Within-Host Location Determinants of Employment in Foreign-Owned Establishments in the U.S., 2000-2011: A survey of business climate, vertical, horizontal, and export platform motivations

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Abstract

The objective of this exploratory study is to assess the effects of within-host location determinants on the intensity of foreign investment as measured by employment in foreign-owned establishments. This statistical analysis is unique for its use of firm-level microdata from the *National Establishment Time-series*, which tracks business activity in U.S. establishments over time and isolates the universe of firms that were at one point foreign-owned from 2000 to 2011. Using a series of mixed models with time, industry, metro, and state fixed effects, this study finds that the most important drivers of employment intensity in foreign-owned establishments are firm-level characteristics, vertical factors pertaining to labor supply and wages, local industrial specialization, business attraction subsidies, market capacity, and investor country characteristics. Measures accounting for business climate, human capital formation, and information-based assets did not generate substantial evidence of a relationship with the relative scale of investment in establishments, however more work is needed.

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I. Introduction

Foreign-direct investment (FDI) occurs when a foreign investor establishes a controlling stake in a business located in another country. FDI can arrive in the form of new physical locations known as greenfield or in mergers and acquisitions (M&A) of existing domestically-owned facilities. Many broad statements are often made about FDI. Compared to portfolio investment which holds a tighter relationship with exchange rates and short-run market fluctuations, FDI is typically viewed as a relatively stable form of capital investment and is thought to target companies with higher long-term expected value in locations that contain the necessary physical infrastructure, supplier networks, and market capacity to support growth.

Those who characterize FDI as beneficial cite the active role of investors in corporate governance and positive externalities associated with multinational corporate (MNC) owners who have an incentive to transfer technology, best practices, and skills to reduce costs and enhance productivity of firms throughout their supply chain (Perkins, Radelet, and Lindauer (2006)). A further benefit for firms that vertically integrate into a parent company's supply chain is that they often gain access to international markets and may begin to export downstream (Head and Ries (2001), Blonigen (2001), Swenson (2004)). Yet, debate continues as to the extent of these benefits and whether there is any observable difference in performance under foreign versus domestic owners (Globerman, Ries, and Vertinsky (1994), Lipsey (2002)). In particular, observers raise concerns about the long-term impact of downsizing following mergers, the weakened ability of overseas owners to monitor subsidiaries, and the growing practice of tax inversion which enables domestic firms to move their legal domicile to a lower-tax country through M&A (Scott and Jolly (2015), Keller and Yeaple (2012), and Hirschfeld-Davis (2014)).

Despite these potential drawbacks, local and national policymakers continue to perceive FDI as an important source of capital and employment as evidenced by high profile government programs like *Select USA* and the billions spent each year on tax incentives by local governments.[1] While the overall contribution of FDI is relatively small, amounting to less than 6 percent of U.S. private sector employment, its presence is indicative of broader economic strength and global competitiveness since it tends to coincide with business activity that features above average compensation, value-add, productivity, trade, capital investment, and R&D expenditures on a per worker basis (see Table 3). The objective of this study is to investigate the

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[1] Mattera, Tarczynska, and LeRoy (2013) found that the largest 240 "megadeals," or subsidy awards with a total state and local cost of 75 million dollars or more, had a cumulative cost of more than 64 billion dollars. www.goodjobsfirst.org/megadeals

location determinants of FDI by analyzing their relationship with the intensity of investment measured by employment in foreign-owned establishments. The results should help the research community better understand the effect of location determinants on the employment intensity of foreign-owned firms as well as policymakers seeking to better align FDI attraction policies with empirical research.

Previous works find mixed results regarding the location determinants of FDI and their relationship with economic growth. Chakrabarti (2001), Blonigen and Piger (2011), and Eicher, Helfman, and Lenkoski (2012) show that many covariates are not robust to changes in model specifications and are at times hampered by uncontrolled heterogeneity resulting from between-host, cross-country macroeconomic comparisons. The contribution of this study is to investigate within-host differences using firm-level microdata from the *National Establishment Time-series*, which tracks business activity in U.S. establishments over time. This rich dataset isolates the universe of firms that were at one point foreign-owned, allowing researchers to evaluate employment changes while controlling for variation across firms, industries, and local areas. The clear advantage in using microdata within the U.S. is that the relatively homogenous lingual, cultural, and institutional conditions allow the model to better control the effects of within-host economic differences such as variation in business climate, labor markets, and market size across local areas.

This study deploys a mixed model with time, industry, metro, and state fixed effects for the statistical analysis. The response variable is employment, which serves as a continuous measure of how intensely foreign firms invest into a specific corporate site. This study will perform two sets of regressions to assess how various location determinants drive the scale of foreign investment. The first set evaluates the moment of foreign investment for both greenfield investments and M&As, and the second surveys employment changes over all years establishments report as active (which includes years under domestic ownership).

The objective of the first set of regressions is to uncover the factors driving the immediate site selection decision. The second set of regressions answer more general questions about the connection between location determinants and the growth trajectory of firms over time. The results from the second set of regressions may not be distinct to foreign-firms and could prove useful in illuminating a generalizable relationship between local area determinants and employment change. Understanding the effects of location determinants on growth within existing foreign-owned establishments is important since according to Census Business Dynamics Statistics during the period from 1977 to 2012, 62.6 percent of job creation and 65 percent of job destruction came from expansions or contractions in existing establishments. The second reason

for two regressions is that the effect of covariates on site selection decisions may diverge from the effect of the covariates on the scale of investment over time since asymmetric information about the expected versus realized asset value may influence the investor's decision to increase or decrease the scale of investment and employment after the initial investment.

The study finds that the most important determinants of employment change in foreign-owned establishments are firm-level characteristics, vertical factors pertaining to labor supply and wages, local industrial specialization, business attraction subsidies, market capacity, and investor country characteristics. Measures accounting for business climate, human capital formation, and information-based assets provide interesting albeit thin evidence of a consistent and robust relationship with establishment level employment patterns. While more research is needed, the most significant takeaway is that contrary to popular belief differences in a region's business climate and human capital display a relatively weak relationship with establishment level employment patterns and that local industrial and workforce dynamics along with firm-specific effects play a more direct role in growth and the scale of foreign investment within the U.S.

This study contains five sections. Section II gives the background and offers descriptive statistics characterizing inward FDI in the U.S., including its relative global position, industry composition, and source countries. Section III summarizes previous theoretical and empirical contributions on the spillover effects and location determinants of FDI. Section IV overviews the unique establishment database utilized in this report, describes steps taken to prepare and clean the data, and gives a thorough description of the covariate matrix including summary statistics and expected signage. Section V explains the model and results. Section VI concludes. Section VII provides bibliographic citations. Section VII is the Appendix which contains all referenced figures and tables.

II.   Background

The U.S. has maintained a relatively dominant position in its global share of total inbound FDI. Since 1985 the U.S. has held the highest share of inbound FDI positions, rising to 40% of the world total in 1999, slumping to 16% in 2008, and then rising slightly to 17% in 2012 (see Figure 1). Although the U.S. continues to retain nearly twice the share of the next top ranking destination, the sharp decline over the past 14 years reflects an increasing fragmentation of global investment. Despite the sharp declines in global share, within the U.S. cumulative foreign direct investment positions measured on a historical cost basis continue to grow, rising from

$2.07 trillion in 2009 to $2.65 trillion in 2012 at an average flow of 180 billion per year (see Figure 2).

For developed economies such as the U.S., the primary source of foreign capital is typically other developed countries. In 2011, over 94% of U.S. employment associated with inbound foreign investment came from developed countries, with the United Kingdom accounting for 16.7% of all employment in majority-owned affiliates, followed by Japan at 12.2%, Germany at 10.3%, and Canada at 9.7% (see Table 1). In terms of wages, the countries which offer the highest compensation per worker tend to have a greater presence in high wage industries such as finance, pharmaceuticals, or petroleum. For example, Bermuda, Venezuela, Saudi Arabia, Finland, Ireland, and Switzerland pay their U.S. based employees $122,070 on average annually. The country with the most R&D intensive workforce in its U.S. based majority-owned affiliates was China, followed by the Caribbean Commonwealth nations. This result is consistent with a vertical investment framework given the relative skills-abundance of the U.S. compared to China.

With respect to industry, 37% of employment in majority-owned foreign affiliates concentrates in the manufacturing sector (see Table 2). To put this in perspective, less than 9% of overall U.S. employment is in the manufacturing sector. Other dominant sectors include wholesale plus retail trade and finance, which account for 18% and 7% of foreign affiliate employment, respectively. There is considerable variation across industries in terms of average affiliate size. While manufacturing, retail, and professional and technical services industries typically staff more than 100 employees in affiliates, wholesalers, financial, and real estate firms usually staff less than 100 employees. With the exception of wholesalers, the highest paying foreign-owned industries tend to be in technology and knowledge-intensive sectors. In 2011, the highest paying sector was finance, followed by professional and technical services, information, wholesalers, and manufacturing. These industries average per worker compensation ranged between $84,200 to 163,200. In terms of R&D employment intensity, the manufacturing sector was measured most intensive at 5.4%, followed by information services and professional and technical services, which both measured 4.5%.

One of the explanations behind the higher performance of foreign affiliates is that they emanate from a group of highly-competitive, globally-engaged firms. These firms are better suited for overseas investment, have more complex supply chains, are larger in scale, more profitable, and likely rely on established business models that feature best-in-class technologies. Compared to the typical private sector firm, majority-owned foreign affiliates in the U.S. engage in 3.2 times more R&D, produce 3.7 times more exports and 5.1 times more imports, invest 2.6 times more capital, and generate 2.3 times more net income (see Table 3) on a per worker basis. In terms of compensation, majority-owned affiliates pay approximately 20 percent more per worker than the

average private firm. However, the exceptional performance of foreign-owned firms in the U.S. moderates when compared against firms belonging to a comparable peer group, namely U.S. multinationals. U.S. owned multinationals have higher profits, more capital investment and R&D, and close to the same level of compensation per worker as foreign-owned firms. This suggests that the performance benefits of foreign-owned firms derive more from firm-level characteristics that correlate with the capacity to invest abroad than their place of origin.

III.   Literature Review

A. Spillover Effects

Moving beyond the background statistics, a major portion of the foreign investment literature documents the spillover effects on broader economic performance. Generally, the literature finds a strong positive relationship between inward FDI and productivity growth. Asheghian (2004) shows a positive and highly significant contribution on U.S. economic growth and total factor productivity. Goss, Wingender, and Torau (2007) estimate that during the nineties FDI accounted for almost 16% of overall productivity growth, significantly higher that the domestic capital's contribution. Lesher and Miroudot (2008) offer a similar assessment, and show that knowledge-related spillovers from FDI vary considerably across sectors with services industries experiencing greater productivity effects. Razin and Sadka (2003) argue that these productivity gains are particularly prevalent in foreign M&A, which accounts for the bulk of FDI activity in the U.S. Under their view foreign investors possess an information advantage about the firm's true value and apply superior managerial know-how to realize the firm's productive potential. Blomström, Globerman, and Kokko (1999) also trace FDI spillovers to specific firm actions such as a relatively higher prevalence of on-site training, tech transfer and licensing, and vertical linkages across value chains. Bode, Nunnenkamp, and Waldkirch (2012) examine over two decades of state level data and find that FDI generates positive externalities on aggregate productivity, while externalities from domestic firms appear negative. In a study of Mexican manufacturing industries, Jordaan (2005) finds positive productivity spillovers from technology differences between domestic and foreign firms in part due to geographic agglomeration.

Relative to the productivity spillover literature, the effect of foreign investment on domestic wages is less clear. Early research by Aitken, Harrison, and Lipsey (1995) shows that higher concentration of FDI leads to higher wages in both foreign and domestic firms. Later work presents a more nuanced picture with effects varying according to industry characteristics. Axarloglou and Pournarakis (2007) find that depending on the industry, FDI inflows can positively or negatively drive wages and employment. Beyond industry differences, Balsvik and Haller

(2011) finds that while foreign M&A have neutral wage effects, greenfield investment increases demand for skilled labor thus increasing labor costs and reducing the productivity of domestic firms. Likewise, in a study of Central and Eastern Europe, Konings (2001) finds no evidence of spillover effects on the productivity of domestic firms and, in fact, finds some evidence for the opposite effect which he attributes to a "negative competition effect."

An important point frequently overlooked due to data limitations is that many desirable effects typically attributed to FDI disappear after controlling for firm level characteristics. One of the first studies to make this argument was Globerman, Ries, and Vertinsky (1994), which found that foreign-owned firms pay higher wages and have higher value added per worker than domestic firms, but differences vanish after controlling for size and capital intensity. Similarly, Lipsey (2002) argues that there is a lack of evidence showing that foreign-owned firms pay higher wages and produce higher productivity spillovers. He observes that foreign-owned firms tend to locate in higher wage sectors, employ higher skilled workers, and tend to be larger, more capital-intensive, and more intensive in their use of intermediate products.

For these reasons, many of the observed benefits commonly attributed to FDI could instead stem from multinational corporate control. On this point, Pérez-González (2004) shows that multinational control drives improvements in total factor productivity (particularly in industries that depend on parent company R&D) and more investment in skill and technology intensive forms of production. Alfaro and Chen (2011) also find that multinationals fared better on average than local establishments with similar economic characteristics during economic crises. Desai, Foley, and Forbes (2004) supports this finding and show that multinationals access to internal capital markets affords a competitiveness advantage over local firms during currency crises. The research implication of these firm level studies is that foreign ownership may confound the ultimate effect of multinational corporate ownership on local economic growth. To take this into account, this study utilizes a highly granular firm level dataset to control for variation across the size, scale, and industry of foreign-owned firms.

B. Location Determinants

Given the potential economic development implications of FDI on productivity, wage, and employment growth, many studies have set out to understand the forces that draw foreign capital to local areas. For an excellent overview of the determinant literature, see Blonigen (2005). In this study, four sets of determinants are examined: 1) business climate, 2) vertical, horizontal, and export-platform factors, 3) agglomeration, and 4) information-based assets.

1. Business Climate:

Hartman (1982) was among the first to introduce empirical evidence that changes in domestic tax policy strongly affect foreign investment in the U.S. More recently, Wijeweera, Dollery, and Clark. (2007) find that the U.S. corporate income tax rate exerts a negative impact on inward FDI, stating that: "a 1% increase in the U.S. corporate income tax rate would decrease FDI inflows by 1%." Lanaspa, Pueyo, and Sanz (2008) show that tax rates on capital incomes affect location decisions and countries with lower rates attract more FDI. Across states there is considerable variation in tax policy. Hines (1996) finds that differences in state corporate income taxes significantly influence inward FDI, while the ability to apply for foreign tax credits against home-country tax liabilities can offset higher host state taxes. Desai, Foley, and Hines (2004) reveal that higher local indirect and income tax rates are associated with lower affiliate assets and output. Rogers and Wu (2012) also show that state business incentives including foreign-trade zones, the provision of better public services, and the establishment of overseas offices in particular countries increase FDI in the U.S.

In terms of regulatory climate, Hanna (2010) shows the effect of U.S. environmental regulation associated with the Clean Air Act Amendments caused U.S. based multinationals to increase their foreign production in emitting industries. At the state level, Keller and Levinson (2002) use the Pollution Abatement Costs and Expenditures (PACE) survey conducted by the U.S. Census Bureau and find that differences in pollution abatement costs among states have had moderate deterrent effects on FDI.

Lastly unionization policies seem to play a smaller, but significant role in firm location decisions. Bartik (1985) finds that differences in unionization, corporate taxes, and workers' compensation insurance rate deter FDI. Coughlin, Terza, and Arromdee (1991) offer evidence that higher unionization rates and taxes deterred FDI, while higher unemployment, extensive transportation infrastructures, and larger promotional expenditures attracted it.

2. Vertical, Horizontal, and Export Platform Factors:

For many firms, FDI is an effective way to establish and expand a trade presence in foreign markets. Typically there are three types of trade related motivations: horizontal which targets the host country's market, vertical which targets the host country's factors of production, and export platform which takes into account third country trade opportunities near the host country. Greenaway and Kneller (2007) explain succinctly:

> "Vertical FDI occurs when the stages of production are located in more than one country; and horizontal when the same stage is located in more than one country. Vertical FDI is factor seeking; horizontal, market seeking. When there are more than two countries and more than two stages of production, multinationals are likely to

undertake more complex FDI choices which involve intra-firm trade and export platform FDI. The effect of adding more countries is to allow for the possibility of a horizontal motive for export platform FDI, adding more stages allows for a vertical motive."

Over the past decade a patchwork of evidence has accumulated documenting horizontal and vertical motivations. Cheng and Kwan (2000) show that large regional markets with good infrastructure attract horizontal foreign investment. Head and Mayer (2004) present further evidence that market potential matters for location choice.

There is also a growing literature documenting the importance of workforce skill typically associated with the vertical motive. Yeaple (2003) shows that outbound U.S. FDI reflects an interaction between skilled-labor abundance and industry skilled-labor intensities in a manner consistent with the theory of comparative advantage. Using cross-state data, Axarloglou (2004) demonstrates that high industry and state specific labor productivity and high state spending on education enhance location attractiveness. Ford, Rork, and Elmslie (2008) show that FDI has a greater impact on per capita output growth than domestic investment in U.S. states with adequate human capital. Lending further support to the importance of human capital factor endowments, many studies in the developing context yield similar results: Borensztein, De Gregorio, and Lee (1998) show that FDI contributes to economic growth only when a sufficient absorptive capacity is available in the host economy and Gachino (2011) also finds that positive spillovers from FDI in Kenya correlate with "systemic support structures, absorptive capacity, firm learning, firm training, and trade orientation."

There are a number of key differences between horizontal and vertical motivations. Horizontal FDI is typically considered a substitute with exportation to the host-country because locating production near consumers markets can eliminate the need to trade or reduce costs in bulk-gaining industries, while vertical is regarded as complementary since intra-company trade necessitates exportation between the host and source countries various stages of production. Evidence of these differences is robust. In early work, Lipsey and Weiss (1984) find that the higher the level of output by a U.S. firm in a foreign area, the higher the firm's exports from the U.S. to that area, especially in the case of intermediate products. As documented in Miroudot and Ragoussis (2009), vertical FDI responds strongly to distance-related trade costs. Similarly, Helpman, Melitz, and Yeaple (2003) uncover that sector and country specific transport costs and tariffs have a strong negative effect on export sales relative to FDI, indicating that when trade costs are present vertical FDI (which necessitates exportation) may decreases, while horizontal FDI (which avoids the need for host to source country trade) may increase. Using firm level data, Head and Ries (2001) find complementarity between FDI and exports and observe substitution in firms unlikely to ship intermediate products to overseas affiliates (which are likely horizontal firms). Blonigen (2001) finds substantial evidence for both a substitution and a complementarity

effect between affiliate production and exports with Japanese automobile parts in the U.S. market. Subsequently, Swenson (2004) shows the product level results match Blonigen (2001) and show that Blonigen's findings apply to an even broader range of products.

Since differences between horizontal and vertical motivations often blur in practice, there is a growing impetus to develop the Knowledge-Capital model of FDI that situates horizontal and vertical motivations under a common theoretical framework. To this end, Markusen, Venables, Konan, and Zhang (1996) demonstrate that vertical multinationals dominate when countries are very different in relative factor endowments, while horizontal multinationals dominate when the countries are similar in size and in relative endowments and trade costs are moderate to high. In a later work appearing in the American Economic Review, Carr, Markusen, and Maskus (2001) find what appears to be strong empirical support for the knowledge-capital model. But Blonigen, Davies, and Head (2003) critique the method and argue that the underlying data support the predictions of the strict horizontal model (the precursor to the Knowledge Capital model), which shows that affiliate activity between countries decreases as absolute differences in skill-labor abundance widen.

Building on these contributions, a number of articles document export platform FDI as it relates to third-country effects from surrounding markets with desirable qualities (either in terms of horizontal factors—like export potential, or vertical factors—like relative skill-labor abundance). Baltagi, Egger, and Pfaffermayr (2007) offer evidence for third-country effects in developing countries. Ekholm, Forslid, and Markusen (2007) develop a three-region model and show foreign manufacturing affiliates of U.S. multinationals inside North America concentrate on home-country export platform, while affiliates inside Europe concentrate on third-country export platform. Garretsen and Peeters (2007) use a twenty year sample of outbound Dutch FDI and find evidence that third country effects and spatial linkages between markets influence location decisions. Kutan and Vukšić (2007) give evidence that FDI increases domestic supply-capacity leading to higher third-country exports. They hypothesize that the increase in third-country exports is because multinational companies may have better information about surrounding export markets and more advanced global supply chain integration than local firms.

3. Agglomeration:

As with many other topics agglomeration, industry clusters, and network effects play an important role in FDI location patterns. Guimaraes, Figueiredo, and Woodward (2000) show that service agglomeration demonstrates a very strong effect, as well as industry-clustering and "urbanization externalities" such as the distance from the principal city. In a study of Japanese manufacturing plants in the U.S., Head, Ries, and Swenson (1995) find strong statistical support

that industry-level agglomeration plays an important role in location decisions. In another study using a similar dataset, Blonigen, Ellis, and Fausten (2005) offer evidence of networking effects. They show that the stock of investment in a region by a firm's vertical keiretsu partners and prior flows of investment into a region by a firm's horizontal keiretsu partners increases the probability of investment. In a study of U.S outbound FDI, Blonigen, Davies, Waddell, and Naughton (2007) find that estimated relationships of traditional determinants of FDI are surprisingly robust to variables that capture spatial interdependence. In summary, the literature appears in agreement that agglomeration is real and significant in the context of FDI.

4. Information-based Assets:

There is strong evidence drawing the link between multinationals with information-based assets (like R&D) and location decisions.[2] Kogut and Chang (1991) offer evidence that Japanese investment in the U.S. is drawn towards R&D intensive industries. Interestingly, when the data is disaggregated between M&A and greenfield investment there are indications that acquisitions are used for "the sourcing and sharing of U.S. technological capabilities." Morck and Yeung (1992) further articulate this work and find that firms with non-rivalrous, non-excludable information-based assets demonstrate a higher stock price reaction upon announcing a foreign acquisition. In a study of Japanese firms, Hennart and Park (1994) reveal that firms with higher R&D expenditures have a greater probability of investing into U.S. production facilities (but find no evidence that advertising expenditures have the same effect). They also document a "follow-the-leader" effect among rival firms and a general attraction to locations with a concentration in high-growth industries.

Although the effect of firm-specific intangible assets based on R&D and marketing efforts explain investment in developed countries, Belderbos and Sleuwaegen (1996) find that investment in Southeast Asia is more closely related to labor resources and inter-firm ties. Conversely, Chung and Alcácer (2002) find that firms in research-intensive industries are more likely to locate in states with high R&D intensity regardless the source country's level of development. In a new branch of the literature, Keller and Yeaple (2012) develop a typology to classify intra-firm knowledge transfer into two groups: "embodied" (traded intermediates) or "disembodied" (direct communication). They argue that disembodied knowledge transfer costs

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[2] In a seminal work, Helpman (1984) introduces a general-equilibrium trade theory to explain the cross-country penetration of multinational corporations and how "firm-specific assets associated with marketing, management, and product-specific R&D" in a source country can service production facilities overseas at a low marginal cost. Extending this theory, Brainard (1993) develops a two-sector, two-country model to illustrate how FDI decisions are most likely to occur when there are greater transport costs relative to fixed plant costs and increasing returns to the corporate level (i.e., R&D) than the plant level (i.e., scale economies). Dunning (2001) and Helpman (2006) further review the advances in multinational corporate trade theory and its implications on industry structure and cross-country trade patterns.

increase with distance, imposing a constraint upon intra-firm trade. This gravity effect is strongest in R&D intensive products and may play an important factor in multinational location decisions. Taken in sum, this body of literature offers statistical support for a relationship between state and industry level R&D intensity and the specific requirements of multinational corporate investors.

5.   General Surveys of Determinants

Given the breadth of the FDI literature, a number of articles fit into what can only be described as general surveys of determinants. These studies help inform expected signage and present interesting information sets to inform variable specifications. Coughlin and Segev (2000) show that increased FDI in Chinese provinces has positive effects on FDI in nearby provinces, that economic size, average productivity, and coastal location are positive determinants of FDI location while average wage and the illiteracy rate are found to be negative factors. Hanson, Mataloni, and Slaughter (2005) find that demand for imported inputs is higher when foreign affiliates face lower trade costs, lower wages for less-skilled labor, and lower corporate income tax rates. Axarloglou (2005) shows that labor productivity, tax incentives, and education spending are among the most important positive location determinants, while crime rates had a significant negative effect. Davies and Kristjánsdóttir (2010) show that fixed costs, distance, and trade openness appear to play a large role in the decision to invest in Iceland. Piteli (2010) finds the strongest factors influencing FDI location are overall business climate, firm profitability, and the overall productivity of the economy. Todo (2011) identifies the firm's internationalization status as the dominant determinants of the export and FDI decision. Bode and Nunnenkamp (2011) show that employment-intensive FDI concentrates in richer states, while capital-intensive FDI tends to concentrate in poorer states. Gheasi, Nijkamp, and Rietveld (2013) find that the number of educated migrants has a positive effect on FDI inflows and outflows. Kornecki and Ekanayake (2012) provide evidence that real per capita income, real per capita expenditure on education, FDI related employment, R&D expenditure, share of scientists and engineers in the workforce, and capital expenditure have a positive impact on FDI inflows, while per capita state taxes, unit labor cost, manufacturing density, unionization, and unemployment rate exert a negative impact on FDI inflows.

Despite the abundance of research, a number of analyses cast uncertainties on the robustness of many determinant specifications. Chakrabarti (2001) using Extreme Bounds Analysis finds that the relations between FDI and many of the variables often reported in the empirical literature (such as, taxes, wages, openness, exchange rates, tariffs, growth rate of GDP, trade balance) are highly sensitive to small changes in the information set, while market size of a host country, as measured by per-capita GDP is the most robust. Using Bayesian statistical techniques, Blonigen and Piger (2011) test various indicators and find that trade

openness, host-country business costs, host-country infrastructure (including credit markets), and host-country institutions are not robust covariates. Eicher, Helfman, and Lenkoski (2012) further examine the varying empirical results using Bayesian Model Averaging and find that half of the previously suggested FDI determinants are not robust. Moreover, there is still considerable uncertainty surrounding the profession's understanding of what determines the location of foreign investment.

IV.   Data

A. Overview of Establishment Dataset and Data Cleaning Process

Turning to data in this analysis, the primary source of the firm-level establishment data is the *National Establishment Time-Series* (NETS) developed by Walls and Associates and collected by Dun and Bradstreet (D&B). D&B provides the most comprehensive available listing of firms and operations in the U.S. which it collects through telephonic surveys and compiles as part of its real-time market intelligence business. According to Walls and Associates, D&B launches over 100 million calls per year from four call centers to maintain and update its database. Companies have an incentive to report accurate information because their participation affects their credit score and ability to access capital. D&B's sources include the Yellow Pages, public records, financial and legal filings, government registries, third party data vendors, corporate announcements, and news reports. All the information is subject to extensive automated quality checks to identify inconsistencies through D&B's proprietary *Intelligence Engine.*[3] Walls and Associates' then assembles the data into an archival database built from annual snapshots of the full *Duns Marketing Information (DMI)* file that contains over 52.4 million establishments between January 1990 and January 2012. Walls and Associates fits these snapshots into a continuous longitudinal data series. To ensure continuity during each reporting period, Walls and Associates uses a basic time-series imputation techniques to fill in missing information.

Despite these stringent quality checks, as with any survey compiled from millions of human responses the records occasionally contain errors resulting from omissions, typos, erroneous and misattributed records. One issue in particular is that some establishments exhibit a "ratcheting effect" in reported employment levels. There are a few explanations for the effect. In

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[3] Economist David Neumark and colleagues have published an academic article which checks the accuracy of the NETS database. Neumark et. al. examine the accuracy of employment levels, changes, relocations, and coverage of new firms. All of these correlated with public data sources except for year to year changes in employment. In fact, they generally found NETS/Dun and Bradstreet to have better coverage on small firms than the QCEW from the BLS.

most cases, the ratcheting is a result of rounding, irregularly updated personnel information, or the respondent's confusion between the concepts of "establishment employment", "campus-wide employment" if it is a multi-establishment site, and "company-wide employment" across all sites.

To minimize inaccuracies, a smoother was applied to establishments displaying irregular growth patterns. The smoothers lead-lag weights were assigned in direct proportion to a composite error score based on the relative and absolute error within and between establishments and the contribution of that error to aggregate measures of employment change at the state and industry levels. After the process was implemented roughly 13,000 of the more than 3.7 million observations were altered, changing under 0.4% of the entire dataset. A small sample of the adjustments were cross-checked against an array of online resources including company websites, LexisNexis news reports, and satellite imagery (using parking spaces as a rough approximation of employment at the establishment). While it would be impracticable to manually check all the changes, the results of a randomized spot check suggest that on balance the correction led to a significant improvement.

To mitigate double counting which occasionally occurs in the process of data collection, the author identified establishments with similar company names and employment levels at the same address. Establishments that were on balance larger, older, and active during a more recent year but were located at the same address and had a similar name were made the 'true' establishment while the others were removed. This duplicate identification process was designed to permit some multi-establishment site activity, while still reducing double counting.

As a further quality check on the aggregate employment values, NETS data in the aggregate strongly correlated with the BEA's estimates of employment in foreign-owned affiliates. See Figure 3 in the appendix for this comparison.[4]

B. Response and Explanatory Variables

As stated in the previous section, the response variable in this study is establishment level employment provided by NETS and measures the relative intensity of investment in foreign-owned firms. The data covers the entire lifespan of all U.S. firms that were at any point majority foreign-owned during the period from 1991 to 2011. The primary advantage in using employment as the dependent variable is that it is the most reliable time-series metric available through NETS, functions as a useful 'performance metric' of economic well-being, and in most cases should be directly proportional to the scale of investment.

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[4] For further information on the data cleaning procedures and other quality checks see the Methodological Appendix associated with the Brookings report "FDI in U.S. Metro Areas: The Geography of Jobs in Foreign-Owned Establishments."

The data consists of longitudinal records of single physical locations (plants and offices) at which businesses operate. This study defines foreign-ownership as an establishment with a parent company that is located outside the U.S. that owns more than 50 percent of the business' capital stock. D&B provides data that links establishments to their parent company. This data is collected during systematic reviews of each firm's corporate hierarchy and legal structure. The process involves the examination of 5,000 of the largest global corporate hierarchies, including every family that has more than 250 establishments or $1 billion in annual sales. Alongside this process, additional ownership data is added from third party sources and in the normal course of tracking mergers and acquisitions, divestitures, and bankruptcies.

The basic regression model sets each establishment's employment level as a function of establishment-specific characteristics and location-based controls. While the underlying NETS data is available from 1991 to 2011, given the limited availability of reliable covariates over time, the regression analysis only covers a subset of the data from 2000 to 2011. The location-based controls build from the literature presented in Section III and include measures accounting for business climate, local trade, factor endowments, agglomeration, and source country characteristics. The following section describes each control variable's theoretical significance, expected signage, and pertinent details about how each was constructed. Table 4 in the appendix lists all covariates and their respective sources.

A number of covariates were initially included in the models, but were excluded due to lack of explanatory power and theoretical significance. These included: highway expenditure per capita by state, PK to 12 students per full-time equivalent teachers by county, school revenue per thousand PK to 12 student by county, eighth grade average math and reading scores by state, gross domestic product by metro, funds for industrial R&D by state, patents granted by metro, and international students spending by metro.

1. Establishment-Specific Controls

Establishment-level characteristics influence a firm's ability to grow and add employees. The following section discusses a series of controls of establishment characteristics such as age, headquarters and ownership status, and whether a firm trades internationally. These controls capture vital firm-specific information that can confound macroeconomic research on location-decisions.

a. General Characteristics

Headquarters: Establishments that have branches or divisions and are legally responsible for their activities are considered headquarters and are expected to be larger in size. If the headquarters is more than 50 percent owned by another corporation, it is classified as both a headquarters and a subsidiary.

Age: Establishment age is a count variable that increases according to the number of years an establishment reports as active. Older sites are expected to employ more workers, holding all else constant.

Parent-owned Employment in-State and out-of-State: Subsidiary establishments owned by the same parent company but at different sites are considered 'siblings'. Parent companies have an incentive concentrate subsidiaries in one region before branching outwards to reduce monitoring and logistics costs. As a result, the marginal effect of additional sibling employment in-state should be greater than the marginal effect of additional sibling employment out-of-state. These variables were tabulated by summing U.S. based employment owned by the establishment's parent company in-state and out-of-state (excluding the establishment itself). For establishments without a parent, the value is reported as zero. It is possible to link establishment's to parent company's given the unique hierarchical coding structure embedded in the NETS Database.

b. Ownership Status

Foreign-Owned: As stated earlier, foreign-ownership indicates that over 50 percent of the establishment's outstanding capital stock is held by a party outside of the United States. The foreign ownership binary is time variant and controls for foreign ownership.

Originated as Greenfield or M&A: An establishment is considered originally greenfield if it was foreign-owned in its first year of operation. It is considered M&A if the establishment initially operated under domestic owners before a foreign company acquired it.[5] These time-invariant binaries test if the mode of entry affects the employment level.

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[5] Note, a subset of firms that were foreign-owned prior to the start of the data in 1991 could not be categorized as originating from either greenfield or M&A, and are thus left to the error term.

M&A Event: This identifies the year that a domestic firm transferred to foreign owners. M&A's should have a negative effect on employment given the practice of downsizing that usually accompanies a merger.

Post-M&A Event: All years after the M&A event are controlled using a binary to assess if establishments display a lasting post-acquisition employment effect. The economic reason to isolate the post-acquisition period is to see if firms that have been acquired are smaller due to downsizing.

Years Post-M&A: This study uses a count variable tabulating the years following the M&A event interacted with the post-M&A event control to evaluate if there is a rebounding effect post-acquisition.

c. Global Trade

Exports and Imports: This study uses information self-reported by firms on whether they export or import to examine the growth effects of global trade. This study used the modal trading status over time to remove variability in how establishments self-report year to year. Firms that trade are expected to employ more workers than firms that solely rely on domestic markets.

2. Business Climate

Conventional wisdom dictates that low taxes, tax incentives, flexible labor markets, and low costs-of-doing business play an important role in business attraction and local economic growth. While research mostly affirms these claims, the relative importance and cost of these factors is inadequately understood. This study tests the role of various aspects of business climate by evaluating the effect of taxes, subsidies, labor laws, and general cost-of-living on establishment employment growth and job creation across local areas.

a. Taxes

Domestic Tax Haven: A few states in the U.S. are considered tax havens for their low taxes and minimal incorporation requirements. In particular, the Department of Treasury Financial Crimes Enforcement Network identified Delaware, Nevada, and Wyoming as particularly well-known domestic tax havens. Using a fixed binary, this variable tests if there is any employment payoff (or opposite effect) in firms that operate in these states.

No Income Tax: A number of states cite their absence of an income tax as a selling point when attracting new business. To assess the effect of no income taxes on employment this study uses a binary for income tax free states, which includes Alaska, Florida, Nevada, New Hampshire, South Dakota, Tennessee, Texas, Washington, and Wyoming.

Corporate Income Tax Rate: One of the most important factors associated with business climate is the corporate income tax rate. Using data from a variety of sources, this study tests if time-variant corporate income tax rates for each state have an effect on employment in establishments over time. Some states charge a graduated corporate income tax, in those cases this study applies the highest corporate tax rate available in that state.

Value Added Tax Rate: The most common alternative to traditional corporate income taxes are value-added taxes which charge the purchaser of a firm's goods or services. A few states have opted for this form of taxation including Hawaii, Ohio, Texas, Washington, and Michigan.

b. Subsidies

Establishment Subsidy Value: This study uses data from Good Jobs First's *Subsidy Tracker* to test the effect of state and local government subsidies on job creation in foreign-owned firms. The *Subsidy Tracker* pulls together over 250,000 subsidy awards from over 500 programs in the U.S. using information disseminated through government reports and web pages along with unpublished data obtained through open record requests. The data itself contains the names and addresses of award recipients, which the author merged against NETS utilizing a fuzzy match algorithm that assigns a score reflecting the probability of a match based on the similarity of the corresponding name and address string. Matches with a probability below eighty percent and above one million dollars were manually checked by hand. The subsidy value is held fixed over the subsidy recipient's lifespan.

c. Labor Law

Right-to-Work: Many Western and Southern states prohibit contractual agreements between employers and labor unions that exclude non-union workers or agreements mandate all employees to pay union fees. Business interests frequently lobby for this kind of legislation as a means to, as some proponents argue, enhance labor market flexibility. The following states are right-to-work as of 2011: Alabama, Arizona, Arkansas, Florida, Georgia, Idaho (1995), Iowa, Kansas, Louisiana, Mississippi, Nebraska (1995), Nevada, North Carolina, North Dakota,

Oklahoma, South Carolina, South Dakota, Tennessee, Texas (1993), Utah, Virginia, and Wyoming.

Employed Represented by Union: To account for unionization this study uses BLS data on the percent of employment represented by a union. This data refers to not only union members but also workers who report no union affiliation but whose jobs are covered by a union or an employee association contract.

Minimum Wage: For some firms an important consideration in location decisions are labor costs, which in some industries are affected by relative differences in minimum wage laws. To account for these differences this study uses minimum wage by state. The Department of Labor maintains an archival database of minimum wage laws.

> *d.   Cost of Living*

Regional Price Parities: To gauge the effect of relative price levels on location decisions this study utilizes the BEA regional price parities which track regional prices by metropolitan and non-metropolitan portions of each state from 2008 onward. These regional price levels are expressed as a percentage of the overall national price level for a given year. The price level is determined by the average prices paid by consumers for the mix of goods and services consumed in each region using data from the Bureau of Labor Statistics' Consumer Price Index program and the Census Bureau's American Community Survey. The price index was held constant for years prior to 2008.

> 3.   Vertical-Factor Seeking:

Many firms base location-decisions on relative factor endowments. One of the most important components in a region's industrial commons is the quality and supply of labor across industries. To evaluate the relative importance of labor inputs on establishment employment concentration and growth, this study uses a number of variables measuring the supply, compensation, and education levels of a region's incumbent workforce.

> *a.   Labor Factors*

Employment: To measure the effect of a local industry's labor supply on establishment employment levels, this study utilizes the Bureau of Labor Statistic's Quarterly Census of Employment and Wages (QCEW) as reported by Moody's Analytics. This data quantifies the

establishment level employment effect of varying degrees of labor abundance across places and industries. Industries with more workers are more likely to exhibit robust labor markets as wells as agglomeration benefits and should therefore demonstrate better growth prospects. This measure also controls for the macroeconomic performance in the regional economy. The data are reported at the NAICS four digit level for each metropolitan, micropolitan, and rest of state area.

Compensation per Worker: To test relative workforce skill-levels across industries and places, this study uses compensation per worker derived from Bureau of Labor Statistic's QCEW data series as reported by Moody's Analytics. While compensation per worker is not the perfect measure of skill (and in fact could be alternatively interpreted as worker cost), it should roughly approximate the skill-intensity of the labor-shed serving a particular industry. This is reported at the sector and NAICS4 level (depending on regression) and same geographic aggregation as employment.

b. Human Capital

Residents with Bachelor's Degrees: Human capital plays an important role in the growth prospects of a local economy and may directly affect the employment growth patterns within establishments. The measure used in this study to control for human capital is the total number of residents in each state who have completed schooling at or above the bachelor's level according to the Census American Community Survey as reported by IPUMS.

Bachelors and Post-Bach. Degrees and Certificates Conferred: Another component in a region's human capital system pertains to the capacity of a metro's higher education system to produce more educated workers. Using the Integrated Postsecondary Education Data System (IPEDS), this study tabulates the total number of awards conferred that normally require at least four years of full-time equivalent college-level work or at least one or more years of work beyond the bachelor's degree including doctoral degrees and first professional degrees. This measure reflects the flow of human capital from the education system to the labor market.

4. Horizontal-Market Seeking

Another driver of firm location-decisions are the sales opportunities that come from locating near a thriving consumer market. Regions that are larger and wealthier have more disposable income, and as a result represent a strategic opportunity to expand business for foreign companies. This study looks at an area's wealth and population to test the appeal of both metropolitan and state consumer markets.

a. Local Market Potential

Local Serving Industry: For establishments in consumer-oriented industries, horizontal market seeking motivations play a greater role in location decisions and thus the scale of their operations should more directly relate to the local market's consumption capacity, holding all else constant. To isolate these industries the author identified forty NAICS three digit industries involved in utilities, construction, wholesale, retail, transportation and warehousing, real estate, administrative support, education, health care, entertainment, accommodation, repair, and personal care.

Personal Income per Capita: One measure of a local markets consumption capacity is personal income per capita, defined as income received by all the persons who live there, including wages, salaries, and contributions from government. This value is reported by the Bureau of Economic Analysis and is tracked in this study at both the state and metropolitan levels.

Population: Another measure of a local consumption capacity is the number of individuals who reside in an area. This variable uses data from the Census Bureau's midyear population estimates at both the state and metro level.

Population and Local Serving Industries: Since local serving industries must locate near population centers, the effect of population should be higher for these establishments. Thus, a significant and positive interaction term suggests that horizontal market seeking motivations may be more of an industry specific phenomena.

5. Horizontal and Vertical-Trade Platform

Firms that combine horizontal and vertical motivations in their location-decision are said to be using regional assets and location as a way to expand into nearby markets, otherwise known as export-platform FDI. These assets include local transportation infrastructure, logistics and trade networks. This study uses metropolitan-level estimates of domestic and international trade flows to account for the level of global trade integration in a particular place and its suitability as a trade platform.

Outflows and Inflows: Establishments in local areas with higher outflows to other domestic markets may be better situated to further their domestic reach. This study uses a measure of metropolitan domestic goods flows from the Freight Analysis Framework and Brookings Freight Series to measure goods sold to and from other domestic markets in 2010 at the local level. Given that the data is only available for one year this is a time-invariant metric held constant over the entire series.

Exports and Imports: In addition to domestic flows, this study controls for goods sold to and purchased from international markets in a particular local area. Establishments in areas with more international outflows may be larger in scale given the opportunity to utilize their location's business and infrastructure networks to access customers overseas.

6. Agglomeration and Information based Assets

Establishments that locate in industry clusters and urban areas are said to have greater access to shared knowledge assets and are more likely to exchange technical expertise with other enterprises. These assets derive from industrial specializations and the flow of workers and knowledge spillovers between industries and universities. Using a number of controls, this study evaluates if concentrated industrial activity which is commonly associated with more competitive economies and richer industrial commons, translates into direct positive employment growth within establishments.

a. *Agglomeration*

Industry Specialization: One way to account for industry clusters is through the use of location quotients, which compare an area's employment concentration in a particular industry to the national average. Firms in industries with above average location quotients are more likely to experience the positive benefits of agglomeration and should thus display a positive relationship with employment. This measure was calculated by the author utilizing the local area employment data at the NAICS four digit level referenced earlier.

Foreign-Owned Establishment Industry Employment: When firms make location decisions they sometimes copy the decisions of first-movers or rival firms. This behavior can create an observable herding or 'follow-the-leader' effect. To examine the validity of this phenomena, this study tracks the total employment in foreign-owned establishments in each establishment's local

area (excluding the employment at that establishment site). A positive and significant result suggests the presence of bandwagon-style network effect among foreign firms consistent with the Hotelling model.

Metropolitan Location: To test the effect of urban agglomeration on the scale of employment in foreign firms, this study uses a binary indicator to control for establishments located in metropolitan areas.

b. University Assets

Higher Education Research & Related Expenses: A common feature in dynamic local economies is the presence of large research universities. This study utilizes data from IPEDS that measures the total expenditures on research including institutional and academic support, and operations and maintenance to evaluate the effect of university research activity. Local areas with a more active university research system may enjoy larger technology spillovers on local firms, which may manifest in increasing employment levels.

Higher Education Revenue from Private Grants and Contracts: Another way to evaluate the effect of universities on private firms is to assess the degree of revenue generated from the private sector at universities. Private revenue is defined as the total revenue received from private donors and contracts for specific services provided to the funder. This may include gifts, grants, and contracts that are directly related to instruction, research, public service, or other institutional purposes. Places with more market oriented institutions may have a higher degree of technology transfer and public-private sector collaboration and funding, which could lead to spillovers in establishments located in those areas.

Flagship University: Another measure of university assets is if a local area has a flagship institution. Flagship institutions are either the oldest campus in a state's higher education system, or it can simply mean it is a large and better-known campus. Each state has only one flagship institution. While flagship universities may not play a direct role in establishment growth patterns, they represent a location-based asset that may help foster a competitive regional economy.

7. Source Country

Characteristics pertaining to source countries such as their wealth, business climate, and trade volume have the potential to influence the scale of foreign investment that its companies pursue. For instance, countries with higher tax burdens or trade barriers could drive its home

firms to other markets such as the United States. Given the limited availability of source country data, these covariates are only featured in one set of regressions.[6]

a. Income

GDP per Capita: The relative wealth in an investor country may affect the likelihood of firms to expand abroad and locate employment in the U.S. This study uses gross domestic product divided by midyear population (in constant 2005 U.S. dollars) using the World Bank and OECD National Accounts data to account for country wealth effects.

b. Business Climate

Labor Tax & Contribution Percent of Profits: Some firms may locate employment in the U.S. to avoid labor taxes in their home country. To evaluate if increases in labor taxes abroad drive business to invest into the U.S. this study uses labor tax contributions as a percent of commercial profits, which covers the amount of taxes and mandatory contributions on labor paid by businesses from the World Bank's Doing Business project.

Profit Tax Percent of Profits: Another important business climate measure is the tax of profits paid by a business. Like labor taxes, profit taxes may drive foreign firms to locate employment in the U.S. if the rate in their home country is higher relative to the U.S. Profit taxes are taken as a percent of commercial profits and are reported by the World Bank's Doing Business project.

c. Trade

Distance from Source Country: The author calculated rough distances between the site of each establishment and the distance to its parent company's home country using a basic longitudinal-latitudinal distance calculation. This measure tests if physical distance plays a role in location

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[6] Source country data was acquired directly from D&B and includes all available location information on foreign headquarters of NETS establishments in the data series. Since D&B does not archive historical data, this universe of foreign headquarters consists of establishments reporting as active in 2013, the time when the data was acquired. Using this technique, over 94 percent of NETS establishments in 2011 had a matching foreign headquarters, however this match rate falls the further back an establishment reports in time. A number of factors contribute to missing records including suppressions from non-responses to survey inquiries, privacy requests from firms, or data quality concerns. In any event, it is unlikely that the lack of coverage disproportionately affects one country more than another, so the relative composition of foreign ownership by country of origin should remain unaffected. The source country data was only applied to a subset of the regression models.

decisions. Distance may explain the concentration of foreign investment in the east coast given its proximity to European markets.

Container Cost to Export: Non-tariff trade barriers such as transportation costs play an important role in a firm's ability to export to foreign markets. Higher trade costs create an incentive for firms to substitute exports with investment. One measure of trade costs are the fees levied on 20-foot containers. These fees include costs for documents, administrative fees for customs clearance and technical control, customs broker fees, terminal handling charges and inland transport (and excludes tariffs or trade taxes). Countries with higher fees on container shipments should display a positive employment effect in their U.S. establishments, suggesting a substitution effect between foreign investment and exports. For more information about this measure see the World Bank's Doing Business project.

Trade Percent of GDP: To assess the relative complementarity and substitutability between foreign investment and exports, this study uses the sum of exports and imports of goods and services measured as a share of gross domestic product for each country. If the coefficient is positive it suggests a complementarity between trade and foreign investment and if negative it suggests a substitution effect. The source of this data is the World Bank OECD National Accounts data files.

Manufacturing Value Added Percent of GDP: Manufacturing accounts for the largest share of foreign-owned establishment employment in the U.S and thus countries that are more manufacturing intensive could be more likely to employ more workers in the U.S. If this results in a positive coefficient it suggests that firms are investing horizontally into the U.S. For this measure, manufacturing refers to industries belonging to International Standard Industrial Classification divisions 15 to 37. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. The source of the data is the World Bank and OECD National Accounts data files.

8. Industry and Geography Controls

Two sources of variation in establishment employment over time result from the establishment's location and industry. To account for time independent fixed effects of industry and geography, this study uses the NAICS four digit industry data and geographic data for states and combined statistical areas (metropolitan areas).

Industry Effects: NETS contains industry classifications at the six-digit North American Industrial Classification System (NAICS) and eight-digit Standard Industrial Classifications (SIC) levels and records these each year. To control for industry fixed effects, this study uses binaries for each NAICS four digit industry. To ensure that the establishments' reported industry stayed constant, each establishment's industry was based on their modal industry across time, with preference given to the most recent industry in cases of a ties.

Metropolitan, Micropolitan, and Rest of State Effects: To control for metropolitan fixed effects, this study uses binaries for each combined statistical area in the U.S. The delineations are formulated by the Office of Management and Budget (OMB) in 2009. There were 366 metropolitan areas in 2009 and hundreds more micropolitan areas. Areas not defined as either a metropolitan or micropolitan area are grouped into regions covering the rest of state territory.

State Effects: To account for state effects emanating from the different political, administrative, and institutional makeup across places, this study uses a binaries for each state and the District of Columbia.

C. Summary Statistics

Considering the role of these covariates in establishment size and growth patterns, Appendix Table 5 and 6 report average establishment characteristics across NAICS two digit sectors and states. The largest establishments that were at one point foreign-owned over the past decade tend to concentrate in the manufacturing sector where the average size was well over one hundred employees, utilities tend to generate the most revenue, parent companies with establishments in finance, retail, and extractive sectors tend to spatially concentrate their subsidiaries, establishments in manufacturing, wholesale trade, and professional, scientific and technical services tend to receive the largest subsidies, manufacturing establishments are most likely to self-identify as exporters, and information and professional, scientific, and technical services tend to concentrate in metros with higher compensation per worker, more population, and more research expenditures in local universities.

Across states there is less variation than industries in the aggregate establishment averages. Generally the southern region of the U.S. displays a more attractive business climate with Kentucky and Tennessee offering the highest subsidy averages, almost all southern states charge below average corporate income tax rates and have less stringent labor regulations as measured by minimum wage and share of employment represented by unions. Coastal, northeastern, and states with highly populous metropolitan areas tend to display the reverse with

notably higher regional price parities, higher taxes, and more stringent labor laws. On the other hand, these places export more, contain higher levels of human capital as measured by bachelor's attainment, and pay higher compensation per worker. These stylized facts are generally consistent with the anecdotal understanding of the differing business and economic conditions across the U.S.

V.   Model and Results

A. Models

There are two sets of regression models in this study. The first set is cross-sectional and examines the effect of location-based determinants on employment-intensity in foreign-owned establishments during their first year of foreign-ownership. The purpose of this regression is to isolate the effect of covariates on site selection decisions. The second set of regressions is time variant cross-sectional and evaluates the effect of location-based determinants on the varying investment intensity as measured by employment in establishments over time. This regression sheds light on the effect of location-based factors on growth in foreign-owned firms.

The reason for using two models is that some determinants may drive investment and spur firms to locate more workers in a particular place, but have an entirely different effect on employment growth over time. For instance, parent companies may initially situate firms in a region because its other foreign-owned firms also locate in that area in a way consistent with a herding effect, but those firms may not grow as rapidly as firms that enter a region with fewer competitors. Taken together these regressions broadly assess the relative explanatory power of different determinants at different stages in an establishment's lifecycle.

The econometric approach uses mixed models that apply random effects and fixed effects across different combinations of industries and places. Mixed models are a useful way to test data with repeated observations for individuals within clusters, which in this case are establishments across time within places and industries. The advantage of a mixed model is that it combines both fixed and random effects estimators, allowing a test that controls for unobserved heterogeneity between industries, states, or metros while at the same time using the more efficient random effects estimator that assumes the unobserved establishment-specific effects within the clusters are uncorrelated with independent variables. A mixed model is preferred over a model that controls for establishment-specific effects because such a model would over-fit the data given that there are tens of thousands of establishments in the sample. Instead, the mixed model strikes a balance; it controls for group specific effects between places and industries, while avoiding overfitting that could lead to bias and less practical insight into the coefficients of

interest. The models in the regressions include a random, metro, state, metro-state, industry, and industry-state effects. All of the models include time-effects to control for macroeconomic fluctuations.

The study performs a number of diagnostic tests on the regression models in order to validate their results. The Breusch-Pagan Lagrange Multiplier tests found no evidence that error variance across all establishments was zero, suggesting that there is indeed a panel effect. The Hausman test rejected the null hypothesis that random effects alone is a more efficient than models with fixed cluster effects for industries and places. Wald tests also rejected the null hypothesis that fixed effect coefficients across industries and places are not jointly equal to zero. The Breusch-Godfrey test for serial correlation found that the residuals were weakly correlated with the lagged residuals. Lastly, the residual versus fitted plots failed to detect non-linearity or unequal error variance; the plots were moderately well-behaved and demonstrated the 'random bounce' and horizontal band around zero associated with constant error variance. Due to the size of the dataset it was not computationally possible to test the presence of panel-level heteroskedascity using an iterated GLS-likelihood ratio approach so one model was estimated using robust standard errors as a precaution.

B. Results

Overviewing the regression results, the first set in Table 7 which examined only the year of investment, covered 151,142 establishments and 80,287 establishments in the regressions containing investor country characteristics, hence the two regression sets.[7] The second set in Table 8, examined the entire establishments' lifespan including years under domestic ownership. This regression covered 1,026,137 establishment-year observations, combining eleven years and 125,689 establishments. Most of the analysis uses models that restrict the sample to establishments that employ ten or more workers on average for a number of reasons. This is primarily due to computational considerations, but also justified by the fact that establishments with ten or more workers account for the bulk of employment and economic activity in the U.S. and thus are the primary population of interest. In any event, the first model in time-series regression sets includes all establishments and displayed insignificant differences with the random effects model that excludes firm with less than ten employees on average.

Each set of regressions includes mixed models controlling for different combinations of fixed effects across industries, metros, states, and time. In both the year of investment and time-series regressions the model with the highest explanatory power controlled for industry and state

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7 After running regressions 1a, 2a, 3a, 4a in Table 7 with the sample from regressions 1b, 2b, 3b, 4b containing the investor country characteristics, the coefficients magnitude, sign, and significance were not noticeably different, suggesting that sample used in the (b) regressions is unbiased.

effects, which had an overall R-squared of 12.16% in the moment of foreign investment regressions and 10.14% in the time-series regressions. Table 7 and 8 show all the regression results. The following section will focus on the consistency of the results across the various specifications, report significance and if results match expected signage, and discuss what insights can be taken, if any, from the within and between effects regressions.

Establishment characteristics proved to be most important determinants on the intensity of investment as measured by employment levels in foreign-owned firms. The establishment's age and status as a headquarters and as an international exporter/importer exhibit a positive and statistically significant effect on static levels and growth and provides consistent results across the various specifications. Holding all else constant, establishments that are headquarters employ 37 to 42 workers and establishments that trade in global markets employ nine to twelve more workers. Because firms that belong to large multinational corporations are more likely to engage in trade, a greater multinational presence may explain part of this effect. A related finding is that companies are much more likely to locate high-employment establishments in states where they already operate. An establishment is expected to employ two to three more workers for every thousand workers that its parent company employs in the same state, compared to a rate of one-half to one more workers per thousand that its parent employs in a different state. This finding indicates a strong clustering effect among subsidiaries of the same parent company and shows that the performance of subsidiaries within the same market are related to one another.

The regressions also quantify the effect of foreign-ownership on employment, which is small, positive, and significant. Caution should be taken to not interpret these results as evidence that foreign ownership is substantively different from domestic ownership given that the dataset is heavily censored and only samples the universe of firm that were at one point foreign-owned.

With respect to the mode-of-entry, establishments originating as a greenfield investment appear to display no systematic pattern in relative employment levels, however, firms that became foreign-owned through a merger or acquisition are usually around ten to eleven workers smaller in size relative to firms foreign-owned firms originating before 1991, holding all else constant. At the moment of foreign acquisition, establishments usually experience a relatively small, but significant negative effect from M&A. This decrease is offset after a merger takes place as establishments display a slight, but positive rebounding effect each year post-acquisition. These results are largely consistent with the expected negative downsizing effect of mergers, but seem to offer preliminary evidence that on balance firms improve in the years following an ownership change.

The next set of covariates represent business climate. In Table 7 all taxation measures and the minimum wage were not found to have a significant effect on the level of foreign investment as measured by employment. However, one area where there was an effect was in terms of right-to-work laws and unionization. Contrary to expectations establishments locating in right-to-work states tended to be smaller in size. The coefficient actually becomes more negative after controlling for state effects and the significance disappears after controlling for investor country characteristics. Also, unionization has a significant negative effect, however the fact that the coefficient becomes more negative after controlling for state effects suggests that states with more unions also display more unobserved pro-business characteristics that offset the true negative effect of unionization. In fact in the time-series regression, unionization has either a positive effect within industries or a weak effect on the scale of investment in establishments.

By and large the business climate covariates were not found to have a consistent effect on the intensity of investment over time in Table 8 and in most cases displayed signs contrary to expectations (with the exception of value added tax rates, subsidies, and regional price parities). Because the business climate covariates are mostly reported at the state level, the regressions containing state fixed effects quantify the employment change in establishments that moved across state lines or that occurred within states over time, serving as a quasi-experiment. The results show that establishments in states without an income tax actually lost employees, but gained employees from locating in states with lower value-added taxes. The rest of the state level business climate variables displayed no significant effect in the state effects regressions.

In Table 8 the taxation measures accounting for domestic tax havens and corporate income taxes, and unionization had significant results in the random and industry effects time-series regressions. However, they all displayed opposite the anticipated sign. These counterintuitive results indicate that within and between industries the investment intensity decreases in states that are domestic tax havens, increases in states which charge higher corporate income tax rates, and increases in states with a higher percentage of workers represented by unions. Moreover, these odd results seem to run against the view that higher taxes and unionization hurt business attraction.

Further, there was no evidence that minimum wage laws or the presence of right-to-work laws spurred increased investment or drove employment changes in either the site selection or time-series regressions (with the exception of the Table 7 regression (1b) which did not control for either state or industry effects). The cost of living as measured by regional price parities at the metro level had a significant negative effect within and between industries, but the effect was lost after controlling for state effects. Generally speaking, this empirical work, while largely

inconclusive, challenges the view that low taxes and lax labor laws entice firms to increase the scale of investment in their foreign-owned establishments.[8]

Despite these inconclusive results, one measure associated with business climate that did have a positive consistent effect across all fixed effects specifications was the value of subsidies received by an establishment. For every million dollars in subsidies, establishments gained slightly less than two employees, holding all else constant (one to six employees in the site selection regression). While there may be a set of uncontrolled characteristics that make subsidized firms more likely to add employees, this result suggests that there is indeed a detectable 'job creation effect' associated with subsidies. Because the effect of subsidies is relatively small, this finding raises questions about the marginal benefit of tax incentives as a tool to increase the size of investment and create jobs.

With respect to vertical-factor seeking motivations, the scale of investments as measured by establishment employment responded most strongly to measures reflecting the quality and quantity of each industry's labor force. These results had expected signs and were significant across the all of the fixed effects models in Table 8's time-series regressions. Measures accounting for industry employment had a significant positive effect over time, suggesting a benefit from locating near a large incumbent workforce in the establishment's primary industry. Compensation per worker was also highly significant and positive and conveys a direct link between workforce skills and the scale of investment as measured by employment growth. While these coefficients remain small, they have a detectable effect and suggest that local macroeconomic conditions impose a real and positive effect on employment growth in firms, especially when the cumulative employment effect across the economy is taken into account. In the case of labor factors, Table 7's site selection regressions presents a slightly more complicated picture with compensation per worker exerting a negative effect within states and between metros, yet that effect reverses after controlling for both states and industries.

The vertical-factor seeking covariates also control for a number of human capital measures including educational attainment of residents and number of degrees conferred by local universities. Both measures display a faint but statistically significant relationship with employment in the random effects and within industry regressions in Table 8, but do not display significant results after controlling for within metro or state effects. The loss of significance suggests that unobserved state and metro characteristics that are correlated with human capital

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[8] In the site selection regressions, the most significant taxation and labor law covariates were the right-to-work and unionization measures. Both of these measures displayed consistently negative effects across the various specifications; showing that while unionization may have a negative effect on investment being a right-to-work state also does not lead to higher employment levels in foreign-owned firms.

better capture the true relationship. Another explanation for the faint effect of human capital is that these measures change very gradually over time, particularly relative to changes in establishment employment making the relationship difficult to detect. A final explanation for the weak effect is that there is relatively less variation in the human capital between states in the U.S. relative to variations between countries. As a result, human capital could matter more in the global context. Overall, these findings suggest that while human capital quality may be important for long-term growth, variation in the measures of bachelor's attainment and degree conferral within the U.S. appears to have a weak effect on employment-related investment in establishments, however more work is needed.

Another motivation driving the investment intensity of foreign-owned firms are horizontal-market seeking factors which account for the sales opportunities in a given market. This study utilized population, average personal income, and an interaction between a binary representing local serving industries and population. These variables were evaluated at both the metropolitan and state geographic level. In both the site selection and time-series regressions, the local industry-population interaction effect put significant positive pressure on investment at both the metro and state level and across most fixed effects specifications (in both Table 7 and 8), lending strong support to the view that market capacity drives the number of employees in firms, holding all else constant. The magnitude of the state level interaction effect is slightly larger than the metro level interaction effect, suggesting that investors put greater emphasis on the demand of an area beyond the local market when deciding the employment intensity of their investment. At the state level average personal income of residents had the largest coefficient, however this variable was not statistically significant in the site selection regressions. This may indicate that potential investors do not factor average disposable income of the location surrounding their investment, but after investing it plays a role in retention and expanding employment.

When an establishment locates in a particular area to access factor endowments *and* to use that location as a base from which to trade to nearby foreign markets it is said to be exhibiting export platform motivations. To test the relationship between how much a region trades and the presence of higher employment levels in its foreign-owned establishments this study uses domestic and international trade flows data for each metro area from a Brookings analysis of the Freight Analysis Framework. The results suggest that while there was little to no 'export platform' effect in the regressions evaluating the moment of foreign investment except an effect of exports within states and between metros, there was a significant positive effect for exports and a negative effect for imports in the time-series regressions.[9] This finding is consistent with

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[9] In the site selection regressions controlling for between and within state effects, metropolitan export had a positive and statistically significant effect, however this disappeared after controlling for industry variation.

theoretical expectations associated with the export platform framework and shows that places that export goods are more likely to host larger foreign establishments. Said differently, "metros that make" attract bigger firms than "metros that take."

Another area of investigation pertains to the relationship between agglomeration and the scale of employment-related changes from investment. To approximate the effect of industry clusters this study uses a location quotient. The results reveal a slight positive effect associated with higher levels of local employment specialization in the establishment's primary industry in both the site selection and time-series regressions (the magnitude was also stable and did not vary across fixed effects specifications). This effect could be interpreted as a performance dividend from collocating near an industry cluster.

This study utilized metro employment in other foreign-owned establishments to detect if there is any presence of a network effect among foreign firms. In the moment of foreign investment regression there appears to be evidence of a positive network effect, suggestive of a herding or follow-the-leader relationship. However, that effect becomes negative in the time-series regressions which suggests the direct opposite; that there is a crowding-out effect over time. These seemingly contradictory results may be consistent with Hotelling's law which observes that it is rational for producers to minimize product differences such as location even though that may adversely affect total potential sales in the long run. Finally, there was a positive and a detectable "urbanization" effect from locating in a metropolitan area in the site selection regressions using industry effects, but the effect becomes negative in the time-series regressions using state effects. While there is no clear explanation for this reversal, however controlling for industry does seem to absorb a lot of the negative effect.

The last set of variables test the role of intangible information-based assets such as higher education research expenditures, the presence of flagship universities, and higher education revenues from private donors. The models find mixed evidence for these measures. In the time-series regressions there was no effect of higher education research expenditures, however higher education private revenues and the presence of flagship universities had a significant negative effect, opposite the theoretical expectations. In the site selection regressions using within industry effects, education research had a negative significant effect, while private revenue and locating in the same metro as a flagship university had a weak positive effect. Moreover, these contradictory results make it difficult to draw conclusions about the role of university research and industry engagement on the intensity of investment in foreign-owned firms. It is likely that there are better measures of information-based assets than these covariates.

The source country variables produced some evidence of a relationship with investment intensity in the site selection regressions to which they were incorporated. Parent firms in countries with higher trade and manufacturing value added as a percent of GDP were more likely to locate more workers in their U.S. establishments as the results were robust across each fixed effects combination. After controlling for the establishment's industry, the magnitude of these seem to diminish somewhat but not enough to remove the effect. In the standard OLS and state effects regressions, increased distance between the parent companies and their U.S. based subsidiary had a significant negative effect however that disappeared after controlling for industry. There was a strong positive relationship between the profit tax in the source country and the intensity of investment in their U.S. subsidiaries, which decreased more after controlling for unobserved industry variation than unobserved state variation. Holding industry constant, the cost to export a container was positively related with the number of employees in a parent firm's U.S. subsidiary. This result suggests that in some cases FDI may be a strategy for reducing the transportation costs of shipping goods exports to the U.S. Lastly, the wealth of a country and the level of taxation on workers did not offer substantial evidence of a relationship with source country labor taxes providing opposite the theoretically expected sign and GDP per capita providing insignificant results.

VI.   Conclusion

The main finding is that the most important drivers of the scale of investment as measured by employment levels in firms are establishment-specific characteristics, vertical factors pertaining to local labor supply and wages, local industrial specialization, business attraction subsidies, market size, and investor country characteristics pertaining to manufacturing and trade propensity. Interestingly the measures accounting for business climate, human capital, and local information-based assets were not as significant nor robust across various specifications nor fully in line with theoretical expectations. While more research is needed, these results suggest that the effect of business climate and human capital development on immediate job creation and the size of investment may be somewhat overstated. While these measures may play a role in the long-term growth of regional economies and overall capacity for growth or even in the global context, there does not appear to be strong statistical support for a direct role in foreign-owned firms in the U.S. over the last ten years.

There are a number of limitations to the model and results. First, the results have somewhat narrow applications since the study's universe of establishments is limited to firms that were at one point foreign-owned. This is a major censoring and truncation issue that limits the generalizability and scope of this study's findings. Ultimately, this limitation makes the analysis

more exploratory in nature than a pure empirical test of the location patterns of foreign-owned firms relative to their domestic counterparts. Additional data sampling non-foreign-owned domestic establishments would enable the study to speak more generally to the underlying drivers of employment growth in firms and whether location decisions are any different for domestically-owned firms as they are for foreign-owned firms. In addition, a broader sampling universe would better isolate the effect of foreign-ownership, especially in the case of mergers and acquisitions and could reveal how domestic firms respond to foreign takeovers and if there are any systematic similarities between firms that are eventually acquired. The inclusion of an identification criterion to control for multinational corporate owners and scale economies would also help to assess the differences in investment patterns across establishments.

Another weakness is in the finding pertaining to business attraction subsidies in that it fails to take into account the selection bias within the universe of establishments that receive subsidies and the counterfactual about what would have happened had the firm not received the subsidy in the first place. A further limitation due to the exclusive focus on within-host differences is that the role of covariates that are relatively less variable in the domestic context could be understated. This is particularly true for human capital and business climate, which vary more significantly on a country to country basis, and should by extension play a larger role in the global decision making of foreign investors.

Despite these drawbacks, the advantage in evaluating employment intensity in the limited context of firms that were at one point foreign-owned is that the location decisions of foreign multinationals may reflect a site selection calculation based more on due diligence and economic fundamentals than hometown preference. As a result, in surveying the location determinants in this study one can better understand what matters to sophisticated and objective international investors and could lead to broader insights into the drivers of investment and job creation more generally.

Future research should continue to investigate the questions raised in this study. There are a number of additional covariates that were not tested and that could yield further insight including data on physical infrastructure, supply chain networks, improved source country data, various interaction terms, and foreign parent characteristics that distinguish vertical from horizontal foreign investment. For instance, future work could create an index of industrial similarity between the NAICS code of parents and subsidiaries in order to control for the relative "horizontalness" or "verticalness" of the investment. Another improvement would be to further test the effects of information-based assets using covariates from the OECD REGPAT database which reports patenting microdata classified by companies, technologies, and metropolitan areas

or the Leiden University Centre for Science and Technology bibliographic citations database containing the number of academic publications that feature collaborations between university and private sector researchers.

Given the research potential provided by the NETS database, a number of related research questions should be explored in future work. More research is needed to understand what happens to firms following an M&A event and whether FDI is a net-positive source of job creation. A Kaplan-Meir survival analysis with cumulative hazard ratios are potential ways to evaluate the probability of a closure or layoff event following a merger. General summary statistics aggregating year-to-year changes across establishments over time may also help quantify cumulative net job impacts of FDI.

With this data it is also possible to test the probability that a firm becomes an exporter after being acquired by a foreign investor using a logistic regression approach. And given the ability to track establishment relocations it is also possible to evaluate the effect of different states on firms that changed locations. Finally, future research should continue to investigate FDI at lower levels of aggregation using covariates at the block and sub-metropolitan scale, especially to test variation in utilities costs or measures of internet connectivity and penetration.

While it is still too early to prescribe urgent policy actions, the most significant implication from this exploratory research is that a "back to fundamentals" approach that leverages workforce skills, industrial specializations, and local market capacity may represent the most empirically-grounded strategy to attract and foster growth in existing foreign-owned establishments. Although a large portion of the variation is unexplained in the econometric model, the theoretically inconsistent or weak effects of business climate, information-based assets, and human capital suggest that more research is needed in understanding how these conditions attract international investment and their role in driving the size and growth in establishments receiving foreign investment. Again, due to the exploratory nature of the study further work is needed to assess the robustness and reproducibility of these results. At a minimum, this research should help inform future work as it offers as an exhaustive look into possible location determinants and the strength of their relationship with the employment in foreign-owned establishments over the past ten years.

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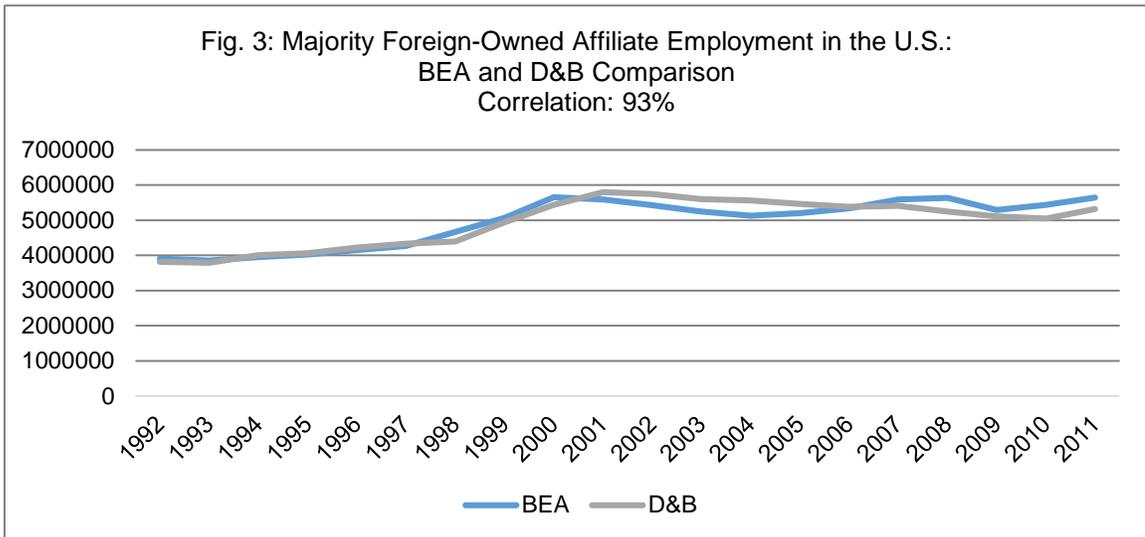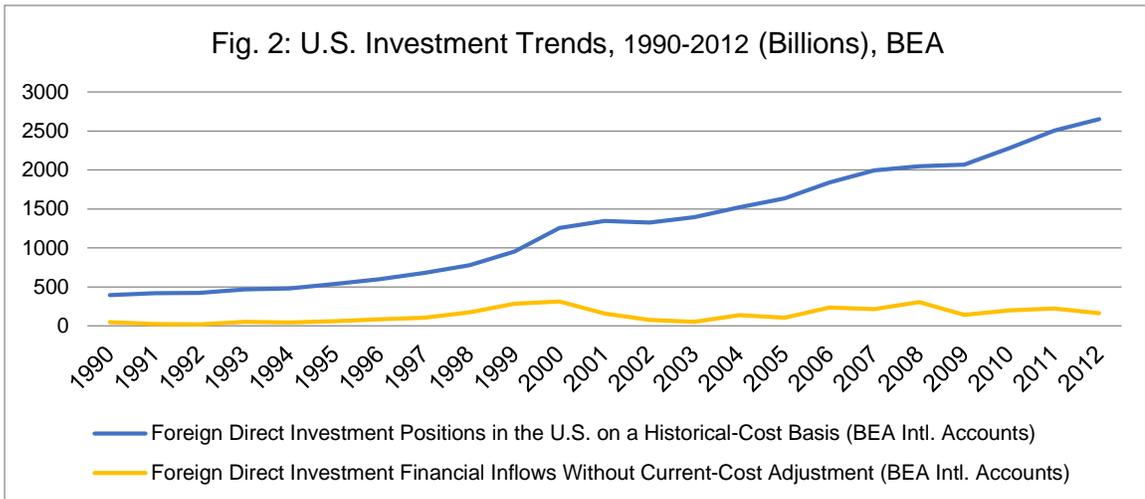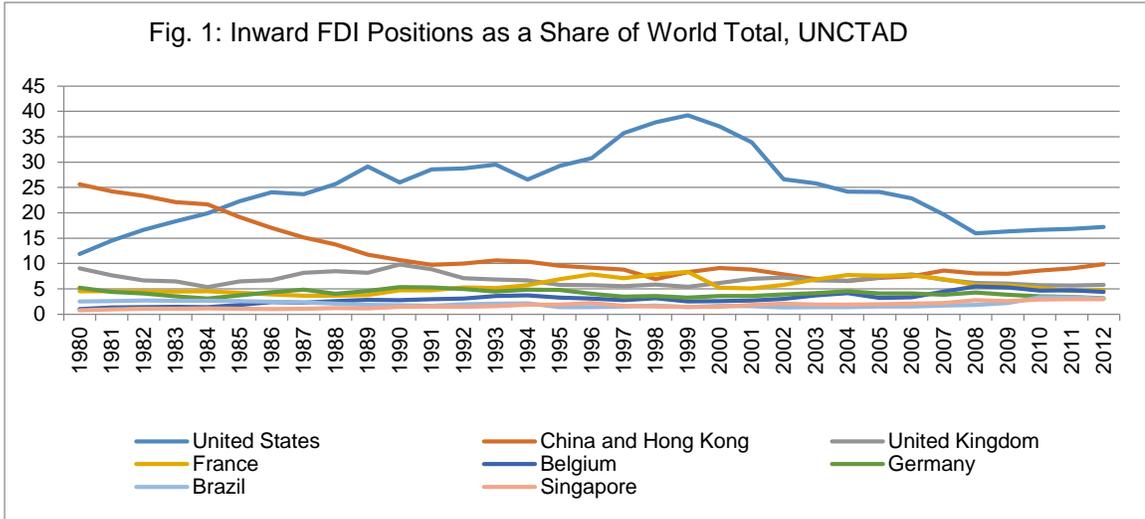
Fig. 1: Inward FDI Positions as a Share of World Total, UNCTAD

Legend:
- United States
- China and Hong Kong
- United Kingdom
- France
- Belgium
- Germany
- Brazil
- Singapore

Fig. 2: U.S. Investment Trends, 1990-2012 (Billions), BEA

- Foreign Direct Investment Positions in the U.S. on a Historical-Cost Basis (BEA Intl. Accounts)
- Foreign Direct Investment Financial Inflows Without Current-Cost Adjustment (BEA Intl. Accounts)

Fig. 3: Majority Foreign-Owned Affiliate Employment in the U.S.: BEA and D&B Comparison
Correlation: 93%

- BEA
- D&B

Table 1					
	Majority-Owned Affiliates, 2011				
Country Name	**Employment (ths.)**	**Share of FDI Employment (%)**	**Share of Employees Engaged in R&D (%)**	**Compen-sation (mil. $)**	**Compen-sation per Employee**
All countries	5640.7	100.0%	2.9%	437897	77632
United Kingdom	943.5	16.7%	2.6%	70287	74496
Japan	686.6	12.2%	2.8%	53799	78356
Germany	581.3	10.3%	4.4%	52068	89572
Canada	546.9	9.7%	0.6%	36230	66246
France	524.4	9.3%	3.8%	41377	78904
Switzerland	446.3	7.9%	5.1%	43670	97849
Netherlands	399.8	7.1%	2.3%	28506	71301
Sweden	190.4	3.4%	1.2%	11628	61071
Ireland	166.9	3.0%	5.9%	16499	98856
Belgium	160.8	2.9%	0.6%	6812	42363
Italy	120.7	2.1%	5.8%	8511	70514
Australia	85.0	1.5%	0.5%	6518	76682
Spain	81.4	1.4%	0.6%	5875	72174
Other Europe	78.7	1.4%	1.7%	5204	66125
Brazil	76.1	1.3%	0.1%	3733	49054
United States	71.1	1.3%	4.2%	5992	84276
Mexico	54.7	1.0%	2.9%	3441	62907
India	45.1	0.8%	0.4%	2928	64922
Other W. Hemisphere	41.4	0.7%	0.4%	4258	102850
Singapore	36.9	0.7%	3.5%	2236	60596
Bermuda	36.9	0.7%	0.3%	5889	159593
Other Asia and Pacific	36.2	0.6%	0.6%	2124	58674
Korea, Republic of	32.3	0.6%	4.3%	2681	83003
Denmark	28.6	0.5%	4.2%	2592	90629
Finland	26.2	0.5%	10.3%	2792	106565
Israel	22.6	0.4%	6.6%	1966	86991
Caribbean (UK)	21.6	0.4%	11.1%	1831	84769
Hong Kong	21.3	0.4%	1.9%	1425	66901
Taiwan	14.4	0.3%	2.8%	1270	88194
Other Middle East	14.3	0.3%	2.1%	1013	70839
China	13.2	0.2%	11.4%	921	69773
United Arab Emirates	10.5	0.2%	5.7%	800	76190
Other S. and C. America	*7.6*	0.1%	1.3%	1016	*134048*
Saudi Arabia	6.8	0.1%	8.8%	840	123529
Venezuela	*5.0*	0.1%	0.0%	673	*134048*
South Africa	4.9	0.1%	2.0%	*464*	*94615*
Other Africa	0.3	0.0%	0.0%	*28*	*94615*
Source:	Authors analysis of BEA Financial and Operating Statistics Table II.F2				

Table 2								
Industry Title	**Majority-Owned Affiliates, 2011**					**Affiliates with Assets, Sales, or Net Income (or Loss) Greater Than $15 mil., 2011**		
	Employ-ment (ths.)	**Share of FDI Employment (%)**	**Share of Employees Engaged in R&D (ths.)**	**Compensat ion (mil. $)**	**Compensation per Employee**	**Less than 100 Employees**	**100 to 999 Employees**	**Over 1000 Employees**
All industries	5640.7		2.9%	437897	77632	52.1%	34.7%	13.2%
Manufacturing	2081.3	36.9%	5.4%	175364	84257	34.6%	47.2%	18.2%
Other industries	1542.4	27.3%	0.3%	74882	48549	57.3%	28.7%	14.0%
Wholesale trade	546.6	9.7%	4.4%	50233	91901	59.3%	31.3%	9.4%
Retail trade	488.5	8.7%	0.0%	16148	33056	31.7%	36.7%	31.7%
Finance and insurance	409.1	7.3%	0.0%	66780	163236	72.1%	19.1%	8.9%
Professional, scientific, & technical services	290	5.1%	4.5%	28660	98828	37.1%	47.3%	15.5%
Information	242.3	4.3%	4.5%	23206	95774	47.6%	39.0%	13.4%
Real estate, rental, and leasing	40.5	0.7%	0.7%	2624	64790	94.7%	4.1%	1.2%
Source:	BEA Financial and Operating Statistics Table II.F1					BEA Financial and Operating Statistics Table I.A4		

Table 3				
	Indicator	**Value, 2011**	**Dollars Per Worker, 2011**	**Ratio Relative to Private Industries in U.S.**
Private Industries in the U.S.	Employees (Thousands) Table 6.5., Line 3	101,937		
	Value Added (Billions) Table 1.5.5., Line 2	13,082	128,332	
	Compensation (Billions) Table 6.2., Line 3	6,553	64,287	
	Private Domestic Investment in Structures and Equipment (Billions) Table 1.5.5., Line 29+30	1,213	11,902	
	R&D (Billions) Table 1.5.5., Line 39	255	2,504	
	Goods Exports (Billions) Table 1.5.5., Line 47	1,474	14,456	
	Goods Imports (Billions) Table 1.5.5., Line 50	2,235	21,921	
	Domestic Industries Corporate Profits After Tax (Billions) Table 6.19., Line 2	1,037	10,169	
U.S. Operations of U.S. Parent Companies and Their Foreign Affiliates	Employees (Thousands)	22,994		
	Value Added (Billions)	3,161	137,463	1.07
	Compensation (Billions)	1,693	73,619	1.15
	Capital Expenditures (Billions)	528	22,955	1.93
	R&D (Billions)	220	9,580	3.83
	U.S. Exports of Goods Associated With U.S. Parents and Their Foreign Affiliates (Billions)	686	29,823	2.06
	U.S. Imports of Goods Associated With U.S. Parents and Their Foreign Affiliates (Billions)	923	40,160	1.83
	Net Income (Billions)	1,062	46,176	4.54
Foreign Direct Investment in the U.S., Majority-Owned Bank and Nonbank U.S. Affiliates	Employees (Thousands)	5,641		
	Value Added (Billions)	736	130,548	1.02
	Compensation (Billions)	438	77,632	1.21
	Expenditures for Property, Plant, and Equipment (Billions)	177	31,430	2.64
	R&D (Billions)	45	8,018	3.20
	U.S. Exports of Goods Shipped by Affiliates (Billions)	304	53,839	3.72
	U.S. Imports of Goods Shipped to Affiliates (Billions)	636	112,786	5.15
	Net Income (Billions)	133	23,630	2.32

Source: Authors analysis of BEA Table 1.5.5, 6.2, 6.5, 6.19; Outward Financial and Operating Statistics Tables K1-R2; Inward Financial and Operating Statistics Tables A1-A9

Table 4

Concept Group	Concept Subgroup	Variable Label	Expect. Sign	Time Periods	Level	Source
ID Variable		D-U-N-S Establishment Number	n/a	2000-2011	Establishment	1
Time Variable		Year	n/a	2000-2011	Establishment	1
Dependent Variable		Number of Employees in Establishment	n/a	2000-2011	Establishment	1
Establishment Controls	General Characteristics	Headquarters (binary), by Establishment	+	2000-2011	Establishment	1
		Parent-owned Employment (ths.) in-State, by Estab.	+	2000-2011	Establishment	2
		Parent-owned Employment (ths.) out-of-State, by Estab.	+	2000-2011	Establishment	2
		Age (years), by Establishment	+	2000-2011	Establishment	2
	Foreign Status	Foreign-Owned (binary), by Establishment	+/-	2000-2011	Establishment	1
		Originated as Greenfield (binary), by Establishment	+/-	2000-2011	Establishment	2
		Originated as M&A (binary), by Establishment	+/-	2000-2011	Establishment	2
		M&A Event (binary), by Establishment	-	2000-2011	Establishment	2
		Post M&A Event (binary), by Establishment	-	2000-2011	Establishment	2
	Trading Status	Exports and Imports (binary), by Establishment	+	2000-2011	Establishment	1
		Imports (binary), by Establishment	+	2000-2011	Establishment	1
Business Climate	Taxes	Domestic Tax Haven (binary), by State	+	2000-2011	State	2
		No Income Tax (binary), by State	+	2000-2011	State	3
		Corporate Income Tax Rate (%), by State	-	2000-2011	State	4
		Value Added Tax Rate (%), by State	-	2000-2011	State	4
	Subsidies	Establishment Subsidy Value ($ mil.), by Establishment	+	2000-2011	Establishment	7
	Labor Regulations	Right to Work (binary), by State	+	2000-2011	State	3
		Employed Represented by Union (%), by State	-	2000-2011	State	5
		Minimum Wage ($), by State	-	2000-2011	State	6
	Cost of Living	Regional Price Parities (index), by State Metro Portion	-	2008-2011	CBSA	8
Vertical Factor Seeking	Labor Inputs	Comp. per Worker ($ ten ths.), by NAICS 2/4 & Metro	+	2000-2011	CBSA, NAICS 4	10
		Employment (ths.), by NAICS4 & Metro	+	2000-2011	CBSA, NAICS 4	10
	Human Capital	BA/Post-BA Degrees Conferred (ths.), by Metro	+	2000-2011	CBSA	11
		Residents w/ BA or Above (ths.), by State	+	2000-2011	CBSA	11
Horizontal Market Seeking	Local Market Potential	Pers. Inc. per Capita ($ ten ths.), by Metro	+	2000-2011	CBSA	9
		Population (hnd. ths.), by Metro	+	2000-2011	CBSA	9
	State Market Potential	Pers. Inc. per Capita ($ ten ths.), by State	+	2000-2011	State	9
		Population (mil.), by State	+	2000-2011	State	9
Horizontal and Vertical	Trade Platform	Domestic Outflows ($bn.), by Metro	+	2010*	CBSA	13
		Domestic Inflows ($bn.), by Metro	+/-	2010*	CBSA	13
		Exports ($ bn.), by Metro	+	2010*	CBSA	13
		Imports ($ bn.), by Metro	+/-	2010*	CBSA	13
Agglomeration	Network Effects	NAICS4 Employment in FOEs (ths.), by Metro	+/-	2000-2011	CBSA, NAICS 4	1
		NAICS4 Specialization (LQ), by Metro	+	2000-2011	CBSA, NAICS 4	10
Info. Based Assets	Univ. Assets	Flagship Universities	+	2000-2011	CBSA	12
		Higher Ed. Private Revenue ($ mil.), by Metro	+	2000-2011	CBSA	12
		Higher Ed. Research Expenses ($ mil.), by Metro	+	2000-2011	CBSA	12
Source Country (2011 universe)	Income	GDP per Capita ('05 $ ten ths.), by Source	+	2000-2011**	Establishment	19
	Business and Trade Climate	Profit Tax (% of comm. profits), by Source	+	2003-2011**	Establishment	20
		Labor Tax & Contrib. (% of comm. profits), by Source	+	2003-2011**	Establishment	20
		Cost to Export ($ ths. per container), by Source	+	2003-2011**	Establishment	20
		Distance from Source Country (ths. miles), by Estab.	-	2000-2011	Establishment	2
	Industry & Information-	Trade (% of GDP), by Source	+/-	2000-2011**	Establishment	19
		Mfg. Value Added (% of GDP), by Source	+	2000-2011**	Establishment	19

* Constant
** Interpolated

Data Source
1 *Walls and Associates D&B National Establishment Time Series*
2 *Author-derived*
3 *Internet Searches*
4 *Author-compiled from various sources including Tax Policy Center, Tax Foundation, and Internet Searches*
5 *U.S. Census Bureau and the Bureau of Labor Statistics, Current Population Survey*
6 *Wage and Hour Division of U.S. Department of Labor, State Minimum Wage History*
7 *Good Jobs First, Subsidy Tracker Database*
8 *Bureau of Economic Analysis Regional Price Parities, RPP1 Table*
9 *Bureau of Economic Analysis, Personal Income and Population, Table CA1-3 and SA1-3*
10 *Moody's Analytics*
11 *Ruggles; Alexander; Genadek; Goeken; Schroeder; and Sobek. IPUMS. Minnesota Population Center, 2010.*
12 *National Center for Education Statistics; IPEDS Analytics: Delta Cost Project Database*
13 *Brookings analysis of EDR-derived data from Dept. of Transportation Commodity Flows Survey and Freight Analysis Framework*
14 *Brookings analysis of EDR, Moody's Analytics, NAFSA, SABRE, EIA, Census, and BEA data*
15 *Department of Education, National Center for Education Statistics, National Assessment of Educational Progress*
16 *Department of Education, National Center for Education Statistics, Elementary/Secondary Information System*
17 *National Science Foundation, Division of Science Resources Studies, Survey of Industrial R&D, Table A-48*
18 *Tax Policy Center analysis of U.S. Census Bureau, 2011 Annual Surveys of State and Local Government Finances*
19 *World Bank National Accounts Database and OECD National Accounts data files*
20 *World Bank, Doing Business Project*

Table 5

Establishment Average by NAICS two digit Sector (2000-2011)	Agri. & Forestry	Mining, oil and gas extraction	Utilities	Cons-truction	Manu-facturing	Wholesale trade	Retail trade	Transport, w are-housing	Infor-mation	Finance & insurance	Real estate	Profes., sci., & technical	Manage-ment, HQs	Admin. & support services	Education	Health care	Arts & rec.	Hotels & food	Other services
Employment, by Establishment	58.6	67.4	58.2	45.1	117.8	26.2	20.8	43.9	69.0	35.7	16.9	57.7	62.5	45.8	36.3	34.1	43.0	53.9	18.3
Age (years), by Establishment	12.9	12.6	12.1	10.8	12.2	11.9	11.5	11.6	10.1	12.4	11.6	10.3	10.8	10.4	11.9	10.4	11.3	12.2	11.6
Parent-owned Employment (ths.) in-State, by Establishment	0.4	1.1	1.6	0.4	0.5	0.4	2.1	0.6	0.6	1.5	0.3	0.4	0.8	0.6	0.3	0.7	0.3	0.9	0.8
Parent-owned Employment (ths.) out-of-State, by Establishment	2.7	5.5	3.8	6.1	5.3	5.6	18.4	7.2	4.9	8.0	3.4	4.2	3.1	8.6	3.7	10.6	3.8	10.9	9.7
Years Post M&A, by Establishment	2.5	2.9	3.2	2.3	2.4	2.5	2.6	2.5	2.6	2.7	2.8	2.3	2.7	2.4	2.5	2.3	2.4	2.8	2.8
Corporate Income Tax Rate (%), by State	6.6	5.7	7.1	6.3	6.7	6.6	6.7	6.5	6.9	7.0	6.3	6.8	7.1	6.8	6.7	6.4	6.7	6.7	6.5
Value Added Tax Rate (%), by State	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Establishment Subsidy Value ($ ths.), by Establishment	32.6	2.5	1.0	3.1	100.0	70.8	1.4	3.7	11.1	16.6	2.9	69.6	24.5	12.0	0.0	0.7	1.8	13.7	4.3
Employed Represented by Union (%), by State	13.2	11.2	14.9	12.7	13.6	14.0	13.3	14.1	15.6	15.4	13.0	14.9	16.2	14.0	14.4	12.5	14.2	13.7	13.8
Minimum Wage ($), by State	5.5	5.0	5.9	5.2	5.4	5.5	5.3	5.5	5.9	5.8	5.3	5.8	5.9	5.4	5.7	5.1	5.6	5.5	5.5
Regional Price Parities (index), by State-Metro Portion	97.9	96.3	100.7	100.4	99.8	101.6	100.9	101.3	104.6	103.1	101.1	104.0	105.1	102.1	103.1	99.1	102.9	101.1	101.0
Employment (ths.), by four digit NAICS & Metro	9.0	5.2	1.9	11.5	4.7	8.4	14.4	6.1	17.5	24.3	6.8	27.8	56.3	21.3	7.3	8.0	7.1	69.0	8.8
Comp. per Worker ($ ten ths.), by four digit NAICS & Metro	2.0	7.4	6.9	5.1	5.6	5.9	2.6	5.0	7.6	7.7	4.3	7.7	9.6	3.9	3.6	3.7	5.2	2.0	2.6
Residents w/ Bachelor's Degrees (ths.), by State	2443.9	2050.2	2035.6	2320.9	2391.7	2641.0	2398.4	2600.5	3015.4	2600.3	2544.4	2828.3	2507.6	2549.6	2778.7	2245.2	2767.0	2530.7	2433.1
Bachelor's/Post-Bach. Degrees Conferred (ths.), by Metro	9.7	11.0	23.4	23.9	25.7	33.5	26.1	32.8	48.0	37.6	29.9	42.1	55.4	33.2	38.5	22.2	33.1	27.7	26.5
Pers. Inc. per Capita ($ ten ths.), by Metro	3.5	3.5	3.7	3.8	3.7	3.9	3.8	3.8	4.2	4.0	3.8	4.2	4.2	3.9	4.0	3.7	3.9	3.8	3.8
Population (hnd. ths.), by Metro	14.8	19.5	29.6	34.7	35.9	47.4	35.5	46.7	65.3	50.3	42.6	56.6	74.0	45.4	51.9	30.7	46.1	38.7	36.8
Population (hnd. ths.) x Local Ind., by Metro	0.0	0.0	29.6	25.4	0.0	47.4	35.5	38.3	0.0	0.0	40.6	0.0	0.0	45.4	51.9	30.7	46.1	38.7	36.8
Pers. Inc. per Capita (ten ths.), by State	3.6	3.5	3.7	3.6	3.6	3.7	3.7	3.7	3.9	3.8	3.7	3.8	3.9	3.7	3.8	3.6	3.7	3.7	3.7
Population (mil.), by State	13.2	11.9	10.6	12.6	12.9	14.1	12.8	14.0	15.6	13.5	13.8	14.8	12.8	13.6	14.7	12.4	14.6	13.6	13.1
Population (hnd. ths.) x Local Ind., by State	0.0	0.0	10.6	9.0	0.0	14.1	12.8	10.9	0.0	0.0	13.4	0.0	0.0	13.6	14.7	12.4	14.6	13.6	13.1
Outflows to Domestic (bn.), by Metro	48.9	70.8	77.1	84.1	94.2	111.8	83.5	112.4	139.6	111.4	101.6	122.6	156.5	103.5	113.8	80.2	106.2	95.4	90.7
Inflows from Domestic (bn.), by Metro	48.2	65.4	71.8	82.8	88.3	104.9	81.5	105.7	131.7	104.9	98.1	118.4	145.8	99.8	110.1	78.8	99.6	90.3	87.9
Exports ($ bn.), by Metro	7.2	11.0	11.9	12.4	13.8	16.0	11.9	16.0	20.0	16.1	14.7	18.8	22.4	14.9	16.4	11.4	14.8	13.5	13.4
Imports ($ bn.), by Metro	10.8	18.2	19.3	21.4	22.7	27.8	20.6	28.0	30.8	26.6	25.8	33.8	41.2	26.4	29.2	19.1	26.6	23.2	22.7
Four digit NAICS Specialization (LQ), by Metro	344.2	1889.3	129.8	120.1	289.4	134.9	109.3	188.5	175.0	119.0	127.6	153.6	112.7	117.3	123.7	104.1	137.8	114.6	109.5
Four digit NAICS Employment in FOEs (ths.), by Metro	0.0	1.2	0.3	0.2	1.0	1.4	1.6	0.9	2.9	4.0	0.2	3.2	0.9	0.8	0.1	0.2	0.2	1.4	0.2
Higher Ed. Research & Related Expenses ($ mil.), by Metro	240.9	276.5	584.0	530.4	571.9	714.8	569.1	701.5	1028.9	820.1	648.6	968.2	1184.8	734.8	853.7	496.7	687.7	601.8	597.1
Higher Ed. Revenue from Private Sources ($ mil.), by Metro	114.6	146.6	330.1	276.1	317.5	408.2	306.1	397.9	585.2	475.5	352.7	529.8	714.2	406.8	471.9	257.6	384.5	325.0	315.7

Average Share of Establishments Exhibiting Condition (2000-2011), Percent	Agri. & Forestry	Mining, oil and gas extraction	Utilities	Cons-truction	Manu-facturing	Wholesale trade	Retail trade	Transport, w are-housing	Infor-mation	Finance & insurance	Real estate	Profes., sci., & technical	Manage-ment, HQs	Admin. & support services	Education	Health care	Arts & rec.	Hotels & food	Other services
Headquarters (binary), by Establishment	14.7	14.3	15.8	14.6	18.8	10.6	1.3	7.7	15.8	6.8	7.0	15.2	41.9	6.7	8.1	4.1	7.0	2.7	3.4
Foreign-Owned (binary), by Establishment	58.9	64.6	57.1	65.4	69.7	73.2	67.1	78.4	64.0	67.0	53.3	64.1	70.7	67.6	65.2	53.3	55.2	53.6	65.4
Originated as Greenfield (binary), by Establishment	18.5	20.6	14.6	24.5	26.7	26.6	23.2	30.5	28.1	19.0	23.6	24.3	18.9	26.1	20.7	24.6	18.1	23.9	20.4
Originated as M&A (binary), by Establishment	68.7	68.1	81.8	67.2	58.0	56.9	64.9	57.3	65.2	70.0	65.4	70.1	74.7	65.2	68.7	72.1	77.0	62.9	72.8
M&A Event (binary), by Establishment	6.0	5.8	8.1	6.2	4.7	4.5	4.8	4.5	6.2	6.1	4.5	7.1	7.3	6.2	6.5	5.3	6.8	4.6	6.0
Post M&A Event (binary), by Establishment	49.5	53.6	63.2	48.8	45.0	47.0	50.3	47.3	52.0	53.5	52.2	49.2	56.6	47.6	49.7	48.7	51.4	52.6	55.8
Exports and Imports (binary), by Establishment	3.6	2.8	0.4	1.1	10.9	5.0	0.2	2.8	3.5	0.3	0.7	3.1	1.4	1.0	1.1	0.2	0.5	0.1	0.5
Imports (binary), by Establishment	6.6	1.7	1.1	1.6	7.7	7.8	0.7	7.4	1.5	1.2	0.9	1.3	1.4	1.0	1.1	0.2	1.3	0.7	1.0
Domestic Tax Haven (binary), by State	0.8	6.3	1.9	2.2	0.9	1.2	1.3	1.0	0.7	1.1	1.6	0.9	11.1	1.5	1.1	1.3	1.5	1.0	1.6
No Income Tax (binary), by State	21.9	35.5	14.3	27.0	18.3	21.2	21.5	23.6	16.8	15.8	27.2	18.2	14.0	21.5	21.1	24.8	19.5	19.9	23.1
Right to Work (binary), by State	43.7	58.9	26.9	48.3	37.7	38.7	43.1	38.1	28.0	29.1	45.9	31.5	24.0	38.0	35.4	46.9	37.8	38.8	38.2
Local Serving Industry (interact w/metro market size)	0.0	0.0	100.0	70.6	0.0	100.0	100.0	77.7	0.0	0.0	97.7	0.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0
Metro	64.4	66.5	75.2	89.7	86.3	92.0	89.8	89.5	94.5	91.4	91.9	96.9	95.8	93.8	92.0	86.9	93.8	89.5	93.8
Flagship Universities	11.9	9.0	19.8	18.2	15.8	16.0	18.5	16.2	23.1	19.6	17.2	25.3	27.0	20.2	21.7	17.4	17.8	18.7	19.6

Table 6

Establishment Average by State (2000-2011)	AK	AL	AR	AZ	CA	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL	IN	KS	KY	LA	MA	MD	ME	MI	MN	MO
Employment, by Establishment	40.3	48.3	58.2	29.3	41.0	40.7	60.3	32.0	50.5	30.8	45.9	46.7	48.9	26.6	59.6	63.9	40.3	64.3	32.0	52.0	44.3	63.0	61.7	58.6	54.0
Age (years), by Establishment	11.8	11.5	11.4	11.9	11.7	11.1	12.0	11.4	11.0	11.2	11.1	12.8	12.0	11.9	11.6	11.8	11.6	11.9	12.0	11.5	11.5	12.2	11.6	10.9	11.8
Parent-owned Employment (ths.) in-State, by Establishment	0.2	0.7	0.2	0.8	1.1	0.3	0.6	0.0	0.1	1.0	0.6	0.2	0.3	0.1	1.1	0.3	0.1	0.4	0.4	1.0	1.2	1.7	1.1	0.4	0.3
Parent-owned Employment (ths.) out-of-State, by Establishment	7.4	11.1	8.7	9.0	5.9	8.9	11.0	6.8	11.4	9.5	9.8	5.8	9.3	9.0	7.2	8.4	10.3	8.2	9.5	9.5	14.6	15.7	8.1	7.8	9.7
Years Post M&A, by Establishment	2.9	2.5	2.5	2.4	2.6	2.5	2.7	2.4	2.4	2.5	2.4	2.7	2.8	2.7	2.5	2.6	2.6	2.7	2.5	2.7	2.5	2.9	2.6	2.5	2.6
Corporate Income Tax Rate (%), by State	9.4	6.3	6.5	7.1	8.8	4.6	7.6	10.0	8.7	5.5	6.0	6.4	12.0	7.7	7.5	8.4	4.0	7.3	8.0	9.3	7.4	8.9	1.7	9.8	6.3
Value Added Tax Rate (%), by State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0
Establishment Subsidy Value ($ ths.), by Establishment	0.0	0.6	42.6	0.0	44.2	0.7	62.2	0.1	0.0	1.9	1.2	0.0	87.6	0.0	18.4	6.0	0.5	556.4	51.6	22.7	0.0	24.1	51.8	2.4	20.2
Employed Represented by Union (%), by State	24.4	10.9	6.3	8.0	18.1	9.2	17.1	14.3	12.8	7.6	6.3	24.9	13.8	7.8	17.9	13.5	9.8	11.3	7.6	15.6	14.9	14.1	20.7	17.2	13.0
Minimum Wage ($), by State	6.9	0.0	5.6	3.0	7.1	6.0	7.3	6.9	6.5	3.5	4.8	6.5	5.9	5.7	6.4	5.7	3.4	5.7	0.0	7.2	5.8	6.5	6.0	5.7	5.9
Regional Price Parities (index), by State-Metro Portion	106.0	90.2	89.3	99.3	112.0	100.8	110.9	114.7	92.1	99.9	94.6	116.9	90.0	93.5	101.7	92.2	91.0	90.1	93.2	108.0	111.9	97.6	95.9	98.1	89.5
Employment (ths.), by four digit NAICS & Metro	1.2	1.8	1.5	12.1	22.7	6.7	3.8	27.1	15.5	10.0	12.8	4.7	1.7	0.9	26.0	6.6	4.2	2.9	3.1	17.3	15.5	1.8	11.8	11.6	6.1
Comp. per Worker ($ ten ths.), by four digit NAICS & Metro	4.6	3.9	3.4	4.0	6.0	5.0	6.5	6.5	5.9	4.3	4.7	3.8	4.0	3.6	5.4	4.4	4.2	4.4	4.1	5.9	4.9	3.9	4.9	6.2	4.3
Residents w/ Bachelor's Degrees (ths.), by State	112.2	664.1	357.8	978.6	6905.2	1114.7	841.1	196.7	157.8	3134.1	1580.7	252.6	490.0	220.2	2522.0	919.7	528.4	564.5	605.8	1698.6	1330.8	240.3	1666.3	1075.3	971.7
Bachelor's/Post-Bach. Degrees Conferred (ths.), by Metro	0.4	3.0	2.4	28.1	46.0	11.3	7.9	47.6	48.0	15.8	18.2	5.2	2.5	1.5	65.3	12.2	4.6	5.9	5.1	56.1	30.0	1.6	13.1	20.9	13.1
Pers. Inc. per Capita ($ ten ths.), by Metro	4.1	3.1	3.0	3.2	4.2	4.1	5.3	5.2	4.1	3.6	3.5	3.5	3.5	3.0	4.0	3.4	3.5	3.3	3.3	4.7	4.6	3.5	3.5	4.0	3.6
Population (hnd. ths.), by Metro	2.4	4.9	4.3	28.0	66.1	15.8	9.2	53.0	46.3	28.5	34.0	7.0	4.0	3.0	74.1	16.8	10.5	8.9	6.9	35.0	33.9	3.7	27.7	24.2	18.5
Population (hnd. ths.) x Local Ind., by Metro	1.8	3.1	2.8	19.4	41.0	9.6	5.2	25.0	24.4	20.5	21.7	5.4	2.2	2.0	42.1	10.5	6.2	5.3	4.8	19.1	22.8	2.1	15.3	15.2	11.8
Pers. Inc. per Capita (ten ths.), by State	3.9	3.0	2.9	3.2	3.9	3.9	5.0	5.8	3.8	3.4	3.3	3.6	3.4	3.0	3.9	3.2	3.5	3.0	3.1	4.6	4.4	3.3	3.5	4.0	3.3
Population (mil.), by State	0.7	4.6	2.8	5.9	35.9	4.7	3.5	0.6	0.8	17.7	9.0	1.3	3.0	1.4	12.6	6.3	2.8	4.2	4.5	6.5	5.6	1.3	10.0	5.1	5.8
Population (hnd. ths.) x Local Ind., by State	0.5	2.9	1.8	4.1	21.8	2.9	2.0	0.3	0.5	12.9	5.9	1.0	1.6	1.0	7.4	3.9	1.7	2.5	3.0	3.6	3.7	0.8	5.6	3.2	3.7
Outflows to Domestic (bn.), by Metro	9.2	22.1	22.9	56.8	172.7	37.1	27.1	34.5	117.6	33.5	101.4	3.2	30.0	9.0	238.1	68.5	48.9	47.7	43.0	74.2	46.0	8.3	76.8	84.3	64.1
Inflows from Domestic (bn.), by Metro	6.5	23.8	23.7	71.2	137.4	40.2	25.6	95.2	115.4	59.8	117.0	8.0	26.9	10.2	216.9	64.8	43.9	48.6	36.3	75.1	81.4	10.5	73.8	65.7	61.8
Exports ($ bn.), by Metro	0.2	2.9	3.3	9.1	21.9	2.8	6.2	7.3	15.7	3.8	9.8	0.4	6.3	1.4	29.9	9.7	7.9	7.3	4.6	16.7	5.5	1.0	16.5	13.1	9.7
Imports ($ bn.), by Metro	0.6	4.4	3.9	10.5	40.0	10.7	5.8	32.4	29.1	10.2	18.2	2.4	5.0	1.8	50.2	13.0	11.8	8.5	9.7	20.6	19.0	1.8	23.2	18.3	14.4
Four digit NAICS Specialization (LQ), by Metro	1655.8	178.1	234.6	136.3	164.2	135.6	135.9	154.0	112.5	127.1	164.1	164.9	202.2	157.5	138.2	181.0	168.0	171.6	365.9	129.5	116.6	163.6	165.7	132.8	132.5
Four digit NAICS Employment in FOEs (ths.), by Metro	0.1	0.1	0.0	0.5	1.7	0.4	0.6	2.1	1.2	0.6	1.2	0.4	0.1	0.0	2.6	0.4	0.2	0.2	0.1	2.0	2.5	0.8	1.8	0.5	0.3
Higher Ed. Research & Related Expenses ($ mil.), by Metro	22.7	115.6	57.5	192.8	1072.2	202.1	147.8	983.0	1288.9	185.1	622.5	240.6	22.1	9.2	1265.2	236.4	53.7	110.0	146.4	2368.6	1073.0	14.0	172.2	491.2	247.4
Higher Ed. Revenue from Private Sources ($ mil.), by Metro	4.2	25.2	24.4	51.2	563.0	68.0	115.9	263.6	683.7	90.6	202.8	18.3	27.4	12.2	766.9	149.8	36.8	48.7	49.1	1274.1	378.7	28.2	73.9	189.4	159.8

Average Share of Establishments Exhibiting Condition (2000-2011), Percent	AK	AL	AR	AZ	CA	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL	IN	KS	KY	LA	MA	MD	ME	MI	MN	MO
Headquarters (binary), by Establishment	4.5	5.0	3.4	5.5	10.5	7.5	14.6	8.3	14.6	6.6	8.5	11.1	5.0	3.9	10.8	6.4	5.9	8.0	4.0	12.7	7.8	7.9	10.1	9.8	6.8
Foreign-Owned (binary), by Establishment	75.7	62.7	62.7	62.1	68.8	66.6	69.7	70.9	68.8	65.3	67.0	68.5	64.6	65.3	69.9	63.0	64.5	65.8	62.8	68.1	67.3	68.0	68.9	66.0	64.7
Originated as Greenfield (binary), by Establishment	26.1	22.3	25.4	20.5	24.0	25.9	23.4	25.4	26.4	25.7	27.8	24.1	20.4	21.9	25.9	24.1	23.4	23.7	21.8	23.9	25.4	20.2	26.0	27.1	24.5
Originated as M&A (binary), by Establishment	65.1	69.2	64.7	72.5	63.0	64.7	64.4	61.7	62.7	64.2	61.3	57.7	70.4	69.3	60.9	64.9	65.4	64.0	66.4	67.1	61.0	70.5	62.5	63.7	63.5
M&A Event (binary), by Establishment	4.9	5.9	5.5	5.9	5.1	5.3	5.0	5.5	5.6	5.3	5.1	4.2	5.3	5.2	5.0	5.3	5.0	5.5	5.4	4.4	5.2	5.4	5.4	5.4	5.1
Post M&A Event (binary), by Establishment	53.8	50.5	48.3	49.6	49.5	50.0	51.5	48.1	48.4	49.5	47.2	48.1	54.8	52.8	48.7	50.7	50.4	50.4	49.5	52.0	48.1	54.6	50.2	49.4	49.8
Exports and Imports (binary), by Establishment	0.9	2.6	3.6	2.1	3.8	2.4	4.1	0.4	2.7	3.8	2.7	1.6	3.9	2.8	3.4	2.8	3.3	4.4	1.9	3.8	1.9	2.6	3.4	4.1	2.7
Imports (binary), by Establishment	2.4	2.6	2.1	1.5	5.0	1.4	3.7	1.5	3.6	2.4	4.4	5.8	2.4	0.9	4.5	2.9	1.7	4.1	2.0	2.4	2.9	2.1	3.1	2.3	2.5
Domestic Tax Haven (binary), by State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
No Income Tax (binary), by State	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Right to Work (binary), by State	0.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	0.0	100.0	100.0	0.0	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0
Local Serving Industry (interact w/metro market size)	71.2	63.1	63.4	69.5	60.8	60.8	56.8	47.0	56.5	72.9	65.6	78.2	54.0	67.8	58.4	62.0	59.9	59.9	67.8	55.3	66.3	57.4	55.8	61.8	63.5
Metro	68.3	81.4	69.5	94.0	99.2	90.9	95.4	100.0	86.8	97.1	90.0	72.2	65.6	72.3	92.1	83.3	75.5	73.7	85.2	99.7	95.9	69.5	90.1	85.5	87.3
Flagship Universities	13.6	4.3	14.8	16.4	16.2	7.1	33.6	100.0	78.6	1.1	1.1	72.2	3.7	1.2	0.0	1.7	2.4	14.6	18.5	79.4	37.5	12.1	4.4	73.5	2.3

Table 6 (continued)

Establishment Average by State (2000-2011)	MS	MT	NC	ND	NE	NH	NJ	NM	NV	NY	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VA	VT	WA	WI	WV
Employment, by Establishment	43.2	23.4	49.7	31.7	47.7	54.6	56.6	26.6	36.5	49.7	51.5	41.3	32.9	52.2	52.8	56.7	40.1	52.6	47.8	42.9	43.3	34.2	35.1	62.8	59.0
Age (years), by Establishment	11.5	11.5	11.4	11.8	12.2	11.9	11.8	11.7	10.4	12.2	11.8	12.0	11.8	11.9	12.1	11.3	12.3	11.2	11.2	11.5	11.0	12.4	11.7	11.9	12.0
Parent-owned Employment (ths.) in-State, by Establishment	0.1	0.1	2.7	0.1	0.1	0.4	0.9	0.1	0.1	1.8	0.8	0.2	0.2	1.0	0.5	0.9	0.1	0.5	1.3	0.3	1.8	0.2	0.3	0.6	0.2
Parent-owned Employment (ths.) out-of-State, by Establishment	10.2	8.7	14.3	9.3	8.8	10.8	8.0	10.2	9.0	8.0	9.7	10.0	9.3	10.5	13.6	14.8	8.3	11.6	6.8	11.0	15.6	11.3	7.9	8.1	12.0
Years Post M&A, by Establishment	2.7	2.7	2.3	2.8	2.6	2.6	2.4	2.7	2.4	2.5	2.5	2.9	2.6	2.6	2.4	2.3	2.6	2.6	2.5	2.8	2.4	3.0	2.7	2.5	2.5
Corporate Income Tax Rate (%), by State	5.0	6.8	6.9	8.3	7.8	8.3	9.0	7.6	0.0	7.6	6.4	6.0	6.9	10.0	9.0	5.0	0.0	6.4	2.6	5.0	6.0	9.2	0.0	7.9	8.8
Value Added Tax Rate (%), by State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Establishment Subsidy Value ($ ths.), by Establishment	17.4	0.0	10.7	0.0	0.0	0.0	26.1	35.1	0.0	66.0	145.0	11.3	4.0	1.9	0.0	0.0	0.0	211.6	1.2	9.4	5.3	26.0	40.2	3.3	5.8
Employed Represented by Union (%), by State	7.7	14.8	4.3	8.7	10.6	11.6	20.3	10.1	16.8	26.4	16.6	8.0	16.7	16.3	17.4	5.2	7.0	7.6	6.4	7.3	6.2	12.6	20.7	16.3	15.3
Minimum Wage ($), by State	0.0	5.8	5.8	5.7	5.7	5.8	6.1	5.6	5.9	6.1	5.5	5.7	7.4	5.9	6.8	0.0	5.7	0.0	5.4	5.7	5.7	7.1	7.6	5.9	5.9
Regional Price Parities (index), by State-Metro Portion	88.8	93.9	92.5	88.4	90.2	106.3	114.0	94.7	99.9	115.7	90.7	91.2	98.2	98.9	100.5	91.8	87.5	91.7	97.8	96.7	104.0	100.1	103.0	93.3	89.2
Employment (ths.), by four digit NAICS & Metro	1.1	0.4	3.1	0.5	2.3	8.2	46.2	1.6	5.1	44.8	4.8	3.2	4.6	10.1	6.4	2.0	0.5	3.4	13.1	2.7	15.7	0.7	8.3	4.0	1.7
Comp. per Worker ($ ten ths.), by four digit NAICS & Metro	3.7	4.0	4.3	3.9	3.7	5.2	6.4	3.6	4.3	6.4	4.1	4.0	4.5	4.5	4.2	3.8	3.7	3.9	5.0	3.9	4.4	4.1	4.8	4.3	3.8
Residents w/ Bachelor's Degrees (ths.), by State	360.2	172.6	1505.7	112.4	311.6	287.5	2023.8	311.7	334.3	4163.2	1838.1	527.5	695.1	2224.9	215.4	690.7	127.6	917.0	3722.6	412.4	1716.9	143.1	1315.0	946.4	221.3
Bachelor's/Post-Bach. Degrees Conferred (ths.), by Metro	1.6	0.8	4.6	1.8	4.2	26.6	115.4	4.5	4.2	92.4	9.8	5.8	8.7	28.5	13.8	3.7	0.6	6.3	14.9	6.7	22.7	2.2	14.4	8.6	2.2
Pers. Inc. per Capita ($ ten ths.), by Metro	2.9	3.2	3.3	3.4	3.7	4.4	4.7	3.1	3.7	4.4	3.4	3.4	3.4	3.8	3.7	3.1	3.6	3.3	3.6	3.1	4.2	3.7	4.1	3.7	3.0
Population (hnd. ths.), by Metro	3.9	1.5	8.7	1.3	5.0	17.3	161.4	4.8	12.1	130.2	13.1	8.1	14.3	28.7	16.0	5.6	1.4	9.5	37.3	7.5	27.1	1.5	23.1	10.5	3.3
Population (hnd. ths.) x Local Ind., by Metro	2.5	0.8	5.6	0.8	2.8	8.9	95.2	3.3	9.3	70.5	8.3	5.4	5.1	16.1	9.7	3.5	0.7	6.8	22.2	5.1	18.1	0.9	15.4	6.0	2.3
Pers. Inc. per Capita (ten ths.), by State	2.7	3.2	3.2	3.4	3.6	4.0	4.6	2.9	3.6	4.3	3.3	3.2	3.3	3.7	3.8	3.0	3.5	3.2	3.4	3.0	4.0	3.6	3.9	3.5	2.8
Population (mil.), by State	2.9	0.9	8.9	0.7	1.8	1.3	8.7	1.9	2.4	19.2	11.5	3.6	3.7	12.5	1.1	4.3	0.8	6.0	23.2	2.5	7.6	0.6	6.3	5.6	1.8
Population (hnd. ths.) x Local Ind., by State	1.9	0.6	5.6	0.4	1.0	0.7	5.1	1.3	1.7	10.7	7.2	2.3	2.4	7.0	0.6	2.8	0.4	4.2	14.1	1.7	5.2	0.3	4.2	3.0	1.1
Outflows to Domestic (bn.), by Metro	34.4	12.0	42.1	11.8	24.3	40.3	262.3	10.9	11.2	213.0	60.5	33.5	43.5	82.2	40.0	20.6	9.5	53.8	133.0	31.0	26.8	6.5	48.0	45.7	13.6
Inflows from Domestic (bn.), by Metro	35.3	9.7	40.5	8.2	21.3	41.4	241.2	13.4	30.0	193.9	56.9	34.9	42.9	78.3	33.5	23.0	10.0	44.2	123.4	31.0	54.8	8.6	59.6	41.4	16.3
Exports ($ bn.), by Metro	4.1	0.9	6.0	2.0	4.2	8.7	38.0	1.8	0.9	30.9	9.0	4.1	6.7	10.7	9.8	3.3	2.0	5.5	24.6	3.1	4.2	1.9	13.1	7.5	2.4
Imports ($ bn.), by Metro	6.7	2.0	7.1	1.8	4.3	10.8	76.7	2.3	3.5	61.6	10.6	7.6	6.6	18.3	7.7	3.5	2.0	6.7	37.9	5.2	16.0	1.5	13.8	8.7	3.0
Four digit NAICS Specialization (LQ), by Metro	230.6	222.0	168.8	349.5	179.8	144.2	138.4	324.2	1177.4	151.7	150.1	193.1	119.0	137.2	117.2	168.5	157.3	142.2	207.6	223.2	141.7	134.2	144.8	187.2	473.6
Four digit NAICS Employment in FOEs (ths.), by Metro	0.0	0.0	0.4	0.0	0.1	1.0	6.2	0.1	0.2	6.3	0.3	0.1	0.3	0.8	1.1	0.2	0.0	0.3	1.2	0.2	2.6	0.0	0.4	0.3	0.3
Higher Ed. Research & Related Expenses ($ mil.), by Metro	28.3	17.5	119.7	29.7	85.5	1132.0	2108.4	157.7	52.4	1627.8	200.3	72.1	170.8	805.7	214.0	73.0	3.9	157.5	361.0	156.7	446.4	67.7	508.0	210.8	35.8
Higher Ed. Revenue from Private Sources ($ mil.), by Metro	13.1	4.7	71.9	8.0	55.3	606.6	1459.1	21.4	13.3	1142.9	92.7	51.9	102.5	397.5	210.5	34.3	5.3	87.6	196.3	52.1	137.6	37.9	116.6	118.9	11.9

Average Share of Establishments Exhibiting Condition (2000-2011), Percent	MS	MT	NC	ND	NE	NH	NJ	NM	NV	NY	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VA	VT	WA	WI	WV
Headquarters (binary), by Establishment	2.7	3.5	6.8	5.0	4.6	9.9	15.0	2.4	5.4	14.2	7.9	4.9	6.3	9.1	10.0	6.3	7.7	6.0	8.5	6.3	7.6	9.5	8.0	8.5	6.4
Foreign-Owned (binary), by Establishment	64.9	65.8	69.4	65.1	60.7	67.1	67.2	64.1	68.1	68.6	66.9	62.1	68.5	66.3	70.9	65.8	60.9	68.0	66.8	68.0	70.6	67.7	69.5	64.2	62.9
Originated as Greenfield (binary), by Establishment	23.4	25.3	27.3	24.3	18.3	24.6	24.4	22.2	27.4	22.4	23.3	21.1	23.6	23.2	27.1	26.3	20.1	27.1	24.7	23.4	26.0	20.1	24.7	23.3	25.0
Originated as M&A (binary), by Establishment	66.2	64.0	60.0	63.9	70.2	64.9	61.1	69.3	65.6	62.0	62.5	68.8	63.2	65.6	59.8	60.7	70.9	62.2	64.3	68.5	61.1	72.0	63.2	66.1	63.7
M&A Event (binary), by Establishment	5.8	5.1	5.6	5.5	5.5	5.1	5.0	6.5	5.8	5.3	5.1	5.5	4.9	5.4	4.1	4.8	5.5	5.1	5.5	5.4	4.8	5.4	5.0	5.2	4.9
Post M&A Event (binary), by Establishment	52.1	51.1	45.8	52.9	51.2	49.6	46.8	53.5	49.3	48.8	48.3	54.5	49.7	50.0	46.2	45.8	52.4	49.5	48.9	54.0	46.7	57.3	50.8	48.7	48.2
Exports and Imports (binary), by Establishment	1.6	1.0	2.7	2.6	1.9	6.6	4.5	0.7	1.6	3.2	3.5	2.5	3.0	3.6	4.0	2.2	4.4	2.8	2.9	2.2	1.9	5.4	3.6	4.4	2.8
Imports (binary), by Establishment	2.9	0.9	3.5	1.0	0.9	2.6	6.7	0.7	1.9	4.6	3.2	1.8	2.6	3.0	2.6	5.7	1.7	3.6	3.1	1.5	2.3	1.3	3.1	2.7	2.1
Domestic Tax Haven (binary), by State	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
No Income Tax (binary), by State	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0
Right to Work (binary), by State	100.0	0.0	100.0	100.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0	100.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0	0.0
Local Serving Industry (interact w/metro market size)	66.3	61.7	63.1	63.9	54.2	50.3	59.3	66.2	71.0	55.7	62.8	62.6	64.5	56.1	60.4	61.4	49.5	69.5	60.9	66.8	68.6	55.8	65.7	54.1	62.4
Metro	51.3	46.9	81.0	51.7	64.4	70.2	100.0	75.9	91.4	94.0	87.5	76.2	87.7	90.6	100.0	83.2	53.8	85.3	93.2	90.3	92.4	46.9	94.6	83.0	63.4
Flagship Universities	0.9	13.0	5.8	9.6	14.7	34.8	11.4	52.6	25.4	8.0	16.6	38.8	7.3	37.1	100.0	17.2	0.8	12.1	6.4	60.5	40.8	46.9	65.2	11.3	9.3

Table 7

			(1a)	(2a)	(3a)	(4a)	(1b)	(2b)	(3b)	(4b)
Determinants of Number of Employees in Foreign-Owned Establishment (One-Period Year of Investment)										
			Dependent: Average Number of Employees in Foreign-Owned Establishments							
GROUPS		**COVARIATES**	OLS	Industry Effects	State Effects	Industry State Effects	OLS	Industry Effects	State Effects	Industry State Effects
Establishment Controls	General Characteristics	Headquarters (binary), by Establishment	79.823***	70.452***	79.667***	70.325***	83.429***	74.209***	83.166***	74.045***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
		Age (years), by Establishment	1.421***	1.718***	1.432***	1.722***	1.679***	1.872***	1.700***	1.875***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
		Parent-owned Employment (ths.) in-State, by Establishment	4.165***	4.861***	4.185***	4.857***	6.482***	6.921***	6.559***	6.968***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
		Parent-owned Employment (ths.) out-of-State, by Establishment	0.198***	0.247***	0.198***	0.244***	0.102***	0.192***	0.101***	0.185***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.000)	(0.010)	(0.000)
	Foreign Status	Originated as Greenfield (binary), by Establishment	-1.454	-4.321**	-1.565	-4.350**	2.876	-2.422	2.605	-2.439
			(0.473)	(0.030)	(0.439)	(0.029)	(0.350)	(0.425)	(0.397)	(0.422)
		M&A Event (binary), by Establishment	-14.781***	-17.208***	-15.018***	-17.305***	-12.134***	-15.937***	-12.544***	-16.006***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	Trading Status	Exports and Imports (binary), by Establishment	51.711***	32.944***	51.751***	33.117***	42.441***	24.292***	42.478***	24.451***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
		Imports (binary), by Establishment	36.048***	20.564***	35.676***	20.485***	36.708***	22.974***	36.606***	23.100***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Business Climate	Taxes	Domestic Tax Haven (binary), by State	0.792	2.153	9.227	5.969	1.672	3.158	-22.625	-9.197
			(0.814)	(0.514)	(0.411)	(0.588)	(0.728)	(0.501)	(0.182)	(0.580)
		No Income Tax (binary), by State	-1.293	1.448	-9.774*	-7.107	-2.248	1.967	9.733	5.900
			(0.372)	(0.309)	(0.099)	(0.221)	(0.266)	(0.320)	(0.228)	(0.455)
		Corporate Income Tax Rate (%), by State	0.130	0.491*	0.097	0.388	-0.285	0.287	0.205	0.809
			(0.622)	(0.057)	(0.858)	(0.466)	(0.429)	(0.417)	(0.778)	(0.254)
		Value Added Tax Rate (%), by State	-0.438	-0.078	-5.539*	-2.010	-2.936	-1.865	-11.471***	-4.605
			(0.792)	(0.962)	(0.062)	(0.490)	(0.203)	(0.409)	(0.004)	(0.238)
	Subsidies	Establishment Subsidy Value ($ mil.), by Establishment	1.699***	1.398***	1.701***	1.400***	6.443***	4.141***	6.471***	4.202***
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	Labor Law	Right to Work (binary), by State	-8.484***	-6.334***	-21.646***	-15.129***	-11.058***	-8.823***	-12.129	-5.624
			(0.000)	(0.000)	(0.000)	(0.007)	(0.000)	(0.000)	(0.116)	(0.456)
		Employed Represented by Union (%), by State	-0.399***	-0.346**	-1.287***	-0.889**	0.038	-0.131	-2.052***	-1.193**
			(0.004)	(0.011)	(0.002)	(0.033)	(0.846)	(0.492)	(0.001)	(0.040)
		Minimum Wage ($), by State	-0.054	0.136	-0.538	-0.084	-0.785**	-0.366	-0.810	-0.002
			(0.827)	(0.577)	(0.214)	(0.844)	(0.021)	(0.273)	(0.172)	(0.997)
	Cost of Living	Regional Price Parities (index), by State-Metro Portion	-0.268***	-0.157	-0.013	0.042	-0.317**	-0.212	-0.179	-0.096
			(0.006)	(0.101)	(0.932)	(0.777)	(0.021)	(0.114)	(0.391)	(0.637)
Vertical Factor Seeking	Labor Factors	Employment (ths.), by four digit NAICS & Metro	-0.031*	0.070***	-0.031*	0.070***	-0.079***	0.044	-0.078***	0.043
			(0.054)	(0.001)	(0.054)	(0.001)	(0.002)	(0.174)	(0.002)	(0.180)
		Comp. per Worker ($ ten ths.), by NAICS sector & Metro	-1.026***	0.365**	-0.996***	0.409**	-1.287***	1.304***	-1.270***	1.443***
			(0.000)	(0.022)	(0.000)	(0.010)	(0.000)	(0.001)	(0.000)	(0.000)
	Human Capital	Residents w/ Bachelor's Degrees (ths.), by State	0.002	0.003	0.010**	0.009**	0.003	0.004	0.009	0.007
			(0.334)	(0.255)	(0.016)	(0.031)	(0.325)	(0.208)	(0.127)	(0.222)
		Bachelor's/Post-Bach. Degrees & Certificates Conferred (ths.), by Metro	-0.138**	-0.118*	-0.148*	-0.159**	-0.231***	-0.214***	-0.166	-0.207**
			(0.023)	(0.049)	(0.050)	(0.032)	(0.005)	(0.009)	(0.106)	(0.039)

Table 7 continued on next page

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Table 7 (continued)

Determinants of Number of Employees in Foreign-Owned Establishment (One-Period Year of Investment)-Continued									
			(1a)	(2a)	(3a)	(4a)	(1b)	(2b)	(3b)	(4b)
			Dependent: Average Number of Employees in Foreign-Owned Establishments							
GROUPS		COVARIATES	OLS	Industry Effects	State Effects	Industry State Effects	OLS	Industry Effects	State Effects	Industry State Effects
Horizontal Market Seeking	Metro	Local Serving Industry (interact w/metro market size)	-37.373*** (0.000)	-22.627* (0.079)	-37.279*** (0.000)	-22.441* (0.082)	-45.715*** (0.000)	-10.450 (0.539)	-45.795*** (0.000)	-9.924 (0.560)
		Pers. Inc. per Capita ($ ten ths.), by Metro	-0.640 (0.486)	-1.396 (0.123)	-0.261 (0.806)	-0.988 (0.345)	0.249 (0.846)	-1.063 (0.402)	1.183 (0.416)	-0.310 (0.829)
		Population (hnd. ths.), by Metro	-0.052 (0.271)	-0.100** (0.031)	0.072 (0.242)	0.027 (0.657)	-0.054 (0.417)	-0.071 (0.278)	0.011 (0.902)	0.014 (0.869)
		Population (hnd. ths.) x Local Ind., by Metro	0.110*** (0.000)	0.075*** (0.000)	0.111*** (0.000)	0.076*** (0.000)	0.136*** (0.000)	0.109*** (0.000)	0.139*** (0.000)	0.112*** (0.000)
	State	Pers. Inc. per Capita (ten ths.), by State	-0.561 (0.719)	-0.681 (0.656)	-4.924 (0.175)	-6.134* (0.084)	-2.080 (0.333)	-1.333 (0.526)	-1.615 (0.751)	-4.350 (0.381)
		Population (mil.), by State	-0.730* (0.091)	-0.878** (0.038)	-1.062 (0.514)	-1.562 (0.328)	-1.093* (0.071)	-1.254** (0.034)	-0.210 (0.927)	-0.949 (0.671)
		Population (hnd. ths.) x Local Ind., by State	0.150** (0.043)	0.168** (0.022)	0.141* (0.059)	0.161** (0.029)	0.375*** (0.000)	0.316*** (0.003)	0.363*** (0.001)	0.307*** (0.003)
Trade Platform	Domestic	Outflows to Domestic (bn.), by Metro	0.021 (0.332)	0.032 (0.127)	0.029 (0.278)	0.045* (0.083)	0.020 (0.516)	0.034 (0.263)	0.007 (0.850)	0.049 (0.181)
		Inflows from Domestic (bn.), by Metro	-0.003 (0.900)	0.000 (0.998)	-0.061* (0.093)	-0.052 (0.140)	0.019 (0.607)	0.010 (0.787)	0.003 (0.954)	-0.023 (0.637)
	International	Exports ($ bn.), by Metro	0.336** (0.015)	0.041 (0.762)	0.506*** (0.003)	0.159 (0.334)	0.308 (0.116)	0.032 (0.869)	0.315 (0.182)	0.032 (0.891)
		Imports ($ bn.), by Metro	-0.011 (0.900)	0.080 (0.354)	-0.164 (0.113)	-0.036 (0.725)	-0.067 (0.593)	-0.010 (0.937)	-0.149 (0.308)	-0.075 (0.603)
Agglomeration and Information based Assets	Clusters	Four digit NAICS Specialization (LQ), by Metro	0.010*** (0.000)	0.008*** (0.000)	0.010*** (0.000)	0.008*** (0.000)	0.014*** (0.000)	0.012*** (0.000)	0.014*** (0.000)	0.012*** (0.000)
		Four digit NAICS Employment in FOEs (ths.), by Metro	1.176*** (0.000)	1.224*** (0.000)	1.146*** (0.000)	1.202*** (0.000)	1.625*** (0.000)	1.422*** (0.000)	1.574*** (0.000)	1.371*** (0.000)
		Metro	5.286*** (0.002)	4.285** (0.011)	1.626 (0.449)	1.331 (0.531)	5.465** (0.020)	3.891* (0.095)	3.385 (0.254)	2.046 (0.485)
	University Assets	Higher Ed. Research & Related Expenses ($ mil.), by Metro	-0.003 (0.151)	-0.004** (0.018)	-0.003 (0.224)	-0.003 (0.104)	-0.003 (0.202)	-0.005** (0.047)	-0.005* (0.061)	-0.005* (0.076)
		Higher Ed. Revenue from Private Grants/Contracts ($ mil.), by Metro	0.001 (0.816)	0.005* (0.100)	0.000 (0.961)	0.003 (0.423)	0.004 (0.400)	0.009* (0.053)	0.004 (0.466)	0.004 (0.419)
		Flagship Universities	1.257 (0.300)	2.052* (0.085)	2.494* (0.075)	2.918** (0.034)	2.102 (0.217)	2.482 (0.136)	3.098 (0.112)	3.858** (0.043)
Source Country	Income	GDP per Capita ('05 $ ten ths.), by Source					0.722 (0.147)	0.097 (0.859)	0.701 (0.160)	0.067 (0.903)
	Business Climate	Labor Tax & Contrib. (% of comm. profits), by Source					-0.166*** (0.005)	0.023 (0.739)	-0.155*** (0.009)	0.042 (0.549)
		Profit Tax (% of comm. profits), by Source					0.345*** (0.000)	0.221** (0.031)	0.327*** (0.000)	0.226** (0.028)
	Trade	Distance from Source Country (ths. miles), by Establishment					-0.763*** (0.000)	-0.061 (0.728)	-0.700*** (0.000)	0.066 (0.721)
		Cost to Export ($ ths. per container), by Source					-0.284 (0.907)	8.513*** (0.002)	-0.252 (0.917)	8.181*** (0.003)
		Trade (% of GDP), by Source					0.117*** (0.000)	0.086*** (0.000)	0.116*** (0.000)	0.086*** (0.000)
		Mfg. Value Added (% of GDP), by Source					0.665*** (0.000)	0.510*** (0.001)	0.636*** (0.000)	0.496*** (0.001)
Constant			93.214*** (0.000)	83.575*** (0.000)	105.649*** (0.000)	98.268*** (0.000)	83.184*** (0.000)	55.657*** (0.002)	88.250*** (0.002)	58.158* (0.059)
*** p-value<0.01, ** p-value<0.05, * p-value<0.1										
Observations			151,142	151,142	151,142	151,142	80,287	80,287	80,287	80,287
Overall R-Square			6.07%	10.34%	6.17%	10.40%	6.95%	12.07%	7.11%	12.16%
Breusch-Pagan Lagrange Multiplier Test (H_0: error variance across all entities is zero. No panel effect, use OLS).			Reject H_0							
Hausman Prob>chi^2 (H_0: RE is an efficient estimator)			-	Reject H_0	Reject H_0	Reject H_0	-	Reject H_0	Reject H_0	Reject H_0
Regressions 1b, 2b, 3b, 4b use a smaller sample size due to limited source country information. After running 1a, 2a, 3a, 4a with the sample from the (b) regressions, the coeffieicents magnitude, sign, and significance were not noticeably different from those found in (b), suggesting sample (b) is unbiased.										
Residual u(i,t) vs. Fitted Plots to detect evidence of non-linearity, unequal error variances (H_0: random bounce and horizontal band around zero, few outliers)			Moderately well-behaved							

Table 8

			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GROUPS		**COVARIATES**	Random Effects (All)	Random Effects	State Effects	Metro Effects	Metro State Effects	Industry Effects	Industry State Effects	Industry State Effects (Robust)
			Dependent: Number of Employees in Establishments							

Determinants of Number of Employees in Foreign-Owned Establishment (Time-Series)

GROUPS		COVARIATES	(1) Random Effects (All)	(2) Random Effects	(3) State Effects	(4) Metro Effects	(5) Metro State Effects	(6) Industry Effects	(7) Industry State Effects	(8) Industry State Effects (Robust)
Establishment Controls	General Characteristics	Headquarters (binary), by Establishment	41.796*** (0.000)	41.634*** (0.000)	41.503*** (0.000)	42.143*** (0.000)	42.138*** (0.000)	38.099*** (0.000)	37.920*** (0.000)	37.920*** (0.000)
		Age (years), by Establishment	1.400*** (0.000)	1.745*** (0.000)	1.727*** (0.000)	1.734*** (0.000)	1.733*** (0.000)	1.552*** (0.000)	1.538*** (0.000)	1.538*** (0.000)
		Parent-owned Employment (ths.) in-State, by Establishment	2.016*** (0.000)	2.780*** (0.000)	2.771*** (0.000)	2.772*** (0.000)	2.773*** (0.000)	2.829*** (0.000)	2.822*** (0.000)	2.822*** (0.000)
		Parent-owned Employment (ths.) out-of-State, by Establishment	0.074*** (0.000)	0.084*** (0.000)	0.084*** (0.000)	0.084*** (0.000)	0.084*** (0.000)	0.075*** (0.000)	0.075*** (0.000)	0.075*** (0.001)
	Foreign Status	Foreign-Owned (binary), by Establishment	0.388* (0.063)	1.142*** (0.004)	1.135*** (0.004)	1.168*** (0.003)	1.174*** (0.003)	1.202*** (0.002)	1.191*** (0.002)	1.191* (0.076)
		Originated as Greenfield (binary), by Establishment	-4.034*** (0.002)	1.189 (0.618)	0.894 (0.707)	1.111 (0.642)	1.145 (0.631)	-2.112 (0.367)	-2.460 (0.293)	-2.460 (0.343)
		Originated as M&A (binary), by Establishment	-11.376*** (0.000)	-10.161*** (0.000)	-10.250*** (0.000)	-10.098*** (0.000)	-10.061*** (0.000)	-11.382*** (0.000)	-11.621*** (0.000)	-11.621*** (0.000)
		M&A Event (binary), by Establishment	-0.547** (0.016)	-1.090** (0.013)	-1.096** (0.013)	-1.098** (0.012)	-1.101** (0.012)	-1.117** (0.011)	-1.122** (0.011)	-1.122* (0.050)
		Post M&A Event (binary), by Establishment	0.711*** (0.009)	1.817*** (0.000)	1.858*** (0.000)	1.790*** (0.000)	1.800*** (0.000)	1.711*** (0.001)	1.753*** (0.001)	1.753* (0.070)
		Years Post M&A, by Establishment	0.049 (0.138)	0.167*** (0.006)	0.171*** (0.005)	0.174*** (0.004)	0.174*** (0.004)	0.156** (0.010)	0.159*** (0.009)	0.159 (0.288)
	Trading Status	Exports and Imports (binary), by Establishment	11.837*** (0.000)	11.104*** (0.000)	11.127*** (0.000)	10.953*** (0.000)	10.959*** (0.000)	9.018*** (0.000)	9.047*** (0.000)	9.047*** (0.000)
		Imports (binary), by Establishment	9.625*** (0.000)	11.642*** (0.000)	11.565*** (0.000)	11.472*** (0.000)	11.481*** (0.000)	10.826*** (0.000)	10.785*** (0.000)	10.785*** (0.000)
Business Climate	Taxes	Domestic Tax Haven (binary), by State	-7.383*** (0.002)	-10.459** (0.022)	-18.039 (0.226)	3.461 (0.682)	70.814 (0.300)	-9.305** (0.039)	-4.941 (0.737)	-4.941 (0.680)
		No Income Tax (binary), by State	-1.296 (0.125)	1.408 (0.370)	-27.355*** (0.000)	9.359 (0.129)	-186.202 (0.356)	2.698* (0.082)	-24.885*** (0.000)	-24.885*** (0.001)
		Corporate Income Tax Rate (%), by State	0.207*** (0.002)	0.338*** (0.007)	0.172 (0.203)	0.148 (0.269)	0.165 (0.222)	0.385*** (0.002)	0.199 (0.140)	0.199 (0.436)
		Value Added Tax Rate (%), by State	0.835** (0.016)	1.305** (0.045)	-1.694** (0.024)	-2.052*** (0.004)	-2.183*** (0.004)	1.244** (0.056)	-1.669** (0.026)	-1.669 (0.403)
	Subsidies	Establishment Subsidy Value ($ mil.), by Establishment	2.022*** (0.000)	2.053*** (0.000)	2.053*** (0.000)	2.042*** (0.000)	2.043*** (0.000)	1.769*** (0.000)	1.771*** (0.000)	1.771*** (0.000)
	Labor Law	Right to Work (binary), by State	-1.176 (0.174)	-3.041* (0.057)	3.120 (0.607)	-1.345 (0.781)	-60.873 (0.355)	-1.538 (0.331)	0.965 (0.872)	0.965 (0.889)
		Employed Represented by Union (%), by State	0.082* (0.079)	0.191** (0.030)	0.085 (0.403)	0.174* (0.085)	0.150 (0.141)	0.205** (0.019)	0.096 (0.346)	0.096 (0.568)
		Minimum Wage ($), by State	0.089* (0.087)	0.162 (0.110)	0.051 (0.642)	0.075 (0.484)	0.064 (0.560)	0.197* (0.052)	0.069 (0.527)	0.069 (0.664)
	Cost of Living	Regional Price Parities (index), by State-Metro Portion	-0.538*** (0.000)	-0.962*** (0.000)	0.207 (0.287)	-1.938*** (0.000)	-1.237 (0.796)	-0.730*** (0.000)	0.187 (0.331)	0.187 (0.389)
Vertical Factor Seeking	Labor Factors	Employment (ths.), by four digit NAICS & Metro	0.058*** (0.000)	0.034** (0.022)	0.032** (0.030)	0.026* (0.073)	0.027* (0.066)	0.138*** (0.000)	0.138*** (0.000)	0.138*** (0.000)
		Comp. per Worker ($ ten ths.), by four digit NAICS & Metro	0.272*** (0.000)	0.340*** (0.000)	0.340*** (0.000)	0.334*** (0.000)	0.334*** (0.000)	0.323*** (0.000)	0.323*** (0.000)	0.323** (0.013)
	Human Capital	Residents w/ Bachelor's Degrees (ths.), by State	0.001 (0.188)	0.002* (0.081)	-0.001 (0.362)	0.002 (0.116)	0.001 (0.393)	0.002** (0.031)	-0.001 (0.387)	-0.001 (0.657)
		Bachelor's/Post-Bach. Degrees & Certificates Conferred (ths.), by Metro	0.037** (0.011)	0.060** (0.027)	0.051* (0.072)	-0.007 (0.815)	-0.000 (0.992)	0.053** (0.049)	0.052* (0.071)	0.052 (0.357)

Table 8 (continued)

			(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Random Effects (All)	Random Effects	State Effects	Metro Effects	Metro State Effects	Industry Effects	Industry State Effects	Industry State Effects (Robust)
GROUPS		**COVARIATES**	Dependent: Number of Employees in Establishments							
Horizontal Market Seeking	Metro	Local Serving Industry (interact w/metro market size)	-42.943*** (0.000)	-62.922*** (0.000)	-62.492*** (0.000)	-60.786*** (0.000)	-60.924*** (0.000)	18.303 (0.300)	21.604 (0.221)	21.604 (0.437)
		Pers. Inc. per Capita ($ ten ths.), by Metro	0.232 (0.536)	0.814 (0.247)	0.640 (0.403)	0.834 (0.369)	0.474 (0.614)	0.980 (0.162)	0.772 (0.311)	0.772 (0.677)
		Population (hnd. ths.), by Metro	-0.024 (0.232)	0.003 (0.937)	0.155*** (0.002)	0.855*** (0.000)	0.808*** (0.000)	0.001 (0.976)	0.121** (0.013)	0.121 (0.195)
		Population (hnd. ths.) x Local Ind., by Metro	0.054*** (0.000)	0.082*** (0.000)	0.082*** (0.000)	0.068*** (0.000)	0.068*** (0.000)	0.020 (0.241)	0.022 (0.203)	0.022 (0.524)
	State	Pers. Inc. per Capita (ten ths.), by State	1.240** (0.018)	2.243* (0.023)	5.142*** (0.000)	4.475*** (0.000)	5.241*** (0.000)	2.121** (0.031)	4.796*** (0.000)	4.796** (0.031)
		Population (mil.), by State	-0.428*** (0.000)	-0.761*** (0.000)	1.347*** (0.003)	-0.406 (0.242)	-0.018 (0.972)	-0.779*** (0.000)	1.472*** (0.001)	1.472 (0.145)
		Population (hnd. ths.) x Local Ind., by State	0.357*** (0.000)	0.639*** (0.000)	0.629*** (0.000)	0.612*** (0.000)	0.618*** (0.000)	0.487*** (0.000)	0.475*** (0.000)	0.475*** (0.000)
Trade Platform	Domestic	Outflows to Domestic (bn.), by Metro	0.005 (0.712)	0.002 (0.924)	-0.014 (0.623)			-0.008 (0.731)	-0.029 (0.315)	-0.029 (0.549)
		Inflows from Domestic (bn.), by Metro	0.006 (0.743)	0.015 (0.639)	-0.046 (0.294)			0.047 (0.127)	0.002 (0.967)	0.002 (0.983)
	International	Exports ($ bn.), by Metro	0.410*** (0.000)	0.589*** (0.000)	0.608*** (0.001)			0.460*** (0.001)	0.432** (0.013)	0.432 (0.212)
		Imports ($ bn.), by Metro	-0.248*** (0.000)	-0.387*** (0.000)	-0.439*** (0.000)			-0.351*** (0.000)	-0.358*** (0.001)	-0.358 (0.148)
Agglomeration and Information based Assets	Clusters	Four digit NAICS Specialization (LQ), by Metro	0.004*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.005*** (0.000)	0.004*** (0.000)	0.004*** (0.000)	0.004*** (0.000)
		Four digit NAICS Employment in FOEs (ths.), by Metro	-0.417*** (0.000)	-0.660*** (0.000)	-0.680*** (0.000)	-0.675*** (0.000)	-0.675*** (0.000)	-0.685*** (0.000)	-0.706*** (0.000)	-0.706*** (0.000)
		Metro	1.022 (0.357)	-0.695 (0.738)	-13.636*** (0.000)			1.423 (0.492)	-8.766*** (0.002)	-8.766** (0.017)
	University Assets	Higher Ed. Research & Related Expenses ($ mil.), by Metro	-0.000 (0.372)	-0.001 (0.388)	-0.000 (0.864)	-0.001 (0.410)	-0.001 (0.489)	-0.000 (0.541)	0.000 (0.931)	0.000 (0.965)
		Higher Ed. Revenue from Private Grants/Contracts ($ mil.), by Metro	-0.002*** (0.002)	-0.003*** (0.002)	-0.003*** (0.003)	-0.003*** (0.002)	-0.003*** (0.002)	-0.003*** (0.002)	-0.003*** (0.001)	-0.003** (0.040)
		Flagship Universities	-3.549*** (0.000)	-6.145*** (0.000)	-5.139*** (0.001)	41.065 (0.659)	118.967 (0.477)	-5.566*** (0.000)	-5.520*** (0.000)	-5.520 (0.117)
		Constant	111.221*** (0.000)	185.148*** (0.000)	78.760*** (0.000)	188.677* (0.051)	-28.650 (0.948)	108.871*** (0.000)	24.006 (0.256)	24.006 (0.476)
*** p-value<0.01, ** p-value<0.05, * p-value<0.1										
Observations			1,947,991	1,026,137	1,026,137	1,026,137	1,026,137	1,026,137	1,026,137	1,026,137
Number of Establishments			244,249	125,689	125,689	125,689	125,689	125,689	125,689	125,689
Overall R-Square			5.98%	5.55%	5.61%	5.75%	5.73%	10.09%	10.14%	10.14%
Breusch-Pagan Lagrange Multiplier Test (H_o: error variance			Reject H_o							
Hausman Prob>chi^2 (H_o: RE is an efficient estimator)			-	-	Reject H_o	Reject H_o	Reject H_o	Reject H_o	Reject H_o	Reject H_o
Wald Test on geography, industry, and time effects (H_o: coefficients are jointly equal to zero)			-	-	Reject H_o (for states)	Reject H_o (for metros)	Reject H_o (for metros states)	Reject H_o (for industry)	Reject H_o (for industry)	Reject H_o (industry)
Breusch-Godfrey test for serial correlation (H_o: Residuals u(i,t)			Residuals are weakly correlated.							
Residual u(i,t) vs. Fitted Plots to detect evidence of non-			Moderately well-behaved							

Determinants of Number of Employees in Foreign-Owned Establishment (Time-Series)-Continued