Intermediaries in Entrepôt Trade: Hong Kong Re-Exports of Chinese Goods

Robert C. Feenstra
Department of Economics
University of California at Davis
and NBER
rcfeenstra@ucdavis.edu

Gordon H. Hanson
Graduate School of International Relations and Pacific Studies
University of California at San Diego
and NBER
gohanson@ucsd.edu

In this paper, we examine Hong Kong's role in intermediating trade between China and the rest of the world. Hong Kong traders distribute a large fraction of China's exports. Net of customs, insurance, and freight charges, re-exports of Chinese goods are much more expensive when they leave Hong Kong than when they enter. Hong Kong markups on re-exports of Chinese goods are higher for differentiated products, products with higher variance in export prices, and products sent to China for further processing. These results are consistent with the view that traders resolve informational problems in exchange. Additional results suggest that traders price discriminate across destination markets and use transfer pricing to shift income from high-tax countries to Hong Kong.

1. Introduction

It is standard in international economics to assume that trade occurs between producers and final users. A firm in the home country hires local resources to produce a good, which it sells directly to foreign consumers. While this view of exchange underlies most major trade models, how goods actually are traded is more complicated. Entrepôt economies such as Hong Kong and Singapore, which intermediate trade

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between buyers and sellers in different nations, are an important feature of global exchange (Findlay and Wellisz, 1993; Sung, 1997). In 1998, the ratio of total trade to GDP was 259% in Hong Kong and 269% in Singapore.

In this paper, we examine Hong Kong's role in re-exporting goods from China to the rest of the world. In this arrangement, traders in Hong Kong import goods from China and then distribute them to a final destination. By definition, goods for re-export cannot be subject to substantial manufacturing operations, but this does not exclude simple processing, such as sorting or packaging, or service activities, such as marketing or transport. Over the period 1988–1998, 53% of Chinese exports were shipped through Hong Kong in this manner. Net of customs, insurance, and freight charges, Chinese goods are much more expensive when they leave Hong Kong than when they enter. For the 1988–1998 period, the average markup on Hong Kong re-exports of Chinese goods was 24%. The income flow from these entrepôt activities is large. In 1998, re-exports of Chinese goods equaled 47% of Hong Kong's gross domestic product (GDP). In that same year, Hong Kong markups on these re-exports totaled 12% of GDP, while manufacturing accounted for only 6% of GDP.[1]

Does it matter whether or not international trade occurs through intermediaries? At a practical level, the answer is clearly yes. Trade in intermediate inputs complicates the calculation of the factor content of trade (Trefler, 2000), on which standard tests of trade theory are based, and affects how we identify the impact of trade and technology shocks on domestic factor markets (Feenstra and Hanson, 1999). At a deeper level, the need for intermediaries to facilitate trade suggests that information costs and other informal barriers to trade may be important (Rauch, 2001). Such barriers have the potential to alter bilateral trade patterns, to reduce trade volumes, and to limit the ability of trade to equalize commodity and factor prices across countries (Rauch and Casella, 2003).

Using trade data from Hong Kong and China, we examine the factors that influence the share of Chinese goods that are re-exported through Hong Kong and the markup Hong Kong applies to these goods.[2] One hypothesis is that Hong Kong traders have an informational advantage in trade between China and the rest of the world. This

1. Enright et al. (1997) estimate that in 1994 export-import services were 18% of Hong Kong's GDP.

2. Hong Kong also intermediates exports to China. In 1996, re-exports by Hong Kong accounted for 47% of China's total imports (Sung, 1997). We focus on Hong Kong's re-exports of Chinese goods (rather than on Hong Kong re-exports to China) since we have detailed data on Chinese exports (but not on exports from other countries bound for China). Hong Kong firms also broker foreign investment in China and advise firms doing business in China (Sung, 1991).

advantage may be due to Hong Kong's proximity to mainland China, especially the southern coastal provinces where export production is concentrated (Sung, 1991). Hong Kong traders may specialize in finding Chinese producers who can meet foreign quality standards and in locating buyers for Chinese goods.[3] As middlemen, traders may earn informational rents, which could account for the markups they charge. This information-based view of entrepôt activities relates to theories of search and intermediation (Biglaiser, 1993; Rubinstein and Wolinsky, 1987; Spulber, 1996a, 1996b, 1999; Townsend, 1978) and to general equilibrium models of international trade with information costs (Casella and Rauch, 2002; Rauch and Casella, 2003; Wan and Weisman, 1999).

Traders are often more than middlemen. Many firms that import goods from China for re-export engage in *outward processing* (Sung, 1991). Before importing goods from China, they may purchase raw materials on the world market, may process these materials in Hong Kong or elsewhere, and may export the unfinished goods to China for yet further processing. In 1998, outward-processing trade accounted for 48% of Hong Kong exports to China and 83% of Hong Kong imports from China. Intermediation and outward processing are often complementary tasks that Hong Kong traders perform as part of managing global supply chains. We estimate the contribution of these different activities to the total markup that traders charge. We also control for other behavior that may influence re-export activity, including transfer pricing, circumventing trade barriers, and hubbing in international shipping.

To preview our results, Hong Kong markups on re-exports of Chinese goods are higher for differentiated products, for products with higher variance in export prices, for products sent to China for further processing, and for products shipped to countries that trade less with China. These findings are consistent with the view that intermediaries help lower information costs. Markups are also lower for products shipped longer distances, consistent with Young (1999); are higher for products subject to multifiber arrangement (MFA) quotas; and are higher for shipments to countries with higher corporate tax rates. These last two results suggest that firms may use re-exporting to transfer income from abroad to the low-tax jurisdiction of Hong Kong.

Our work adds to a growing empirical literature on informational costs and trade. Young (1999) presents evidence on entrepôt trade involving Hong Kong, the United States, and The Netherlands. He finds that transport costs do not appear to account for increases in the prices

3. In a related view, Naughton (1999) suggests that Hong Kong firms engage in "property rights arbitrage": They use their specific knowledge of business conditions in China and the security of property rights in Hong Kong to broker deals with agents who want access to China's market but who are wary about its insecure property rights.

of goods as they pass through international hubs. This paper extends his findings by examining the impact of product quality, outward processing, transfer pricing, and trade barriers on entrepôt activity. Related literature includes Gould (1994), Head and Ries (1998), and Rauch and Trindade (2002), who find that bilateral trade volumes are higher between countries that share large immigration flows and/or ethnic business networks.

In the next section, we discuss theories of intermediation and how they apply to Hong Kong. In Sections 3–5, we describe the data used in the analysis, motivate the empirical specification, and present the results. Section 6 contains our conclusions.

2. Theories of Intermediation

2.1 Information Costs

Information costs create an incentive for agents to trade through middlemen. These costs may arise if buyers are informed imperfectly about the quality of suppliers or if suppliers are informed imperfectly about the tastes of buyers.

Hong Kong traders provide a range of services in matching foreign buyers with Chinese suppliers. Consider Li & Fung, a Hong Kong trading house that in 1998 had global sales of $2 billion and offices in over 20 countries (but had no production facilities of its own). The typical trading arrangement is for a foreign manufacturer or retailer to approach Li & Fung with a product they would like to purchase or to have produced. In simple transactions, Li & Fung is a matchmaker: "The idea is that maybe foreigners don't know which factory to go to, so you perform an introductory role, maybe a quality-control role and there it stops," says its managing director (Slater and Amaha, 1999, p. 11). In more complex transactions, Li & Fung oversees the entire fabrication of a good, from purchasing inputs and planning production to monitoring manufacturing among the 7,500 independent plants to which it subcontracts orders. In return for its services, Li & Fung earns commissions of 7–12% on each order it fills.

Based on the Li & Fung example, one set of traders' activities appears to involve evaluating and monitoring the quality of Chinese suppliers. That quality verification is a basis for entrepôt trade is consistent with theories of intermediation in which middlemen resolve informational problems (Biglaiser, 1993; Spulber, 1996a, 1999). In Biglaiser (1993), middlemen are experts. Some sellers are endowed with a high-quality good, and other sellers are endowed with a low-quality good, where quality is observable only to the seller. Sellers have an incentive to claim that their goods are high quality, and buyers are unwilling to

believe claims on quality without proof. Middlemen resolve this impasse by investing in an inspection technology that allows them to detect quality. One can think of this technology as capturing market knowledge that traders acquire through experience, research, or kinship networks (Rauch, 2001).

In equilibrium, middlemen announce that they sell high-quality goods only. They pay high-quality prices for all goods they buy, but, given inspection costs, inspect only a subset of these goods. All high-quality sellers sell their goods to middlemen. Some low-quality sellers also sell their goods to middlemen, trying to pass them off as high quality. Low-quality goods that middlemen detect are returned to sellers, but those that are not are sold inadvertently to buyers as high-quality goods. To make credible their claims on quality, middlemen guarantee to buy back any low-quality good sold as a high-quality one, where these guarantees are enforced by reputation. Middlemen resell low-quality returns at a loss (since they were bought at high-quality prices). Some goods, then, are sold at a negative markup.

In this quality-verification view of intermediation, middlemen are likely to be more active and to charge higher markups where quality is more variable and harder to observe. In the estimation, we associate variability and unobservability of quality with product differentiation. If demand for quality is income elastic, higher-income countries are likely to import more high-quality goods, and so make a higher fraction of their purchases from middlemen and at higher markups.[4] Similarly, lower-income countries are likely to purchase a higher fraction of the "return" goods that middlemen sell at negative markups.

A second set of traders' activities may involve helping Chinese suppliers find markets for their goods abroad. If suppliers in China lack information about foreign buyers, they may not know what types of goods to produce or may have difficulty negotiating international deals.[5] Trading houses such as Li & Fung may acquire knowledge about

4. Traders also might charge higher markups in high-income countries by way of price discrimination.

5. A related motivation for intermediation is uncertainty in demand. Traders might help pool risk across suppliers by purchasing goods from many producers and by distributing these goods across destination markets. Risk pooling may yield predictions similar to the quality-sorting model. While we cannot differentiate between information costs and risk pooling as explanations for re-export activity, there are reasons to doubt that risk pooling accounts for the behavior of Hong Kong traders. One is that most traders are small (Sung, 1991, 1997), which limits their ability to pool risk. Another is that in China's main export industries production orders tend to originate with large retailers. In apparel, footwear, and consumer electronics, orders flow from US and other retailers to traders who farm out orders to suppliers. Gereffi (1994) refers to these as "buyer-driven commodity chains," which predominate in industries where retailers are large relative to producers. Abernathy et al. (1999) document how large retailers coordinate global apparel and textile production. In these cases, traders appear not to be pooling risk but to be matching small producers to larger buyers.

foreign markets through experience or through the trading offices they staff in foreign countries.

If buyers and sellers each have incomplete information about the other, information problems are two sided. This setup is close to Rubinstein and Wolinsky's (1987) model of middlemen, in which buyers and sellers each must engage in costly searches to find an acceptable trading partner. Middlemen, due perhaps to previous investments, are able to locate buyers or sellers at a relatively low cost. In equilibrium, the markups middlemen charge are increasing in buyer–seller search costs. Empirically, we expect these search costs to be higher for differentiated products and in smaller destination countries, both of which tend to have markets that are relatively thin. These predictions are similar to Biglaiser's (1993), which suggest that incomplete information on either the buyer or the seller side produces similar intermediation patterns and markup behavior.

A third set of traders' activities involves coordinating outward processing—purchasing and shipping inputs, packaging and distributing outputs, and so forth. Part of traders' markups may be management fees for helping firms coordinate business activities in different countries. But information costs also may play a role in why traders engage in outward processing. Where production involves multiple stages and where exchange between suppliers and buyers is subject to informational problems at each stage, there may be gains to having traders manage the entire supply chain. Applying the logic of Rubinstein and Wolinsky (1987) and Biglaiser (1993), the involvement of traders in outward processing may be a natural extension of their involvement in simple intermediation. In the empirical work, we attempt to identify the contribution of the different services traders provide to the markups they charge.[6]

2.2 Transport Hubs

One alternative reason firms may ship exports from China through Hong Kong is to take advantage of hubbing in international shipping.

6. One remaining question is why traders re-export goods through Hong Kong rather than having them shipped directly from source to destination markets. Physically re-exporting goods through Hong Kong may allow traders to provide certain services, such as inspecting goods, evaluating quality, or determining the optimal destination market, more efficiently. It also may allow traders to protect information from suppliers and buyers about the identities of their respective trading partners (Sung, 1991). This information-protection motive is consistent with Young's (1999) findings on the "acute angle" of Hong Kong re-exports. During the 1990s, around 50% of Hong Kong's re-export trade followed an angle of less than 90 degrees, such that Hong Kong traders often re-exported to countries that were much closer to the export-producing country than they were to Hong Kong.

Similar to passenger air travel, it may be efficient for exporting firms in a particular country to ship goods in bulk to an international hub, where they are unloaded, are combined with other goods going to the same destination market, and then are loaded onto a new ship for the final leg of travel. As we note in the next section, goods whose presence in Hong Kong is due solely to hubbing should, in principle, not appear in our re-export data. Goods in transit do not clear customs in Hong Kong and so are not counted as re-exports. Clearing customs involves costly delay, so we expect there to be an economic rationale for re-exporting over simply transshipping. Hubbing provides no such rationale, as goods may benefit from hubbing without clearing customs.

Since re-export markups are calculated net of freight and insurance charges, it might seem that they would be orthogonal to transport costs. In perfectly competitive markets, buyers pay the full transport cost. There are two important exceptions to this logic, for which we control by including measures of transport costs in the estimation. The first exception is where traders have market power in the sale of re-exported goods; in this case they may absorb some of the transport costs by way of price discrimination. A second exception is where there is a "Washington apples" effect (Alchian and Allen, 1964, pp. 74–5), in which fixed costs associated with transport (e.g., loading and unloading) induce firms to export relatively high-value goods. Here, high markups may be a byproduct of the fact that at each hub firms select relatively high-value items to ship on to the next destination. By implication, the goods being shipped the longest distances should have the highest markups since they are more likely to pass through multiple hubs and thus to be subject to the fixed costs associated with loading and unloading multiple times. Young (1999) finds no evidence of this effect in the transshipment of goods through international ports. Our results confirm his findings.

2.3 Taxes, Tariffs, and Quotas

Another reason for entrepôt trade is to evade taxes and trade barriers. Given lower corporate taxes in Hong Kong, firms with a business presence in both Hong Kong and China may attempt to transfer profits to Hong Kong by setting an artificially low price on Chinese exports to Hong Kong.[7] This incentive exists regardless of the good being produced

7. In the context of outward processing, a related practice is underinvoicing (Sung, 1991). Firms may underreport the value of goods imported into China for further processing to minimize the import duties for which they are liable (though in principle duties are not applied to imports used to produce exports). When the processed goods then are exported from China to Hong Kong, their import price in Hong Kong will be artificially low.

or where it ultimately is sent and so may affect the level of re-export shares and export markups, but not their variation across products or destination markets. One exception is where a Hong Kong firm has a business presence in the destination market. For destination markets with lower corporate tax rates than Hong Kong, firms may have an incentive to set an artificially low price on exports from Hong Kong in order to transfer profits abroad. We control for this possibility by including corporate tax rates in destination markets in the empirical analysis. Since transfer pricing is more likely to be issue for multinationals, we include the share of China exports that are due to foreign-invested enterprises (FIEs) as an independent variable.

For some items, destination-market trade barriers depend on whether a good originates in Hong Kong, China, or some other country. Apparel and textiles, which are subject to MFA quotas during the sample period, are one example. These quotas tend to bind on Hong Kong and China in each year. We control for the presence MFA quotas in the analysis.

3. Background and Data

Hong Kong's position as an entrepôt dates back to China's cession of the Island to Britain in 1842 (Sung, 1991). Trade between Hong Kong and China was mostly dormant during the rigid Chinese communist rule of 1949 to 1978. The opening of China to foreign trade and investment in the late 1970s has led to dramatic changes in both economies. Before 1980, Hong Kong grew largely through producing and exporting labor-intensive manufactures, such as apparel, textiles, footwear, toys, and consumer electronics (Findlay and Wellisz, 1993). Learning about the production and marketing of these goods, which also account for a large fraction of China's current exports, may have helped Hong Kong become a middleman for global trade (Hamilton, 1999).

Since 1980, Hong Kong has begun to specialize more heavily in business services, particularly those related to trade and investment in China. China's export manufacturers are concentrated in southern coastal provinces, especially Guandong, which borders Hong Kong (Sung, 1997).[8] Over the last two decades, many Hong Kong manufacturing firms have moved their production facilities to Guandong,

8. Until the early 1990s, China had two regimes for exporters (Naughton, 1997). Those doing outward processing for foreign buyers could import inputs duty free and could export abroad directly. Other exporters faced barriers on imported inputs and had to export through state-controlled foreign trade corporations. In 1992, the government began to lift these restrictions. Since Hong Kong returned to Chinese rule in 1997, it continues to be open to foreign trade and investment, as part of the "one country, two systems" policy.

which they manage from headquarters in Hong Kong.[9] Hong Kong firms typically supply plants in China with raw materials and often ship the goods through Hong Kong for inspection, finishing, or packaging before exporting them to a final destination (Sung, 1991). As Hong Kong has shifted production to China, manufacturing has become a much less important part of the Hong Kong economy, declining from 24% of GDP in 1980 to 6% of GDP in 1998.

3.1 Data Sources and Issues

The trade data we use for the analysis come from two sources: Hong Kong imports, exports, and re-exports from disaggregate electronic data provided by the Hong Kong Census and Statistics Office; and China imports and exports from disaggregate electronic data provided by the Customs General Administration, People's Republic of China. We also use data from the World Bank on country GDP and exchange rates and from PriceWaterhouse on country corporate income tax rates. The data span the period 1988–1998. Chinese and Hong Kong trade data are available by either disaggregate standard industrial trade classification (SITC) or harmonized system (HS) categories. To concord these data, we aggregate up to four-digit SITC products.

We construct two measures of entrepôt activity in Hong Kong: (1) the fraction of total Chinese exports that are re-exported by Hong Kong, to which we refer as the *re-export share*; and (2) the log difference in average price (unit-value) of Chinese re-exports between when they enter and when they leave Hong Kong, to which we refer as the *re-export markup*. Both series are calculated by year, four-digit SITC product, and destination market, over 1988–1998.

It is worth discussing the re-export data in some detail. Re-exports are observed twice: once when they enter Hong Kong as imports and again when they leave Hong Kong as exports. In the meantime, they are held in possession by Hong Kong firms but cannot be subject to "substantial transformation."[10] At the time re-exports enter the country, Hong Kong identifies the *country of origin* but not the *country of final destination*, in part because this may not yet be determined. At the time re-exports leave the country *both origin and destination countries*

9. Hsieh and Woo (1999) find that outsourcing to China has been associated with a rise in the relative demand for skilled labor in Hong Kong, consistent with the observation that Hong Kong firms tend to move labor-intensive manufacturing operations to China while keeping skill-intensive management operations in Hong Kong.

10. A good is subject to "transformation" in Hong Kong if any process "has changed permanently the shape, nature, form, or utility of the product" (Hsia, 1984, p. 24). Note that goods in transit and goods entered for transshipment on a through bill of lading do not clear customs in Hong Kong and thus are not counted as re-exports.

are identified. Thus, there is some mismatch between the import and re-export data. Letting the unit-value of Hong Kong imports from China be denoted by PM_i and unit-value of Hong Kong re-exports of Chinese goods to country j be denoted by PX_{ij}, the markup is computed as[11]

$$\text{Markup}_{ij} = \ln(PX_{ij}) - \ln(PM_i). \quad (1)$$

Notice that in (1) import unit values do not vary across destination markets, which may introduce bias into the measure. In unreported results, we calculated an adjusted markup, which corrected the import unit values for possible variation in import prices by country of destination. This method is described in Feenstra et al. (1998, 1999). We implemented this method for the dataset used in this paper, disaggregated by four-digit SITC and all countries of destination, but it had practically no effect on our results.

The *re-export shares*, which are the other measure of entrepôt activity, are constructed by combining the Chinese and Hong Kong trade data. Specifically, we sum the *direct* Chinese exports to each destination market (which do not pass through Hong Kong) with the value of Chinese *re-exports* through Hong Kong to each destination market to obtain the total exports from China of each product. Then the Chinese re-exports through Hong Kong are expressed relative to this total to obtain the re-export share.

Data on direct Chinese exports are useful for another purpose as well. China distinguishes trade based on outward processing and trade related to multinational firms from other trade. The outward-processing designation comes from the fact that China permits the duty-free import of goods used to manufacture exports (Sung, 1991). These goods are treated as being under contract with a foreign firm, and their value is recorded when they enter and when they leave China. Chinese trade data also identify the value of exports by multinational firms, whose official designation is foreign-invested enterprises. These exports are of interest since many of these firms either are headquartered in Hong Kong or have operations there. In the empirical analysis, we use the value of Chinese exports that are related to outward processing or are exported by FIEs as additional explanatory variables.

3.2 Hong Kong Re-Exports of Chinese Goods

Table I shows China exports and the share of Hong Kong re-exports of Chinese goods in China exports by year. Total China exports have

11. Actually, the unit-values PX_{ij} and PM_i are computed at the five-digit SITC or six-digit HS level and then are aggregated to the four-digit SITC before applying formula (1). Details are available on request.

Table I.

Direct Exports and Re-Exports of Chinese Goods, 1988–1998

Year	Total China Exports (billions US$) (1)[a]	Re-Export Share of Total China Exports (2)[b]	Outward Processing Share of China			Foreign-Invested Enterprise Share of China		
			Direct Exports (3)[c]	Exports to Hong Kong (4)[c]	Total Exports (5)[c]	Direct Exports (6)[d]	Exports to Hong Kong (7)[d]	Total Exports (8)[d]
1988	38.7	43.1	12.8	49.7	32.1	1.2	8.5	4.7
1989	46.3	51.5	19.7	56.9	40.3	3.1	13.4	8.3
1990	55.4	55.2	21.9	58.5	43.4	4.2	16.7	10.9
1991	67.8	59.1	24.9	61.5	47.1	6.5	19.1	13.5
1992	84.7	60.1	24.8	63.1	47.9	8.6	20.8	15.2
1993	98.0	61.3	24.4	67.2	49.4	17.8	35.1	27.1
1994	120.2	57.7	27.4	62.1	47.7	19.8	35.2	28.5
1995	151.6	53.3	32.7	65.8	50.1	21.9	40.6	31.3
1996	161.0	49.8	38.1	76.0	54.3	31.3	49.8	39.0
1997	181.3	46.9	39.6	69.9	52.7	33.3	47.1	39.1
1998	177.7	45.4	40.7	73.8	54.7	36.4	49.7	41.9

[a]Shows total China exports (direct exports plus re-exports through Hong Kong) in billions of current U.S. dollars.
[b]Shows Chinese re-exports through Hong Kong as a share of total Chinese exports.
[c]Shows the share of exports related to outward processing in direct Chinese exports to countries other than Hong Kong, Chinese exports to Hong, and total Chinese exports.
[d]Shows the share of exports by FIEs in direct Chinese exports, Chinese exports to Hong Kong, and total Chinese exports.

risen dramatically over time, and shipments through Hong Kong are a substantial part of this total. The re-export share of total Chinese exports increases from 43.1% in 1988 to 61.1% in 1993 and then declines to 45.4% by 1998. The decline in the later period may be due in part to recent increases in exports by Chinese regions relatively distant from Hong Kong (Sung, 1997). Outward processing accounts for a large fraction of China's exports, especially those shipped through Hong Kong. For goods China exports to Hong Kong, outward processing accounts for 73.8% of shipments in 1998, up from 49.7% in 1988, while for goods China exports directly, outward processing accounts for 40.7% of shipments in 1998, up from 12.8% in 1988. Multinational firms account for a rising fraction of Chinese exports. The share of FIEs in total China exports rises from 4.7% in 1988 to 41.9% in 1998. The FIE share in China exports to Hong Kong is larger than the FIE share in direct China exports in every year, which may be attributable to the central role Hong Kong plays in coordinating activities in China by FIEs.

Table II shows the distribution of direct Chinese exports and Hong Kong re-exports of Chinese goods across one-digit SITC industries. Re-exports are concentrated in SITC 8, light manufactured articles, whose major subsectors are apparel and footwear. This industry accounts for 57.5% of total re-exports over the sample period (where shares are stable over time). Machinery and transport equipment (SITC 7) and manufactured materials (SITC 6), which includes textiles, are also important sources of re-exports, accounting for 22.4% and 14.0% of total re-exports, respectively. SITC 7 and 8 are the two industries in which re-exports account for the largest fraction of total exports, with re-export shares of total Chinese exports equal to 69.5% and 70.1%, respectively. These are also the two industries in which outward-processed goods and exports by FIEs dominate China's shipments to Hong Kong.

In contrast to re-exports, *direct* Chinese exports are spread relatively evenly across industries. Light manufactured articles (apparel, footwear) account for only 27.9% of direct exports. Food, mineral fuels, chemicals, and crude material, which account for very small fractions of total re-exports, are relatively large sources of direct exports. In all industries outward processing and exports by FIEs account for a lower fraction of China's direct exports than of China's exports to Hong Kong.[12]

To examine the distribution of exports across sectors in more detail, Table III lists the two-digit SITC industries that account for an average of

12. Some firms registered as FIEs in China do so only to receive favorable tax treatment and achieve this by having a partner in Hong Kong. This so-called "round tripping" creates an artificial correlation between FIE activity and trade through Hong Kong.

TABLE II.

DIRECT EXPORTS AND RE-EXPORTS OF CHINESE GOODS BY SITC INDUSTRY*

SITC Industry		Industry Share of Direct Exports (1)[a]	Industry Share of Re-Exports (2)[b]	Re-Export Share of Total Exports (3)[c]	Outward Processing Share of		FIE Share of	
					Direct Exports (4)[d]	Exports to Hong Kong (5)[e]	Direct Exports (6)[f]	Exports to Hong Kong (7)[g]
0	Food, Live Animals	11.5	1.9	14.2	8.9	16.0	14.4	16.1
1	Beverages, Tobacco	0.6	0.3	35.1	6.7	17.0	6.7	4.2
2	Crude Materials	6.1	1.9	22.0	2.8	11.6	7.9	10.5
3	Mineral Fuels	10.0	0.1	0.6	3.9	15.8	1.2	25.3
4	Animal, Vegetable Oils	0.1	0.0	17.1	15.1	72.5	18.2	73.6
5	Chemical Products	7.7	1.9	21.9	12.9	27.6	7.9	21.4
6	Manufactured Materials	21.9	14.0	41.6	28.0	42.1	11.2	25.3
7	Machinery, Transport Equipment	11.5	22.4	69.5	44.7	84.4	27.9	49.2
8	Light Manufactured Articles	27.9	57.5	70.1	43.9	71.4	23.4	35.5
9	Miscellaneous Manufactured Items	2.5	0.1	62.8	20.3	45.7	4.5	2.3

*All figures are averages over the 1988–1998 period.
[a]Shows each one-digit SITC industry's share of total Chinese direct exports.
[b]Shows each one-digit SITC industry's share of total re-exports of Chinese goods through Hong Kong.
[c]Shows the share of re-exports in Chinese exports for each industry.
[d]Shows for each industry outward-processing exports as a share of direct China exports (to countries other than Hong Kong).
[e]Shows outward-processing exports as a share of China exports to Hong Kong.
[f]Shows exports by FIEs as a share of direct China exports.
[g]Shows FIE exports as a share of China exports to Hong Kong.

Table III.
Direct Exports and Re-Exports of Chinese Goods for Selected Two-Digit Industries*

SITC	Industry	Industry Share of Direct Exports (1)	Industry Share of Re-Exports (2)	Re-Export Share of Total Exports (3)	Outward Processing Share of: Direct Exports (4)	Outward Processing Share of: Exports to Hong Kong (5)	FIE Share of: Direct Exports (6)	FIE Share of: Exports to Hong Kong (7)
03	Fish	2.9	0.6	16.9	17.5	23.2	26.2	23.5
05	Vegetables, Fruit	3.6	0.9	19.6	4.6	6.2	13.0	12.2
33	Fuel Oils	8.2	0.1	0.8	5.7	28.8	0.6	4.8
52	Inorganic Chemicals	2.1	0.3	12.2	5.3	7.0	4.2	9.2
65	Textile Yarn Fabrics	10.2	8.7	48.6	26.5	37.8	9.1	27.1
66	Nonmetal. Minerals	2.2	1.1	37.5	8.5	29.2	18.8	24.8
67	Iron, Steel	2.7	0.2	8.6	43.1	55.5	4.4	13.1
69	Metal Products	3.7	2.3	41.0	29.2	55.3	10.3	23.6
75	Office Machines	0.6	3.4	88.1	81.3	97.5	63.0	56.2
76	TVs, Radios	1.5	9.3	86.2	75.7	93.2	51.8	58.6
77	Elec. Machinery	2.5	7.1	78.1	50.2	80.0	35.2	41.8
83	Luggage	0.8	5.5	88.5	50.9	85.4	26.8	31.4
84	Apparel	17.2	17.4	53.5	43.5	56.8	21.2	27.3
85	Footwear	2.7	7.8	76.7	52.5	85.0	29.0	55.3
88	Cameras, Watches	0.4	3.2	89.9	58.1	86.2	36.7	46.5
89	Toys, Games	4.9	21.0	82.9	42.5	78.0	25.7	36.5

*The two-digit industries listed in here account for at least 2% of direct Chinese exports or 2% of re-exports of Chinese goods through Hong Kong on average over the period 1988–1998. See footnotes to Table III for definitions of column headings.

at least 2% of either total direct exports or total re-exports over the sample period. Apparel and textile yarn fabrics are major sources of both direct exports and re-exports. Industries that are important for re-exports but not for direct exports include toys and games, televisions and radios, footwear, electrical machinery, luggage, and office machines. These are also industries for which outward processing dominates China's shipments to Hong Kong. Industries that are important for direct exports but not for re-exports include fuel oils, vegetables and fruit, fish, and inorganic chemicals.

It appears that the industries that rely most heavily on re-exports are those that produce differentiated products, such as apparel, footwear, toys, and consumer electronics. For many differentiated goods, product quality is often difficult to observe or to verify, which may create demand for intermediaries to resolve informational problems in exchange. These also tend to be goods whose production stages span both high-skill activities, such as product design, and low-skill activities, such as simple assembly, which makes them suitable for outward processing. Differentiated goods frequently are produced in small batches, creating an incentive to ship through hubs, but they are also high-value-to-weight items, offsetting the incentive to use hubs. Additionally, apparel and textiles are subject to MFA quotas in many countries during the sample period. Shipping these goods through Hong Kong may be a means of circumventing binding quotas on Chinese exports.

Table IV shows the distribution of direct exports and Hong Kong re-exports across regions and the average share of re-exports in total exports by region. To the extent that information costs motivate re-exporting goods through Hong Kong, we would expect to see a higher fraction of re-exports going to rich regions, which have a relatively strong demand for differentiated goods. To the extent that transport costs motivate re-exporting goods, we would expect to see a higher fraction of re-exports going to distant regions, for which the extra distance of shipping goods through a hub would add relatively little to no cost.

For both direct exports and re-exports, the major destinations are, not surprisingly, the relatively large markets of North America, Western Europe, and East Asia. The regions for which re-exports account for most trade include the relatively rich and distant regions of North America (71.4%) and Western Europe (62.1%), the relatively rich and near region of Oceania (61.2%), and the relatively poor and distant regions of Latin America (65.0%) and Africa (49.9%). This variation in re-export shares across regions suggests that both information costs and transport costs may be important for entrepôt trade.

TABLE IV.
DIRECT EXPORTS AND RE-EXPORTS OF CHINESE GOODS BY REGION*

Region	Region Share of Direct Exports (1)[a]	Region Share of Re-Exports (2)[b]	Re-Export Share of Total Exports (3)[c]
Africa	3.2	2.6	49.9
East Asia	36.8	18.0	35.6
Eastern Europe	4.2	0.9	24.8
Latin America	2.5	4.2	65.0
Middle East	4.0	2.6	42.8
North America	16.7	37.3	71.4
Oceania	1.7	2.4	61.2
South Asia	2.7	1.0	30.6
Southeast Asia	11.2	6.0	37.8
Western Europe	16.9	24.9	62.1

*All figures are averages over the period 1988–1998.
[a]Shows each region's share of Chinese direct exports.
[b]Shows each region's share of Hong Kong's total re-exports of Chinese goods.
[c]Shows the share of re-exports in Chinese exports to each region.

3.3 MARKUPS ON HONG KONG RE-EXPORTS OF CHINESE GOODS

Figures 1–3 present estimates for markups on Hong Kong re-exports of Chinese goods. There are a moderate number of markups with extreme values, which may reflect errors in reporting or in transcribing trade quantities or values. In the figures reported below, we address this problem by trimming from the data the highest and lowest 2.5% of markups.

Figure 1 shows the distribution of markups by year using box plots. The midline in the box shows the median; the box shows the interquartile (25th–75th percentile) range; and the upper and lower horizontal lines extend to 1.5 times the interquartile range above or below the box. Individual points are observations above or below this range. Median markup values range from 0.28 to 0.34 and are relatively stable over time. A substantial fraction of markups are *negative*, even after trimming extreme observations. Figure 2 shows the distribution of markups by one-digit SITC industry. Markups appear to be largest for light manufactured articles (SITC 8) and machinery and transport equipment (SITC 7) and to be lowest for mineral fuels (SITC 3) and animal and vegetable oils (SITC 4). Figure 3 shows the distribution of markups by region. Markups appear to be highest in the rich regions of

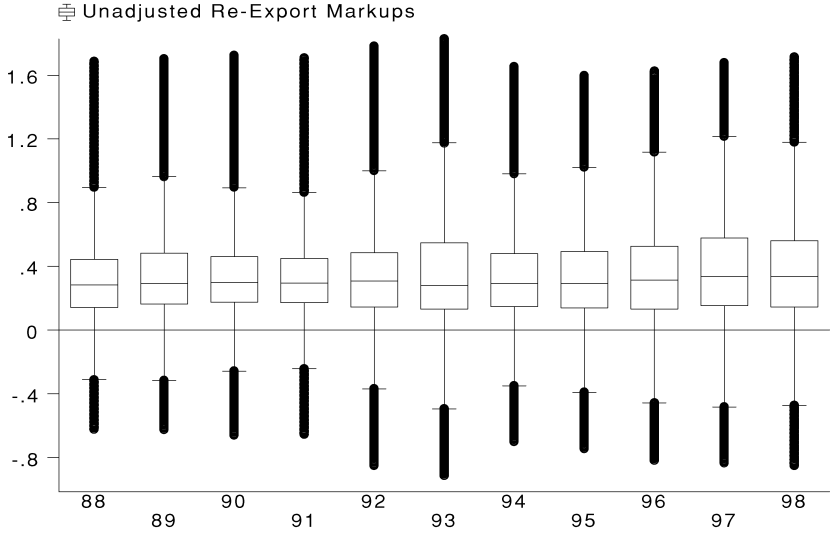

FIGURE 1. RE-EXPORT MARKUPS BY YEAR

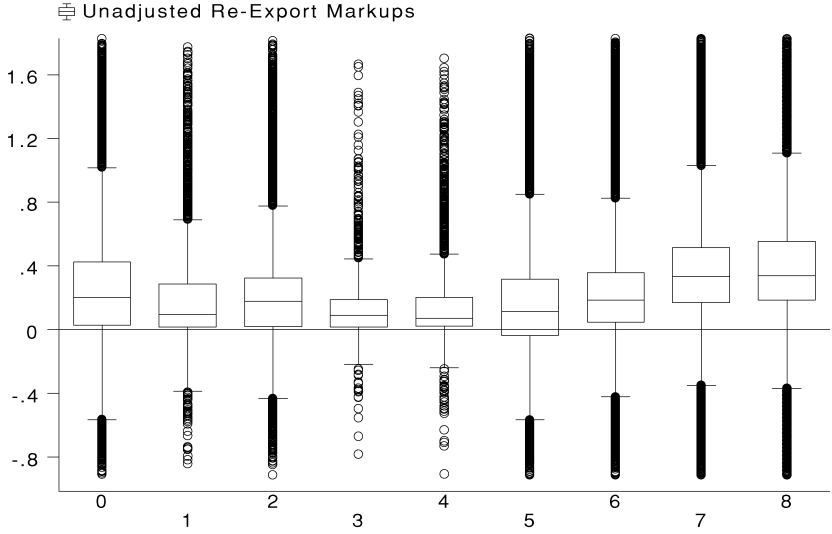

FIGURE 2. RE-EXPORT MARKUPS BY SITC INDUSTRY

North America, Oceania, and Western Europe and to be lowest in the poor regions of Africa and Latin America.

There are several possible explanations for negative markups. One is that they are a real feature of the data. Information-cost based

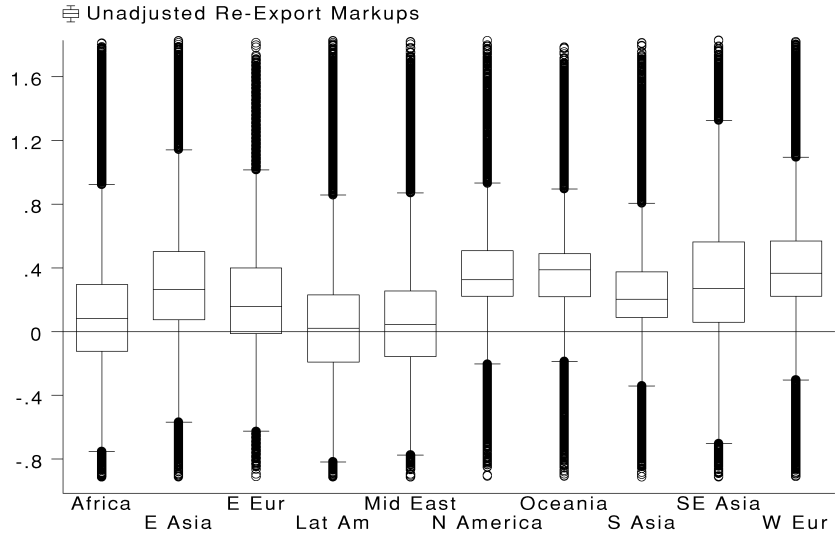

FIGURE 3. RE-EXPORT MARKUPS BY REGION

models of intermediation predict that negative markups will occur with positive probability.[13] A second explanation for negative markups is that they are a byproduct of measurement error, and in particular, the bias introduced by calculating markups using export unit values, which are specific to the destination market, and import unit values, which are not. Even when we attempt to correct for this bias, as discussed previously, negative values are a prominent feature of the data.

Two other types of measurements errors that could produce negative markups are time lags in import and export activity and errors in classifying imported and re-exported goods. In the first case, suppose Hong Kong imports Chinese goods in one year and exports them in the following year. Then the import unit values and the export unit values used to calculate re-export markups for a given year would be based on disjoint sets of goods. Alternatively, if imports and re-exports of the same good are classified in different SITC industries, markups also would be inaccurate. We checked for both of these possibilities by calculating two-year moving averages (weighted by relative export values) for markups by four-digit SITC product and destination-country and by calculating annual markups by three-digit industries. In both

13. A related explanation is that Hong Kong traders may take orders from buyers at preset prices and then may be forced to take losses if they cannot find suppliers who can deliver goods at these prices. For any of these explanations, it is still surprising that average markups are negative for entire industries in particular countries.

cases, negative markups remained a prominent feature of the data after this time-series or cross-sectional averaging. We accept, therefore, that negative markups on disaggregate products may be a genuine feature of our data.

4. Empirical Specification

Using data on Hong Kong re-exports of Chinese goods and China direct exports by product (i), destination market (j), and year (t), we estimate two equations. The first has as its dependent variable the re-export markup, as in (1). The second equation has as its dependent variable the re-export share, the share of Chinese exports re-exported through Hong Kong.

The regression equations take the following form:

$$y_{ijt} = V_{ijt}\gamma + X_{it}\beta + Z_{jt}\phi + \varepsilon_{ijt}, \tag{2}$$

where y_{ijt} is the dependent variable; V_{ijt} is a vector of product and destination-market characteristics, which include indicators of whether a particular country applies MFA quotas on a particular product; X_{it} is a vector of product characteristics, which include the variance in export prices across destination markets within the same three-digit industry, the prevalence of differentiated goods in industry output, the share China industry exports that are associated with outward processing, and the share of China industry exports by FIEs;[14] Z_{jt} is a vector of destination-market characteristics, including log GDP, log per capita GDP, log China exports to the destination market, the log nominal exchange rate in the destination market, corporate tax rates in the destination market, and log distance from Hong Kong to the destination market; and ε_{ijt} is an error term assumed to be independently and identically distributed. Table V gives summary statistics on the regression variables.

Destination-country trade barriers influence the incentive to re-export Chinese goods through Hong Kong if they are more restrictive on imports from China than on imports from other countries. Such instances occur frequently with MFA quotas on apparel and textiles.[15] Where MFA quotas bind on imports from China, traders have an

14. The variance in export prices, the value of exports to the destination market, the outward processing share of China exports and the FIE share of China exports are each calculated excluding the observation in question (and so vary across destination markets, products, and time).

15. The Uruguay Round of the General Agreement on Tariffs and Trade (GATT) (1994) eliminated the MFA. Countries will convert quotas into tariffs gradually and then will eliminate the tariffs altogether by 2005.

Table V.
Summary Statistics*

Variable	Definition	Mean	Std. Error	*N*
Re-Export Markup	% Markup on Hong Kong Re-Export of Chinese Goods	0.357	0.358	172,109
Re-Export Share	Share of China Exports Re-Exported through Hong Kong	0.528	0.388	345,134
Export Price Variance	Log Variance in Export Price for Other All Goods in Three-Digit Industry	3.520	3.598	172,109
Differentiated	Equals One If Differentiated Good	0.734	0.442	345,134
Reference Priced	Equals One if Reference-Priced Good	0.206	0.404	345,134
Outward Processing Share	Share of Outward Processed Goods in China Exports to Hong Kong	0.549	0.319	172,109
FIE Share (a)	Share of Exports by FIEs in China Exports to Hong Kong	0.322	0.241	172,109
FIE Share (b)	Share of Exports by FIEs in Total China Exports	0.257	0.226	345,134
MFA	Equals One if MFA Product and Country Applies MFA Quotas	0.033	0.178	345,134
Export Volume	Log Value of China Exports to Country	21.624	2.083	345,134
Per Capita GDP	Log per Capita GDP	8.694	1.092	345,134
GDP	Log GDP	25.361	1.947	345,134
Distance	Log Great Circle Distance from Hong Kong	8.897	0.705	345,134
Taiwan	Equals One if Taiwan	0.018	0.132	345,134
Southeast Asia	Equals One if Indonesia, Malaysia, Philippines, Singapore or Thailand	0.088	0.283	345,134
Korea	Equals One if South Korea	0.018	0.133	345,134
Corporate Tax Rate	Highest Marginal Corporate Income Tax Rate in Country	0.386	0.109	280,419
Exchange Rate	Log Currency Units per Hong Kong Dollar in Destination Market	0.789	2.820	333,076

*Observations are over four-digit SITC industries and countries to which Hong Kong ships re-exports of Chinese goods and/or to which China exports directly. Markups are weighted by the value of re-exports; the re-export share is weighted by the value of total China exports of good to destination market; and all other variables are unweighted.

incentive to disguise re-exports as originating in a country other than China. Though importing countries go to elaborate lengths to determine the country of origin for imports, the presence of MFA quotas may still influence re-export behavior. We include as a regressor an indicator variable for whether a product is subject to MFA quotas and the destination country is one that applies MFA quotas (Canada, European Union, Norway, and the United States).

The variability in export prices across destination markets is one measure of information costs in exchange. Industries with higher destination-market variability either in the quality of goods sold or in buyer valuations are likely to have higher variability in export prices. We thus expect middlemen to be more active and to charge higher markups for products with greater export-price variability.

The prevalence of differentiated products in an industry is a second measure of information costs in exchange. Differentiated products tend to be goods whose quality is difficult to establish objectively (e.g., the style of a woman's high-heel shoe versus the size and weight of a grain of rice) and for which buyer valuations vary widely. Many differentiated goods are branded and thus are subject to definitions of quality that are manufacturer specific. This may make it difficult to establish industry-wide norms for product quality in these goods. Also, buyer perceptions about specific brands may differ across national markets. The absence of quality standards or uniform buyer sentiments creates a role for middlemen. They may help evaluate product quality and manufacturer reliability and reduce search costs.

We measure product differentiation using Rauch's (1999) classification of SITC products into homogeneous goods, reference-priced goods, and differentiated goods. Rauch constructs this classification based on how the majority of five-digit products inside a three- or four-digit SITC industry are sold. Homogeneous goods are those sold on organized exchanges, such as commodities markets; reference-priced goods are those whose prices are listed in published international trade journals; and differentiated goods are all other goods. The sale of homogeneous and reference-priced goods tends to occur through exchanges in which the identity of buyers and sellers is either well known or is unimportant. Differentiated goods presumably are ill-suited to the impersonal exchange of standardized markets.[16]

16. To control for ambiguities in designating industries into one of the three categories, Rauch uses two schemes to aggregate five-digit product categories to the three- or four-digit level. We report results for an aggregation scheme based on a "conservative" designation of whether homogeneous goods dominate the three- or four-digit industry. Results using a scheme based on a "liberal" designation are very similar to those we present in Section 5.

The share of outward processing in China exports controls for the extent of outward processing in an industry. Goods sent to China for processing may be subject to an array of service activities in Hong Kong, such as finishing, sorting, and packaging, and so may exhibit higher re-export markups. The outward processing share, along with export-price variability and the prevalence of differentiated products, capture the contribution of services related to supply-chain management to the markups that middlemen charge. Since multinational firms often produce such trading services in house, they may be unlikely to use middlemen. We control for the share of FIE exports in China exports by product.

As for the other variables, GDP and per capita GDP reflect market size and average consumer income, which are correlated with the demand for quality, market thickness, and the average price sensitivity of buyers. Corporate tax rates control for the impact of transfer pricing on re-export behavior. The nominal exchange rate controls for pricing-to-market behavior. The value of exports to the destination market controls for two possibilities: (1) that informational problems are less severe in markets that trade more with China, in which case re-export markups and re-export shares should be decreasing in export volumes; or (2) that there are economies of scale in shipping, such that traders would set lower markups to higher-cost, lower-volume markets. Distance controls for the influence of transport costs on re-exports.

Finally, note that some of our regressors—the product-differentiation variables, the outward-processing share, and the FIE share—vary across products but not destination markets. Moulton (1986) shows that in this instance, standard errors on coefficient estimates are likely to be biased downward. In all specifications, we adjust the standard errors for correlation in the disturbances across observations within the same four-digit SITC category. This raises estimated standard errors substantially. We also adjust for heteroskedasticity. In addition, markup regressions are weighted by the value of Hong Kong re-exports, and re-export share regressions are weighted by the value of Chinese exports (Hong Kong re-exports plus direct China exports). All regressions include year dummy variables, and some regressions include country dummy variables.[17] To control for changes in re-export behavior over time, due to China gaining experience in world markets or policy changes in China (see footnote 4), we report results for the full sample, 1988–1998, and split samples, 1988–1993 and 1994–1998.

17. To control for cases of extreme measurement error in the dependent variable, observations with the 2.5% highest and lowest values for markups are trimmed from the sample.

5. Estimation Results

In this section, we report estimation results for ordinary least squares (OLS) regressions using either the markup on Hong Kong re-exports of Chinese goods or the share of China exports re-exported by Hong Kong as the dependent variable. See Table V for descriptions of the regression variables.

5.1 Re-Export Markups

Table VI shows estimation results for re-export markups. The first two columns show results excluding country dummies; the second four columns show results including them. We begin by examining coefficient estimates for product-market characteristics. Consider first the results on the variance of export prices. Markups are higher for products with higher export-price variability, where this relationship is estimated reasonably precisely in all regressions. This suggests that products subject to higher information costs have higher re-export markups. Similarly, markups are higher for differentiated products than for referenced-priced goods or goods sold on organized exchanges. The coefficient estimates on the differentiated-product variable, which is estimated precisely, indicate that, relative to homogenous-good industries, differentiated-product industries have re-export markups that are 9–13% higher. Coefficient estimates on the referenced-priced variable are small and are estimated imprecisely. These results are consistent with information-based theories of intermediation, which predict that markups will be higher for goods subject to greater informational problems in exchange.

Goods subject to outward processing also have higher markups. The coefficient on the share of industry exports subject to outward processing is positive and is estimated precisely. Components sent to China for processing into final goods may be subject to additional value added in Hong Kong—in the form of packaging, labeling, or related activities—which results in higher export prices and thus in higher markups on re-exports. Goods subject to outward processing have re-export markups that are 10–11% higher than goods than are not subject to outward processing, an impact that is comparable roughly to that of product differentiation.

Together, the results on export-price variability, product differentiation, and outward processing suggest that fees for services related to supply-chain management activities help explain variation in markups. This is consistent with the view that middlemen help lower information costs. Also consistent with this reasoning, the coefficient on the FIE share of industry exports is negative—suggesting that foreign firms in

Table VI.
Estimation Results for Re-Export Markups

Time Period	1988–98 (1)	1988–98 (2)	1988–98 (3)	1988–98 (4)	1988–93 (5)	1994–98 (6)
Export Price Variance	0.018	0.018	0.019	0.019	0.017	0.020
	(1.91)	(1.88)	(1.96)	(1.93)	(2.20)	(1.85)
Differentiated	0.128	0.128	0.110	0.115	0.094	0.122
	(2.51)	(2.62)	(2.26)	(2.36)	(2.30)	(1.97)
Reference Priced	0.043	0.038	0.030	0.028	0.026	0.041
	(0.93)	(0.87)	(0.67)	(0.65)	(0.67)	(0.62)
Outward Processing	0.102	0.104	0.108	0.108	0.114	0.089
Share	(2.08)	(2.12)	(2.31)	(2.30)	(2.25)	(1.28)
Foreign-Invested	−0.10	−0.113	−0.109	−0.116	−0.051	−0.138
Enterprise Share	(−0.99)	(−1.12)	(−1.12)	(−1.18)	(−0.63)	(−1.01)
MFA	0.208	0.201	0.212	0.210	0.224	0.198
	(5.66)	(5.43)	(5.17)	(5.13)	(4.92)	(4.61)
Export Volume	−0.021	−0.027	0.001	−0.002	−0.059	0.070
	(−3.67)	(−4.53)	(0.08)	(−0.13)	(−2.61)	(2.22)
Per Capita GDP	0.092	0.117	0.143	0.093	1.023	−0.272
	(7.44)	(8.66)	(0.85)	(0.53)	(3.21)	(−0.78)
GDP	0.040	0.041	0.012	0.053	−1.000	0.325
	(6.59)	(6.71)	(0.07)	(0.31)	(−2.90)	(0.95)
Distance	0.731	0.496				
	(2.88)	(2.09)				
Distance Squared	−0.050	−0.036				
	(−3.45)	(−2.63)				
Taiwan	−0.264	−0.264				
	(−3.25)	(−3.20)				
Corporate Tax Rate		0.141		−0.069		
		(3.25)		(−0.48)		
Exchange Rate			−0.022	−0.022	−0.045	−0.045
			(−3.26)	(−3.04)	(−4.57)	(−1.57)
Country Dummies	No	No	Yes	Yes	Yes	Yes
Adjusted R^2	0.177	0.18	0.223	0.219	0.237	0.222
Observations	172,109	147,170	165,435	142,124	77,984	87,451

Notes: t statistics are in parentheses. Observations with the 2.5% highest and lowest values for the dependent variable have been trimmed from the sample. Data availability on additional regressors restricts the sample size in some specifications. Standard errors are adjusted for heteroskedasticity and correlation in the disturbances across observations within four-digit industries. The sample is 172,109 observations on markups of Hong Kong re-exports of Chinese goods by destination country and four-digit SITC industry for the period 1988–1998. Regressions are weighted by the value of re-exports.

China provide their own trading services—but this effect is estimated imprecisely.

Coefficients on the variable MFA, which takes a value of one if the good is an apparel or textile item covered by the MFA and if the destination country applies MFA quotas, are positive and are estimated precisely. Markups on MFA goods are 20–22% higher than on other

goods. One interpretation of this result is that Hong Kong traders are able to charge higher markups on goods subject to binding quotas in destination markets. Higher markups may derive from traders' control over quota rights in destination markets or from their ability to find other means (e.g., smuggling) of delivering goods to market. Alternatively, the MFA effect on markups may indicate transfer pricing. Firms in China that hold quota rights—the right to export MFA goods to specific countries—may earn rents, which they transfer to Hong Kong by exporting goods at artificially low prices.

We see more evidence for the relationship between transfer pricing and markups in the coefficient estimate on corporate tax rates in column (2). Markups are higher in markets where corporate tax rates are higher. Higher markups mean higher export prices, through which traders may transfer income from high-tax countries to Hong Kong.[18] Since corporate tax rates vary relatively little over time, it is not surprising that this correlation disappears once we control for country fixed effects. Since we lack data on corporate tax rates for many countries, we do not include this variable in all specifications.

In regressions without country dummies, we include a variable for whether the destination market is Taiwan. While China has lax restrictions on trade and investment with Taiwan, Taiwan restricts direct trade and investment with China (though indirect flows are large). We thus expect Hong Kong to intermediate a large fraction of China's exports to Taiwan, and this prior is confirmed. Given strong cultural ties and increasingly strong business ties between Taiwan and China, Hong Kong traders may not have the same informational advantage relative to Taiwan as they do relative to other countries. Consistent with this reasoning, re-export markups are 26% lower for goods shipped to Taiwan. In unreported results we examine whether markups also are lower for the major economies of Southeast Asia (Indonesia, Malaysia, the Philippines, Singapore, and Thailand), which have large communities of overseas Chinese active in international commerce, but find no such effect.

We turn next to results on other country characteristics. The coefficient estimate on the volume of exports indicates that markups are lower for products shipped to countries that have higher aggregate Chines imports. This is consistent with the idea that higher trade volumes reduce informational problems, and so traders are able to charge markups. Since export volumes vary little across observations with the same destination, it is not surprising that the variable becomes statistically insignificant

18. In unreported results we examine whether the positive correlation between corporate tax rates and markups is stronger in products where foreign-invested firms have a larger presence, and we find no such effect.

when country dummies are added to the regression. For the 1988–1993 period (column 5), we find that even controlling for country fixed effects markups are correlated negatively with country export volumes, but this effect is reversed in the 1994–1998 period (column 6).

Coefficients on the distance terms imply markups rise and then fall as distance from Hong Kong rises. Over 95% of the observations are to the right of maximum point of the implied distance function, which means that for most data points, markups decrease in distance to destination markets. Similar to Young (1999), we find no evidence that export prices rise with distance, as would be implied by a "Washington apples" effect. That markups decrease in distance may indicate that Hong Kong traders price discriminate by setting lower markups in markets where transport cost are higher.[19]

Turning to the GDP variables, in the first two columns markups are higher in countries with higher per capita GDP or higher total GDP. The first result is consistent with information-based theories of intermediation, but the second is not. We expect informational problems to be less severe in thicker markets, which then would be reflected in a negative correlation between markups and market size. With the inclusion of country dummies, we find that for the first half of the sample period (column 5), there is the expected positive correlation between markups and per capita GDP and negative correlation between markups and total GDP. These effects disappear in the later time period (column 6). Given that the results appear to depend on the time period, it is not surprising that for the full sample period with country dummies there is a weak correlation between markups and GDP and per capita GDP (columns 3 and 4).

In specifications with country dummies, we include the nominal exchange rate in the destination market as a regressor. The dummies control for initial relative-prices in Hong Kong and each destination market, which let us see whether traders price to market by changing prices as the exchange rate changes. There is a negative correlation between markups and exchange rates, which means markups fall when destination-market currencies fall relative to the Hong Kong dollar. The negative coefficient on the nominal exchange rate implies that traders lower Hong Kong dollar export prices to a particular market when a nominal depreciation causes local currency prices to rise, such that

19. Since re-export markups are based on free-on-board (fob) export prices, these results do not imply that prices of delivered exports from Hong Kong decrease with distance. We expect these prices to increase with distance, consistent with literature on purchasing power parity (Engel and Rogers, 1999). What our results on declining markups do suggest is that any increase in the price of delivered exports with distance will occur at a decreasing rate.

traders offset a portion of rising local currency prices through lower markups. The elasticity of markups with respect to the exchange rate is small but is estimated precisely. This sensitivity of markups to local currency prices is consistent with traders having market power in the products they distribute.

In unreported results, we experimented with alternative specifications and sample restrictions to gauge the robustness of the coefficient estimates. The results are unaffected by dropping observations whose export quantities greatly exceed their import quantities, which is an indication of measurement error; dropping the share of outward processing in China exports to Hong Kong, whose inclusion may introduce simultaneity into the estimation; or controlling for industry fixed effects. Coefficient estimates on the industry variables are also robust to replacing country dummy variables with country-by-year fixed effects. We also experimented with interacting the regressors but obtained imprecise estimates on most interaction terms and so do not report them. In unreported results, we adjusted re-export markups for possible bias in their construction. These results are quite similar to those in Table VI.

5.2 Re-Export Shares

Table VII shows results for the re-export share regressions. Columns 1 and 2 exclude country dummies from the estimation, while columns 3–6 include them. There are several differences in the regressors for the re-export share regressions and those for the markup regressions in Table VI. Since re-export activity is correlated highly with outward-processing trade, we do not include the outward-processing share of China exports as a regressor. Doing so likely would introduce simultaneity into the estimation. We also exclude the export-price variance as a regressor, since we have nonmissing observations on the variable for only half of the observations on re-export shares. Also, the FIE share of industry exports is calculated based on total China exports rather than on China exports to Hong Kong as in Table VI.

We again begin with results on product-market characteristics. Consistent with the results on re-export markups, re-export shares are higher for differentiated products. Coefficient estimates on the differentiated product variable, which are estimated precisely, imply that re-export shares are 21–30% higher for differentiated goods. Reference-priced goods, on the other hand, appear to be no more likely to be re-exported through Hong Kong than are homogeneous goods. This result supports the idea that middlemen are more likely to intermediate trade where informational problems are more severe.

Table VII.
Estimation Results for Re-Export Shares

Time Period	1988–98 (1)	1988–98 (2)	1988–98 (3)	1988–98 (4)	1988–93 (5)	1994–98 (6)
Differentiated	0.292	0.295	0.284	0.291	0.301	0.212
	(6.29)	(6.26)	(6.35)	(6.37)	(6.09)	(5.60)
Reference Priced	0.062	0.057	0.049	0.047	0.097	−0.060
	(1.56)	(1.43)	(1.26)	(1.22)	(2.21)	(−2.33)
Foreign-Invested Enterprise Share	0.672	0.659	0.648	0.643	0.783	0.551
	(11.90)	(11.62)	(11.60)	(11.34)	(11.52)	(7.74)
MFA	−0.088	−0.096	−0.110	−0.112	−0.121	−0.089
	(−2.22)	(−2.43)	(−2.72)	(−2.76)	(−2.79)	(−1.95)
Export Volume	−0.043	−0.042	−0.092	−0.094	−0.039	−0.056
	(−2.97)	(−2.99)	(−7.99)	(−7.19)	(−3.09)	(−3.12)
Per Capita GDP	0.055	0.057	−0.197	−0.217	−0.541	0.569
	(2.49)	(2.51)	(−1.69)	(−1.79)	(−3.21)	(3.48)
GDP	0.030	0.028	−0.093	−0.096	0.013	−0.604
	(2.52)	(2.37)	(−0.87)	(−0.85)	(0.07)	(−3.75)
Distance	−1.610	−1.380				
	(−5.78)	(−5.19)				
Distance Squared	0.103	0.091				
	(6.53)	(5.98)				
Taiwan	0.370	0.422				
	(5.81)	(6.67)				
Southeast Asia	0.199	0.205				
	(7.79)	(7.91)				
Korea	0.170	0.181				
	(3.88)	(3.93)				
Corporate Tax Rate		−0.015		0.146		
		(−0.44)		(1.56)		
Exchange Rate			0.014	0.016	0.030	0.020
			(3.04)	(3.45)	(4.81)	(1.71)
Country Dummies	No	No	Yes	Yes	Yes	Yes
Adjusted R^2	0.485	0.495	0.543	0.544	0.593	0.515
Observations	345,134	280,419	333,076	272,095	145,656	187,420

Notes: *t* statistics are in parentheses. Observations with the 2.5% highest and lowest values for the dependent variable have been trimmed from the sample. Data availability on additional regressors restricts the sample size in some specifications. Standard errors are adjusted for heteroskedasticity and correlation in the disturbances across observations within four-digit industries. The sample is 345,134 observations on the share of total Chinese exports that are re-exported through Hong Kong by destination country and four-digit SITC industry for the period 1988–1998. (The potential number of observations is 11 years × 176 countries × 944 industries, or 1,827,584.) Regressions are weighted by the value of total Chinese exports.

Re-export shares are higher for products where multinational firms have a larger presence. The coefficient estimates show that re-export shares are 55–78% higher in products where all exports are by FIEs compared to products where FIE exports are zero. Since we do not find that re-export markups are higher for products dominated by FIEs (see Table VI), the positive correlation between re-export shares and the FIE export share may reflect Hong Kong's role in coordinating FIE

production and distribution in China.[20] This role results from a stark pattern of specialization between the two countries, in which China specializes in labor-intensive production and Hong Kong specializes in skill-intensive management and marketing. Since the activities done in Hong Kong come at the beginning and end of FIEs' value-added chain, it is natural that Hong Kong distributes FIE exports from China.

Re-export shares are lower for goods subject to MFA quotas. The MFA dummy is negative and is estimated precisely in all cases. This finding is not what we would expect if re-exporting goods through Hong Kong was a means of evading trade barriers on Chinese goods, leading to the interpretation that either MFA quotas are more binding for Hong Kong than for mainland China or that China circumvents MFA quotas through channels other than Hong Kong.

Re-export shares are lower to countries that have higher aggregate imports of Chinese goods. One interpretation of this result is that higher trade volumes increase information flows between economies and so reduce the need for middlemen to intermediate exchange. Another interpretation is that higher trade volumes permit producers in China to ship goods directly rather than to ship them through a transport hub like Hong Kong.

Turning to country characteristics, coefficient estimates on distance suggest that re-export shares are increasing globally in distance. This is consistent with two interpretations: (1) that more distant markets are at a greater informational disadvantage in trade with China and so are more dependent on middlemen in Hong Kong to intermediate exchange; and (2) that re-exporting goods through Hong Kong, which requires additional unloading and reloading, is relatively less costly for goods shipped longer distances.

Consistent with the idea that Hong Kong offers access to Chinese goods for countries that restrict direct trade with China, the dummy variable for Taiwan is positive and is estimated precisely. We also include a dummy variable for Korea, which has embargoed direct trade with China in the past. Similar to the Taiwan case, these observations also have higher re-export shares. Interestingly, re-export shares are also higher for the major economies of Southeast Asia. This may reflect the existence of production networks within Asia, in which Southeast Asian countries import goods from China, process them further, and then ship them on to destination markets (Naughton, 1997).

In columns 1 and 2 of Table VII, re-export shares are correlated positively with per capita GDP and total GDP. When country dummy

20. As mentioned in footnote 12, the correlation between FIE and re-export shares may also reflect "round tripping," whereby firms in China establish a partnership with a firm in Hong Kong in order to obtain tax benefits.

variables are included in columns 3 and 4, however, neither correlation is significant. These results do not support information-based theories of intermediation, which suggest that re-export shares would be higher for richer markets and smaller for larger markets. We do find support for this prediction in the later time period, 1994–1998, in column 6, in which re-export shares are correlated positively with per capita GDP and are correlated negatively with total GDP with both effects precisely estimated.

To shift income from high-tax destination markets to Hong Kong through transfer pricing, we would expect re-export shares to be correlated positively with corporate tax rates. We find weak evidence for this in column 4, in which controls for country fixed effects are included, but not in column 2, in which controls for country fixed effects are excluded.

Finally, in columns 3–6 we find a positive correlation between re-exports and nominal exchange rates. Given that country dummies are in the regression, this result implies that, for a given destination market, China exports a higher fraction of its foreign shipments through Hong Kong when the nominal exchange rate in that market depreciates relative to the Hong Kong dollar. Stated differently, China exports a higher fraction of its foreign shipments of a good through Hong Kong when local currency prices of that good rise. One interpretation of this result is that within product categories, goods re-exported through Hong Kong tend to have lower demand elasticities than goods China exports directly. While a rise in local currency prices may diminish both types of exports, it would tend to diminish low-demand-elasticity goods less, thus leading to a rise in re-export shares.

In unreported results, we experimented with alternative specifications and sample restrictions to examine the robustness of the coefficient estimates. The coefficient estimates are unaffected by dropping observations whose export quantities greatly exceed their import quantities, which is an indication of measurement error; by controlling for industry fixed effects; or by estimating the regressions separately by year or industry. Coefficient estimates on the industry variables are also robust to replacing country dummy variables with country-by-year fixed effects. Similar to the re-export markup regressions, we experimented with interacting the regressors and again obtained imprecise estimates on most interaction terms.

6. Conclusions

We have examined here Hong Kong's role in the distribution of China's exports. China ships a substantial fraction of its exports through Hong Kong and Hong Kong appears to add value to these goods through a

range of intermediation activities. The variation in Hong Kong markups on the re-export of Chinese goods and in the share of China's exports that are re-exported through Hong Kong are consistent with information-based theories of intermediation and with the existence of international outsourcing networks. Markups are higher for differentiated products and for products with higher variance in export prices. These are goods for which we expect quality to be more difficult to observe and for buyer valuations to be more variable and so to be more likely to require the services of middlemen to resolve informational problems in exchange. Markups are also higher for goods that have been sent to China for further processing. Both sets of results suggest that the markups traders charge reflect returns to managing global supply chains.

Hong Kong traders appear to have market power in the goods they distribute, as evidenced by their apparent ability to price discriminate across destinations. Markups on Hong Kong re-exports of Chinese goods fall when local currency prices rise in a destination market (due to a depreciation in the nominal exchange rate) and are lower in markets where transport costs are higher. There is some evidence that Hong Kong traders shift income from high-tax destination markets to Hong Kong through transfer pricing, as re-export markups are higher where corporate income tax rates in destination markets are higher.

For China, and for many other countries, the services of intermediaries appear to be essential for national exports to reach foreign markets. Were Hong Kong's re-exports of Chinese goods merely a case of hubbing in international shipping, we might dismiss it as having no bearing on why countries trade and on how trade impacts domestic economies. But Hong Kong's role in distributing China's exports is multifaceted and clearly goes far beyond that of a simple transshipment point in world trade. Hong Kong traders influence product prices in destination markets, the allocation of production activities across countries, and how trade responds to income taxes and trade barriers. The need for intermediaries in trade suggests that they are wedges between goods' prices in exporting and importing countries and cannot be eliminated solely through the reduction of policy barriers, such as tariffs and quotas. Information costs limit the ability of trade to integrate markets for goods and factors across borders and may play an important role in directing bilateral trade flows. This suggests that entrepôt economies, as well as intermediaries in exchange more broadly, play a fundamental role in how international markets operate.

While we have examined a single case of entrepôt trade, there is little reason to believe that Hong Kong is unique. Hong Kong stands out in part because it was until, recently, a city-state. Other cities, such as Amsterdam, London, Los Angeles, New York, Shanghai, Singapore,

and Tokyo, also provide a wide range of intermediary services related to international finance and trade. Our results support the conclusion that entrepôt centers have a substantial effect on the prices and therefore on the magnitude of trade flows, which merits increased attention to their role in international trade.

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