THE LOCATION AND TIMING OF NEW U.S. IMPORT ENTRY

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Abstract

I use sub-national U.S. import data to estimate the geographical distribution of the consumer benefits from new import entry. Statistical analysis of the data indicates that imports initially enter one or two customs districts closest to the exporting country, and their participation in the U.S. market is usually short-lived. If import entry is sustained for three or more years, the imports expand to other regions of the United States at a predictable rate. I use data on recent entries of imports from 12 middle income countries to estimate econometric models that forecast this gradual expansion.

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1 Introduction

New import entry into the United States can provide benefits to consumers and downstream industries by increasing variety and reducing prices. An increase in imports can also expand employment in ports and in downstream industries that use the imports as inputs in production. However, these economic benefits are likely unevenly distributed across regions of the United States, since new import entries tend to be concentrated in a single region of the country, at least initially.

In theory, it is possible that the location of import entry would not impact the availability of the imports to consumers in different regions of the country. This theory requires a perfectly integrated nationwide product market in the United States without significant domestic shipping costs. However, the patterns in trade and domestic shipment data suggest that this is not the case. It is more likely that imports that arrive in Los Angeles are consumed on the West Coast than in New England, for example.

In this paper, I consider many different tabulations of the sub-national import data, examining the location and timing of new U.S. import entry. I also use data on recent import entries to estimate econometric models that predict the geographic expansion of import entry conditional on the initial number of districts or regions entered.

I find that new import entry is initially concentrated in the district or region closest to the exporting country and is usually short-lived. After initial entry, the number of districts declines with exits from the U.S. market. However, the new entries that survive in the U.S. market expand to other parts of the country. These expansions occur at a predictable rate, increasing at an increasing rate over time. In addition to establishing these qualitative patterns in the data, I estimate their magnitudes.

The patterns in the data suggest that it is more likely that the location of import entry is indicative of the location of consumer benefits. Domestic shipping costs segment the

large national market, and so the uneven distribution of consumer benefits from the imports depends on the locations where the imports enter. Entry requires sufficient scale to cover district- or region-specific fixed costs. Consequently, new import entries are initially concentrated, often in the district or region closest to the exporting country. The low survival rates of new import entries suggest that the fixed costs are recurring or quickly depreciating. If the new entries survive, their profitability from supplying many sub-national markets increases, perhaps because they learn about the export process or are able to reduce their costs of production.

My analysis contributes to, and complements, three related branches of the economics literature: the extensive margins of trade, entry into exporting, and international trade flows within a country. The economic literature on the extensive margin of trade usually analyzes new entries into a national market of a new product from a specific exporter. Hummels and Klenow (2005), Helpman, Melitz and Rubenstein (2008), and Chaney (2008) are seminal contributions to this literature. Hepenstrick and Tarasov (2015) and Zhao, Luckstead and Devadoss (2022) provide more recent contributions. In this literature, the extensive margin of trade usually refers to a change in the number of products traded. In this paper, I analyze two different extensive margins of trade, both this conventional one (the entry of new products exported from a country to the United States) and also an under-studied one (the geographic extension of import entry and import penetration to different parts of the United States).

The economic literature on entry into trade usually focuses on supply conditions that shape individual firms' decisions about whether to engage in exporting. Das, Roberts and Tybout (2007), Aw, Roberts and Xu (2011), and De Loecker (2013) are important early contributions, and Alessandria, Arkolakis and Ruhl (2021) is an excellent recent survey of this literature. Some recent work, including Albornoz, Pardo and Corcos (2023), studies the expansion of exporting to multiple destination countries, but not geographic expansion *within*

a destination country. My analysis is similar to the literature in its emphasis on dynamics and the geographic expansion of trade to include additional markets, but it uses industry-level rather than firm-level data and is applied to a broader group of exporting countries. It has a demand-side focus on import penetration into many sub-national markets of one destination country, the United States. This paper also contributes to a relative small literature on models of international trade that utilize sub-national import data. Riker (2020) and Riker (2022) are examples of this literature.

The rest of the paper is organized into five parts. Section 2 describes the data on district-level U.S. imports and the definitions used in my analysis of new import entry. Section 3 develops econometric models that forecast the gradual increase in the number of U.S. districts and regions where the imports enter. Section 4 examines the specific location of new import entries, both initial entries and expansions over time. Section 5 offers concluding remarks.

2 Data and Definitions

I utilize annual data on U.S. commodity imports for consumption in 2014-22, disaggregated to the level of the exporting country, four-digit Harmonized Tariff Schedule (HTS) code, and customs district from the International Trade Commission's Trade Dataweb.[1] A district is a group of neighboring ports, including land crossing points and airports as well as seaports. The district of an import indicates where it entered the United States and cleared customs. I group the customs districts into five regions of the United States: North Central, North East, South East, South West, and West. Each district is located in one of the five regions (Table 1).

[1]The data are publicly available at `https://dataweb.usitc.gov`.

Table 1: U.S. Regions and Customs Districts

Region	Customs Districts
North Central	Chicago IL, Cleveland OH, Detroit MI, Duluth MN Milwaukee WI, Minneapolis MN, Pembina ND, St. Louis MO
North East	Baltimore MD, Boston MA, Buffalo NY, New York NY, Ogdensburg NY, Philadelphia PA, Portland ME, Providence RI, St. Albans VT, Washington DC
South East	Charleston SC, Charlotte NC, Miami FL, Mobile AL, New Orleans LA, Norfolk VA, Savannah GA, Tampa FL
South West	Dallas-Ft. Worth TX, El Paso TX, Houston-Galveston TX, Laredo TX, Nogales AZ, Port Arthur TX
West	Columbia-Snake OR, Great Falls MT, Los Angeles CA, San Diego CA, San Francisco CA, Seattle WA

I focus on U.S. imports from 12 middle income countries in Asia, Central and South America, Europe, and Africa.[2] Table 2 groups the 12 countries by continent.

Table 2: Middle Income Exporting Countries in the Analysis

Continents	Countries
Asia	Cambodia, Pakistan, Philippines, Thailand, Vietnam
Central and South America	Brazil, Costa Rica, Honduras
Europe and Africa	Egypt, Ghana, Kenya, Turkey

I define a *new import entry* as a positive value of imports in a specific four-digit HTS code from a specific exporting country in a specific year but no imports in the four-digit HTS code from the country in the prior two years. By this definition, there were a total of 2,704 new import entries from the 12 middle income countries in 2016–20.[3] Table 3 reports the persistence of the 2,704 new import entries in 2016–20.[4]

[2]It would be straightforward to extend the analysis to include additional source countries.

[3]New entries in 2014, 2015, 2021, and 2022 drop from the sample because the 2014–22 data set does not include two prior years for observations in 2014 and 2015 or two years of observations following 2021 or 2022.

[4]Besedes and Prusa (2006) is an excellent example of the related literature that analyzes the duration of U.S. import trade at the national, rather than sub-national, level.

Table 3: Persistence of New Import Entries

Years in the Market	Frequency (% of New Import Entries)
Only One Year	63.35
Only Two Years	13.06
Three or More Years	23.59

I define a *sustained new import entry* as a new import entry that also has a positive value of the country's imports in the four-digit HTS code in the following two years (i.e., the Only One Year and Three or More Years rows in Table 3. By this definition, there were a total of 717 sustained new import entries.

Next, I examined changes in the number of entry locations over time. Figure 1 is a histogram of the number of regions that the 2,704 new import entries entered in their first, second, and third year. By definition, all of the new entries initially arrived in at least one region, and in fact more than 80% arrived in only one region (the black vertical bars in Figure 1). By the second year of import entry, more than half of the new entries left the U.S. market entirely, and the number of regions went to zero, while the share entering three or more regions had risen slightly (the orange vertical bars). By the third year, 60% had left the U.S. market and the share entering three or more regions had risen further (the green vertical bars).

Figure 1: The Number of Regions of New Import Entries Over Time

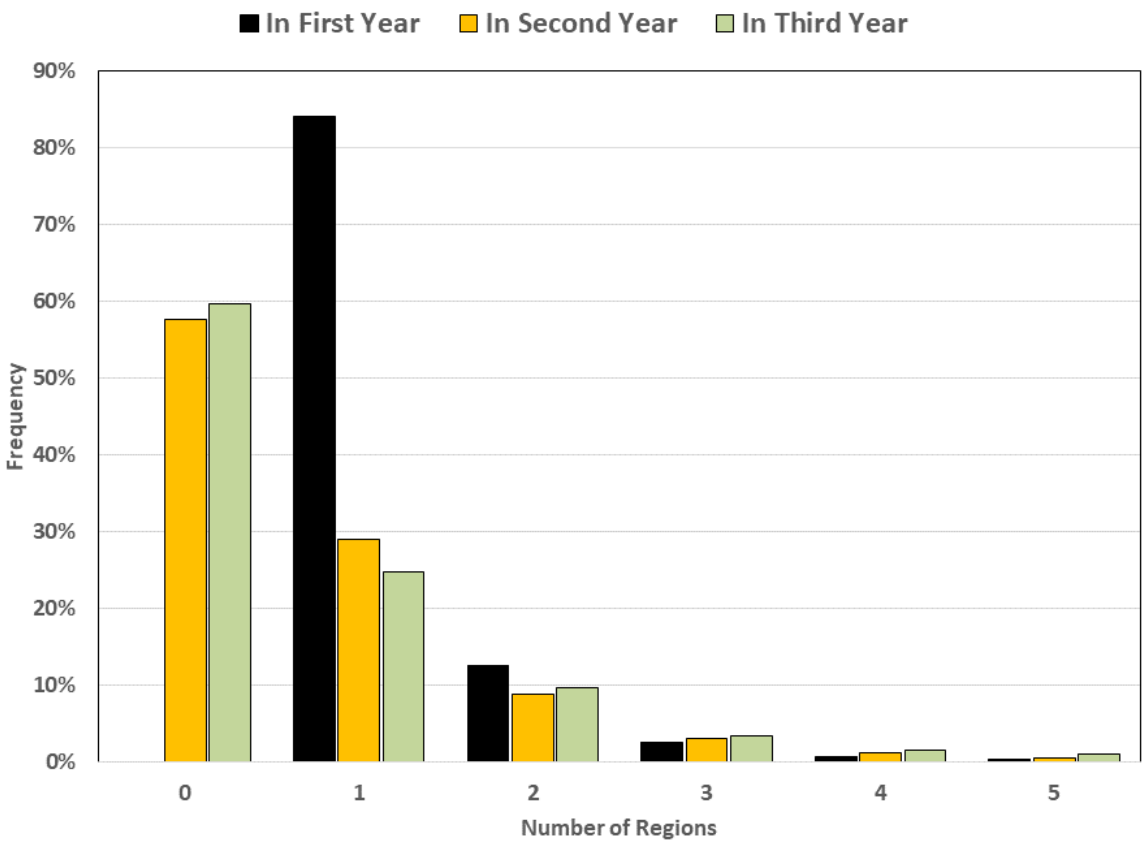


Table 4 reports the number of new import entries from each of the 12 middle income countries between 2016 and 2020. The greatest number were new imports from Pakistan, followed by Costa Rica. The least were new imports from Ghana.

Table 4: Number of Import New Entries in 2016-20

Source Country	Number of New Entries	Share of 12-Country Total (%)
Brazil	212	7.84
Cambodia	222	8.21
Costa Rica	273	10.10
Egypt	245	9.06
Ghana	182	6.73
Honduras	215	7.95
Kenya	200	7.40
Pakistan	280	10.36
Philippines	247	9.13
Thailand	190	7.03
Turkey	231	8.54
Vietnam	207	7.66
Total	2,704	100.00

3 Forecasting the Expansion of Import Entry

Next, I estimated Poisson Pseudo-Maximum Likelihood (PPML) econometric models that forecast the expansion of import entry conditional on the number of entry locations in the initial year. PPML models are commonly used to analyze count data and have become the standard estimator for gravity models of trade flows, following Santos Silva and Tenreyro (2006) and Yotov, Piermartini, Monterio and Larch (2016), for example. Equation (1) is the econometric specification.

$$n_{j,c,(t+s)} = e^{\ \alpha \ + \ \beta \ \ln n_{j,c,t}} \quad \phi_{j,c,(t+s)} \tag{1}$$

$n_{j,c,t}$ is the number of entry locations (districts or regions) for imports of product j from country c in year t, and $n_{j,c,(t+s)}$ is the number of entry locations s years later. $\phi_{j,c,(t+s)}$ is the multiplicative error term in the econometric specification. As I noted in the last section, I define new import entry in product j from country c in period t as positive imports in that

year and no imports in the two prior years, so there is new entry if $n_{j,c,t} > 0$, $n_{j,c,(t-1)} = 0$, and $n_{j,c,(t-2)} = 0$. The expected number of locations of import entry in year $t + s$ depends on the probability that the imports survive in the market and the expected expansion in the number of locations conditional on survival. Both of these factors vary with the number of initial locations $n_{j,c,t}$.

I analyze two different measures of the extent of new import entry: the number of districts of import entry and the number of regions. While both measures provide an indication of the geographic dispersion of import entry, the number of regions is probably more informative. For example, import entry into New York and nearby Philadelphia is entry into two districts but only one region (Northeast), while import entry into New York and distant Los Angeles is entry into two districts and two regions (Northeast and West). In this case, the number of regions is a better indicator of geographic dispersion.

I estimate the parameters α and β for four different models, two that include all new entries (one for the second-year outcomes and another for the third-year outcomes) and two that only include entries that survive to the second or third year. Table 5 reports the econometric estimates of these parameters as well as the forecast value of $n_{j,c,(t+1)}$ and $n_{j,c,(t+2)}$ conditional on observed $n_{j,c,t}$ equal to one in each of the four models. For example, using all new entries, if initial entry is in a single district ($n_{j,c,t} = 1$), then the forecast number of districts in the second year of entry, $n_{j,c,(t+1)}$, is 0.532. The forecast number in the third year of entry, $n_{j,c,(t+2)}$, is 0.574. This expected decline from initial $n_{j,c,t} = 1$ mainly reflects the probability that a new import entry will not survive in the market and therefore the number of districts will go to zero, but also the expected expansion in the number of districts conditional on surviving in the market. These forecast numbers depend on $n_{t,c,t}$.[5]

The forecasts of $n_{j,c,(t+1)}$ and $n_{j,c,(t+2)}$ reported in the last column of Table 5 isolate the

[5]For example, if $n_{t,c,t} = 2$, then the model predicts $n_{j,c,(t+1)} = 1.195$ and $n_{j,c,(t+2)} = 1.331$. Similarly, if $n_{t,c,t} = 3$, then the model predicts $n_{j,c,(t+1)} = 1.918$ and $n_{j,c,(t+2)} = 2.177$. These estimates for different values of $n_{t,c,t}$ are calculated from the econometric estimates of α and β but are not reported in Table 5.

Table 5: Forecast Number of Districts Entered

Variable	Number of Districts	Number of Districts
In Second Year	All Entries	Entries Sustained to Second Year
α	-0.630	0.333
	(0.035)	(0.024)
β	1.166	0.634
	(0.052)	(0.047)
$n_{j,c,t+1}$ if $n_{j,c,t} = 1$	0.532	1.395
	(0.019)	(0.034)
In Third Year	All Entries	Entries Sustained to Third Year
α	-0.556	0.602
	(0.047)	(0.042)
β	1.214	0.606
	(0.064)	(0.067)
$n_{j,c,t+2}$ if $n_{j,c,t} = 1$	0.574	1.825
	(0.024)	(0.077)

expected expansion conditional on surviving in the market. For example, the conditional forecast number of districts in the second year, $n_{j,c,(t+1)}$, is 1.395, an increase from the initial $n_{j,c,t} = 1$. The forecast number in the third year, $n_{j,c,(t+2)}$, is 1.825.

The two columns of forecasts have distinct uses.[6] The column of estimates that includes all import entries is useful because it is a full forecast for years $t+1$ and $t+2$ that conditions only on data in year t, while the column with sustained entries is not a forecast in year t since the future survival of individual entries is not known. The advantage of the last column that includes sustained import entries is that it isolates, and therefore better illustrates, geographic expansion, since it is conditional on survival.

Table 6 reports the forecasts for the number of regions of the import entries. The forecasts using districts and regions are similar, but the rate of expansion is different. The forecast number of districts is increasing at a fairly steady, slightly decreasing rate in Table 5. On the other hand, the number of regions is increasing at decreasing rate in Table 6. The forecasts in Table 6 probably reflect the fact that there are only five regions for potential expansion.

[6]There are similarities as well. In both columns, the number of districts increases in the third year relative to the second year: $n_{j,c,(t+1)} < n_{j,c,(t+2)}$.

Table 6: Forecast Number of Regions Entered

Variable	Number of Regions	Number of Regions
In Second Year	All Entries	Entries Sustained to Second Year
α	-0.690	0.270
	(0.031)	(0.017)
β	1.134	0.500
	(0.057)	(0.041)
$n_{j,c,t+1}$ if $n_{j,c,t} = 1$	0.502	1.310
	(0.016)	(0.023)
In Third Year	All Entries	Entries Sustained to Third Year
α	-0.650	0.455
	(0.033)	(0.025)
β	1.121	0.429
	(0.062)	(0.049)
$n_{j,c,t+2}$ if $n_{j,c,t} = 1$	0.522	1.576
	(0.017)	(0.039)

4 The Specific Location of New Import Entries

The econometric models in Section 3 predict the number of districts or regions of new import entries but not the specific locations. Next, I focus on which regions and districts are the most frequent locations of import entry. Table 7 reports the location in the first year, specifically the percentage of new import entries from Honduras, Thailand, and Turkey that entered each of the five regions in the first year. Initial entries can arrive at more than one district or region, so these percentages do not sum to 100 percent.

Table 7: Percentage of New Import Entries in Each Region

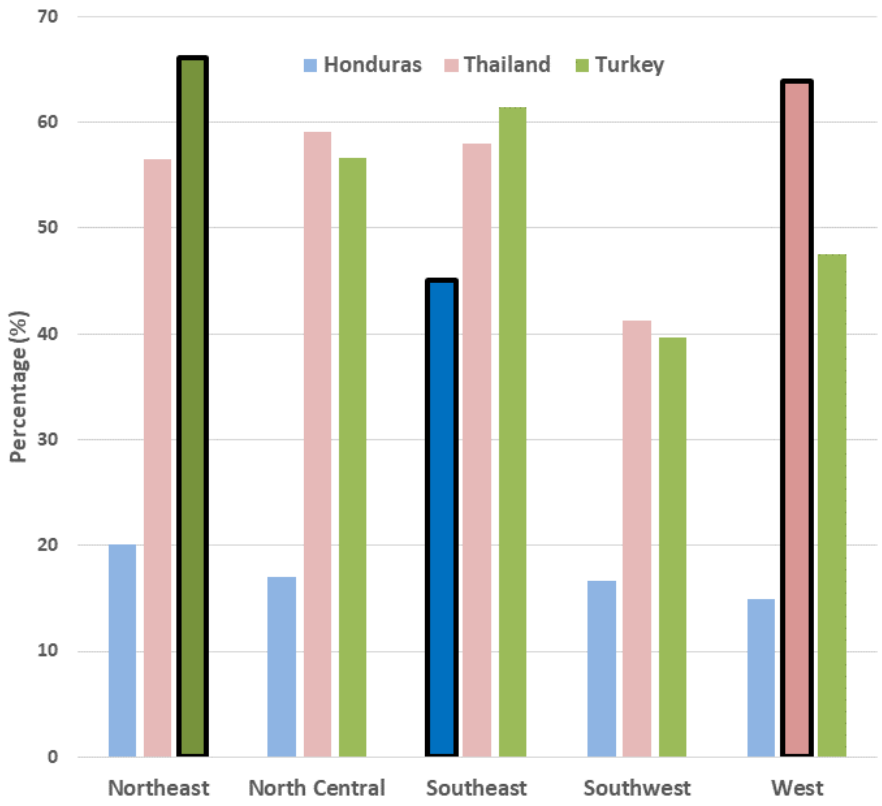
	Imports from Honduras	Imports from Thailand	Imports from Turkey
Regions:			
Northeast	20.04	56.55	**66.16**
North Central	17.06	59.11	56.67
Southeast	**45.11**	58.00	61.48
Southwest	16.64	41.27	39.68
West	14.91	**63.84**	47.56
Districts:			
Chicago, IL	4.63	43.00	38.76
Cleveland, OH	13.71	45.54	41.78
Houston, TX	13.11	28.57	35.13
Los Angeles, CA	11.43	**58.62**	41.84
Miami, FL	**38.03**	28.52	36.30
New York, NY	10.91	50.91	**61.52**
Savannah, GA	7.06	41.15	40.63
Seattle, WA	2.35	32.21	18.43

Initial entries are usually concentrated in the district or region closest to the exporting country. New imports from Central and South America are concentrated in Miami and the Southeast region.[7] New imports from Asia are concentrated in Los Angeles and the West region.[8] New imports from Europe and Africa are concentrated in New York and the

[7] In addition to Honduras, Central and South America includes Brazil and Costa Rica.
[8] In addition to Thailand, Asia includes Cambodia, Philippines, and Vietnam.

Northeast region.[9] Figure 2 depicts the information on the region of entry from the top panel of Table 7. The darker, outlined bars indicate the region with the largest percentage for imports from each of the three countries.

Figure 2: Percentage of New Entries in Each Region



[9]In addition to Turkey, Europe and Africa includes Egypt, Ghana, Kenya, and Pakistan.

Tables 8 and 9 focus more narrowly on sustained import entries, those that remain in the U.S. market for at least three years. The tables illustrate the shifts in the shares of entries in each district or region from the first to the third year of sustained entry.

Table 8: Percentage of New Import Entries in Each Region

	Imports from Honduras	Imports from Thailand	Imports from Turkey
Northeast Region			
First Year of Entry	20.93	26.92	**53.49**
Third Year of Entry	30.23	40.38	**60.47**
North Central Region			
First Year of Entry	6.98	21.15	33.72
Third Year of Entry	11.63	44.23	34.88
Southeast Region			
First Year of Entry	**76.74**	26.92	44.19
Third Year of Entry	**79.07**	28.85	45.35
Southwest Region			
First Year of Entry	11.63	17.31	5.81
Third Year of Entry	16.28	25.00	18.60
West Region			
First Year of Entry	11.63	**50.00**	15.12
Third Year of Entry	13.95	**48.08**	29.07

Table 9: Percentage of New Import Entries in Each Major U.S. District

	Imports from Honduras	Imports from Thailand	Imports from Turkey
Chicago, IL			
First Year of Entry	0.00	5.77	6.98
Third Year of Entry	2.33	19.23	17.44
Cleveland, OH			
First Year of Entry	6.98	13.46	23.26
Third Year of Entry	9.30	19.23	13.95
Houston, TX			
First Year of Entry	9.30	13.46	5.81
Third Year of Entry	13.95	21.15	16.28
Los Angeles, CA			
First Year of Entry	6.98	28.85	11.63
Third Year of Entry	11.63	30.77	17.44
Miami, FL			
First Year of Entry	60.47	0.00	6.98
Third Year of Entry	60.47	3.85	9.30
New York, NY			
First Year of Entry	6.98	19.23	43.02
Third Year of Entry	11.63	28.85	55.81
Savannah, GA			
First Year of Entry	0.00	11.54	23.26
Third Year of Entry	2.33	15.38	15.12
Seattle, WA			
First Year of Entry	0.00	3.85	0.00
Third Year of Entry	2.33	7.69	5.81

The maps in Figures 3, 4, and 5, depict the shifting shares from Table 9 for imports from Honduras, Thailand, and then Turkey. The relatively large light blue circle in each map indicates the district most frequently entered by imports from the exporting country.

Figure 3: Districts' Shares of New Entries from Honduras

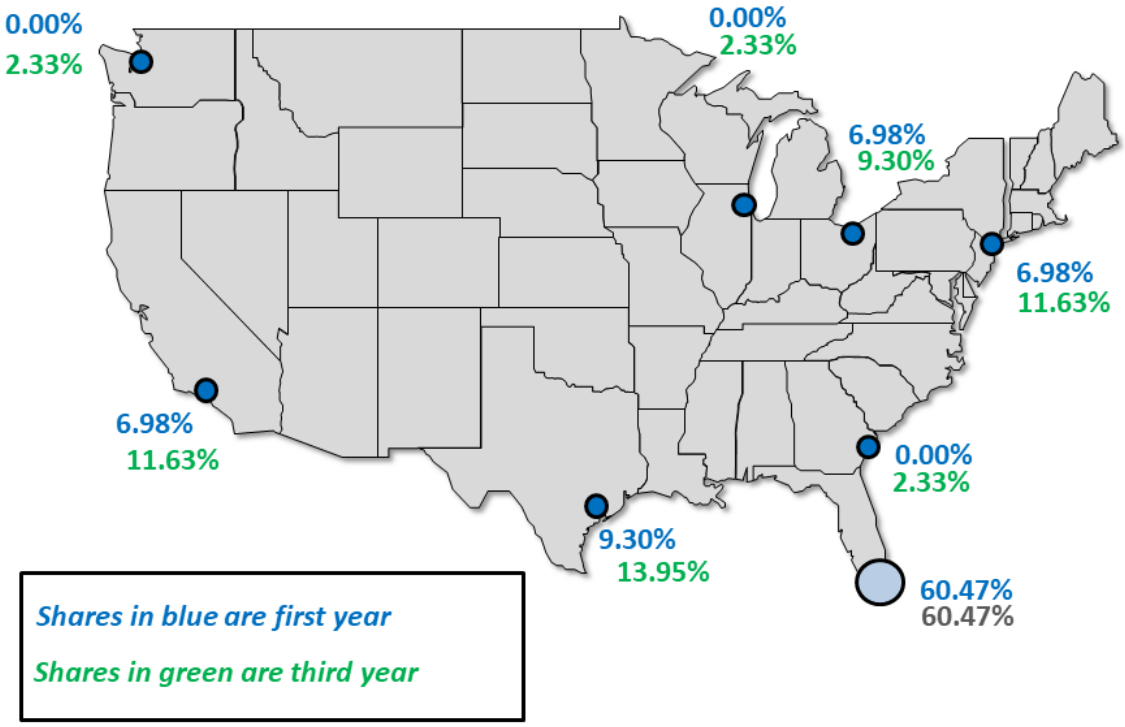


Figure 4: Districts' Shares of New Entries from Thailand

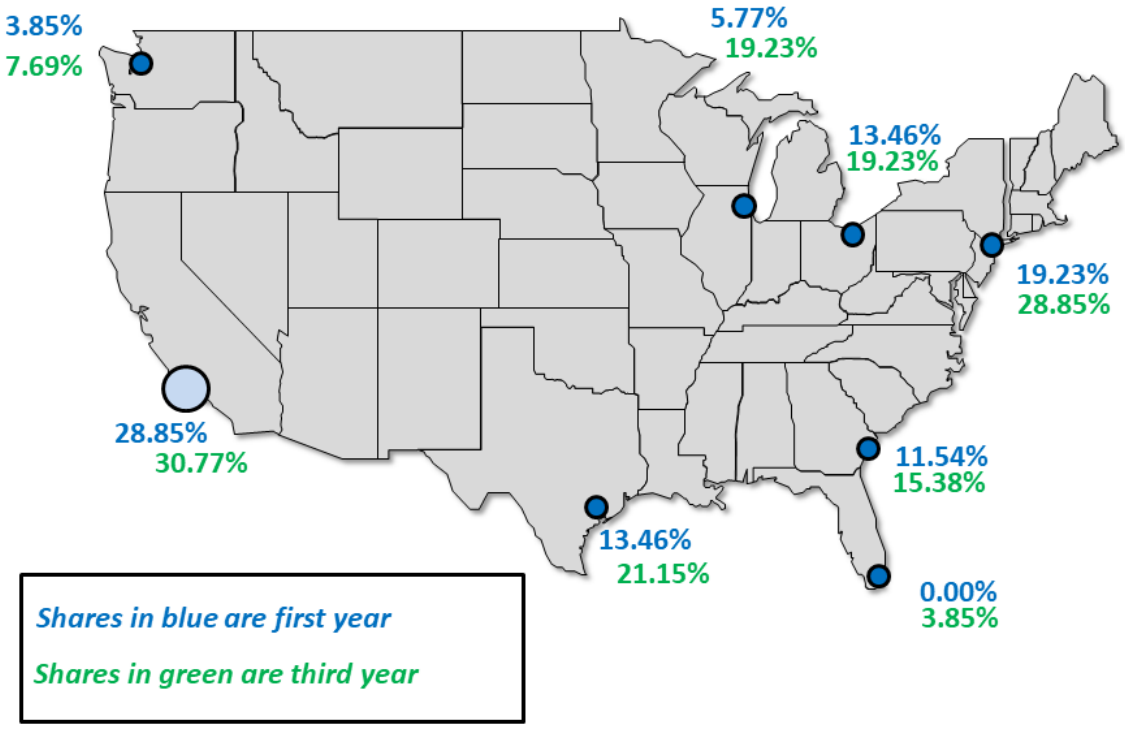
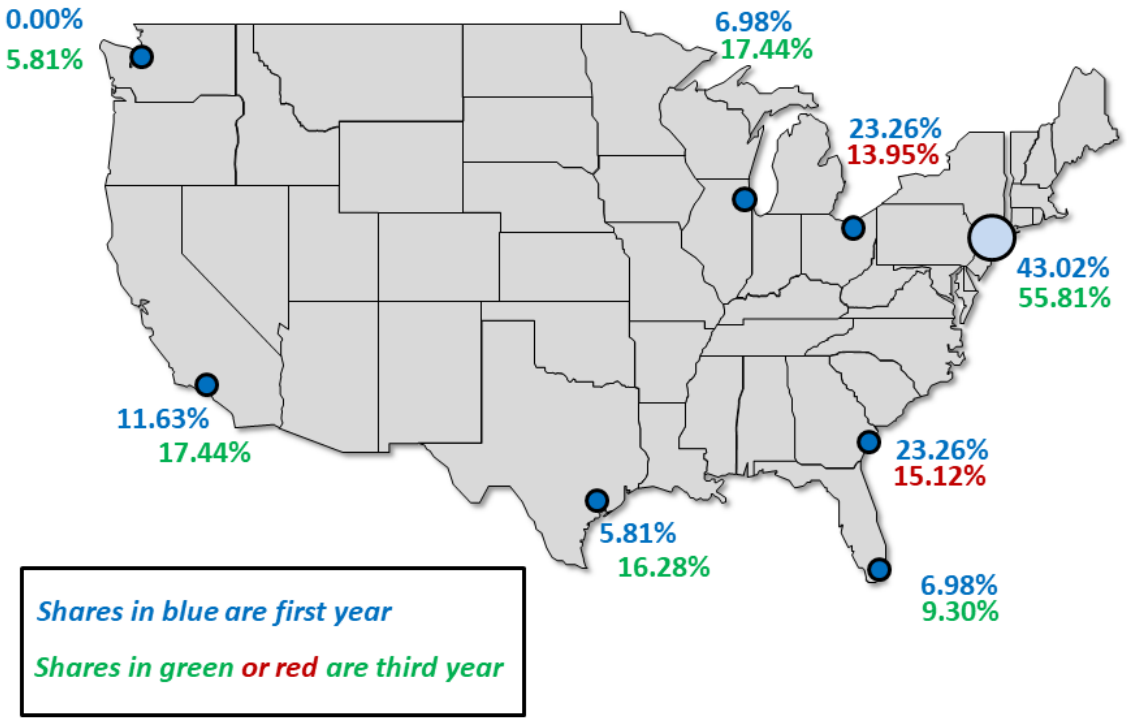


Figure 5: Districts' Shares of New Entries from Turkey



Generally there is an increase in the share in this most-frequent district from the first year to the third year and in almost all cases there is an increase in the shares of other districts over time (green share numbers in the three maps). There were a few declining shares for imports from Turkey (red share numbers in Figure 5).

5 Conclusions

The sub-national trade data indicate that the location of import entry into the United States is initially concentrated in a small number of districts and regions. New entry is often not persistent, but when entry lasts for several years, import penetration expands to other districts, spreading the benefits to consumers to other parts of the country.

The analysis of the sub-national data on the location of import entry uncovers consistent patterns, and the forecast models of import expansion provide an indicator of what is ahead following new import entries.

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