Foreign direct investment and agglomeration in six southern California counties

Jose N. Martinez
California State University, Dominguez Hills

Fynnwin Prager
California State University, Dominguez Hills

Carlos Kattan
California State University, Dominguez Hills

This paper analyzes data on Foreign Owned Enterprises (FOEs) in Southern California. Spatial agglomeration is higher with respect to industrial sector than to country of origin. Cities with high FOE concentrations have larger labor forces, lower unemployment rates, higher sales, more workers, and higher 3-year growth rate in sales volume than cities with lower FOE concentration. These findings suggest that Southern California cities receiving a large number of FOEs benefit from this agglomeration. Similarly, potential FOEs might benefit by locating in areas with high concentrations of FOEs, like Los Angeles County and the Southern California region in general.

INTRODUCTION

Political debates over the benefits and costs of trade and globalization have intensified in recent years. Nonetheless, the demand for presence in the U.S. market by foreign companies does not appear to have diminished, and international trade and inbound FDI remain critical to many regions. Southern California is one such region as it sits at the gateway between Central American, the Pacific, East Asian markets and the U.S. The contribution of FOEs to Southern California in terms of number of firms, jobs, and wages is significant and growing. As shown in Table 1, in 2016 there were an estimated 9,964 FOEs in Southern California, representing 1.2% of all firms in the region (Dun & Bradstreet, 2017). These firms have 439,101 employees, or 4.3% of the region's workers, and pay them $27.4 billion in wages (Employee data is from Dun & Bradstreet (2017) and California Employment Development Department (2017), while the authors calculated wage estimates from these data). The average wage paid by these firms is $61,489, which is over 10% more than the mean wage for the region.

As shown in Table 2, Japanese firms are the largest foreign investors to Southern California, with 2,465 firms paying 87,247 workers a total of $5.5 billion. UK companies are the second most prominent, with 1,089 firms paying 66,366 workers a total of $3.7 billion. It is notable that while both countries have expat communities in the region – for example, the Japanese American National Museum is in the Little Tokyo

area of Downtown Los Angeles, which emerged in the late 1800s – both nations each contribute only 1% of the total foreign-born population in the Los Angeles Metropolitan Statistical Area (MPI, 2017). Canada, France and Germany complete the top five source nations. Nearly half of these firms and jobs are located in Los Angeles County, with Orange County accounting for close to one quarter. For individual countries, Los Angeles is the most common destination, while the second most common destination tends to switch between Orange County and San Diego County. Table 3 shows that retail and wholesale trade continue to be largest sectors for the number of FOEs – 2,351 and 1,695 respectively – with manufacturing the largest sector in terms of employment – 140,582 jobs – and total estimate wages – $9.7 billion, followed by professional and business services, which pays 78,373 workers an estimated $4.6 billion in wages.

This research aims to inform policy makers and stakeholders related to FOEs in Southern California, and to better-understand the motivations for foreign firm location choices in Southern California. In particular this analysis explores whether economic sector or country of origin are the dominant factors influencing location choices for foreign investors. As such, this paper analyzes the level of spatial agglomeration among FOEs and the correlation between spatial agglomeration and measures of economic growth at the city and firm level, and presents some of the results from the survey of FOEs in Southern California.

TABLE 1
SOUTHERN CALIFORNIA FOES BY DESTINATION COUNTY, 2016

Rank	County	Jobs	% of all FOE Jobs	Firms	Est. Wages ($millions)
1	Los Angeles	212,512	48.4%	4,682	$13,248
2	Orange	114,001	26.0%	1,998	$7,103
3	San Diego	58,076	13.2%	1,619	$3,659
4	San Bernardino	21,596	4.9%	726	$1,325
5	Riverside	16,211	3.7%	561	$1,017
6	Ventura	16,705	3.8%	378	$1,077
	Total	**439,101**	**100.0%**	**9,964**	**$27,428**

Source: Dun & Bradstreet, CA EDD, Author calculations

TABLE 2
SOUTHERN CALIFORNIA FOES BY SOURCE NATION, 2016

Rank	Source Nation	Jobs	% of All FOE Jobs	Firms	Est. Wages ($millions)	Employment per Firm	Ave Wage Per Employee
1	Japan	87,247	19.9%	2,465	$5,513	35.4	$63,186
2	United Kingdom	66,366	15.1%	1,089	$3,747	60.9	$56,459
3	Canada	39,798	9.1%	858	$2,655	46.4	$66,724
4	France	35,981	8.2%	689	$2,369	52.2	$65,834
5	Germany	34,141	7.8%	858	$2,047	39.8	$59,971
6	Switzerland	24,675	5.6%	387	$1,843	63.8	$74,684
7	Sweden	23,177	5.3%	121	$1,021	191.5	$44,046
8	Ireland	20,985	4.8%	203	$1,368	103.4	$65,210
9	China	11,221	2.6%	323	$726	34.7	$64,695
10	Netherlands	11,104	2.5%	216	$727	51.4	$65,463
	Total	**439,101**	**100.0%**	**9,964**	**$27,428**	**44.1**	**$62,465**

Source: Dun & Bradstreet, CA EDD, Author calculations

TABLE 3
JOBS, FIRMS, AND WAGES BY SECTOR, 2016

Sector	Jobs	Firms	Est. Wages ($millions)
Natural Resources	2,260	48	$182.6
Construction	5,047	146	$295.1
Manufacturing	140,582	1,481	$9,714.2
Wholesale Trade	56,842	1,695	$4,045.7
Retail Trade	40,253	2,351	$1,229.7
Transportation, Warehousing and Utilities	22,749	489	$1,234.3
Information	19,907	523	$1,158.3
Financial Activities	43,496	1,168	$3,767.5
Professional and Business Services	78,373	1,232	$4,551.0
Education and Health Care	5,992	239	$354.4
Leisure and Hospitality	15,339	309	$473.4
Other Services	6,361	177	$283.8
Public Administration	1,900	106	$138.1
Total	**439,101**	**9,964**	**$27,428.3**

Source: Dun & Bradstreet, CA EDD, Author calculations

LITERATURE REVIEW

Two areas of the academic economics literature pertain to this study. First, studies of Foreign Direct Investment explore the motivations for, and impacts of, cross-border business investments. This could include foreign firms investing in the U.S. to gain market access, benefit from technology spillovers, or

recruit high-skilled U.S. workers. Although the determinants of FDI have been studied extensively in the literature (see Blomstrom, Kokko and Globerman, 2001 and Neilsen, Asmussen and Weatherall, 2017 for notable and comprehensive literature reviews), there has been relatively limited research on the macroeconomic impacts of *inward* FDI on U.S. regional economies. Moreover, there have been fewer studies of the economic impacts of inward FDI in the U.S. (Mérette, Papadaki, Hernandez, & Lan, 2008 is a notable exception), and the authors could find no examples of analyses examining the economic impacts of inward FDI on sub-national regions, such as the South Bay.

Second, studies of Agglomeration or clustering of industries examine the location choices of businesses. At the heart of this literature is a tension between firms wanting to gain as much market coverage as possible – a Starbucks on every corner – and businesses locating close to one another – for example jewelry districts or car dealership clusters – to benefit from lower transaction costs for customers, and knowledge and technology spillovers between firms. This literature can provide insight into the influence of agglomeration on investment decisions. Industry agglomeration has been found to be most notable at the state level and reduces in industry concentration at lower levels (Ellison & Glaeser, 1997). As such, this paper further contributes to the literature by looking at the regional level.

Taken together, these two literatures highlight the interactions between foreign direct investment and clustering effects, as well as whether a firm would be more influenced by industry or country of origin factors when choosing locations. Let us take the perspective of a foreign firm that has unique products or production techniques and has out-grown its domestic market. Dunning's "Ownership, Location, and Internalization" framework makes the common-sense assertion that our firm will seek foreign investment locations for which benefits outweigh costs of operating in a foreign country (Dunning, 1977). Southern California clearly offers a myriad of benefits for our foreign business seeking to gain a foothold in the lucrative and extensive U.S. market. It is likely that this firm has already gained some knowledge of the region by exporting through the largest twin ports in the U.S., the ports of Los Angeles and Long Beach. Such experimentation through exporting before investments are made is common (Fosfuri, Motta, and Ronde, 2001). Rosenthal (2001) similarly noted that proximity to input material and transportation hubs have a significant role in the location choices, particularly for those industries sensitive to transportation costs (see also Shaver and Flyer, 2000).

Foreign investments are often located as close to home as possible (Halvorsen, 2012). If our firm is from a Pacific Rim nation, they are more likely to investment in Pacific Rim states. This would stand to reason given lower transport costs, greater cultural connections and more expats from Pacific Rim countries in the Southern California region compared to other U.S. states. Foreign firms succeed more in regions where the proportion of foreign owned businesses are higher and invest a greater amount into productivity enhancing activities (Girma, et al., 2013). Interestingly, the presence of more developed businesses may positively influence the entrance of smaller businesses to a region (Shaver and Flyer, 2000). Indeed, business agglomerations support the development of small, high-technology firms but may deter larger, more developed firms from locating in these clusters (Halvorsen, 2012). Crozet and colleagues (2004) found similar patterns in a 2004 study of investments from neighboring European nations into France (Crozet et al, 2004). Firms clustered by industry and wages, yet location choice was initially closer to home (e.g. Italian firms started in the south east, German firms started in the east) and but then dispersed throughout the whole country. A 2003 study showed that "demonstration effects" occurred in Ireland for U.S. firms. The first-mover firms were able to provide information to other U.S. firms about the risks and rewards of investing in Ireland. Further studies have shown similar effects for German firms abroad and foreign firms in China. This highlights a key question behind this report: Why do firms leave Southern California? Behind this dispersion effect are pull factors that draw foreign-owned firms away from California, such as tax incentives, labor costs, costs of business, and regulatory environment.

Southern California is also appealing to our example firm because of the diverse and high-skilled workforce living in a region with obvious lifestyle benefits. Firms with more sophisticated technologies in

place benefit from the spillover effects of agglomeration through improved access to educated workforce and proximity to input supply chains (Shaver and Flyer, 2000). Workers trained in new technologies retain their knowledge as they decide to remain in their current organization or choose to move to a local competitor (Girma, Gong, Gorg, and Lancheros, 2015). Rosenthal (2001) found that industries with a high reliance on skilled labor also have a higher propensity to cluster at all geographic levels. Halvorsen's (2012) findings suggest that more developed firms, and thus larger potential investments, selected states with higher wages in order to isolate themselves from the negative effects of agglomerations. The author reasons that by locating in states that increase the burden to smaller, less technologically advanced firms in the way of higher wages, larger firms reduce the likelihood of knowledge and employee poaching by competitors. This all suggests that Southern California is particularly appealing to developed businesses.

The benefits of inward FDI to the local economy are also important. Many studies find positive impacts to host regions in terms of increased wages (Aitken et al, 1996), employment opportunities and the spillover effects of host countries learning from foreign producers (Gorg and Greenaway, 2004; Girma et al, 2015; Haskel, Pereira and Slaughter, 2007).

SPATIAL AGGLOMERATION ANALYSIS

Agglomeration and clustering effects identify the locational connections between companies. The literature review highlighted the importance of understanding the intersection between inbound FDI and agglomeration effects, especially with respect to economic sector and source nation. This paper studies agglomerations by generating and examining:

- Aggregate county data
- Clusters on maps, calculating
- Herfindahl-Hirschman Indices (H-indices) that indicate the relative densities of clusters based on city-level data, and
- Distance-based data that includes the number of firms and employees from the same economic sector and country of origin within fixed distances from each FOE in the Southern California region. This analysis reveals the economic benefits of clustering.
- Survey of FOEs in Southern California, administered in 2017, asking about location and investment choices and connections with other firms and institutions.

Dun & Bradstreet firm-level data retrieved in March 2017 complements California Employment Development Department data on wages to estimate total wages for different categories. Dun & Bradstreet data only shows the ultimate ownership of firms above a ten percent threshold, and does not provide indication whether the FOE is the result of a merger or acquisition, a "greenfield" investment, or some other investment arrangement. As such, the jobs and wages described in this report are not necessarily created as a consequence of the inbound FDI, nor would they necessarily be lost if the FDI was removed.

County Aggregate Data

To Table 4 compares Southern California counties by the FOE rankings, job shares, and wages shares for source nations. While interesting in their own right, these findings also shed light on the agglomeration locations of firms by source nation in different counties. For 2016, Compared to the Southern California average, it is notable that Swiss and Swedish-owned firms have a disproportionate presence in Los Angeles County, while Ireland, Israel, Taiwan and India firms are clustered in Orange County. San Diego is home to more UK, Irish and Dutch firms compared to the Southern California average, while Mexican and Canadian firms are particularly prominent in San Bernardino. For 2017, Swiss and Swedish firms stand out in Los Angeles County, while UK firms are prominent in Orange County, and Irish and Dutch firms are disproportionately represented in San Diego County much like 2016. Table 5 provides similar insights, but by economic sector, for Japanese and UK FOEs only. This table shows that Japanese firms are most likely

to cluster in the manufacturing and wholesale trade sectors, while UK firms are most likely to cluster in the professional and business services sectors.

TABLE 4
LOS ANGELES, ORANGE AND SAN DIEGO COUNTIES COMPARED TO SOUTHERN CALIFORNIA BY SOURCE NATION: RANKINGS AND SHARES, 2016

SoCal Rank	Los Angeles County			Orange County			San Diego County		
	Rank change	Jobs share	Wages share	Rank change	Jobs share	Wages share	Rank change	Jobs share	Wages share
Japan	0	51.8%	51.0%	-1	26.1%	26.3%	0	13.6%	14.2%
UK	0	40.6%	43.3%	1	35.8%	31.5%	0	15.4%	16.6%
Canada	-1	44.5%	45.5%	0	31.8%	31.5%	-1	11.5%	11.7%
France	-3	42.4%	41.8%	0	22.9%	23.5%	-2	11.2%	11.2%
Germany	0	46.5%	46.2%	0	23.3%	24.2%	2	14.2%	14.5%
Switzerland	0	63.5%	66.1%	-2	12.9%	11.9%	-1	13.0%	12.1%
Sweden	4	76.9%	74.1%	N/A	N/A	N/A	-2	6.5%	6.6%
Ireland	0	31.8%	32.9%	2	34.9%	37.3%	3	21.0%	17.1%
China	N/A	N/A	N/A	2	53.1%	56.4%	N/A	N/A	N/A
Netherlands	1	49.3%	49.7%	N/A	N/A	N/A	2	25.2%	24.4%
County Average		**48.4%**	**48.3%**		**26.0%**	**25.9%**		**13.2%**	**13.3%**
SoCal Rank	**San Bernardino County**			**Riverside County**			**Ventura County**		
	Rank change	**Jobs share**	**Wages share**	**Rank change**	**Jobs share**	**Wages share**	**Rank change**	**Jobs share**	**Wages share**
Japan	0	3.4%	3.1%	-1	2.3%	2.3%	-1	2.8%	3.1%
UK	-3	1.7%	1.7%	-1	2.8%	2.7%	-1	3.7%	4.2%
Canada	1	6.6%	6.3%	-2	3.8%	3.4%	-3	1.9%	1.5%
France	1	6.6%	6.4%	-5	2.2%	1.9%	3	14.7%	15.2%
Germany	1	4.8%	4.3%	4	6.9%	7.1%	1	4.4%	3.7%
Switzerland	-2	3.5%	3.2%	2	6.7%	6.2%	N/A	N/A	N/A
Sweden	0	4.2%	4.3%	1	6.3%	7.6%	0	3.1%	3.4%
Ireland	-2	3.5%	3.8%	0	3.9%	3.9%	3	4.9%	5.1%
China	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Netherlands	N/A	N/A	N/A	N/A	N/A	N/A	2	5.3%	6.0%
County Average		**4.9%**	**4.8%**		**3.7%**	**3.7%**		**3.8%**	**3.9%**

Source: Dun & Bradstreet, Author calculations.

TABLE 5
JOBS BY ECONOMIC SECTOR FOR FOES FROM JAPAN AND UK

Japan FOEs		UK FOEs	
Top 5 Sectors by Jobs	**Jobs**	**Top 5 Sectors by Jobs**	**Jobs**
Manufacturing	22,837	Professional, Business Services	24,070
Wholesale Trade	19,449	Manufacturing	12,996
Retail Trade	11,174	Transportation, Warehousing, Utilities	7,928
Financial Activities	10,738	Retail Trade	6,885
Information	8,364	Financial Activities	3,658
Grand Total	**72,562**	**Grand Total**	**55,537**

Source: Dun & Bradstreet

Cluster Maps

As shown in Appendix A, Figures A1-8 represent the clusters of foreign-owned businesses in Southern California (except San Diego, which is omitted for resolution reasons), with respect to the top 4 source nations (Figures A1-4) and industries (Figures A5-8) by number of firms. There are notable clusters of Japanese-owned companies in Culver City, Torrance, Westminster, Lake Forrest, and Downtown. For UK-owned companies, the prominent clusters are in El Segundo, Costa Mesa, Santa Monica, and Downtown LA. While German-owned companies are most concentrated in Newport Beach, French-owned companies are more evenly dispersed around the region, with stronger presence in Santa Monica, El Segundo and Century City.

In terms of foreign-owned businesses by industry, there are strong manufacturing clusters in Lake Forrest, Costa Mesa/Irvine and Corona, while wholesale trade is more evenly distributed across the region, despite large clusters in Lake Forrest, Westminster and Downtown LA. In terms of retail trade, the strongest clusters appear to center on major shopping malls such as South Coast Plaza in Costa Mesa and Westfield Topanga in Canoga Park. Finance and insurance foreign-owned businesses cluster in Newport Beach and Downtown LA.

H-Index Clustering Analysis

Tables in this section measure the level of spatial agglomeration in Southern California with respect to sector and country of origin, and then compare the two. This approach provides insight into the question of whether individual FOEs more likely to locate next to another foreign company from the same sector than locating next to another foreign company from the same country of origin? We also assess whether there is statistical evidence of a correlation between the level of spatial agglomeration among FOEs and city- and firm-level measures of growth.

This analysis measures the level of spatial agglomeration in a particular area based on the number of FOEs. FOEs might choose to cluster with other firms in their own sector in order to benefit from customers' supply, positive spillovers, and common infrastructure and supply chain synergies. FOEs might instead choose to cluster with other firms from the same country of origin in order to benefit from their shared background and resources, as well as similar learning experiences when locating, competing, and expanding in the U.S. The H-Indexes (Tables 6 and 7) are calculated using the proportion of all FOEs located in each city. In this study, the size of different cities is not considered when calculating the proportions.. The H-Index for a particular sector/county will equal to one when all activity is located in only one city. The H-Index is close to zero when all activity is spread almost equally among many cities. Analysis based on the proportion of FOE workers follows the same procedure.

It is important to note that the agglomeration analysis, like the H-Index analysis, provides more robust results when all the units of observation cover the same amount of surface area. Unfortunately, this is not possible given our data, so the decision is whether to make it based on zip code, city, county, or any other units used by the census bureau. The zip code unit is often too small to capture fully the extent of clustering in the area, while the county unit is usually too large and would result in only a couple of observations. Analysis in this section uses the city level. Firm level analysis below uses 5 km radius measurements. In all sections, results presented by county are the average values for each county.

TABLE 6
SECTOR H-INDEX FOR FOE FIRMS BY COUNTY, 2016

Sectors	Southern California	LA	Orange	River-side	San Bernardino	San Diego	Ventura
Natural Resources	0.043	0.018	0.156	0.185	0.184	0.188	0.500
Construction	0.051	0.025	0.193	0.181	0.431	0.133	0.301
Manufacturing	0.029	0.029	0.034	0.135	0.178	0.175	0.341
Wholesale Trade	0.025	0.030	0.050	0.114	0.134	0.187	0.341
Retail Trade	0.018	0.034	0.046	0.073	0.094	0.093	0.185
Transp, Warehousing, Utilities	0.041	0.041	0.072	0.160	0.117	0.138	0.610
Information	0.041	0.041	0.088	0.132	0.157	0.099	0.389
Financial Services	0.043	0.043	0.128	0.114	0.081	0.071	0.272
Prof / Business Services	0.055	0.043	0.119	0.189	0.185	0.204	0.487
Education / Health Care	0.034	0.046	0.042	0.103	0.184	0.134	0.326
Leisure / Hospitality	0.046	0.051	0.092	0.100	0.194	0.207	0.478
Other Services	0.030	0.055	0.058	0.096	0.140	0.173	0.444
Public Administration	0.503	0.503	0.702	0.556		1.000	0.515

Source: Dun & Bradstreet, Author calculations. Calculations are based on the number of firms at the city level.

TABLE 7
SECTOR H-INDEX FOR FOE FIRMS BY SOURCE NATIONS AND COUNTY, 2016

Country of Origin	Southern California	Los Angeles	Orange	Riverside	San Bernardino	San Diego	Ventura
Japan	0.032	0.075	0.089	0.102	0.115	0.292	0.141
United Kingdom	0.033	0.073	0.113	0.113	0.135	0.336	0.142
Germany	0.023	0.045	0.108	0.129	0.156	0.289	0.169
Canada	0.027	0.076	0.120	0.123	0.104	0.251	0.175
France	0.027	0.056	0.087	0.146	0.139	0.392	0.253
Switzerland	0.042	0.108	0.138	0.136	0.099	0.405	0.300
Luxembourg	0.021	0.054	0.083	0.120	0.142	0.246	0.238
China	0.032	0.053	0.186	0.240	0.264	0.517	0.500
Korea Rep Of	0.075	0.199	0.200	0.333	0.234	0.578	0.680
Taiwan	0.043	0.068	0.243	0.500	0.340	0.222	0.333
Mexico	0.026	0.044	0.111	0.098	0.084	0.260	0.172
Netherlands	0.042	0.103	0.297	0.117	0.324	0.348	0.153
Ireland	0.054	0.063	0.324	0.225	0.242	0.662	0.247
Australia	0.048	0.135	0.108	0.340	0.218	0.299	0.375
Italy	0.031	0.069	0.113	0.333	0.280	0.258	0.333

Source: Dun & Bradstreet, Author calculations. Calculations are based on the number of firms at the city level.

Table 6 shows that public administration is the sector with the highest level of spatial agglomeration in Southern California, but this might be determined by the relatively small number of firms located in a few cities in each county. For example, the City of Los Angeles houses roughly 85 percent of all firms in this

industry in the Los Angeles County. Among industries with a large number of FOEs, financial Services and professional and business services and retail trade are the industries with the highest level of spatial agglomeration.

Also in Table 6, among FOEs in the manufacturing, wholesale trade, and retail trade industries, San Diego County shows by far the highest level of spatial agglomeration. This again is driven mainly by a relatively small number of firms located in a few cities in that county. For the construction industry, the highest level of spatial agglomeration occurs in Riverside County. Besides public administration, FOEs in Orange County show a higher level of spatial agglomeration in professional and business services. As an example, a perspective FOE seeking to locate in Southern California in the public administration industry could use this information and realize that Los Angeles County has by far the highest number of FOEs in this sector and the level of spatial agglomeration is among the highest in Southern California. On the other hand, a perspective FOE in the transportation, warehousing, utilities industry would see that Los Angeles County has by far the highest number of FOEs in this sector, but the level of spatial agglomeration is higher in San Diego and Orange County.

In terms of country of origin (see Table 7), Korea shows the highest level of spatial agglomeration in Southern California, followed by Taiwan and Switzerland. For the Los Angeles County, Korea, Switzerland, and Canada show the highest level of spatial agglomeration, in that order. For Orange County, the order is Taiwan, Korea, and China. Japan and the United Kingdom have the highest number of firms in Southern California, and they show a higher level of spatial agglomeration in San Diego and Ventura County. Similar results are presented for the other top 10 countries with FOEs in Southern California. As an example, the perspective FOE from Japan or United Kingdom seeking to locate in Southern California could use this information and acknowledge that Los Angeles County has the highest number of FOEs from these countries, but also the lowest level of agglomeration among Southern California counties.

The analysis presented in this section also provides evidence that spatial agglomeration tends to be higher for industrial sectors than for country of origin, except for countries with the largest number of FOEs in the area, like Japan and United Kingdom. This suggests that firms might be more likely to locate close to another firm in the same sector than to another firm from the same country of origin, with the exception of Japan and United Kingdom.

Distance Analysis

Another, and probably more intuitive, approach to measure clustering is to take the individual firm's perspective and consider how many FOEs from the same sector or the same country of origin are located within a predetermined radius. This information could be useful for existing firms and prospective investors to assess the level of competition and spillover benefits associated with spatial agglomeration in a particular area. Once firms located inside the radius are identified, they are further classified based on whether they belong to the same industrial sector or the same country of origin. The results presented in Tables 8 through 11 utilize a 5 km radius and represent average measures. 5 km radius is an arbitrary measure; different specifications were tested with no particular effect on the analysis results.

TABLE 8
AVERAGE NUMBER OF FOREIGN-OWNED FIRMS WITHIN A 5KM RADIUS

Sector	Los Angeles	Orange	Riverside	San Bernardino	San Diego	Ventura
Natural Resources	146	162	35	71	5	38
Construction	215	239	51	62	101	40
Manufacturing	156	214	51	113	100	39
Wholesale Trade	182	206	39	113	97	40
Retail Trade	172	184	29	75	73	47
Transp, Warehousing, Utilities	195	230	44	93	96	41
Information	196	216	30	78	96	40
Financial Services	211	174	24	49	86	40
Prof / Business Services	225	257	39	111	122	44
Education / Health Care	132	192	31	69	98	43
Leisure / Hospitality	204	213	30	92	84	52
Other Services	179	173	30	95	104	27
Public Administration	347	184	0	51	101	0

Source: Dun & Bradstreet, Author calculations

TABLE 9
AVERAGE NUMBER OF FOREIGN-OWNED FIRMS
WITHIN THE SAME SECTOR WITHIN A 5KM RADIUS

Sector	Los Angeles	Orange	Riverside	San Bernardino	San Diego	Ventura
Natural Resources	2	1	0	1	0	1
Construction	4	4	3	2	2	0
Manufacturing	19	45	16	29	22	7
Wholesale Trade	41	40	7	27	15	6
Retail Trade	41	39	10	18	20	14
Transp, Warehousing, Utilities	40	5	2	6	5	1
Information	20	7	1	3	4	1
Financial Services	40	19	3	2	9	5
Prof / Business Services	40	55	5	11	31	7
Education / Health Care	3	4	1	2	5	1
Leisure / Hospitality	10	7	1	1	5	1
Other Services	3	3	1	1	3	1
Public Administration	31	1	0	0	2	0

Source: Dun & Bradstreet, Author calculations

TABLE 10
AVERAGE NUMBER OF FOREIGN-OWNED FIRMS
FROM THE SAME SOURCE NATION WITHIN A 5KM RADIUS

Sector	Los Angeles	Orange	Riverside	San Bernardino	San Diego	Ventura
Natural Resources	16	17	4	6	1	1
Construction	37	20	7	3	10	4
Manufacturing	23	22	4	7	11	5
Wholesale Trade	42	28	4	7	11	3
Retail Trade	24	22	3	7	9	5
Transp, Warehousing, Utilities	32	26	7	8	15	4
Information	24	26	3	8	11	3
Financial Services	26	24	2	4	11	4
Prof / Business Services	31	24	4	10	11	4
Education / Health Care	14	20	3	7	9	7
Leisure / Hospitality	37	22	3	9	10	5
Other Services	26	26	3	3	11	4
Public Administration	9	7	0	0	2	0

Source: Dun & Bradstreet, Author calculations

TABLE 11
AVERAGE NUMBER OF FOREIGN-OWNED FIRMS
FROM THE SAME SECTOR AND SOURCE NATION WITHIN A 5KM RADIUS

Sector	Los Angeles	Orange	Riverside	San Bernardino	San Diego	Ventura
Natural Resources	0	0	0	0	0	0
Construction	1	0	2	1	1	0
Manufacturing	3	5	1	2	3	2
Wholesale Trade	13	8	1	2	2	1
Retail Trade	6	6	1	3	3	2
Transp, Warehousing, Utilities	5	1	1	1	1	0
Information	4	1	0	0	1	0
Financial Services	5	5	0	0	2	1
Prof / Business Services	6	7	1	1	4	1
Education / Health Care	1	0	0	1	1	1
Leisure / Hospitality	2	1	0	0	1	1
Other Services	1	0	0	0	0	0
Public Administration	1	0	0	0	0	0

Source: Dun & Bradstreet, Author calculations

As shown in Tables 8, the results for Los Angeles County suggest that FOEs in the public administration, professional and business services, and construction tend to be located in dense business areas. FOEs in professional and business services, construction, and transportation, warehousing, utilities are located in the most dense business areas in Orange County. The highest concentration areas for Riverside County FOEs are construction and manufacturing, while professional and business services and

other services are the highest concentration areas for FOEs in San Diego County, while public administration in Los Angeles County shows the highest level of agglomeration.

As mentioned before, spatial agglomeration impacts might be larger for firms in the same sector and/or along the supply chain. Table 8 shows the average number of firms located within the 5 km radius and that belong to the same sector. The results for Los Angeles County show that FOEs in the wholesale and retail trade industry are located in areas with an average of more than 40 FOEs in their same sectors within a 5 km radius, but the agglomeration of FOEs in professional and business services and manufacturing is even higher in Orange County. For San Diego County, the highest concentration is for FOE in professional and business services and manufacturing, while the highest FOE agglomeration in Ventura County is in retail trade.

The results for spatial agglomeration based on country of origin (Table 10) show that FOEs in Los Angeles County present a high level of concentration in the wholesale trade, construction, and leisure and hospitality industries. For FOEs in Orange County, firms in wholesale trade, transp., warehousing, and utilities, and information industries show the highest level of spatial agglomeration. On average FOEs in these industries could find close to 30 other FOEs from the same country of origin within a 5 km radius.

Comparing the level of spatial agglomeration based on sector and country of origin (Table 11), the results suggest that FOEs tend to be slightly more concentrated when based on the country of origin. That suggests that FOEs located in most of Southern California tend to have a closer proximity to another company from the same country of origin than from the same sector. As before, these results are driven mainly by the large number of FOEs from Japan, United Kingdom, and Germany that tend to be located in Los Angeles County. Finally, further analysis into industry concentration based on both sector and country of origin show that FOEs in wholesale trade, for example, can expect to see an average of 10 other FOEs in the same sector and from the same country of origin within a 5 km radius when located in Los Angeles and Orange County.

Statistical Correlation Analysis

So far, this analysis has focused on identifying the county and sector level of spatial agglomeration based on the H-Index and the number of FOEs from the same sector or same country of origin within a predetermined radius. This section analyzes whether spatial agglomeration is correlated with measures of economic development and growth at the city and firm level applying Analysis of Variance (ANOVA). ANOVA is a statistical tool that tests the hypothesis that the means of two different groups are statistically different. In this case, the null hypothesis is that the difference between two groups' means is not statistically significant and probably driven simply by randomness. This technique is applied here to test whether or not spatial agglomeration of FOEs is statistically correlated with city and firm level measures of economic development and growth.

At the city level, all FOEs are measured with respect to the average sales volume, number of employees, city-level labor force and unemployment rates, the 3-year growth rate in sales, and the 3-year growth rate in employment[1] (summary statistics provided in Table 12). Although arguably optimal measures of economic development and growth, these are intuitively good measures of economic conditions at the city and firm level. At this stage, the ANOVA considers cities in Southern California and groups them in quartiles according to the average number of FOEs. The following table presents the summary statistics and the results at the city level.

[1] The sales volume, number of employees, and the 3 year growth rates in sales and employment measures are part of the Dun & Bradstreet data, while city level unemployment rates and labor force comes from CA EDD.

TABLE 12
SUMMARY STATISTICS FOR AGGLOMERATION REGRESSION ANALYSIS

Variable	Statistic	Value
Sales Volume	Median	$4,045,456
Number of Workers	Mean	44
3 Year Growth % Sales Volume	Mean	1.44
3 Year Growth % Employees	Mean	10.80
Y-O-Y Change Sales Volume	Mean	$2,294,932
Y-O-Y Change in Employees	Mean	0.17
Subsidiary	Mean	0.724
Female CEO	Mean	0.149
Minority Owned	Mean	0.003
Distance to LAX (km)	Mean	66.2
Distance to San Pedro Ports (km)	Mean	63.5
Distance to US-Mexico Border (km)	Mean	165.6
FOE in 5 km Radius	Mean	157.0
FOE Same Sector in 5 km Radius	Mean	27.8
FOE Same Country of Origin in 5 km Radius	Mean	21.0
FOE Same Country of Origin and Sector in 5 km Radius	Mean	4.6

Source: Dun & Bradstreet, Author calculations

TABLE 13
ANOVA: CONCENTRATION BASED ON NUMBER OF FOES AT CITY LEVEL

	Low Concentration		High Concentration
Sales Volume (Mean)	$18,100,000	***	$90,300,000
Number of Workers	20.9	***	41.0
Labor Force	16,339	***	91,386
Unemployment Rate	5.9	*	5.5
3 Year Growth % Sales Volume	0.0	**	1.3
3 Year Growth % Employees	11.4		11.9
Note: ***,**,* refers to statistical significance at the 1%, 5%, and 10%, respectively			
Low and high FOEs concentration refers to cities in the lowest and highest quartile, respectively			

Source: Dun & Bradstreet, Author calculations

According to Table 13, cities with higher concentrations of FOEs have statistically larger labor forces and lower unemployment rates[2]. FOEs in these cities also have statistically higher sales, more workers, and higher 3-year growth rates in sales volume when compared with FOEs in cities with lower concentrations. To explore further the issue of spatial agglomeration, this analysis groups cities in Southern California into quartiles according to the number of average number of FOEs located within a 5 km radius. The previous

[2] At the current level of analysis, we do not consider whether FOEs choose to locate in cities with a larger labor force and/or lower unemployment rates, or whether FOEs might cause in part larger labor forces and/or lower unemployment rates.

analysis considers only the number of FOEs in the city, while this approach considers cities with spatially agglomerated FOEs.

TABLE 14
ANOVA: CONCENTRATION BASED ON NUMBER OF FOES
WITHIN A 5KM RADIUS AT CITY LEVEL

	Low Concentration		High Concentration
Sales Volume (Mean)	$29,800,000	*	$53,500,000
Number of Workers	20.9	***	37.6
Labor Force	18,135	**	74,828
Unemployment Rate	6.3	***	5.4
3 Year Growth % Sales Volume	1.1		1.9
3 Year Growth % Employees	9.5		8.6
Note: ***,**,* refers to statistical significance at the 1%, 5%, and 10%, respectively			
Low and high FOEs concentration refers to cities in the lowest and highest quartile, respectively			

Source: Dun & Bradstreet, Author calculations

Results in Table 14 show that cities with higher levels of spatial agglomeration tend to have larger labor forces and a lower unemployment rates. FOEs in high spatial concentration cities also tend to have larger average sales and larger average numbers of employees. Although there is a natural overlap of cities in the high concentration categories of the previous two tables, cities classified as high concentration in the number of FOEs are not necessarily those same cities classified as having high spatial agglomeration.

This analysis also examines whether or not firms are more likely to locate in the proximity of another firm from the same sector or of another firm from the same country of origin. Although there is some overlap in the cities for both groups, Table 15 presents support for the idea that FOEs located in cities with high agglomeration of firms from the same sector tend to have higher average sales volume and employ more workers than FOEs located in cities with high spatial agglomeration based on the country of origin. These FOEs also tend to have higher 3-year growth rates in sales and employment, while city level measures are not statistically different for these two groups. These results suggest that spatial agglomeration based on sector might have larger impacts on economic development and growth than spatial agglomeration based on country of origin. In other words, FOEs seeking to locate in Southern California might benefit more when they choose areas of high spatial concentration based on sector.

TABLE 15
ANOVA: CONCENTRATION BASED ON NUMBER OF FOES
WITHIN A 5KM RADIUS AT CITY LEVEL

	Sector High Concentration		Country of Origin High Concentration
Sales Volume (Mean)	$60,700,000	**	$48,500,000
Number of Workers	37.6	*	35.9
Labor Force	73,965		75,982
Unemployment Rate	5.3		5.3
3 Year Growth % Sales Volume	2.6	*	2.2
3 Year Growth % Employees	14.2	**	9.0

Note: ***,**,* refers to statistical significance at the 1%, 5%, and 10%, respectively
High concentration FOEs refers to cities in the highest quartile based on the number of firms in the same sector and the number of firms from the same country of origin, respectively

Source: Dun & Bradstreet, Author calculations

Survey Analysis

To complement the analysis of FOEs in Southern California, a survey of FOEs in Southern California was conducted between January and May of 2017. This survey aims to better-understand the contribution of these 9,000+ businesses to the regional economy, their motivations for locating in Southern California, their experiences doing business here, and which factors encourage foreign firms to continue a presence the region. The survey was administered through phone calls and an online instrument. All 9,105 firms from the 2016 dataset were contacted, via email or phone call. The results were also compared to the results from a previous survey implemented in 2009. A total of 143 responses were collected; similar to the 118 responses collected in the 2009 survey.

When considering future investments, survey responses favored expansions of current facilities and growth into new facilities (see Tables B-4 and B-5). The results also show that more than 80 percent of respondents consider their situation to be good or satisfactory and more than half of respondents have plans to expand, establish new facilities/branches, or invest in other sectors.

Some respondents in appear to be considering relocation. In terms of potential for new investment, of those responding, most are considering Los Angeles County, followed by San Diego County, and Orange County. Within other areas of California, the Bay Area is the most popular response. Outside of California, investment potential is spread across the US, with a slight preference for the states of Texas, New York, Hawaii, Nevada, and Florida. Outside the US, Asian countries were the most popular potential market, followed by Canada and Europe.

In terms of connections to other institutions, as shown in Table B-6, respondent FOEs are most likely to be in contact with industry organizations and local or city governments. While a majority of respondents still engage with local chambers of commerce and local home-nation consulates, the numbers are significantly lower than for industry organizations and local and city governments. This last figure appears to be consistent over time, as 2009 respondents all reported favorable interactions with local government offices.

Respondents were asked to report which regional programs would benefit their company. The most popular response was “Economic reports on local markets”, followed by “Public road network investment”, “Training and workshops on doing business in Southern California (export training, etc…)” and

"Workforce development initiatives, such as job-training, layoff support". It is notable that there was significantly less interest in "Public mass-transit investment", "Sister-city/sister region programs connected to a city in your home country", "Matchmaking events" and "Trade missions abroad".

CONCLUSION

This analysis of FOEs in Southern California considered the number of firms, employees, and the wages paid by FOEs in Southern California and the changes in composition from 2016 to 2017. The analysis was based on sector, county, and country of origin. It also compared two methods to identify and measure the level of spatial agglomeration among FOEs: the city-level H-Index of agglomeration based on the number of firms and the number of FOEs located within a predetermined radius from each FOE. The latter approach was further divided into FOEs in the same sector and FOEs from the same country of origin. Maps of the clusters by country of origin and sector are also available in Appendix A below.

Excluding the effect of countries with large number of FOEs in Southern California, like Japan and the United Kingdom, this analysis found evidence that spatial agglomeration is larger when based on sector than when based on country of origin. In other words, FOEs locating in Southern California are more likely to locate close to other FOEs from the same industrial sector, rather than locating nearby FOEs from the same country of origin.

This analysis also explored whether spatial agglomeration is correlated with measure of economic development and growth. This analysis found statistical evidence that cities with higher levels of spatial agglomeration tend to have larger labor forces and lower unemployment rates. FOEs located in these cities also tend to have higher sales volumes and more employees. In some cases they also have higher 3-year growth rates in sales and/or employment. Similarly, this analysis found that FOEs in cities with high levels of spatial agglomeration by sector show higher 3-year growth rates in sales volume and employment than FOEs in cities with high levels of spatial agglomeration based on country of origin.

This study was complemented with a survey of FOEs that shows that more than 80 percent of companies are generally positive about their business experience in Southern California. Furthermore, a majority of respondents have plans to expand, establish new facilities/branches, or invest in other sectors, and only a small number of firms expressed their interest in relocating outside the region. For the prospective FOE, these results might assist in their decision where to locate within Southern California.

All of these suggests that cities in Southern California might benefit from receiving FOEs and those foreign companies seeking to locate in areas with already a high concentration of FOEs, like Los Angeles County and Southern California in general, might also benefit from the presence of other foreign companies in the area.

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APPENDIX A. MAPS OF FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION

FIGURE A1
FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION: JAPAN

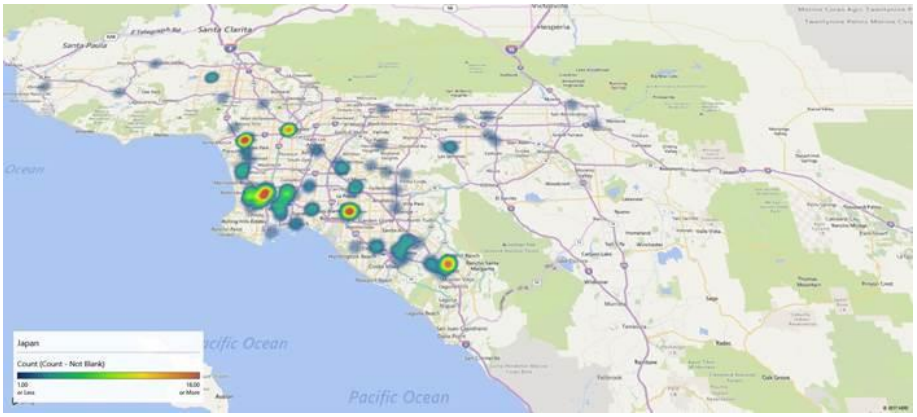


FIGURE A2
FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION: UK

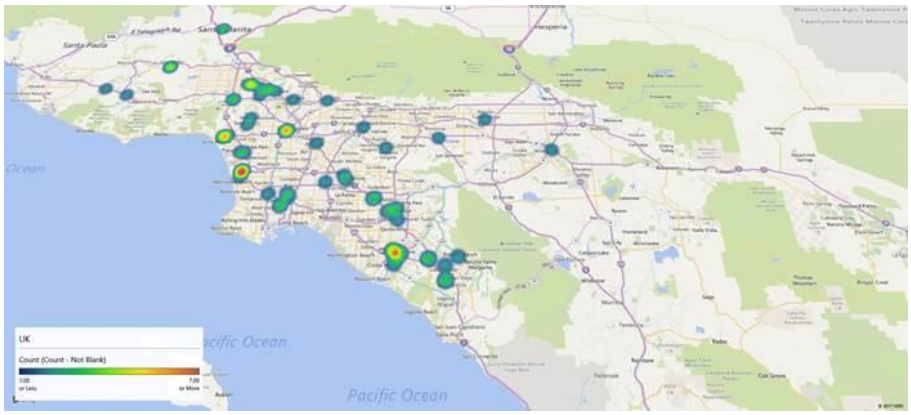


FIGURE A3
FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION: GERMANY

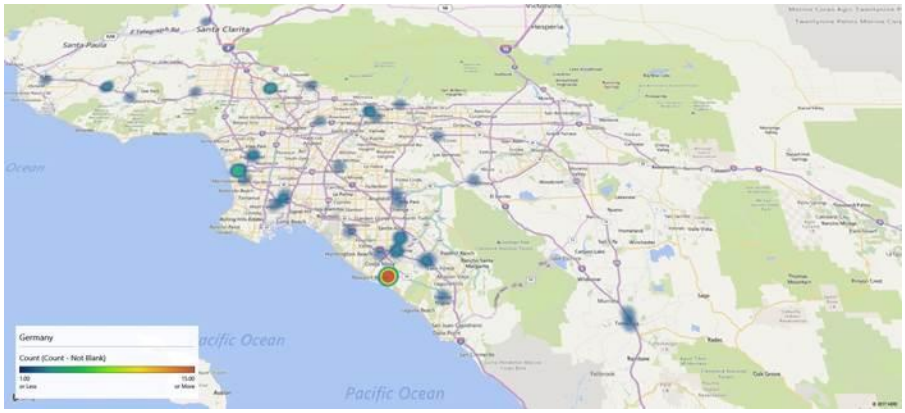


FIGURE A4
FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION: FRANCE

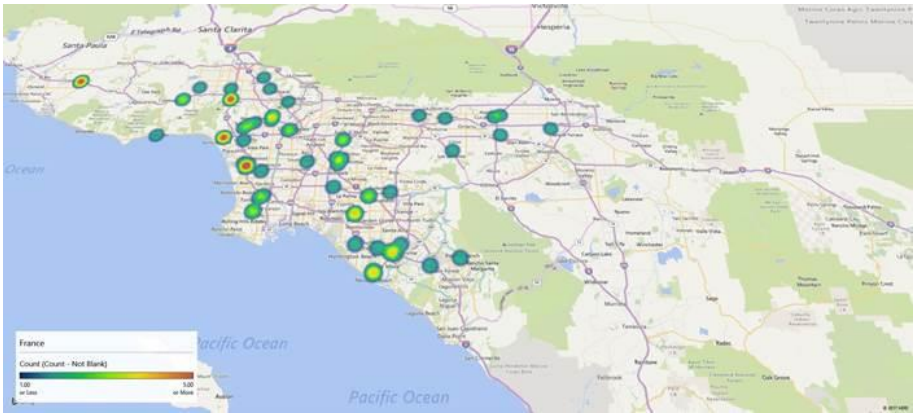


FIGURE A5
FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION: MANUFACTURING

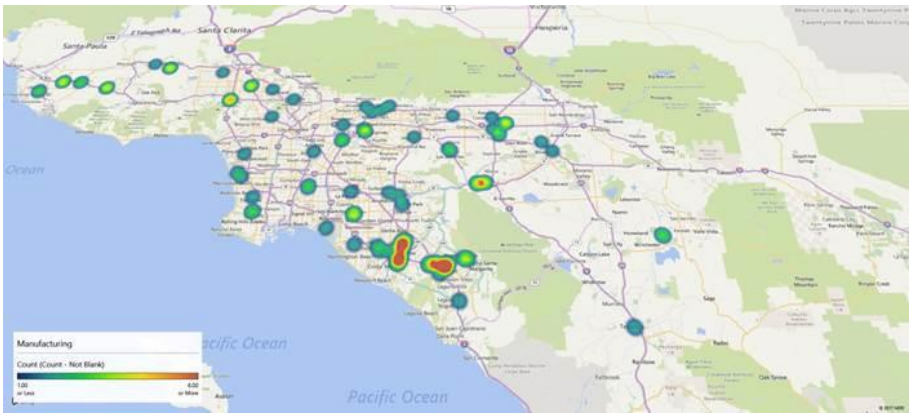


FIGURE A6
FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION: WHOLESALE TRADE

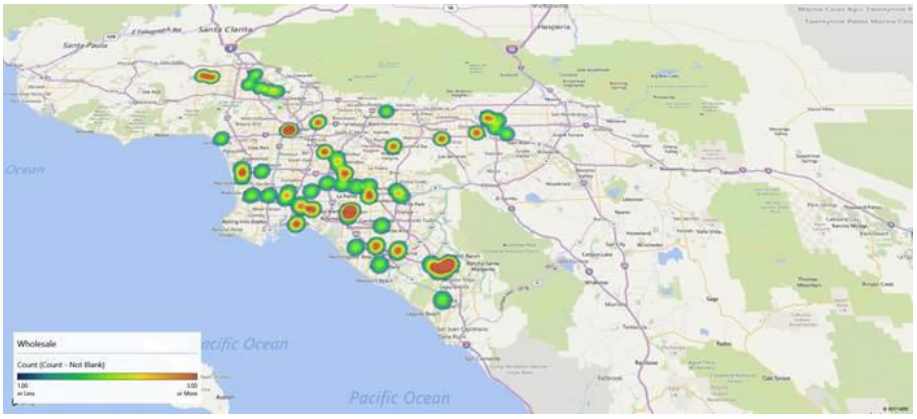


FIGURE A7
FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION: RETAIL TRADE

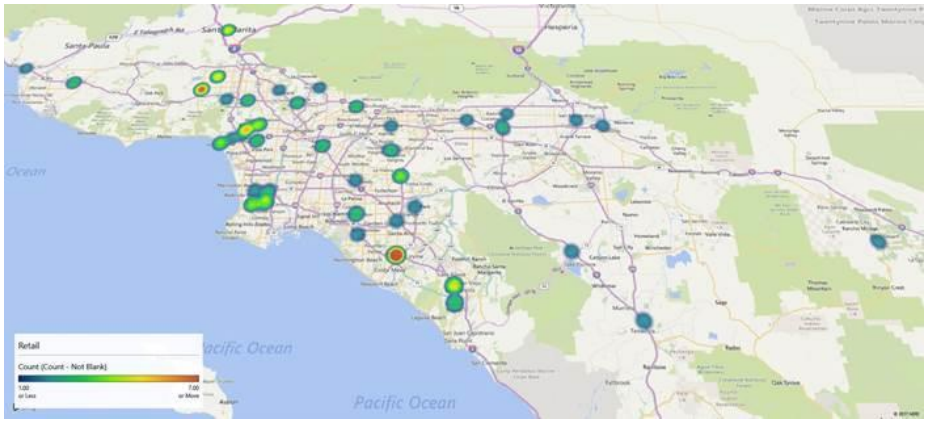
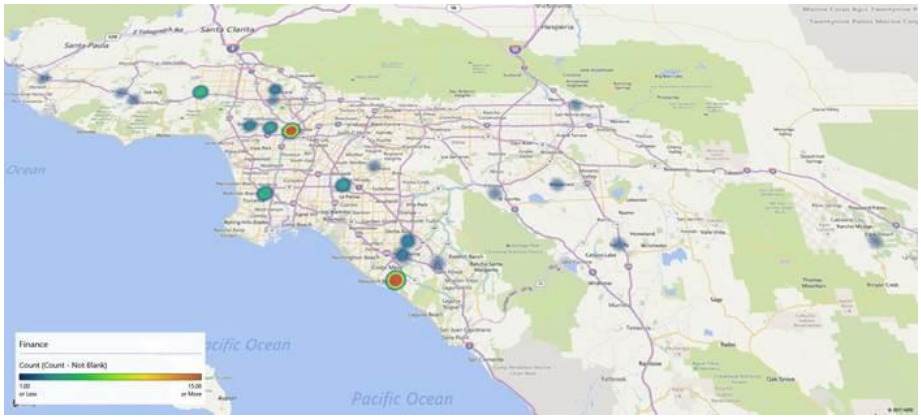


FIGURE A8
FOREIGN-OWNED BUSINESSES IN THE SOUTHERN CALIFORNIA REGION: FINANCE AND INSURANCE



APPENDIX B. DETAILED SURVEY RESULTS

TABLE B1
PROPORTION OF SURVEY RESPONDENTS BY SECTOR

Sector	% of respondents answering question
Manufacturing	12.9%
Wholesale Trade	12.9%
Retail Trade	35.5%
Transportation, Warehousing and Utilities	1.6%
Information	6.5%
Financial Activities	12.9%
Professional and Business Services	9.7%
Education and Health Care	1.6%
Leisure and Hospitality	1.6%
Other Services	4.8%

TABLE B2
PROPORTION OF SURVEY RESPONDENTS BY SOURCE NATION

Source Nation	% of respondents
Luxembourg	16%
Taiwan	16%
Japan	11%
Switzerland	11%
Germany	10%
Canada	6%
Spain	5%
Hong Kong	3%
Ireland	3%
Netherlands	3%
Thailand	3%
Other nations	11%

TABLE B3
PROPORTION OF SURVEY RESPONDENTS BY COUNTY

County	% of respondents
Los Angeles	53.2%
Orange	16.1%
Riverside	6.5%
San Bernardino	6.5%
San Diego	9.7%
Ventura	8.1%

TABLE B4
WHAT ARE YOUR COMPANY'S PLANS FOR INVESTMENT AND BUSINESS OPERATIONS WITHIN SOUTHERN CALIFORNIA OVER THE NEXT TWO YEARS?

Response	Count
Expansion of existing facilities or branches (including purchase of equipment)	46
Establishment of a new facility or branch	43
Investment in a different business sector	18
Scale-down or closure of existing facility	10
Relocation of branch or facility within Southern California	11
Relocation of branch or facility within California	12
Relocation of branch or facility outside California	6
Revision of the role of existing facilities or branches	11
Nothing in particular	38

TABLE B5
REGIONS HOLDING THE MOST POTENTIAL FOR NEW INVESTMENT BY SOUTHERN CALIFORNIA FOES

Within Southern California		Other California		Other United States		Other Countries	
County	Responses	Region	Responses	State	Responses	Country/ Region	Responses
Los Angeles	33	Bay Area	15	Texas	5	Canada	4
Orange	13	Central CA	5	New York	4	Mexico	1
Riverside	10			Hawaii	3	China	3
San Bernardino	5			Nevada	3	Other Asia	8
San Diego	15			Florida	3	Europe	4
Ventura	4			Colorado	2		

TABLE B6
CONTACTS WITH INDUSTRY ORGANIZATIONS, CHAMBERS OF COMMERCE, CONSULATES, AND LOCAL GOVERNMENTS

Is your company…	Yes	%	No	%
…an active member of an industry organization?	61	67%	30	33%
…in close contact with your local chamber of commerce?	48	52%	44	48%
…in close contact with your home-nation's consulate in Southern California?	48	54%	41	46%
…in close contact with your local/city government in Southern California?	58	64%	33	36%