the host country. Overall, FODCs drive FDI in the U.S., with the potential to significantly influence key aspects of the economy.

2.2 Place-based tax incentives

Tax policies used to attract investments, businesses, and skilled labor from abroad give rise to tax competition between nations, resulting in lower statutory tax rates and more advantageous tax incentives (Devereux, Lockwood, and Redoano 2008; Avi-Yonah 2012; Devereux and Loretz 2013). Federal, state, and local governments in the U.S. also add to this tax competition by offering place-based tax benefits to firms, ranging from tax credits, tax holidays, and tax abatements to tax exemptions in certain locations. For example, U.S. state and local governments spent an estimated $47 billion on tax incentives in 2018 (Bartik 2019b).

By offering these tax incentives, the governments intend to create economic spillover effects. When a firm builds a new production facility or engages in an investment activity within a state, it stimulates job creation within the local supply chain and service industries, thereby fostering regional economic growth. This expansion not only enriches local employment opportunities (Slattery and Zidar 2020; De Simone et al. 2025) but also enhances local firms' productivity (Greenstone and Moretti 2004; Moretti and Wilson 2014). For instance, incumbent plants in counties that secured a new large manufacturing plant through subsidies experienced a

12% increase in total factor productivity within five years of the new plant's opening (Greenstone, Hornbeck, and Moretti 2010). Furthermore, place-based policies create opportunities to attract emerging industries and foreign capital that may not be readily available in local markets (Amy and Bynum 2023). By connecting state and local governments with foreign MNCs, these place-based tax policies help bridge institutional and market gaps, and foster economic diversification and inward investment (Glaeser 2001).

Despite the perceived economic benefits of place-based tax policies, policymakers and academic researchers have debated their net costs and benefits, specifically whether the economic gain from attracting a firm outweighs the total cost of granting tax relief to the firm (Scholes and Wolfson 1992). Prior research suggests that this cost includes the value of tax subsidies, opportunity costs from the alternative use of these subsidies, administrative costs, political motives, and inefficient subsidy recipients (Mitchell, Farren, Horpedahl, and Gonzalez 2020; Bartik 2019a; Slattery 2024a; 2024b). Notably, Slattery and Zidar (2020) find that the positive employment effects of discretionary expansion and relocation subsidies awarded to 543 firms are confined to recipient industries, with no significant spillover to other sectors. Anecdotally, the $2.85 billion in tax credits in 2017 granted by the state of Wisconsin to Foxconn, a Taiwanese electronics manufacturer, resulted in unfulfilled commitments and serves as a prominent example of a failed tax subsidy project (Carr 2019; 2020). Combined together, available evidence on net economic effects of place-based tax subsidies is mixed.

2.3 Competitive externalities of tax cuts

Firms, even within the same peer group or industry, often face different levels of tax burdens due to tax planning and policy instruments such as tax subsidies (Weisbach 2002; Kubick et al. 2015; Bird, Edwards, and Ruchti 2018). Unlike corporate tax planning, which may be subject

to audits or legal challenges, tax subsidies provide a stable and less risky means of reducing tax liabilities. This reduction in tax burden enhances firms' cash flow, which allows them to deploy a greater amount of internal financing to pursue alternative investment opportunities. Relatedly, if such alternative investment projects involve competitive strategies (e.g., product prices and costs, targeted advertising), then a firm's tax reduction can pose a threat to the economic performance of its competitors.

Two studies in accounting have explored competitive externalities of a tax cut by investigating how a firm's tax savings affect its peer firms' operating performance. First, Kim et al. (2021) examine corporate tax rate cuts in foreign countries that have plausibly increased the after-tax cash flows of foreign firms. Consistent with foreign firms deploying increased after-tax cash flows to pursue alternative investments and competitive strategies, they find reductions in gross margins and profit margins in the next two years for U.S. firms within the same industry of foreign competitors following foreign firms' tax rate cuts. Second, Donohoe et al. (2022) study a repatriation tax holiday under the American Jobs Creation Act of 2004, which temporarily excluded 85 percent of foreign earnings from U.S. tax. The authors argue that the repatriation tax cut increases repatriating firms' after-tax return, which in turn decreases the cost of internal financing to pursue investment opportunities in the U.S. Consistent with their argument, Donohoe et al. (2022) report a decrease in profitability for nonrepatriating peers competing in the same product markets as repatriating firms. Overall, the empirical results consistently document a negative association between a firm's tax cuts and its competitors' economic performance.

2.4 Hypothesis development

Place-based tax subsidies lower the overall tax burden on recipient firms (Glaeser 2001). Consequently, these tax subsidies function as a tax cut and incentivize firms to invest in specific

regions. In this study, I examine state and local tax subsidies granted to FODCs as a mechanism that encourages FDI and shapes the economic performance of U.S. domestic competitors. On the one hand, the tax subsidies granted to FODCs can negatively influence U.S. firms in two ways. First, these subsidies disproportionately lower the tax burden and financing costs for FODCs compared with U.S. firms, enabling foreign firms to adopt more competitive strategies and increase U.S. market share at the expense of U.S. firms (Fresard 2010; Chi and Su 2016). Additionally, by increasing local labor demand, FODCs can raise labor costs for U.S. firms, further reducing their profitability (Busso, Gregory, and Kline 2013; Setzler and Tintelnot 2021). Second, tax subsidies alleviate FODCs' financial constraints due to their limited access to external financing in host countries. Given that foreign MNCs need routine access to external capital to operate local subsidiaries (Manova 2013; Dyreng and Markle 2016), tax subsidies effectively serve as one form of external capital that subsidizes their activities in the U.S. This financial relief in turn allows FODCs to invest in projects that enhance their market power and compete with U.S. domestic firms (Djankov, Ganser, McLiesh, Ramalho, and Shleifer 2010; Mukherjee et al. 2017; Giroud and Rauh 2019).

On the other hand, tax subsidies provided to FODCs can also enhance the economic performance of U.S. peer firms through two channels. First, tax subsidies attract FDI, leading to job creation and wage growth, which in turn boosts the purchasing power and savings of local communities (Setzler and Tintelnot 2021; De Simone et al. 2025). Higher disposable income should in turn increase local household consumption, benefiting local domestic firms around the FODCs. Second, tax subsidies increase FDI that encourages technology transfer to local suppliers, fostering competition and improving productivity while lowering input costs (Markusen and Venables 1999; Blalock and Gertler 2008). To the extent that technology transfer enhances

supplier efficiency, U.S. firms may benefit from reduced input prices. Moreover, tax subsidies can generate positive spillover effects that improve the productivity of domestic firms (Haskel et al. 2007; Keller and Yeaple 2009). Specifically, foreign MNCs introduce knowledge assets, including patents and advanced technologies, to their local affiliates. Subsequent interactions between these affiliates and local domestic firms can lead to knowledge diffusion, thereby optimizing the domestic firms' operations and reducing production costs (Marshall 1920; Mansfield and Romeo 1980; Haskel et al. 2007).[6] Therefore, if tax subsidies to FODCs promote investments that facilitate these positive spillover effects, then they can ultimately lower costs and increase the profitability of U.S. domestic firms. Overall, the theories predict both a negative and positive association between tax subsidies granted to FODCs and their U.S. domestic competitors' economic performance. Thus, I state my hypothesis in the null:

> ***Hypothesis****: State and local tax subsidies granted to foreign-owned U.S. firms are not associated with the economic performance of their U.S. domestic competitors.*

3. Cumulative Abnormal Returns and welfare analysis

3.1 Cumulative Abnormal Returns (CAR)

3.1.1 Research design

I first seek to understand how the shareholders of U.S. domestic firms perceive the tax subsidies granted to rival FODCs by examining the cumulative abnormal returns (CAR) surrounding the announcement dates of 10 prominent tax subsidies between 2012 and 2021. Specifically, among the 10 largest tax subsidies by amount from each year of the sample period, I

[6] Information spillover can occur through both a formal channel, such as an industry linkage (Rodriguez-Clare 1996), and an informal channel, such as supplier/distributor discussions, reverse engineering, and labor mobility (Song, Almeida, and Wu 2003; Haskel et al. 2007).

select that with the greatest peer firm coverage to compute CAR for U.S. peer firms.[7] If the peer firms experience positive (negative) CAR relative to non-peer firms, then I can conclude that investors perceive positive (negative) net benefits from FODCs' tax subsidies.

I rely on the standard four-factor asset pricing model (Fama and French 1993; Carhart 1997) to estimate abnormal returns for the three days surrounding each tax subsidy announcement date. Abnormal returns are defined as the difference between an actual return and an estimated return using the asset pricing model from one year to two days before each announcement date. I aggregate these daily abnormal returns over the three-day period surrounding each announcement date to compute CAR. Appendix A provides detailed descriptions of all variables.

3.1.2 Sample and results

The left-half columns of Table 1 report the sample used for computing CAR over the period 2012–2021. Seven different states (California, Kentucky, Iowa, Louisiana, New Jesey, Tennessee, Texas) provide tax subsidies to FODCs from a variety of countries (Brazil, Germany, Japan, Sweden, South Africa, U.K.). These tax subsidies mainly consist of tax credits and property tax abatements ranging from $5.2 million to $1.5 billion.

Columns (1) to (3) of Table 1 present the CAR results for peer and non-peer firms. Column (1) shows the number of peer firms, who are most likely affected by tax subsidies, and their CAR on respective announcement dates. A wide range of peer firm coverage (from 8 to 123) is observed, with both negative and positive CAR for the peer firms. Column (2) presents similar information for non-peer firms. To inform the shareholder perception of the FODCs' tax subsidies, I compute the difference in CAR between peer and non-peer firms in Column (3). The results indicate that in

[7] Because the GJF Subsidy Tracker data do not contain announcement dates of any tax subsidies, I glean various sources (e.g., state government websites, granting institutions' search engines) to identify the official approval dates of the tax subsidies used in this analysis and assign them as the announcement dates. These sources are available upon request.

six of the ten years (2012–2015, 2018–2019), peer firms have significantly more negative CAR than their non-peer counterparts. The remaining four years show a statistically insignificant difference between peer and non-peer firms' CAR. Taken together, the significantly negative differences in CAR for peer firms suggest a negative shareholder perception of tax subsidies granted to FODCs, potentially due to increased foreign competition.

3.2 Welfare effects

3.2.1 Research design

Next, I explore potential local welfare effects of tax subsidies granted to FODCs on the MSA markets where the tax subsidy recipients are located. If tax subsidies attract foreign investments and spur economic growth in these regions (Setzler and Tintelnot 2021; De Simone et al. 2025), then the MSA markets that host tax subsidy recipients will likely exhibit an increase in aggregate income. Therefore, I focus on the change in aggregate income as a function of FODCs' tax subsidies, using the following Ordinary Least Squares (OLS) regression model:

$$\begin{aligned} \Delta Income_{c,t+\tau} = {} & \beta_0 + \beta_1 Ln_FODC\ Tax\ Subsidies_{c,t} + \beta_2 Ln_Other\ Subsidies_{c,t} \\ & + \beta_3 Ln_Non - FODC\ Tax\ \ Subsidies_{c,t} + \sum \beta_{4c} MSA_c + \sum \beta_{5t} YEAR_t \\ & + \varepsilon_{c,t} \end{aligned} \quad (1)$$

The subscripts c and t denote the MSA market and year, respectively. My dependent variable, $\Delta Income_{c,t+\tau}$, is the change in aggregate MSA income from year t to year t+τ, and is equal to the difference between the average of one- and two-year ahead MSA income and the current year MSA income. I employ two proxies of MSA income including adjusted gross income (AGI) and taxable income. My independent variable of interest is $Ln_FODC\ Tax\ Subsidies$, the logged value of the aggregate amount of tax subsidies granted to all FODCs located within the MSA market. If the tax subsidies granted to FODCs attract foreign investments to the jurisdictions

and generate positive welfare effects in the receiving MSA markets, then I expect the coefficient on $Ln_FODC\ Tax\ Subsidies$ to be positive.

In Equation (1), I control for non-tax-based subsidies granted to both domestic and foreign firms ($Ln_Other\ Subsidies$) as well as tax subsidies granted to all domestic firms ($Ln_Non-FODC\ Tax\ Subsidies$) located within the MSA markets to isolate the effect of FODCs' tax subsidies on MSA income. I include MSA and year fixed effects to ensure that neither time-invariant MSA characteristics nor macroeconomic conditions confound the identification of β_1. I cluster standard errors by MSA. Appendix A provides detailed descriptions of all variables.

3.2.2 Sample and results

To examine the welfare effects, I start with county data from the IRS SOI between 2011 and 2022, comprising 38,313 county-year observations. I aggregate the county-level data to the MSA level and merge it with subsidy information from the GJF Subsidy Tracker.[8] I exclude MSA-year observations that lack the necessary data to compute variables in Equation (1). I also restrict the sample to MSA markets with at least one tax subsidy entry at some point during the sample period. This criterion ensures that the regression captures the effect of tax subsidies on MSA income relative to other MSA markets that similarly host firms that receive state and local tax subsidies. These sample selection procedures result in a final sample of 1,183 (179) MSA-year (MSA) observations.

Table 2 reports the results estimating Equation (1). In Columns (1) and (2), I regress average MSA AGI ($\Delta AGI_{c,t+\tau}$) and taxable income ($\Delta Taxable\ Income_{c,t+\tau}$) on subsidies, respectively. In both columns, I observe a positive and statistically significant coefficient on $Ln_FODC\ Tax\ Subsidies$ ($p < 0.10$). These results suggest that tax subsidies provided to FODCs

[8] I provide a more detailed description of sample selection from the GJF data in Section 4.

attract foreign investment to the MSA markets where these firms are located, which in turn stimulates the local economy by increasing household income.[9] Overall, the positive spillover effect of FODCs' tax subsidies on the local household income contrasts with the negative shareholder perception documented in Subsection 3.1. The mixed findings add tension to my main research question regarding whether the tax subsidies will produce a negative competitive externality on U.S. domestic firms.

4. Tax subsidies granted to FODCs and U.S. domestic competitors' economic performance

4.1 Research design

To test the hypothesis on the relation between tax subsidies granted to FODCs and U.S. domestic competitors' operating performance, I estimate the following OLS regression that adjusts standard errors for firm-level clustering:

$$\begin{aligned}\Delta Y_{i,t+\tau} = {} & \beta_0 + \beta_1 FODC\ Tax\ Subsidies_{i,t} + \beta_2 Focal\ Firm\ Tax\ Subsidies_{i,t} + \beta_3 MVAL_{i,t} \\ & + \beta_4 MB_{i,t} + \beta_5 Capital - labor\ intensity_{i,t} + \beta_6 PPE_{i,t} + \beta_7 INTAN_{i,t} \\ & + \beta_8 Sales\ Growth_{i,t} + \beta_9 HHI_{i,t} + \beta_{10} Industry\ Sales\ Volatility_{i,t} + \beta_{11} Y_{i,t} \\ & + \sum \beta_{12k} IND_k + \sum \beta_{13t} YEAR_t + \varepsilon_{i,t} \qquad (2)\end{aligned}$$

The subscripts i, t, and k denote firm, year, and industry, respectively. My dependent variable, $\Delta Y_{i,t+\tau}$, is the change in profitability from year t to year t+τ. I define the dependent

[9] In untabulated analyses, I examine whether the cost of living in MSA markets increases subsequent to FODCs' receipt of tax subsidies, because foreign investment may also increase the local demand for basic necessities such as housing, food, and transportation, potentially offsetting the documented increase in MSA income. Specifically, I measure cost of living as the natural log of the MSA median home price and re-estimate Equation (1) with this measure as the dependent variable. I find that the coefficients on $Ln_FODC\ Tax\ Subsidies$ are statistically insignificant, indicating that tax subsidies do not significantly influence local cost of living. Moreover, the confidence intervals of these coefficients are all within three percent of the standard deviation of the dependent variable. Given that Cready, He, Lin, Shao, Wang, and Zhang (2022) deem 10 percent of a standard deviation as economically inconsequential in the context of unrecognized tax benefits, these results suggest that the confidence intervals are sufficiently close to zero and that the association is economically insignificant. Overall, the lack of both statistical and economic significance supports the notion that FODCs' tax subsidies do not influence the cost of living in MSA markets.

variable as the simple average of $Y_{i,t+1}$ and $Y_{i,t+2}$ minus $Y_{i,t}$ to focus on short-term outcomes and minimize potential confounding from events unrelated to tax subsidies. The first-differenced feature of Equation (2) also purges time-invariant firm-specific fixed effects. My first measure of profitability in Equation (2) is the firm's operating profit margin (*Operating Profit*), computed as the ratio of operating income to sales and captures overall operational performance. My second measure of profitability is gross margin, *GM*, which reflects financial performance related to production. I compute *GM* as sales less the cost of goods sold (COGS) divided by sales. My independent variable of interest is $FODC\ Tax\ Subsidies$, which captures the aggregate amount of tax subsidies granted to all rival FODCs within each firm's product market or industry in year t, deflated by lagged total assets. I identify rival FODCs based on firms' pairwise similarity in their business and product market descriptions (Hoberg and Phillips 2016) as well as industry classifications using three-digit NAICS and SIC codes (Kim et al. 2021). Therefore, $FODC\ Tax\ Subsidies$ represents reduced tax burden, and thus lower internal financing costs, of FODCs that potentially translates to competitive actions against their U.S. domestic competitors. A negative (positive) coefficient on $FODC\ Tax\ Subsidies$ – β_1 – suggests that U.S. peer firms' economic performance decreases (increases) after state and local governments provide tax subsidies to rival FODCs. Figure 1 illustrates how I construct the main variable of interest.

In Equation (2), I control for firm-level and industry-level characteristics because the local conditions of the firms or industries may influence state and local governments' decisions to grant tax subsidies to FODCs. For example, these governments may seek to attract foreign investments in sectors or industries in which they perceive an insufficient presence of local firms. Therefore, I include firm-level lagged values of the outcome variable ($Y_{i,t}$) to account for economic forces such as competition or diminishing marginal returns, which could correlate with the trajectory of the

firm's operating performance. I also control for the firm's own tax subsidies in year t ($Focal\ Firm\ Tax\ Subsidies$) to isolate the effect of FODCs' tax subsidies on the firm's profitability. Moreover, I account for local competitors' own investment opportunities and ability to mitigate FODCs' competition using firm size (*MVAL*), market-to-book ratio (*MB*), ratio of capital to labor intensity (*Capital-labor intensity*), property, plant, and equipment (*PPE*), intangible assets (*INTAN*), and sales growth (*Sales Growth*). For industry-level characteristics, I control for industry concentration and sales patterns using the Herfindahl–Hirschman Index (*HHI*) and sales volatility (*Industry Sales Volatility*).[10] Finally, I include industry (two-digit SIC) and year fixed effects to control for heterogeneity across industries and time, respectively.[11] Appendix A provides detailed descriptions of all variables.[12]

4.2 Sample and descriptive statistics

I obtain FODCs' tax subsidy data from the GJF Subsidy Tracker and U.S. firms' financial data from the Compustat fundamentals annual database.[13] Table 3, Panel A describes the sample selection procedures for the final sample in years 2000–2021. I begin my sample period from 2000, the first year in which GJF collects countries of foreign parent companies, and end in 2021, as it was the last fiscal year with observations in the merged data between the GJF and Compustat. From the merged data of 263,004 (28,135) firm-year (firm) observations, I remove firms incorporated outside the U.S. and firms-years with missing variables used in my analyses. Lastly, I remove firm-years without industry classifications or 10-K filings necessary to compute the Text-

[10] I construct industry-related variables at the two-digit SIC level for specifications using TNIC-based peer classifications. I construct them at three-digit NAICS (SIC) level for specifications using NAICS (SIC)-based peers. Similarly, I cluster standard errors by industry-year for models using NAICS- and SIC-based peer classifications.
[11] The results are robust to including industry-by-year fixed effects.
[12] I winsorize all continuous variables used in this subsection at 1st and 99th percentiles.
[13] GJF collects data on subsidies from a variety of sources: state documents, news articles, press releases, and Freedom of Information Act (FOIA) requests.

Based Network Industry Classification (TNIC). The sample criteria result in a NAICS (SIC) [TNIC] sample with 85,863 (84,440) [51,129] firm-year observations.

To shed light on the distribution of state and local tax subsidies granted to FODCs in the U.S. across years, industries, tax subsidy programs, states, and home countries, I decompose the tax subsidies in the sample according to the categories in Appendix C. Several notable observations emerge from the sample decomposition. First, FODCs originate from 40 countries, ranging from long-time economic partners such as the U.K., Canada, and Japan to various tax havens such as Bermuda, Jersey, and Cayman Islands (Dyreng and Lindsey 2009). Second, tax credits and property tax abatements (mean of $1.8 and $1.7 million, respectively) are the most common form of tax subsidies provided to foreign firms in the U.S. Lastly, foreign firms in the manufacturing industries receive the greatest amount of tax subsidies from the state and local governments.

Table 3, Panel B displays descriptive statistics for the variables used in my analysis. $FODC\ Tax\ Subsidies$ has a mean value of 0.344, suggesting that the annual tax subsidies granted to foreign competitors amount to 34.4 percent of the average U.S. firm's total asset value. Its standard deviation of 2.277 indicates a sizable variation in the amount of tax subsidies depending on the U.S. firm. Similarly, the mean value of $Focal\ Firm\ Tax\ Subsidies$ is 0.310, indicating that the average U.S. domestic firm annually receives state and local tax subsidies equivalent to 31.0 percent of their total asset value. By contrast, the median value of both tax subsidy variables is close to zero, suggesting a right-skewed distribution in the sample.[14] *ΔOperating Profit* (*ΔGM*) has a mean value of -0.136 (-0.055) and a median close to zero, which is broadly consistent with Kim et al. (2021).

[14] I test the sensitivity of my results to potential outliers by using natural logarithm of the tax subsidy variables (i.e., 1+$FODC\ Tax\ Subsidies$; 1+$Focal\ Firm\ Tax\ Subsidies$). The results are robust to the alternative measurements.

Panel C presents Pearson correlation coefficients for the variables in Panel B. Although the correlations between $FODC\ Tax\ Subsidies$ and other regressors are statistically significant ($p <$ 0.05), no correlation coefficients exceed -0.22 in absolute value. Moreover, no variance inflation factor (VIF) score in my analysis exceeds 4.00, with the exception of VIF for *HHI*, which is 6.50. Because no VIF is greater than 10, multicollinearity does not appear to be an issue in the data (Belsley, Kuh, and Welsch 1980).

4.3 Results

Table 4 contains the results of the multivariate analysis of the competitive externality from tax subsidies. The odd (even) columns report the results of estimating Equation (2) using the change in average operating profit margin (gross margin) as the dependent variable. I report the results using TNIC, NAICS, and SIC peer classifications from left to right. In all the columns, the coefficient on $FODC\ Tax\ Subsidies$ is significantly negative ($p < 0.10$), which is consistent with the notion that tax subsidies granted to foreign competitors are negatively associated with the firm's future operating performance. These results are also economically meaningful. For instance, the coefficient on $FODC\ Tax\ Subsidies$ in Columns (1) and (2) suggests that a one-standard-deviation increase in tax subsidies is associated with an 8.4 percentage point decrease in operating profit margin and a 2.5 percentage point decrease in gross margin of U.S. firms in the same product market as foreign competitors.

The coefficients of the control variables in Table 4 are consistent with those in prior studies (Kim et al. 2021; Donohoe et al. 2022). Among the firm-level characteristics, I find negative coefficients on *Capital-labor intensity*, *Sales Growth*, *Operating Income*, and *GM*. The negative coefficients suggest that the capital-to-labor ratio, sales growth rate, and current profitability are

negatively associated with future profitability. Conversely, I find a positive coefficient on *MVAL*, suggesting that firm size is positively related to future profitability.

5. Cross-sectional analyses

I perform cross-sectional analyses to understand how tax subsidies to FODCs affect the operating performance of U.S. domestic firms and to mitigate the concern that correlated omitted variables might have contributed to my primary results. Omitted variables are unlikely to vary both systematically with the tax subsidies and predictably across the partitioned samples.

5.1 Financial constraints

My findings thus far indicate that, on average, tax subsidies granted to FODCs adversely affect the future profitability of U.S. domestic competitors. My empirical framework based on competition further suggests that the negative externalities should be concentrated among domestic firms that are financially constrained and thus have limited ability to mitigate heightened competition (Donohoe et al. 2022). I investigate this prediction by estimating Equation (2) on subsamples of constrained and unconstrained U.S. competitors, proxied by (1) the Hadlock and Pierce (HP) index (Hadlock and Pierce 2010) and (2) the Altman (1968) Z-score. I define financially constrained firms as those with above the annual sample median of the HP index (*HP*) or Z-score (*Z-score*).

I tabulate the results of estimating Equation (2) with the financial constraint proxies in Table 5, Panel A, with Columns (1) and (2) using *HP* and *Z-score* as partitioning variables, respectively. In Columns (A) and (B), I regress *ΔOperating Income* and *ΔGM* on $FODC\ Tax\ Subsidies$, respectively. Notably, in Columns (1A) and (1B), I find that the coefficient on $FODC\ Tax\ Subsidies$ is significantly negative only for the financially constrained subset of

firms ($p < 0.05$). Similarly, when I use *Z-score* in Columns (2A) and (2B), $FODC\ Tax\ Subsidies$ has a significantly negative coefficient only for the constrained firms ($p < 0.01$). Furthermore, the difference in the coefficients between constrained and unconstrained subsamples is statistically significant in Columns (1A) and (2B). In total, the significantly negative coefficients on $FODC\ Tax\ Subsidies$ only for the financially constrained group suggests that the reduction in FODCs' tax burden disproportionately affects financially constrained U.S. domestic firms.[15]

5.2 Product market power

Next, I examine whether the negative externalities vary in the degree to which firms can fend off foreign competition. Prior research argues that firms with greater product market power face fewer competitive threats because they have a greater ability to determine the price, quality, and nature of a product in the marketplace (Shepherd 1970; Kubick et al. 2015). Based on the prior studies, U.S. firms with greater product market power should be able to adjust their competitive strategies against the growing competition from FODCs. They could also pass along the negative shocks to customers by increasing prices or to suppliers by bargaining. Accordingly, I predict that the relation between tax subsidies and U.S. firms' profitability is weaker for firms with greater product market power.

To test this prediction, I calculate the price-cost margins for firms (*PCM*), defined as operating profit divided by sales adjusted by the industry average, as a proxy for product market power. Table 5, Panel B presents the results in Column (1). Using the annual sample median of the firms' *PCM*, I find evidence consistent with the prediction that firms with greater product market power mitigate adverse competition from foreign competitors in the U.S. market. Specifically, Columns (1A) and (1B) show a significantly negative coefficient on

[15] Though not shown to conserve space, all the cross-sectional results in Section 5 are consistent when using NAICS and SIC peer classifications.

$FODC\ Tax\ Subsidies$ among firms with lower *PCM* ($p < 0.05$) but not among those with higher *PCM*. Moreover, the coefficients are significantly different from each other in Column (1A) ($p < 0.05$). Overall, the cross-sectional results suggest that U.S. domestic firms with greater product market power adjust their competitive strategies in response to a reduction in foreign competitors' tax burdens, thereby mitigating any negative impacts on their future profitability.

5.3 High-tech industries

I also consider potential positive externalities from tax subsidies granted to FODCs. Prior research documents positive technology spillover effects of FDI on host countries and local stakeholders, including incumbent firms (Keller and Yeaple 2009). Given that place-based tax subsidies granted to foreign MNCs attract FDI to the regions (Hines, Jr. 1996), local firms can benefit from these positive spillover effects. To this end, prior studies note that FDI facilitates a transfer of technology from foreign MNCs to domestic firms, leading to higher productivity and profitability for the domestic firms, especially those in high-technology sectors (Blalock and Gertler 2008; Keller and Yeaple 2009). Specifically, high-tech firms in the U.S often cluster in regions that induce active labor mobility, which in turn promotes FDI spillovers (Bartik 2019b). Taken together, tax subsidies to foreign firms can produce positive spillover effects on the profitability of U.S. domestic firms in high-tech sectors, potentially offsetting the negative competitive externalities. Thus, I expect to find a weaker negative relation between tax subsidies and the profitability among U.S. firms in high-tech sectors.

Table 5, Panel B presents the results in Columns (2) and (3). In Column (2), I use the annual sample median of R&D intensity, defined as the ratio of R&D expenses to sales, to classify firms in high-tech sectors. In Column (3), I follow Francis and Schipper (1999) and define a firm as

high-tech if it falls under one of the high-tech industries.[16] Consistent with the prediction, I find a significantly negative coefficient on $FODC\ Tax\ Subsidies$ among firms in low-tech sectors ($p < 0.01$) but not in high-tech sectors. Importantly, the difference in the coefficients between the low- and high-tech sectors is statistically significant ($p < 0.01$) in Column (2A) and (2B). Taken together, the results suggest that tax subsidies granted to FODCs potentially create positive externalities to U.S. firms in certain industries which, in turn, dampens the negative effect of competition documented in the main analysis.

5.4 Local U.S. domestic firms

Finally, I examine whether the negative competitive externalities vary in a firm's likelihood to receive local welfare benefits from tax subsidies. Because tax subsidies increase the aggregate income of MSA markets hosting FODCs that receive state and local tax subsidies, as documented in Subsection 3.2, U.S. peer firms geographically close to FODCs plausibly benefit from the welfare gain. The presence of both negative and positive externalities from tax subsidies obscures the relationship between tax subsidies and the profitability for U.S. domestic firms near foreign tax subsidy recipients.

I test the locality effect by partitioning the sample into local and non-local firms. I define a local (non-local) firm as one whose headquarter office (HQ) in year t is located within the same state as any (none) of its FODC rivals receiving tax subsidies (*Local_SameState*).[17] Additionally, recognizing that U.S. domestic firms may operate beyond their HQ states, I define a local firm based on comprehensive establishment-level data from Data Axle's Historical Business Data.[18] Specifically, I measure firms' sales activities across states to capture their local exposure. For each

[16] Francis and Schipper (1999) characterize the following as high-tech industries: three-digit SIC codes of 283, 357, 360-368, 481, 737, and 873.
[17] I identify firms' primary headquarter locations using the Loughran and McDonald (2016) historic headquarters.
[18] I use Historical Business Data from years 2000–2018 because of data provider restriction.

firm, I calculate the percentage of sales generated in each state relative to total firm sales, and then compute the total share of sales occurring in states that host foreign competitors receiving tax subsidies (*Local_SalesExp*). I define firms with above (below) the sample median local sales exposure as local (non-local) firms.[19] Table 5, Panel C presents the results in Columns (1) and (2). I find a negative and significant coefficient on $FODC\ Tax\ Subsidies$ in the specifications using non-local firms ($p < 0.01$), consistent with the negative competitive externalities found in the main analysis. In stark contrast, the coefficient becomes positive for local U.S. firms and even statistically significant in Columns (1A), (2A), and (2B) ($p < 0.10$). The difference in the coefficients between local and non-local firms is statistically significant in all the columns ($p < 0.10$). Taken together, the results suggest that U.S. firms in the same state as foreign tax subsidy recipients experience increased profitability, likely driven by greater local household consumption, which may help offset the negative competitive externalities of the state and local tax subsidies granted to foreign competitors.

6. Supplementary analyses and robustness tests

6.1 U.S. domestic firms' response: Investments and productivity

If state and local tax subsidies reduce FODCs' tax burden and adversely affect the competitive environment of U.S. domestic firms, then I expect the U.S. firms will respond. The response is ex ante unclear. On the one hand, domestic firms can invest in R&D, undertake capital expenditures, or acquire other firms to differentiate their products and mitigate the rising competition (Peterson and Tran 2018). In addition, if the spending on R&D or capital expenditures

[19] Suppose U.S. Firm A generates 40 percent of its total revenue in California and 25 percent in Florida every year. If Firm A's foreign product market competitor receives tax subsidies in CA in Year 1, then its *Local_SalesExp* is equal to 40 percent. If, in Year 2, its foreign competitors receive tax subsidies in both CA and FL, then its *Local_SalesExp* is equal to 65 percent.

leads to a more efficient production process, then domestic firms will improve their productivity (Kim et al. 2022). On the other hand, U.S. firms may accommodate foreign competitors' expansion in the local market by reducing costs. Relatedly, prior research shows that product market competition leads to lower investments in R&D and that U.S. firms reduce capital expenditures in response to tariff cuts and Chinese import penetration (Dasgupta and Stiglitz 1980; Fresard and Valta 2016; Hombert and Matray 2018). Given the two opposing predictions, I investigate whether U.S. firms respond to the rising competition by using firm-level capital expenditures (*ΔCAPX*), R&D expenses (*ΔR&D*), acquisition expenditures (*ΔAQC*), and total factor productivity (*ΔTFP*) as outcome variables in Table 6. Specifically, I construct *ΔCAPX, ΔR&D*, and *ΔAQC* using Compustat while following Imrohoroglu and Tuzel (2014) to construct *ΔTFP*.

The regression results in Table 6 show that $FODC\ Tax\ Subsidies$ has a significantly negative coefficient in Columns (1) and (3) when I use *ΔCAPX* and *ΔAQC* as dependent variables ($p < 0.05$). However, it is statistically insignificant when I use *ΔR&D* and *ΔTFP* in Columns (2) and (4). Overall, I interpret the results as providing some evidence that U.S. domestic firms reduce certain aspects of their operations—namely, capital expenditures and acquisition expenditures—in response to competitive pressures arising from the tax subsidies granted to FODCs.

6.2 Sensitivity to unobservable factors

Despite the robustness of my results to alterative peer classifications and fixed effects, an unobservable variable potentially invalidates the observed significant coefficient if it is correlated with both the dependent and independent variables. To mitigate the potential concern for the correlated omitted variable, I use the Oster (2019) framework to conduct a coefficient stability analysis. This method allows for the possibility of omitted variable bias arising from one or more

unobserved confounders and quantifies the degree of bias necessary to fully attenuate the observed relationship.

I implement the Oster (2019) sensitivity analyses to assess the robustness of the regression results reported in Table 4 (untabulated). I find that unobservable factors would need to be between 2.21 and 6.57 times larger than the observable control variables and fixed effects to render my results statistically insignificant. Overall, the results provide further evidence that potential unobservable factors correlated with both tax subsidies for FODCs and U.S. firms' profitability are unlikely to drive my results.

7. Conclusion

I examine the association between state and local tax subsidies granted to foreign-owned domestic corporations (FODCs) in the U.S. and their U.S. competitors' operating performance. While place-based tax subsidies represent one of the fastest-growing tax incentives in the U.S. to draw FDI from abroad (Bartik 2019b), the net economic effect of these tax subsidies is still uncertain (Slattery and Zidar 2020). In this study, I add more context around the mixed evidence by exploring competitive implications of tax subsidies granted to FODCs. Specifically, I find evidence suggesting that tax subsidies reduce FODCs' tax burden, allowing them to undertake competitive actions against U.S. firms in the same product markets and hurting domestic competitors' profitability. These findings add to the literature on the negative influence of tax subsidies intended to draw FDI, highlighting the unintended consequences of a place-based tax policy.

In the cross-sectional analyses, I find that the negative externalities from tax subsidies granted to FODCs are more pronounced among financially constrained firms. By contrast, the

negative externalities are weaker for firms with greater product market power, within high-tech sectors, or that operate in the same state as foreign tax subsidy recipients. Moreover, consistent with competitive pressures on U.S. firms to reduce costs, I find that U.S. domestic firms decrease their capital and acquisition expenditures after the foreign competitors in the U.S. receive state and local tax subsidies.

By documenting these findings, my study contributes to the literature on tax-driven competition (e.g., Bird et al. 2018; Kim et al. 2021; Donohoe et al. 2022). Specifically, I advance the literature examining various ways taxes drive competition among peer firms by illustrating tax subsidies as one channel through which foreign firms impair U.S. firms' profitability. My findings also highlight a hidden cost of a place-based tax policy that policymakers and academics must consider in future analyses of tax subsidies. That is, to conduct a more complete economic analysis of a place-based tax policy, one must account for the negative competitive externalities associated with tax subsidies granted to foreign multinational corporations.

References

Aitken, B. J., and A. E. Harrison. 1999. Do domestic firms benefit from direct foreign investment? Evidence from Venezuela. *American Economic Review* 89 (3): 605–618**.**

Altman, E. 1968. Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *Journal of Finance* 23 (4): 589–609.

Amy, J., and R. Bynum. 2023. Higher investment means Hyundai could get $2.1 billion in aid to make electric cars in Georgia. *Associated Press*. Available at: https://apnews.com/article/hyundai-georgia-electric-vehicles-incentives-tax-breaks-b071c820f55a7946912af11acf2eea63 (last accessed May 20, 2025).

Avi-Yonah, R. S. 2012. Tax competition and the trend toward territoriality (University of Michigan Public Law Research Paper 297).

Bartik, T. 2019a. Costs and benefits of a revised Foxconn project. Kalamazoo: *W. E. Upjohn Institute*.

Bartik, T. 2019b. Making sense of incentives: Taming business incentives to promote prosperity. Kalamazoo: *W. E. Upjohn Institute*.

Belsley, D., E. Kuh, and R. Welsch. 1980. *Regression diagnostics: Identifying influential data and sources of collinearity*. New York, NY: John Wiley & Sons.

Bird, A., A. Edwards, and T. G. Ruchti. 2018. Taxes and peer effects. *The Accounting Review* 93 (5): 97–117.

Blalock, G., and P. Gertler. 2008. Welfare gains from foreign direct investment through technology transfer to local suppliers. *Journal of International Economics* 74 (2): 402–421.

Brown, S. V., and J. W. Tucker. 2011. Large-sample evidence on firms' year-over-year MD&A modifications. *Journal of Accounting Research* 49: 309–346.

Busso, M., J. Gregory, and P. Kline. 2013. Assessing the incidence and efficiency of a prominent place based policy. *American Economic Review* 103 (2): 897–947.

Carhart, M. 1997. On persistence in mutual fund performance. *Journal of Finance* 52 (1): 57–82.

Carr, A. 2019. Inside Wisconsin's disastrous $4.5 billion deal with Foxconn. *Bloomberg Businessweek*. Available at: https://www.bloomberg.com/news/features/2019-02-06/inside-wisconsin-s-disastrous-4-5-billion-deal-with-foxconn (last accessed May 20, 2025).

Carr, A. 2020. What is going on with Foxconn. *Bloomberg Businessweek*. Available at: https://www.bloomberg.com/news/newsletters/2020-10-26/what-s-going-on-with-foxconn (last accessed May 20, 2025).

Caves, R. 1974. Multinational firms, competition, and productivity in host-country markets. *Economica* 41: 176–193.

Chi, J., and X. Su. 2016. Product market threats and the value of corporate cash holdings. *Financial Management* 45: 705–735.

Chirinko, R., and D. Wilson. 2008. State investment tax incentives: A zero-sum game? *Journal of Public Economics* 92: 2362–2384.

Corasaniti, N, and M. Haag. 2019. The tax break was $260 million. Benefit to the state was tiny: $155,520. *New York Times*. Available at: https://www.nytimes.com/2019/05/01/nyregion/nj-tax-break-kevin-sheehan.html (last accessed May 20, 2025).

Cready, W. M., J. He, W. Lin, C. Shao, D. Wang, and Y. Zhang. 2022. Is there a confidence interval for that? A critical examination of null outcome reporting in accounting research. *Behavioral Research in Accounting* 34 (1): 43–72.

Das, S. 1987. Externalities and technology transfer through multinational corporations: A theoretical analysis. *Journal of International Economics* 22: 171–182.

Dasgupta, P., and J. Stiglitz. 1980. Industrial structure and the nature of innovative activity. *Economic Journal* 90 (358): 266–293.

Department of Commerce. 2024. Foreign direct investment in the United States. Available at: https://www.commerce.gov/data-and-reports/reports/2024/10/foreign-direct-investment-united-states (last accessed May 20, 2025).

Devereux, M. P., B. Lockwood, and M. Redoano. 2008. Do countries compete over corporate tax rates? *Journal of Public Economics* 92 (5-6): 1210–1235.

Devereux, M. P., and S. Loretz. 2013. What do we know about corporate tax competition? *National Tax Journal* 66 (3): 745–773.

De Simone, L., R. Lester, and A. Raghunandan. 2025. Tax subsidy disclosure and local economic effects. *Journal of Accounting Research* 63 (2): 547–598.

Djankov, S., T. Ganser, C. McLiesh, R. Ramalho, and A. Shleifer. 2010. The effect of corporate taxes on investment and entrepreneurship. *American Economic Journal Macroeconomics* 2: 31–64.

Drake, M., R. Hess, J. Wilde, and B. Williams. 2022. The relevance of non-income tax relief. *Contemporary Accounting Research* 39: 1797–1833.

Dong, Q., A. Raghunandan, and S. Rajgopal. 2024. When do firms deliver on the jobs they promise in return for state aid? *Review of Accounting Studies* 29: 3633–3678.

Donohoe, M. P., H. Jang, and P. Lisowsky. 2022. Competitive externalities of tax cuts. *Journal of Accounting Research* 60 (1): 201–259.

Dyreng, S. D. and J. L. Hoopes. 2024, September 3. Utah State tax policy: A chat with Senator Daniel McCay. *Tax Chats*. Podcast. Available at: https://taxchats.buzzsprout.com/1878989/episodes/15670835-utah-state-tax-policy-a-chat-with-senator-daniel-mccay (last accessed May 20, 2025).

Dyreng, S. D., and B. P. Lindsey. 2009. Using financial accounting data to examine the effect of foreign operations located in tax havens and other countries on U.S. multinational firms' tax rates. *Journal of Accounting Research* 47 (5): 1283–1316.

Dyreng, S. D., and K. S. Markle. 2016. The effect of financial constraints on income shifting by U.S. multinationals. *The Accounting Review* 91 (6): 1601–1627.

Fama, E., and K. French. 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33 (1): 3–56.

Francis, J., and K. Schipper. 1999. Have financial statements lost their relevance? *Journal of Accounting Research* 37 (2): 319–352.

Fresard, L. 2010. Financial strength and product market behavior: The real effects of corporate cash holdings. *The Journal of Finance* 65: 1097–1122.

Fresard, L., and P. Valta. 2016. How does corporate investment respond to increased entry threat? *Review of Corporate Finance Studies* 5 (1): 1–35.

Giroud, X., and J. Rauh. 2019. State taxation and the reallocation of business activity: Evidence from establishment-level data. *Journal of Political Economy* 127 (3): 1262–1316.

Glaeser, E. L. 2001. The economics of location-based tax incentives. Harvard Institute of Economic Research Working Paper No. 1932, Harvard Institute of Economic Research.

Greenstone, M., R. Horneck, and E. Moretti. 2010. Identifying agglomeration spillovers: Evidence from Million Dollar Plants. *Journal of Political Economy* 188: 536–598.

Greenstone, M., and E. Moretti. 2004. Bidding for industrial plants: Does willing a 'Million Dollar Plant' increase welfare? NBER Working Paper No. 9844, Cambridge, MA: National Bureau of Economic Research.

Hadlock, C. J., and J. R. Pierce. 2010. New evidence on measuring financial constraints: Moving beyond the KZ Index. *The Review of Financial Studies* 23: 1909–1940.

Haskel, J. E., S. C. Pereira, and M. J. Slaughter. 2007. Does inward foreign direct investment boost the productivity of domestic firms? *The Review of Economics and Statistics* 89 (3): 482–496.

Hines, Jr., J. R. 1996. Altered states: Taxes and the location of foreign direct investment in America. *American Economic Review* 86 (5): 1076–1094.

Hoberg, G., and G. Phillips. 2016. Text-based network industries and endogenous product differentiation. *Journal of Political Economy* 124: 1423–1465.

Hombert, J., and A. Matray. 2018. Can innovation help U.S. manufacturing firms escape import competition from China? *Journal of Finance* 73 (5): 2003–2039.

Huang, Y. 2022. Government subsidies and corporate disclosure. *Journal of Accounting and Economics* 74: 101480.

Imrohoroglu, A., and S. Tuzel. 2014. Firm-level productivity, risk, and return. *Management Science* 60 (8): 2073–2090.

Javorcik, B. S. 2004. Does foreign direct investment increase the productivity of domestic firms? In search of spillovers through backward linkages. *American Economic Review* 94 (3): 605–627.

Javorcik, B. S. 2015. Does FDI bring good jobs to host countries? *World Bank Research Observer* 30 (1): 74–94.

Keller, W. 2021. Knowledge spillovers, trade, and FDI. NBER Working Paper No. 28739, Cambridge, MA: National Bureau of Economic Research.

Keller, W., and S. R. Yeaple. 2009. Multinational enterprises, international trade, and productivity growth: Firm-level evidence from the United States. *Review of Economics and Statistics* 91 (4): 821–831.

Kim, J., M. Nessa, and R. Wilson. 2021. How do reductions in foreign country corporate tax rates affect U.S. domestic manufacturing firms? *The Accounting Review* 96 (3): 287–311.

Kubick, T. R., D. P. Lynch, M. A. Mayberry, and T. C. Omer. 2015. Product market power and tax avoidance: Market leaders, mimicking strategies, and stock returns. *The Accounting Review* 90 (2): 675–702.

Loughran, T., and B. McDonald. 2016. Textual analysis in accounting and finance: A survey. *Journal of Accounting Research* 54 (4): 1187–1230.

Lu, Y., Z. Tao, and L. Zhu. 2017. Identifying FDI spillovers. *Journal of International Economics* 107: 75–90.

Manova, K. 2013. Credit constraints, heterogeneous firms, and international trade. *The Review of Economic Studies*, 80 (2): 711–744.

Mansfield, E., and A. Romeo. 1980. Technology transfer to overseas subsidiaries by U.S.-based firms. *Quarterly Journal of Economics* 95 (4): 737–750.

Markell, J. 2017. Let's stop government giveaways to corporations. *New York Times*. Available at: https://www.nytimes.com/2017/09/21/opinion/incentives-businesses-corporations-giveaways.html (last accessed May 20, 2025)..

Markusen, J., and A. Venables. 1999. Foreign direct investment as a catalyst for industrial development. *European Economic Review* 43: 335–356.

Marshall, A. 1920. *Principles of Economics*. 8th edition. London: Macmillan.

Mitchell, M. D., M. Farren, J. Horpedahl, and O. Gonzalez. 2020. The economics of a targeted economic development subsidy. Mercatus Center at George Mason University.
Moretti, E., and D. J. Wilson. 2014. State incentives for innovation, star scientists and jobs: Evidence from biotech. *Journal of Urban Economics* 79: 20–38.
Mukherjee, A., M. Singh, and A. Žaldokas. 2017. Do corporate taxes hinder innovation? *Journal of Financial Economics* 124 (1): 195–221.
Oster, E. 2019. Unobservable selection and coefficient stability: Theory and evidence. *Journal of Business & Economic Statistics* 37 (2): 187–204.
Peress, J. 2010. Product market competition, insider trading, and stock market efficiency. *Journal of Finance* 65 (1): 1–43.
Raghunandan, A. 2024. Government subsidies and corporate misconduct. *Journal of Accounting Research* 62: 1449–1496.
Rodriguez-Clare, A. 1996. Multinationals, linkages, and economic development. *American Economic Review* 86 (4): 852–873.
Scholes, M., and M. Wolfson. 1992. *Taxes and Business Strategy: A Planning Approach*. 1st edition. Upper Saddle River, NJ: Prentice Hall.
Setzler, B., and F. Tintelnot. 2021. The effects of foreign multinationals on workers and firms in the United States. *The Quarterly Journal of Economics* 136 (3): 1943–1991.
Shepherd, W. 1970. *Market Power and Economic Welfare: An Introduction*. New York, NY: Random House.
Slattery, C. 2024a. Bidding for firms: Subsidy competition in the U.S. Working paper, University of California, Berkeley.
Slattery, C. 2024b. The political economy of subsidy giving. Working paper, University of California, Berkeley.
Slattery, C., and O. Zidar. 2020. Evaluating state and local business incentives. *Journal of Economic Perspectives* 34: 90–118.
Song, J., P. Almeida, and G. Wu. 2003. Learning-by-hiring: When is mobility more likely to facilitate interfirm knowledge transfer? *Management Science* 49: 351–365.
Weisbach, D. 2002. Ten truths about tax shelters. *Tax Law Review* 55: 215–254.

Appendix A: Variable definitions

Dependent Variables

$\Delta AGI_{(t+1,t+2)}$	Average adjusted gross income (AGI) of the MSA market in years t+1 and t+2 minus AGI in year t.
$\Delta AQC_{(t+1,t+2)}$	Average acquisition expenditures in years t+1 and t+2 minus acquisition expenditures in year t. Acquisition expenditures (AQC) = acquisition expenditures [AQC]/average total assets [AT].
$\Delta CAPX_{(t+1,t+2)}$	Average capital expenditures in years t+1 and t+2 minus capital expenditures in year t. Capital expenditures (CAPX) = capital expenditures [CAPX]/average total assets [AT].
CAR	The average cumulative abnormal return (CAR) computed over a three-day window centered on each tax subsidy announcement date. Abnormal returns are defined as the difference between the actual return and an estimated return using the four-factor model (Fama and French 1993; Carhart 1997) from one year to two days prior to each announcement. Stock return data retrieved from CRSP.
$\Delta GM_{(t+1,t+2)}$	Average gross margin in years t+1 and t+2 minus gross margin in year t. Gross margin (GM) = (sales [SALE] - cost of goods sold [COGS])/sales [SALE]).
$\Delta Operating\ Income_{(t+1,t+2)}$	Average operating profit margin in years t+1 and t+2 minus operating profit margin in year t. Operating profit margin = operating income before depreciation [OIBDP])/sales [SALE]).
$\Delta R\&D_{(t+1,t+2)}$	Average research and development (R&D) expenditures in years t+1 and t+2 minus R&D in year t. Research and development expenditures (R&D) = R&D [XRD]/sales [SALE]. R&D = 0 if missing in Compustat.
$\Delta TaxableInc_{(t+1,t+2)}$	Average taxable income of the MSA market in years t+1 and t+2 minus taxable income in year t.
$\Delta TFP_{(t+1,t+2)}$	Average total factor productivity (TFP) in years t+1 and t+2 minus TFP in year t. See Imrohoroglu and Tuzel (2014) for a detailed description of the estimation of TFP.

Variables of Interest

FODC Tax Subsidies	The aggregate amount of tax subsidies granted to all rival foreign-owned domestic corporations (FODC) within in each firm's product market or industry at year t, scaled by total assets in year t-1.
Ln_FODC Tax Subsidies	The log of the aggregate amount of tax subsidies granted to all FODC in the MSA market in year t.

Interaction Variables

HighTech_SIC	High-tech sectors based on SIC codes following Francis and Schipper (1999). Equal to 1 if the firm falls under three-digit SIC codes of 283, 357, 360-368, 481, 737, and 873, and 0 otherwise.
HP	The Hadlock and Pierce (HP) index that is equal to –0.737*(*SIZE*) plus 0.043*(*SIZE*)^2 minus 0.040*(*AGE*), where *SIZE* equals the log of total assets (AT) and *AGE* is the number of years the firm is present in my sample. Following Hadlock and Pierce (2010), *SIZE* is capped at the log of $4.5 billion, and *AGE* is capped at 37 years.
Local_SalesExp	The local sales exposure that is equal to the total share of sales in year t occurring in states that host the firm's foreign product market competitors that receive tax subsidies.
Local_SameState	An indicator for the local U.S. domestic firm that is equal to 1 if the firm's HQ office in year t is located in the same state as any of its foreign product market peers receiving tax subsidies, and 0 otherwise.
PCM	The excess price-cost margin for each firm every year that is equal to the operating profit (SALE - COGS - XSGA) divided by sales (SALE) of each firm minus the value-weighted (based on sales) industry average (based on two-digit SIC). If COGS or XSGA are missing, then I define operating profit as operating income after depreciation (OIADP).
R&D_HighTech	R&D intensity to determine high-tech sectors. R&D intensity is defined as R&D expenditures (XRD) divided by sales (SALE). R&D = 0 if missing in Compustat.
S&P cred	S&P domestic long-term issuer credit rating equal to 1 if Standard & Poor's (S&P) domestic long-term issuer credit rating (SPLTICRM) exists, and 0 otherwise.
Z-score	The Altman (1968) Z-score that is equal to –1.0*[3.3*(pretax income (PI) divided by total assets (AT)) plus (sales (SALE) divided by total assets (AT)) plus 1.4*(retained earnings (RE) divided by total assets (AT)) plus 1.2*((current assets (ACT) minus current liabilities (LCT)) divided by total assets (AT)) plus 0.6*(closing price (PRCC_F) multiplied by common shares outstanding (CSHO) divided by total liabilities (LT))].

Control Variables

Capital-labor intensity	The ratio of total invested capital (ICAPT) to the number of employees ([EMP] * 1000).
Focal Firm Tax Subsidies	The aggregate amount of tax subsidies granted to the firm in year t, scaled by total assets in year t-1.
HHI	The Herfindahl-Hirschman Index calculated at the two-digit SIC level.
Industry Sales Volatility	The volatility of sales over years t-4 to year t at the two-digit SIC level.
INTAN	Intangible assets (INTANG) in year t, scaled by total assets (AT) in year t–1. If INTANG is missing, then I set it equal to 0.

Ln_Non-FODC Tax Subsidies	The log of the aggregate amount of tax subsidies granted to all domestic firms in the MSA market in year t.
Ln_Other Subsidies	The log of the aggregate amount of non-tax subsidies granted to all firms in the MSA market in year t.
MB	The ratio of market value of equity to the book value of equity [PRCC_F * CSHO]/[CEQ].
MVAL	Market capitalization, computed as the natural logarithm of [PRCC_F * CSHO].
PPE	Property, plant, and equipment [PPENT] deflated by total assets [AT].
Sales Growth	Sales growth from year t-1 to t, calculated as (sales [SALE] in year t - sales in year t-1)/sales in year t-1.

Appendix B.1: Summary of textual analysis procedures to generate Text-based Network Industry Classifications (TNIC) for foreign-owned domestic corporations

In this appendix, I discuss the textual analysis procedures used to collect business/product descriptions of foreign-owned domestic corporations (FODCs) and calculate firms' pairwise cosine similarity to identify U.S. domestic product market peers (Hoberg and Phillips 2016).

First, I collect a complete list of unique tax subsidy recipients with a foreign (i.e., non-U.S.) parent company from the Good Jobs First Subsidy Tracker. I obtain 737 unique parent company observations in the sample period of 2000–2021. I then identify the year in which each parent company has the highest volume of state and local data records to manually retrieve the corresponding year's product descriptions from one of the following sources in the listed order of priority: (a) Form 10-K, (b) Form 20-F, (c) Form 40-F, and (d) company annual reports stored in S&P Capital IQ or company websites. I apply the firm's product descriptions to every year the foreign firm receives a tax subsidy in my sample.

Next, I obtain a list of Form 10-K filings by U.S. domestic firms for the sample period from WRDS SEC Analytics Suite. I use the Electronic Data Gathering, Analysis, and Retrieval (EDGAR) links to Form 10-K to scrape Item 1 that contains business/product descriptions of the U.S. firms. The scraping results in a sample of 51,129 firm-year observations with 10-K filings.

To prepare the data for calculating the pairwise similarity scores, I parse the product descriptions of both foreign and domestic firms to exclude common words and words that are neither nouns nor proper nouns. Specifically, I restrict the analysis to nouns and proper nouns that appear in no more than 25 percent of all product descriptions to avoid common words. I define proper nouns as words that appear with the first letter capitalized at least 90 percent of the time in my sample of product descriptions. I also omit geographical terms, including country names as well as U.S. state and city names. Lastly, I remove stop words and stem the final output.

Finally, I capture the relatedness of products between firms by calculating the cosine similarity of a set of unique words that firms use to describe their products. Cosine similarity, often used to measure document similarity in text analysis, quantifies how similar two vectors are by measuring the cosine of the angle between them and indicates whether they point in approximately the same direction within an inner product space (Brown and Tucker 2011; Hoberg and Phillips 2016). I calculate the cosine similarity of the word vectors of each firm and form a matrix of pairwise similarity scores between foreign and domestic firms in my sample in year t.[20] Then, I classify the most similar peers of a U.S. firm as foreign firms in the top 2.5 percent of the scores.[21] Appendix B.2 provides examples of product market peers identified using these procedures.

[20] I use *cosine_similarity* programming language available in *sklearn.metrics.pairwise* Python library to calculate the cosine similarity scores.

[21] Because I have 737 unique foreign-owned firms in my sample, there are 19 (=737*0.025) or fewer foreign rivals for each firm-year. For reference, Hoberg and Phillips' (2016) baseline TNIC-3 data has a total of 4,157 firms in 2020 with a mean of 168 competitors for each firm in the sample.

Appendix B.2: Examples of product market peers

U.S. Firms	Product Descriptions (Form 10-K Item 1)	SIC	Foreign Product Market Peers	Source	Foreign Peer Product Descriptions
Whirlpool Corporation	FYE 2020: Our principal products are **laundry appliances** (including commercial **laundry appliances**), **refrigerators** and **freezers**, **cooking appliances**, **dishwashers**, mixers and other small **domestic appliances**.	3630	Samsung	Annual report	Its product lineup includes **refrigerators**, air conditioners, **washers**, **ovens**, vacuum cleaners and other **appliances**.
			Panasonic	Form 20-F	In home appliances, leveraging the latest environmental technologies, Panasonic delivers products and services that meet customer needs in the homemaking, **cooking**, beauty & grooming and health, **cooling** and heating, hot water supply, and cold chain equipment fields. Overseas, Panasonic marketed high value-added products including air conditioners, **refrigerators**, and **washing machines** equipped with the ECO NAVI function focusing mainly on Asia and South America.
			LG	Annual report	The company offers **refrigerators**, **washing machines**, **vacuum cleaners**, air conditioners, air and water purifiers, microwave ovens, **dish washers**, and stylers. It also provides digital, OLED, and LED signages, as well as commercial TV's for corporate, education, hospitality and healthcare, luxury home, retail and QSR, and transportation industries; audio products; HVAC products; commercial, residential, and industrial ESS products; commercial laundry products, including washer and dryer; compressor and motors; and robot products.

Advanced Micro Devices	FYE 2021: We are a global **semiconductor** company primarily offering: x86 **microprocessors** (CPUs), as standalone devices or as incorporated into accelerated **processing** units (APUs), chipsets, discrete and **integrated graphics processing** units (GPUs), data center and professional GPUs, and development services; and server and embedded processors, semi-custom **system-on-chip** (SoC) products, development services and technology for game consoles. Semiconductors are **components used in a variety of electronic products and systems**. An **integrated circuit** (IC) is a semiconductor device that consists of many interconnected transistors on a single chip.	3674	Taiwan Semiconductor Manufacturing Company	Annual report	TSMC offers 3DFabricTM, a comprehensive family of 3D silicon stacking and advanced packaging technologies to complement its **process technology** offerings. 3DFabricTM provides customers greater **chip** design flexibility to unleash innovation and is another differentiating competitive advantage for the Company. Taiwan Semiconductor Manufacturing Company Limited (TSMC) engages mainly in the manufacturing, sales, packaging, testing and computer-aided design of **integrated circuits** and other **semiconductor** devices and the manufacturing of masks. As a foundry, the company manufactures **semiconductors** using its manufacturing processes for its customers based on proprietary integrated circuit designs provided by them.
			NXP Semiconductors	10-K	We offer customers a broad portfolio of **semiconductor** products including **microcontrollers**, application **processors**, communication **processors**, connectivity **chipsets**, analog and interface devices, RF power amplifiers, 6 security controllers and sensors.
			Foxconn Technology	Annual report	Foxconn Technology Co., Ltd. manufactures, processes, and sells cases, heat dissipation modules, and consumer electronics products. It offers 3C product and alloy material. The company also engages in the research, development, manufacture, and sale of computer thermal modules, **computer components**, and aluminum magnesium cases; and manufacture and marketing of computer cases, new alloy materials, precision molds, **electronic components**, and portable **computers and its components**. In addition, it produces and sells aluminum alloy materials, rail vehicle components, car accessories and **electronic components**, structured metal products, metal containers, automobile parts, power plugs, wall sockets, and micro ribbon connectors, as well as aluminum alloy parts for automobiles and electronics.

Appendix C: Distribution of U.S. state and local tax subsidies granted to FODCs across years, industries, programs, states, and home countries

Year	N	Total amount ($M)	Mean amount ($M)
2000	161	55	0.34
2001	186	112	0.60
2002	171	85	0.50
2003	261	103	0.40
2004	337	144	0.43
2005	398	252	0.63
2006	365	316	0.87
2007	567	605	1.07
2008	768	554	0.72
2009	745	1,033	1.39
2010	1,083	2,742	2.53
2011	1,127	2,465	2.19
2012	1,029	1,002	0.97
2013	1,145	1,748	1.53
2014	1,043	1,077	1.03
2015	913	1,422	1.56
2016	1,068	2,537	2.38
2017	817	4,022	4.92
2018	763	1,004	1.32
2019	670	768	1.15
2020	599	1,010	1.69
2021	659	1,062	1.61

Fama French 12 Industries	N	Total amount ($M)	Mean amount ($M)
Consumer Non-Durables	1,172	775	0.66
Consumer Durables	1,029	338	0.33
Manufacturing	7,049	14,956	2.12
Energy	0	0	0
Chemicals	553	512	0.93
Business Equipment	887	1,909	2.15
Telecommunications	224	3,072	13.71
Shops/Retail/Wholesale	344	562	1.63
Healthcare	1,173	1,338	1.14
Finance	2,274	1,881	0.83
Utilities	23	23	1.02
Other	665	799	1.20

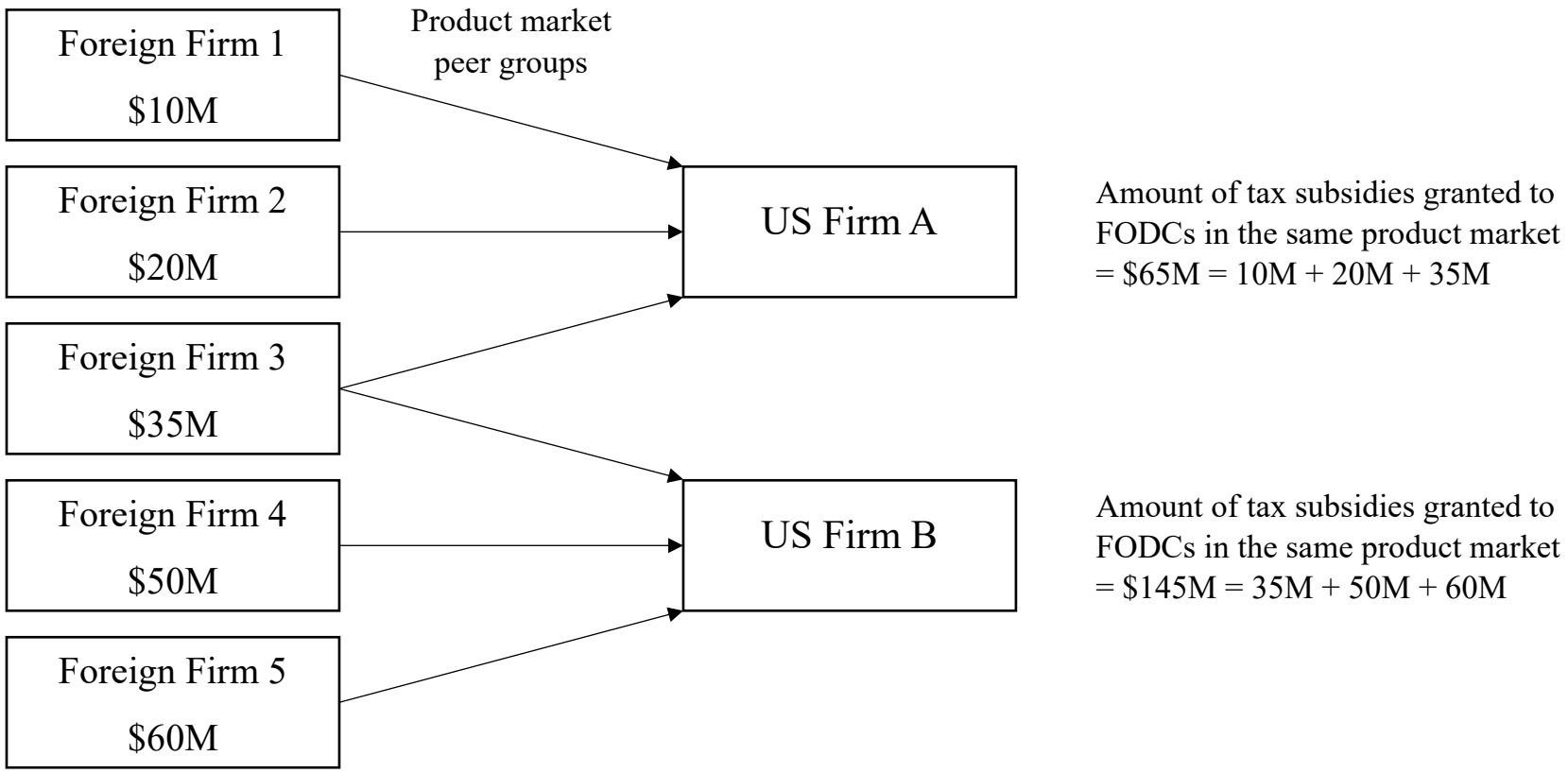
Programs	N	Total amount ($M)	Mean amount ($M)
Enterprise Zone	1,437	1,261	0.88
Property tax abatement	5,790	9,699	1.68
Tax credit	7,941	14,004	1.76
Tax increment financing	133	111	0.84

Appendix C (continued)

States	N	Total amount ($M)	Mean amount ($M)
AK	10	108	10.76
AL	11	0	0.02
AR	91	141	1.55
AZ	121	63	0.52
CA	81	112	1.38
CO	454	61	0.13
CT	38	298	7.84
DC	24	10	0.42
FL	135	151	1.12
IA	100	174	1.74
ID	2	6	3.10
IL	336	200	0.59
IN	480	503	1.05
KS	49	0	0.00
KY	462	1,412	3.06
LA	1,221	6,731	5.51
MA	105	112	1.07
MD	277	50	0.18
ME	586	128	0.22
MI	909	4,020	4.42
MN	27	49	1.81
MO	109	88	0.81
MS	12	2	0.20
NC	1,550	486	0.31
NE	158	62	0.39
NJ	55	1,368	24.87
NM	39	12	0.31
NV	74	79	1.06
NY	2,124	2,256	1.06
OH	224	267	1.19
OK	516	153	0.30
OR	245	135	0.55
PA	381	130	0.34
RI	21	16	0.75
SC	151	1	0.01
TN	1,856	300	0.16
TX	618	2,149	3.48
UT	18	39	2.18
VA	124	10	0.08
VT	4	6	1.46
WA	1,128	177	0.16
WI	69	3,012	43.66

Countries	N	Total amount ($M)	Mean amount ($M)
Australia	267	292	1.09
Austria	61	9	0.15
Belgium	249	88	0.35
Bermuda	64	81	1.26
Brazil	130	43	0.33
British Virgin Islands	8	2	0.22
Canada	1,573	1,743	1.11
Cayman Islands	3	1	0.35
Chile	8	3	0.38
China	251	778	3.10
Denmark	116	117	1.01
Finland	120	38	0.32
France	1,377	705	0.51
Germany	2,147	3,608	1.68
Hong Kong	8	25	3.13
India	176	251	1.42
Ireland	933	509	0.55
Israel	65	87	1.33
Italy	203	277	1.36
Japan	2,472	2,915	1.18
Jersey	1	13	12.50
Luxembourg	181	120	0.66
Mexico	133	185	1.39
Netherlands	645	2,271	3.52
New Zealand	161	31	0.19
Norway	73	173	2.37
Portugal	3	11	3.74
Russia	8	11	1.37
Saudi Arabia	43	433	10.07
Singapore	38	9	0.24
South Africa	88	2,581	29.33
South Korea	205	1,210	5.90
Spain	248	300	1.21
Sweden	412	335	0.81
Switzerland	755	661	0.88
Taiwan	144	3,169	22.00
Thailand	18	57	3.19
United Arab Emirates	51	939	18.40
United Kingdom	1,891	2,056	1.09
Venezuela	53	30	0.57

Figure 1: Tax subsidy variable construction



Notes: This figure illustrates the concept of the U.S. firm-centric product market space and identification of foreign peers, which underpins my empirical design of this study. I proxy for the extent to which FODCs reduce their tax burdens by using state and local tax subsidies granted to the foreign firms. I then examine how these tax subsidies influence the operating performance of U.S. domestic peer firms. In the figure, FODCs with tax subsidies are in the same product market peer groups as U.S. firms. Depending on their peer classifications, U.S. firms have different amounts of tax subsidies granted to their foreign competitors.

Table 1: Cumulative abnormal returns around the announcement dates of tax subsidies granted to FODCs

									(1) Peer Firms		(2) Non-peer Firms		(3) Difference	
Foreign-owned Firm Name	Parent Company Country	Tax Subsidy Program	Tax Subsidy Type	State	County	Amount ($K)	Year	Announcement Date	N	CAR	N	CAR	CAR	t-stat
Toyota Motor Manufacturing, Kentucky, Inc.	Japan	Kentucky Business Investment Program	Tax credit/rebate	KY	Scott	6,500	2012	4/26/2012	12	-0.280	3,241	-0.153	-0.127	1.91*
Gerdau Ameristeel U.S. Inc.	Brazil	Kentucky Reinvestment Act	Tax credit/rebate	KY	Marshall	6,000	2013	2/28/2013	58	-0.132	3,120	-0.041	-0.091	3.08***
Monsanto Company & Subsidiaries	Germany	High Quality Jobs Program	Tax credit/rebate	IA	Muscatine	4,156	2014	11/21/2014	75	-0.253	3,216	-0.127	-0.126	3.46***
IKEA Property, Inc.	Sweden	Shelby County PILOT Agreements	Property tax abatement	TN	Shelby	5,352	2015	1/21/2015	20	-0.134	3170	-0.043	-0.091	2.85***
Sasol USA Corporation	South Africa	Industrial Tax Exemption	Property tax abatement	LA	Calcasieu	1,481,996	2016	6/24/2016	12	-0.191	3,108	-0.184	-0.007	0.10
Barclays Services Corporation	United Kingdom	Grow New Jersey Assistance Program	Tax credit/rebate	NJ	Morris	40,000	2017	5/11/2017	77	0.010	3,000	0.021	-0.011	1.20
Shell Chemical LP	United Kingdom	Industrial Tax Exemption	Property tax abatement	LA	Ascension	71,851	2018	12/14/2018	123	-0.130	2,945	-0.075	-0.055	2.35**
BASF Corporation	Germany	Industrial Tax Exemption	Property tax abatement	LA	Ascension	49,728	2019	12/13/2019	8	-0.126	2,871	0.031	-0.157	2.88***
American Honda Finance Corporation	Japan	California Competes	Tax credit/rebate	CA	Los Angeles	5,200	2020	10/19/2020	47	0.044	2,660	0.021	0.023	0.93
Fujifilm Diosynth Biotechnologies Texas, LLC	Japan	Chapter 313/Economic Development Act	Property tax abatement	TX	Brazos	17,958	2021	10/15/2021	122	-0.143	2,471	-0.124	-0.019	0.69

Table 2: Welfare analysis – Tax subsidies granted to FODCs and MSA income

Dependent Variable	(1) *ΔAGI*	(2) *ΔTaxable Income*
Ln_FODC Tax Subsidies	0.044*	0.041*
	(1.56)	(1.52)
Ln_Other Subsidies	-0.051*	-0.066*
	(-1.36)	(-1.31)
Ln_Non-FODC Tax Subsidies	0.060*	0.064**
	(1.57)	(1.95)
Constant	2.815***	2.763***
	(4.25)	(3.94)
MSA F.E.	YES	YES
Year F.E.	YES	YES
Observations	1,183	1,183
R-squared	0.454	0.461

Notes: Table 2 shows the welfare effect of tax subsidies granted to FODCs on MSA markets that host foreign tax subsidy recipients by estimating an OLS regression of aggregate MSA income on the amount of tax subsidies received by foreign firms located within the MSA market. All regressions control for MSA and year fixed effects. T-statistics presented in parentheses are calculated using standard errors clustered by MSA markets to control for both heteroscedasticity and serial correlation. *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (one-tailed tests).

Table 3: Tax subsidies granted to FODCs and U.S. domestic peer firms' profitability – Sample selection, descriptive statistics, and correlations
Panel A: Sample selection

Selection criteria	Firm-years	Firms
Merged Compustat and Good Jobs First Subsidy Tracker firm-years with data from 2000 to 2021	263,004	28,135
Delete observations with missing control variables	(149,647)	(15,384)
Delete observations with firms incorporated outside the U.S.	(27,494)	(1,840)
Final sample under three-digit NAICS peer classification	85,863	10,911
Delete observations with missing SIC industry classification	(1,423)	(1,303)
Final sample under three-digit SIC peer classification	84,440	9,608
Delete observations without 10-K filing necessary for Text-based Network Industry Classifications (TNIC)	(33,311)	(3,142)
Final sample under the TNIC peer classification	51,129	6,466

Table 3 (continued)
Panel B: Descriptive statistics

Variables	N	Mean	Std Dev	P25	Median	P75
FODC Tax Subsidies	51,129	0.344	2.277	0.000	0.003	0.034
Focal Firm Tax Subsidies	51,129	0.310	1.860	0.000	0.000	0.000
ΔOperating Income	51,129	-0.136	3.135	-0.030	0.001	0.033
ΔGM	51,129	-0.055	1.592	-0.024	0.000	0.025
MVAL	51,129	6.219	2.288	4.606	6.279	7.806
MB	51,129	2.995	7.666	1.094	1.941	3.646
Capital-labor intensity	51,129	0.747	1.865	0.108	0.264	0.637
PPE	51,129	0.234	0.258	0.044	0.135	0.329
INTAN	51,129	0.193	0.253	0.005	0.084	0.302
Sales Growth	51,129	0.158	0.606	-0.037	0.062	0.189
Operating Income	51,129	-0.734	5.392	0.026	0.114	0.224
GM	51,129	0.022	2.845	0.218	0.372	0.583
HHI	51,129	0.066	0.067	0.031	0.040	0.072
Industry Sales Volatility	51,129	0.076	0.076	0.025	0.060	0.095
ΔR&D	51,129	0.409	3.101	0.000	0.000	0.056
ΔCAPX	50,805	0.036	0.059	0.003	0.020	0.050
ΔTFP	27,304	0.002	0.295	-0.119	0.000	0.118
ΔAQC	48,042	0.000	0.065	0.000	0.000	0.006
HP	51,129	0.780	0.414	1.000	1.000	1.000
Z-score	43,824	-2.294	12.128	-5.132	-2.942	-1.200
PCM	51,114	-1.149	6.960	-0.161	-0.042	0.026
R&D_HighTech	51,129	2.146	73.059	0.000	0.000	0.072
HighTech_SIC	51,129	0.280	0.449	0.000	0.000	1.000
Local_SameState	51,129	0.119	0.324	0.000	0.000	0.000
Local_SalesExp	12,613	0.410	0.369	0.074	0.288	0.757

Table 3 (continued)
Panel C: Correlations

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	*FODC Tax Subsidies*	1.00	**-0.02**	**-0.04**	**-0.03**	**-0.22**	**-0.04**	**-0.05**	**-0.02**	**-0.01**	**0.09**	**-0.13**	**-0.04**	**-0.03**	**-0.01**
2	*Focal Firm Tax Subsidies*		1.00	**0.01**	**0.01**	**0.26**	**0.04**	**0.02**	**0.06**	**0.03**	**-0.02**	**0.03**	**0.02**	**0.02**	**-0.02**
3	*ΔOperating Income*			1.00	**0.75**	**0.04**	0.00	**-0.02**	**0.01**	**0.02**	**-0.07**	**-0.01**	0.00	**0.01**	**0.01**
4	*ΔGM*				1.00	**0.03**	-0.01	**-0.02**	0.00	0.01	**-0.08**	**-0.02**	**-0.08**	**0.01**	0.01
5	*MVAL*					1.00	**0.15**	**0.11**	**0.12**	**0.21**	**-0.02**	**0.14**	**0.10**	**0.07**	**0.01**
6	*MB*						1.00	**-0.02**	**-0.01**	**0.03**	**0.06**	**0.01**	0.00	**-0.01**	0.00
7	*Capital-labor intensity*							1.00	**0.14**	**-0.09**	**0.05**	**-0.01**	**-0.02**	**-0.08**	**-0.11**
8	*PPE*								1.00	**-0.15**	**0.04**	**0.06**	**0.05**	**0.16**	**0.12**
9	*INTAN*									1.00	**0.09**	**0.06**	**0.07**	**-0.02**	0.01
10	*Sales Growth*										1.00	**-0.06**	**-0.05**	**-0.05**	**-0.01**
11	*Operating Income*											1.00	**0.79**	**0.07**	**0.04**
12	*GM*												1.00	**0.06**	**0.03**
13	*HHI*													1.00	0.39
14	*Industry Sales Volatility*														1.00

Notes: Table 3 pertains to the multivariate analysis of U.S. domestic firms' operating performance on tax subsidies granted to FODCs. Panel A presents the sample selection, and Panel B the descriptive statistics of the sample. Panel C reports Pearson correlations, with statistically significant correlations at the 0.05 level presented in bold.

Table 4: Tax subsidies granted to FODCs and U.S. domestic peer firms' profitability – Regression results

	(1)	(2)	(3)	(4)	(5)	(6)
Peer Classification	TNIC		Three-digit NAICS		Three-digit SIC	
Dependent Variable	*ΔOperating Income*	*ΔGM*	*ΔOperating Income*	*ΔGM*	*ΔOperating Income*	*ΔGM*
FODC Tax Subsidies	-0.037**	-0.011*	-0.006**	-0.002*	-0.034***	-0.006*
	(-2.15)	(-1.82)	(-2.39)	(-1.72)	(-3.32)	(-1.81)
Focal Firm Tax Subsidies	-0.004	0.000	-0.001	0.002	-0.003	0.000
	(-1.42)	(0.24)	(-0.28)	(1.29)	(-1.34)	(0.18)
MVAL	0.062***	0.024***	0.062***	0.022***	0.065***	0.025***
	(6.33)	(5.94)	(7.79)	(6.06)	(8.35)	(6.66)
MB	-0.000	-0.000	0.001	0.000	0.002	0.000
	(-0.04)	(-0.20)	(0.50)	(0.09)	(0.74)	(0.39)
Capital-labor intensity	-0.033***	-0.021***	-0.037***	-0.024***	-0.038***	-0.026***
	(-2.82)	(-3.43)	(-3.03)	(-3.18)	(-2.98)	(-3.25)
PPE	0.432***	0.171***	0.498***	0.171***	0.425***	0.132**
	(3.75)	(3.24)	(4.88)	(3.01)	(4.10)	(2.36)
INTAN	0.225***	0.107**	0.261***	0.155***	0.263***	0.155***
	(2.85)	(2.41)	(4.42)	(4.61)	(4.40)	(4.35)
Sales Growth	-0.297***	-0.198***	-0.128***	-0.080***	-0.105***	-0.068***
	(-4.02)	(-5.03)	(-3.87)	(-4.52)	(-3.18)	(-4.03)
HHI	0.256	0.104	-0.535	0.188	0.106	0.058
	(1.00)	(0.99)	(-1.54)	(1.45)	(0.87)	(1.02)
Industry Sales Volatility	0.126	0.006	0.030	0.063	-0.085	-0.007
	(0.65)	(0.06)	(0.29)	(1.30)	(-1.02)	(-0.17)
Operating Income	-0.027		-0.052**		-0.060***	
	(-1.44)		(-2.42)		(-3.18)	
GM		-0.065***		-0.058***		-0.065***
		(-3.52)		(-3.38)		(-4.20)
Constant	-0.626***	-0.222***	-0.587***	-0.234***	-0.647***	-0.242***
	(-7.69)	(-6.69)	(-8.02)	(-6.61)	(-9.24)	(-6.99)
Industry F.E.	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES
Observations	51,129	51,129	85,863	85,863	84,440	84,440
R-squared	0.018	0.027	0.021	0.024	0.025	0.028

Notes: Table 4 shows the competition effect of tax subsidies granted to FODCs on the operating performance of U.S. domestic firms. It presents the OLS regression results for U.S. firms' operating profit margins and gross margins as proxies of the operating performance. All regressions control for year and industry fixed effects. I winsorize all continuous variables at the top and bottom 1%. T-statistics presented in parentheses in specifications using TNIC-based (NAICS- and SIC-based) peer classifications are calculated using standard errors clustered by firm (industry-year) to control for both heteroscedasticity and serial correlation. *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed tests).

Table 5: Cross-sectional analyses
Panel A: Financial constraints

	(1)				(2)			
	(1A)		(1B)		(2A)		(2B)	
Dependent Variable	*ΔOperating Income*		*ΔGM*		*ΔOperating Income*		*ΔGM*	
Partitioning Variable	*HP*				*Z-score*			
	Unconstrained	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*	*Unconstrained*	*Constrained*
FODC Tax Subsidies	0.014	-0.034***	0.002	-0.010**	0.005	-0.047***	0.008	-0.012***
	(0.33)	(-3.76)	(0.08)	(-2.13)	(0.37)	(-5.38)	(1.08)	(-2.90)
Test of Unconstrained = Constrained	-0.048**		-0.012		-0.052		-0.004**	
	3.93		0.88		2.18		4.06	
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Industry F.E.	YES	YES	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES	YES	YES
Observations	25,549	25,578	25,549	25,578	21,914	21,910	21,914	21,910
R-squared	0.057	0.024	0.061	0.032	0.027	0.032	0.022	0.052

Table 5 (continued)
Panel B: Product market power and high-tech sectors

	(1)				(2)				(3)			
	(1A)		(1B)		(2A)		(2B)		(3A)		(3B)	
Dependent Variable	*ΔOperating Income*		*ΔGM*		*ΔOperating Income*		*ΔGM*		*ΔOperating Income*		*ΔGM*	
Partitioning Variable	*PCM*				*R&D_HighTech*				*HighTech_SIC*			
	Low	*High*	*Low*	*High*	*Low Tech*	*High Tech*	*Low Tech*	*High Tech*	*Low Tech*	*High Tech*	*Low Tech*	*High Tech*
FODC Tax Subsidies	-0.039***	0.001	-0.010**	-0.002	-0.095***	-0.001	-0.031***	0.000	-0.059***	-0.017	-0.017***	-0.004
	(-4.17)	(0.11)	(-2.24)	(-0.74)	(-16.07)	(-0.12)	(-13.37)	(0.00)	(-10.34)	(-1.16)	(-6.96)	(-0.52)
	-0.040**		-0.008		-0.094***		-0.031***		-0.042		-0.013	
Test of Low *PCM* = High *PCM*; Low Tech = High Tech	3.86		1.29		8.21		6.88		1.59		1.14	
Controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry F.E.	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	25,558	25,556	25,558	25,556	27,669	23,460	27,669	23,460	36,833	14,296	36,833	14,296
R-squared	0.026	0.042	0.032	0.062	0.033	0.026	0.069	0.034	0.019	0.027	0.031	0.036

Table 5 (continued)
Panel C: Local U.S. domestic firms within the same state as FODCs receiving tax subsidies

	(1)				(2)			
	(1A)		(1B)		(2A)		(2B)	
Dependent Variable	*ΔOperating Income*		*ΔGM*		*ΔOperating Income*		*ΔGM*	
Partitioning Variable	*Local_SameState*				*Local_SalesExp*			
	Non-local	*Local*	*Non-local*	*Local*	*Low local exposure*	*High local exposure*	*Low local exposure*	*High local exposure*
FODC Tax Subsidies	-0.049***	0.036**	-0.014***	0.012	-0.107***	0.085***	-0.028***	0.012*
	(-7.12)	(2.06)	(-4.18)	(1.25)	(-7.11)	(6.52)	(-3.79)	(1.75)
Test of Non-local = Local	-0.085***		-0.026***		-0.192**		-0.040*	
	4.34		4.87		3.97		3.13	
Controls	YES	YES	YES	YES	YES	YES	YES	YES
Industry F.E.	YES	YES	YES	YES	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES	YES	YES	YES	YES
Observations	45,047	6,082	45,047	6,082	6,306	6,307	6,306	6,307
R-squared	0.020	0.041	0.031	0.028	0.093	0.116	0.044	0.148

Notes: Table 5 presents the cross-sectional analyses of the negative competitive externalities of tax subsidies granted to FODCs. All regressions control for year and industry fixed effects. I winsorize all continuous variables at the top and bottom 1%. T-statistics presented in parentheses are calculated using standard errors clustered by firm to control for both heteroscedasticity and serial correlation. *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed tests).

Table 6: Tax subsidies granted to FODCs and U.S. domestic firms' investment responses

	(1)	(2)	(3)	(4)
Dependent Variable	*ΔCAPX*	*ΔR&D*	*ΔAQC*	*ΔTFP*
FODC Tax Subsidies	-0.000**	-0.002	-0.001***	0.002
	(-2.15)	(-0.73)	(-8.87)	(0.99)
Focal Firm Tax Subsidies	-0.000	-0.001	-0.001***	0.001
	(-0.44)	(-0.72)	(-4.73)	(0.86)
MVAL	0.000**	-0.012***	0.002***	0.072***
	(2.08)	(-4.57)	(14.95)	(27.74)
MB	0.000**	0.002*	0.000*	0.001**
	(1.98)	(1.92)	(1.87)	(2.50)
Capital-labor intensity	0.000	0.013***	-0.001***	0.044***
	(0.97)	(3.62)	(-5.49)	(12.85)
PPE	-0.011	-0.137***	-0.009***	-0.018
	(-1.30)	(-4.12)	(-4.59)	(-1.09)
INTAN	0.001	-0.065**	0.016***	0.071***
	(0.46)	(-2.31)	(4.47)	(5.65)
Sales Growth	-0.000	0.074***	-0.001*	-0.002
	(-0.80)	(2.96)	(-1.79)	(-0.10)
HHI	-0.007	-0.072	-0.001	0.026
	(-1.52)	(-1.12)	(-0.12)	(0.36)
Industry Sales Volatility	-0.007**	-0.073	-0.005	0.037
	(-2.20)	(-1.38)	(-0.91)	(0.78)
CAPX	-0.119*			
	(-1.80)			
R&D		-0.001***		
		(-4.49)		
AQC			-0.773***	
			(-34.44)	
TFP				-0.377***
				(-32.93)
Constant	0.005***	0.137***	0.004***	-0.631***
	(6.91)	(5.78)	(3.15)	(-28.81)
Industry F.E.	YES	YES	YES	YES
Year F.E.	YES	YES	YES	YES
Observations	50,805	51,129	48,042	27,304
R-squared	0.151	0.018	0.555	0.247

Notes: Table 6 shows the investment and productivity responses of U.S. domestic firms after their foreign competitors in the U.S. receive state and local tax subsidies. All regressions control for year and industry fixed effects. I winsorize all continuous variables at the top and bottom 1%. T-statistics presented in parentheses are calculated using standard errors clustered by firm to control for both heteroscedasticity and serial correlation. *, **, *** indicate statistical significance at the 0.10, 0.05, and 0.01 levels, respectively (two-tailed tests).