Notes to "Facts and Figures on Intermediated Trade"

Bernardo S. Blum
Rotman School of Management, University of Toronto

Sebastian Claro
Pontificia Universidad Catolica de Chile and Central Bank of Chile

Ignatius J. Horstmann
Rotman School of Management, University of Toronto

December 2009

1 Introduction

Over the past several years, trade economists have begun exploring the role that intermediaries play in facilitating trade. Papers by Rauch and Watson (2004), Petropoulou (2007) and Antras and Costinot (2009) model intermediaries as agents that facilitate matching between sellers/exporters and foreign buyers. These papers examine how improved intermediation (matching) technologies affect trade volumes and the gains from trade. Blum, Claro and Horstmann (2009) embed a reduced-form matching model in a heterogeneous firm, trade model and examine how changes in the trading environment affect trade costs, export/import volumes and the extent of trade flowing through trade intermediaries.

A key modeling challenge for this literature is how to structure matching and intermediation technologies in trading environments. Blum, Claro and Horstmann provide certain facts for Chile-Colombia trade and use these facts to structure their trading technologies. In this paper we provide a broader set of facts on trade intermediaries, using new data sets for

Chile and for Chile-Argentina trade. We think that these facts will prove particularly useful for future modeling of trade intermediaries.

2 The Data

To develop the facts that follow we analyze information from Chilean transaction-level import data between 2004 and 2008. For each transaction over this period, the data set provides information on the identity of the importing agent – name and ID – the 8-digit Harmonized System code of the products imported, the country of procedence, and characteristics of the shipment such as weight, quantity, FOB and CIF values. Critically, for each importer we know its main line of business, as defined by the Chilean Revenue agency (SII). For instance, seven importers have as their main line of business being a "wholesaler of machinery for working with textiles and leather", while eighteen other importers are "manufacturers of machinery for processing food, beverages, or tobacco". The data set also contains information on the exporting parties with which each Chilean importer transacts in foreign markets. We combine this information with the information on Argentine exporters available in Argentina's customs data. This allows us to match Argentine exporters with their Chilean importers to create a data set with bilateral and global trade information for each exporter/importer pair. We are able to match around 90% of all Argentine exporters to Chile, and around 95% of all Argentina export-Chilean import transactions between 2005 and 2007. Our matching procedure is less successful in 2004 and 2008. This is mainly due to the fact that some transactions that occurred in 2003 are recorded in the first months of

2004, and some transactions that occurred at the end of 2008 are recorded only in 2009. The analysis that follow restrict the sample to 2005-2007.

The top panel of Table 1 shows summary statistics for Chilean imports. On average, 58% of all Chilean imports are done by manufacturers or service providers. Wholesalers account for 35% and retailers for 6% of Chilean imports. Typical importers that are either manufacturers or service providers buy from 3.2 countries, 11.9 different HS8-classified products, and 3.9 different HS2-classified products per year. In contrast, importers that are wholesalers buy from 3.6 countries, 18.1 different HS8-classified products, and 5.2 different HS2-classified products. Retailers buy from fewer countries but buy slightly more products.

The bottom panel of the same table shows similar statistics for Chilean imports from Argentina. Around 65% of Chilean imports from Argentina are done by manufacturers or service providers, while wholesalers and retailers account for 30% and 5% respectively. On average, manufacturers and service providers trade with 2.10 Argentine exporters per year, while wholesalers trade with 2.03 and retailers trade with 2.25 exporters.

3 Trade and Intermediation Facts

A fact that features prominently in Blum, Claro and Horstmann is that, for trade between Chilean exporters and Colombian importers, there are virtually no cases in which small (worldwide) exporters match with small (worldwide) importers. In addition, small exporters typically sell to one, large Colombian importer. These same facts are found in the matched Chile-Argentina data. Specifically, we see from Figure 1 below that, while there are many

Argentine exporters that sell small amount to Chile and to the world, virtually none of them sell to small worldwide Chilean importers.

We also see from Table 2 that more than 50 percent of Argentinian exporters match with a single Chilean importer and these exporters are the small exporters.

We can summarize these results as:

FACT 1: *Small exporters from Argentina match typically with one large Chilean importer.*

As discussed in Blum, Claro and Horstmann, if one thinks of trading costs as arising from the cost of either the seller identifying a foreign customer or a customer identifying a foreign seller, these facts suggest that a large trading agent is more easily identified (and matched with) than a small trading agent. In essence, trading / matching costs are declining in the volume of trade in which an agent engages. Trade intermediaries – wholesalers and retailers – become large trading agents by consolidating the exports of a number of small, as well as a few large, exporters.

In addition to structuring the costs of matching and trading, modelers also must structure the technology of intermediation. One might imagine two scenarios, one in which intermediaries specialize in a narrow range of products and become large by importing these products from many countries and one in which the intermediary specializes in a small number of countries and becomes large by importing some number of different products from these countries. The former case would imply low cross-country matching costs but high cross-product matching costs while the latter implies high cross-country matching costs. The nature of the cross-product matching costs depends on the number of distinct products the

intermediary carries.

To examine this issue, we look at both the average number of countries from which Chilean intermediaries import and the average number of products (HS8, HS6 and HS2) imported. Table 3 below provides this information for importers of different sizes, as measured by total worldwide imports. Examining the top panel of Table 3, we see both for wholesalers and retailers that even importers in the 75th to 90th percentile in terms of import value obtain over 70 percent of that value from 1 country and almost 90 percent from two countries. Even intermediaries in the top 1 percent of the distribution, and that import from on average more than 15 countries, obtain approximately 60 percent of import value from 1 country and 75 percent from two countries. Overwhelmingly, then, the evidence is that, except for the absolute largest ones, intermediaries import from a small number of countries. Virtually all intermediaries, including the largest ones, obtain the vast majority of their imports from one or two countries.

In terms of product specialization, the bottom panel of Table 3 shows that even the smallest intermediaries import, on average, two different HS2 products. Those intermediaries in the 75th to 90th percentile import almost thirty HS6 codes on average and almost nine HS2 codes. The largest intermediaries import one hundred or more products. By this measure, import intermediaries are not very specialized. As with the country data, however, a significant share of total import value for the typical import intermediary comes from a small number of HS6 codes. Even for the largest wholesalers, carrying over 50 HS6 codes, approximately 60 to 65 percent of import value is accounted for by two HS6 codes. For the

largest retailers, two HS6 codes account for between 50 and 60 percent of import value.

What we don't see in the data are intermediaries that specialize in small value products that they import from many countries. This pattern suggests that cross-country matching costs are significant. Instead, we see intermediaries specializing in countries, obtaining the vast majority of their import value from at most 1 or 2 countries. Within this pattern, we also see considerable specialization in products; that is, upon specializing in countries, intermediaries achieve size via one or two large import value HS6 codes. At the same time, these intermediaries carry, in total, large number of products – even the smallest intermediaries carry, on average, two HS2 codes while the largest intermediaries carry many HS codes.

To summarize, we have:

FACT 2: *Import intermediaries specialize in countries, with, on average, 75% to 95% of imports coming from 2 countries. These intermediaries achieve scale by importing a small number of large volume HS6 codes; at the same time, intermediaries import a large total number of HS6 codes.*

Exploiting the panel nature of the data, we can also follow small intermediaries that grow over time and see how they achieve their growth. In this way we can provide additional evidence regarding specialization and size. The results are provided in Table 4 and are for wholesale intermediaries only. The left-hand column of the top panel of the table indicates that, in 2005, there were 1176 wholesalers with worldwide imports in the bottom 25 percent of imports for wholesalers in Chile. Subsequent panels in the left-hand column show that, on average, these wholesalers imported 2.9 HS6 products valued at US$7000 from

1.3 foreign destinations. By 2006, only 621 of these wholesalers continued to import at all. Of these continuing importers, 36 moved from the first to third quartile of the import value distribution. These 36 firms' import value grew to roughly US$247,000 on average and they imported 18 HS6 codes from 3 countries. For 42 percent of these firms, the country that represented the main source of import value in 2005 is no longer the main source of import value in 2006. Two things stand out as noteworthy. First, as above, these 36 firms continued to specialize in a relatively small number of countries, 3.2, but added a significant number of HS6 codes, 18. Second, there is evidence of these intermediaries searching for high import value countries – the number of importing countries rose from 1.3 to 3.2 and 42 percent of wholesalers switch the top import value country.

The right-hand column of Table 4 show the transition between 2006 and 2007. For the 36 wholesalers that transitioned to the third quartile in 2006, 19 remained in the third quartile. On average, these firms imported from 3.9 countries and 26 percent of saw a switch in the top import value country. Five wholesalers transitioned to the top quartile, with import values, on average of US$416,00. For these wholesalers, on average, the number of countries from which they imported declined to 2 and none of them saw a switch in the top import value country. The contrast here is startlingly. The wholesalers that transitioned to the top quartile found a large import source – there were no top country switches– and grew with that source. They pared out a country and added HS6 codes. Those that failed to grow added a country and saw switches in the top import source. They added very few extra HS6 codes. These firms appear to be still searching for a country to generate import value

growth. In common parlance, these firms are still fishing for a successful country match.

We can summarize these results as:

FACT 3: *For wholesalers, initial growth in total import value occurs by adding countries and features switches in the highest value import country. Additional growth occurs by pruning countries and growing with the previous highest value import country. In both instances, wholesaler growth features significant increases in the number of HS6 codes.*

These findings confirm the previous findings on country specialization. In addition, they suggest that there is a non-trivial amount of cross-country search involved in becoming a large intermediary.

Table 5 provides a similar analysis for within country growth using the matched Chile-Argentina data. Here the question is how a Chilean wholesaler achieve import growth from Argentina. We see here a pattern that is similar to the across-country pattern. Specifically, we see that small wholesalers grow initially by matching with more firms and often switching the firm that is the top import source. Wholesalers that fail to achieve additional growth continue to search for an "export champion". Those that achieve further growth do so by growing with the same top import source firm.

In summary, we have at the country level:

FACT 4: *For wholesalers, initial growth in import value from Argentina occurs by adding firm matches and features significant amounts of switches in the highest value import firm. Additional growth occurs by growing with the previous highest value export firm. Firms that*

fail to grow continue to see significant amounts of switches in the highest value import firm.

Finally, the above facts all suggest that, if any intermediary either imports from small exporting countries or imports products having small export values, it will be the large intermediaries. To test this hypothesis, we first identify, for each country from which any Chilean firm imports, the smallest Chilean firm, based on worldwide imports, that imports from this country. We then plot this smallest import firm size, in logs, against total import value, also in logs, from the paired country. This plot is reported in Figure 2. We see that the countries with the smallest import values are paired with the large import firms. The top panel of Table 6 provides regression results confirming this conclusion. From column 1 of the table, we see that a one log point increase in trade value from a country results in a .82 log point decrease in the size of the smallest Chilean firm importing from that country. The conclusion is that, if an intermediary imports goods from a small, to Chile, importing country, this intermediary is large.

Since Both the plot and the regression results include all importing firms, intermediaries and manufacturers, we cannot conclude from the above that intermediaries, in fact, are importing from the small countries. To examine this question, Figure 3 shows, for each country, the share of imports undertaken by Chilean intermediaries. We see that, for some small countries, intermediaries account for all imports; for others, intermediaries account for none of the imports. In general, we see that intermediaries account for a significant share of the imports from small countries and that this share declines as the value of imports from the country increase. The regression results in column 3 of the top panel of Table 6 confirm

this fact. We see that, on average, intermediaries account for 50 percent of the smallest country imports and that this share declines as country size increases. Together, these two results confirm that, for small (to Chile) export countries, imports are undertaken by large firms and that a significant fraction of these firms are import intermediaries.

We examine similar plots for HS6 codes. Now, for each HS6 product imported into Chile, we identify the smallest Chilean firm that imports this product. We then plot, for each HS6 product, the size of the smallest import firm against the value of imports of the paired product. This plot is reported in Figure 4. Again we see that the products having the smallest import values to Chile are imported by very large firms. Figure 5 gives the share plot for these HS6 codes. Again we see that the products with the smallest import value are imported by large firms and that a significant fraction of these firms are intermediaries. The bottom panel of Table 6 provides the associated regression results for HS6 codes.

Together, these results give us our final fact.

FACT 5: *The countries that sell the least value to Chile are imported by large Chilean firms, a significant fraction of which are intermediaries. The same is true for products (at the HS6 level) that sell the least to Chile.*

In essence, we have that the large intermediaries play a significant role in facilitating trade in low volume products and from low volume countries. This fact is important. It suggests that growth in the intermediation sector gives consumers access to products and countries that they would otherwise not be able to access. In this sense, a large intermediation sector is crucial if consumers are to have access to "niche" foreign products. Looked at the other

way, a large intermediation sector facilitates trade for small traders, small products and small exporting countries.

4 Conclusion

We find that firms with small amounts of worldwide exports invariably match with an importer that is a large world wide importer. This importer may be an intermediary or a manufacturer. Focussing on import intermediaries, we find that intermediaries become large by matching with a few large sellers located in one or two countries and buying a few large import products. At the same time we find that, having achieved significant size, the large intermediaries are the source of imports for both small import value countries and small import value products.

Tables and Figures

Table 1: Summary Statistics

All Chilean Imports									
Importer	Imports (Mill. US $)	Import Share	# Firms	Imp per Firm (Mill. US $)	# Countries	# hs8	# hs6	# hs2
Individuals	$ 194	0.01	8,844	$ 0.02	1.25	4.13	3.83	2.10
Manufacturers & Service Providers	$ 19,400	0.58	9,543	$ 2.03	3.21	11.90	10.98	3.92
Retailers	$ 2,150	0.06	2,734	$ 0.78	2.83	17.63	15.36	5.02
Wholesalers	$ 11,600	0.35	6,162	$ 1.87	3.62	18.12	16.16	5.20
All	$ 33,344	1.00	27,282	$ 1.10	2.63	11.37	10.28	3.73

Chilean Imports from Argentina								
	Imports (Mill. US $)	Import Share	# Firms	Imp per Firm (Thou. US $)	# Exporters	# hs8	# hs6	# hs2
Individuals	$ 13	0.00	395	$ 32.7	1.29	2.81	2.62	1.69
Manufacturers & Service Providers	$ 2,310	0.63	2,047	$ 1,129.4	2.10	4.22	3.95	2.21
Retailers	$ 186	0.05	441	$ 421.7	2.25	7.75	6.83	2.77
Wholesalers	$ 1,120	0.31	1,373	$ 812.7	2.03	5.60	5.07	2.59
All	$ 3,629	1.00	4,256	$ 852.2	2.02	4.90	4.49	2.35

Note: Statistics reported are 2005-2007 averages.

Table 2: Distribution of Chilean Importers per Argentine Exporter

Percentile	Distribution of Importers per Exporter	Distribution of Exporter Size	Importers per Exporter, by Exporter Size Percentiles
1	1	$ 680	1.30
10	1	$ 3,456	1.39
25	1	$ 9,871	1.70
50	1	$ 38,048	2.15
75	2	$ 168,240	3.18
90	5	$ 771,742	4.68
99	14	$ 18,800,000	10.43

Note: Statistics reported are 2005-2007 averages.

Table 3: Distribution Patterns for Selected Characteristics

Distribution of Country Statistics of Chilean Imports					
Percentile	Imports	# Countries	Top Country Share	2nd-Top Country Share	Country Mean/Median
Wholesalers					
0-25	$ 7,874	1.3	0.94	0.05	1.09
25-50	$ 63,262	2.1	0.85	0.11	5.50
50-75	$ 320,885	3.5	0.77	0.15	5.41
75-90	$ 1,710,247	5.8	0.72	0.15	16.13
90-99	$ 9,806,967	9.7	0.64	0.17	22.35
99+	$ 67,800,000	16.0	0.59	0.17	34.70
Retailers					
0-25	$ 3,779	1.2	0.96	0.04	1.01
25-50	$ 24,699	1.7	0.88	0.10	1.28
50-75	$ 108,016	2.6	0.81	0.13	2.81
75-90	$ 409,187	4.1	0.74	0.15	5.06
90-99	$ 3,698,522	7.5	0.67	0.16	11.92
99+	$ 41,500,000	20.0	0.61	0.15	34.99
Manufacturers and Service Providers					
0-25	$ 18,262	1.2	0.96	0.04	1.14
25-50	$ 42,260	1.8	0.88	0.09	2.04
50-75	$ 286,285	3.0	0.80	0.13	2.89
75-90	$ 3,467,899	5.1	0.72	0.16	5.64
90-99	$ 14,200,000	9.7	0.63	0.17	11.51
99+	$ 31,200,000	14.9	0.59	0.18	14.88

Distribution of Product Statistics of Chilean Imports							
Percentile	Imports	# HS8	# HS6	# HS2	Top HS6 Import Share	2nd-Top HS6 Import Share	HS6 Mean/Median
Wholesalers							
0-25	$ 7,874	3.1	3.0	1.9	0.80	0.12	1.94
25-50	$ 63,262	8.2	7.6	3.6	0.66	0.16	7.94
50-75	$ 320,885	17.0	15.5	5.7	0.58	0.17	24.39
75-90	$ 1,710,247	32.3	28.9	8.4	0.53	0.17	40.93
90-99	$ 9,806,967	56.7	49.0	10.9	0.49	0.16	98.68
99+	$ 67,800,000	116.8	96.6	16.3	0.46	0.15	206.79
Retailers							
0-25	$ 3,779	2.9	2.8	1.8	0.80	0.12	1.76
25-50	$ 24,699	7.5	6.8	3.2	0.66	0.16	16.28
50-75	$ 108,016	15.6	14.0	5.4	0.56	0.16	9.62
75-90	$ 409,187	27.9	24.6	7.8	0.49	0.16	14.67
90-99	$ 3,698,522	56.4	47.7	11.5	0.44	0.15	37.67
99+	$ 41,500,000	217.9	169.8	23.8	0.33	0.14	50.35
Manufacturers and Service Providers							
0-25	$ 18,262	2.1	2.0	1.5	0.87	0.09	1.65
25-50	$ 42,260	4.4	4.3	2.4	0.75	0.14	3.65
50-75	$ 286,285	9.3	8.7	3.9	0.67	0.15	7.89
75-90	$ 3,467,899	19.7	18.3	6.1	0.60	0.16	16.21
90-99	$ 14,200,000	51.0	45.9	10.8	0.52	0.16	47.40
99+	$ 31,200,000	91.5	79.2	15.5	0.52	0.14	122.43

Note: Statistics reported are 2005-2007 averages.

Table 4: Transition data on Small (from World) Importers

Wholesalers

Number of Importers				
Quartile	2005-2006		2006-2007	
1	1,176	425		4
2		155		5
3		36	36	19
4		5		5
Average Imports per Importer				
Quartile	2005-2006		2006-2007	
1	$ 7,042	$ 9,306		$ 10,913
2		$ 56,309		$ 64,462
3		$ 247,021	$ 247,021	$ 311,630
4		$ 680,224		$ 416,126
Average Number of Countries				
Quartile	2005-2006		2006-2007	
1	1.3	1.4		1.3
2		1.9		3.2
3		3.2	3.2	3.9
4		2.8		2.0
Share of Imports for Top Country				
Quartile	2005-2006		2006-2007	
1	0.95	0.91		1.00
2		0.87		0.72
3		0.80	0.80	0.82
4		0.73		0.92
Fraction of Importers that Switch Top Country				
Quartile	2005-2006		2006-2007	
1	0.66	0.32		0.75
2		0.37		0.40
3		0.42	0.42	0.26
4		0.60		0.00
Average Number of HS6				
Quartile	2005-2006		2006-2007	
1	2.9	3.4		3.5
2		7.2		11.8
3		17.9	17.9	19.3
4		10.0		31.2

Notes: Quartiles are defined based on firm's import values within five 3-digit lines of business that account for 97% of Chilean imports done by wholesalers. These are: wholesalers of machinery, wholesalers of automotive vehicles, wholesalers of intermediate products, wholesalers of consumer products, and wholesalers of agricultural products.

Table 5: Transition data on Small (from Argentina) Importers

Wholesalers

Number of Importers				
Quartile	2005-2006		2006-2007	
1	356	86		
2		49		5
3		15	15	5
4		6		4
Average Imports per Importer (from Argentina)				
Quartile	2005-2006		2006-2007	
1	$ 4,785	$ 5,794		
2		$ 28,405		$ 41,824
3		$ 104,719	$ 104,719	$ 137,041
4		$ 683,280		$ 1,023,746
Average Number of Matches				
Quartile	2005-2006		2006-2007	
1	1.1	1.2		
2		1.6		2.0
3		2.9	2.9	3.4
4		2.2		3.0
Share of Imports for Top Match				
Quartile	2005-2006		2006-2007	
1	0.97	0.94		
2		0.86		0.84
3		0.72	0.72	0.42
4		0.86		0.77
Fraction of Importers that Switch Top Match				
Quartile	2005-2006		2006-2007	
1	0.74	0.33		
2		0.27		0.40
3		0.80	0.80	0.60
4		0.83		0.00
Average Number of HS6				
Quartile	2005-2006		2006-2007	
1	1.9	2.0		
2		3.5		4.6
3		5.7	5.7	9.2
4		4.3		4.5
Share of Imports for Top HS6				
Quartile	2005-2006		2006-2007	
1	0.88	0.85		
2		0.79		0.73
3		0.72	0.72	0.47
4		0.84		0.61
Fraction of Importers that Switch Top HS6				
Quartile	2005-2006		2006-2007	
1	0.79	0.38		
2		0.51		0.40
3		0.73	0.73	0.60
4		1.00		0.25

Notes: Quartiles are defined based on firm's import values within five 3-digit lines of business that account for 97% of Chilean imports done by wholesalers. These are: wholesalers of machinery, wholesalers of automotive vehicles, wholesalers of intermediate products, wholesalers of consumer products, and wholesalers of agricultural products.

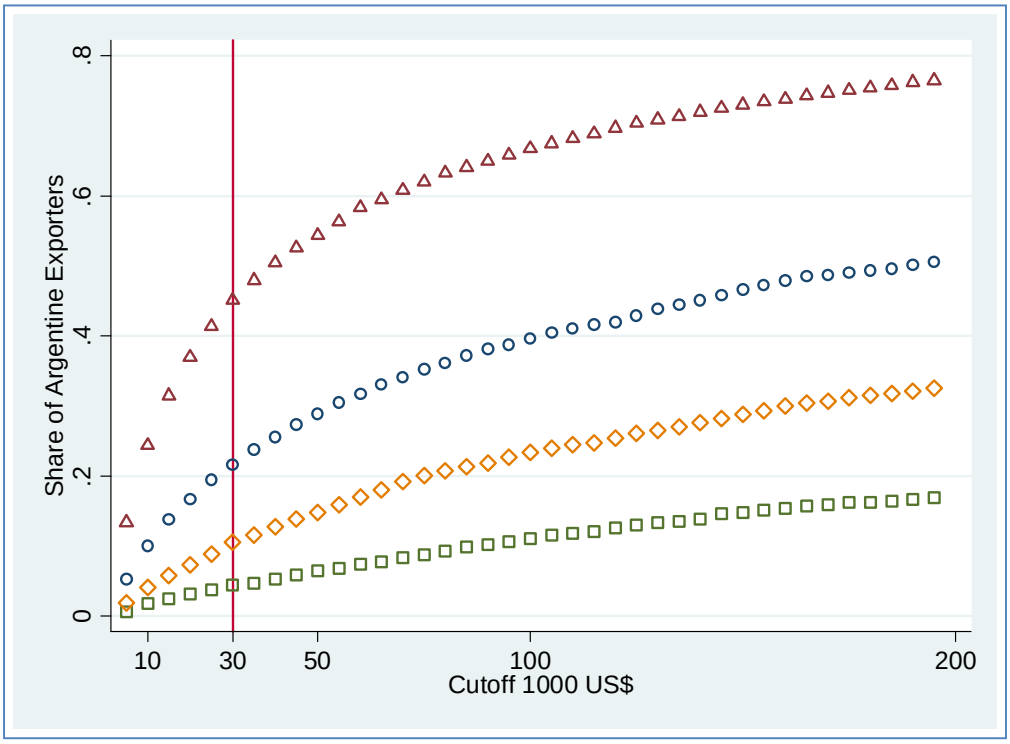
Table 6: Large Importers Facilitate Small Trade

Regressions Results				
Dep. Var.	Min. Log(Imports)		Distribution Share	
	(1)	(2)	(3)	(4)
Country Imports	-0.817***		-0.0259***	
	[0.0390]		[0.00234]	
HS6 Imports		-0.393***		-0.0184***
		[0.00901]		[0.000591]
Constant	20.71***	16.09***	0.467***	0.248***
	[0.639]	[1.031]	[0.0384]	[0.0677]
Year Effects	Yes	Yes	Yes	Yes
HS4 Effects	No	Yes	No	Yes
R-Squared	0.506	0.527	0.221	0.282
N	426	14002	426	14002

Standard errors in brackets
* p<.1, ** p<.05, *** p<.01

Notes: “Min. Log(Imports)” measures, from each country from which any Chilean firm imports (column 1), or in each HS6 product classification that any Chilean firm imports (column 2), the log-imports of the smallest Chilean importer that imports from this country (column 1) or this HS6 product(column 2). “Distribution Share” measures, from each country from which any Chilean firm imports (column 1), or in each HS6 product classification that any Chilean firm imports (column 2), the share of trade imported by Chilean Wholesalers or Retailers.

Figure 1: Characteristics of Importer-Exporter Pairs



Series marked with triangles shows the share of Argentine exporters to Chile that sell less than the "Cutoff Value" -- shown in the x-axis -- to Chile in 2006. Series marked with circles shows the share of Argentine exporters meeting first criterion and that traded exclusively with Chilean importers that bought less than the "Cutoff Value" from Argentina. Series marked with diamonds shows the share of Argentine exporters to Chile meeting the first two criteria and that sold exclusively to Chilean importers that bought less than the "Cutoff Value" from the World in 2006. Series marked with squares shows the share of Argentine exporters that satisfy the first three criteria and that sold less than the "Cutoff Value" to the World.

Figure 2: Importer Size and Country Import Values

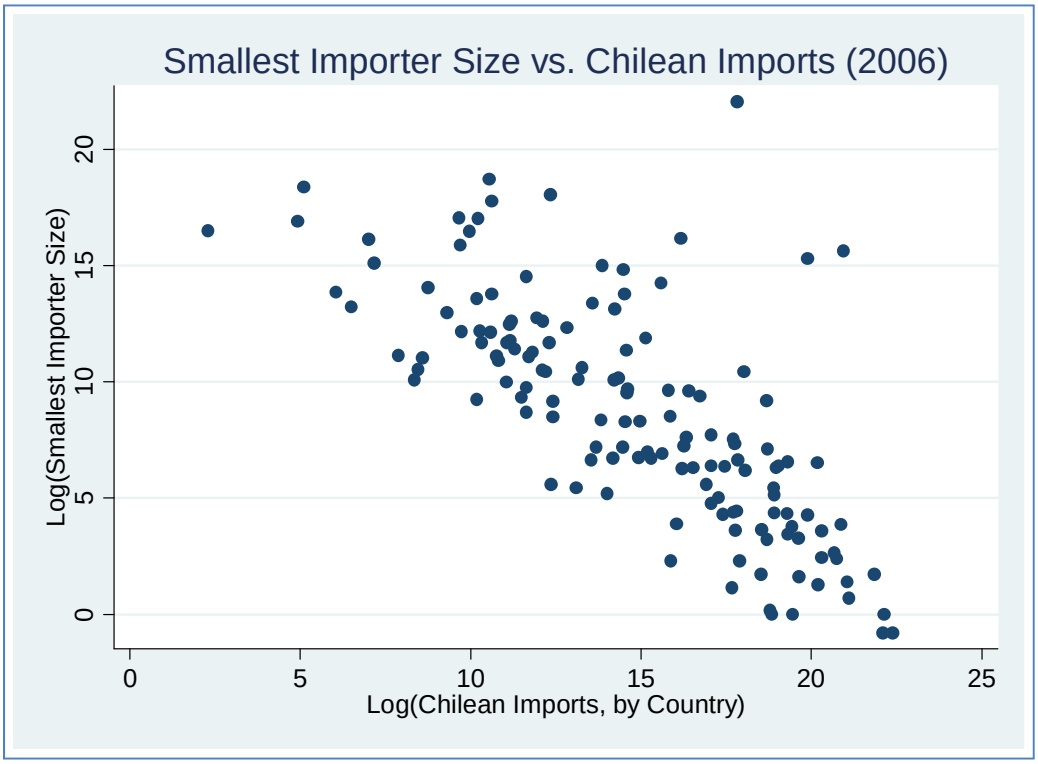


Figure 3: Share of Imports via Distributors and Country Import Values

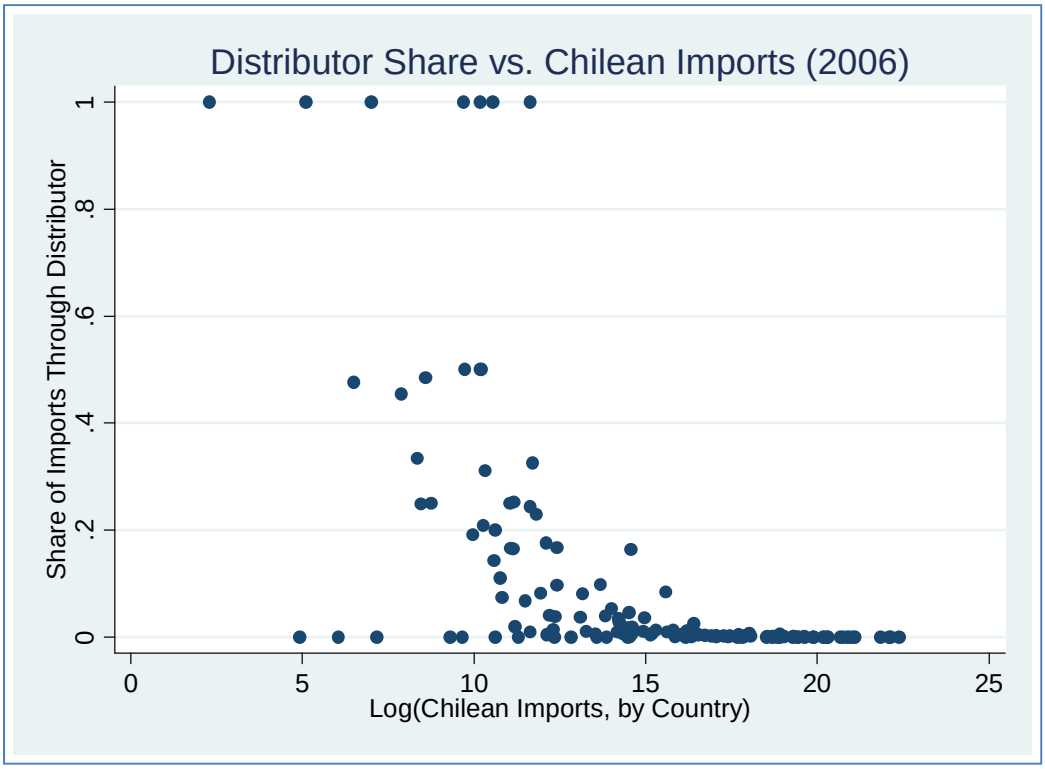


Figure 4: Importer Size and HS6 Import Values

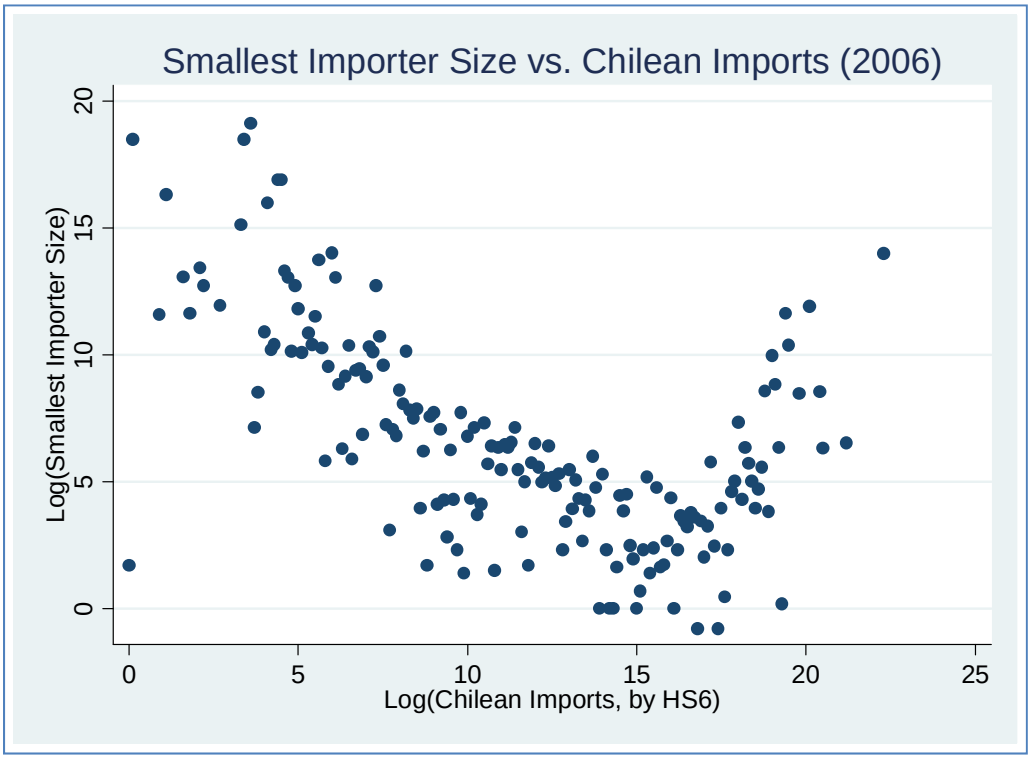


Figure 5: Share of Imports via Distributors and HS6 Import Values