CHINESE NETWORKS AND TARIFF EVASION

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Abstract - Chinese networks are known to act as trade catalysts by enforcing contracts and providing market information. This paper shows they also play a crucial role in import-tariff evasion. As illegal trade activities occur outside the law, market information is scant and formal contract-enforcement institutions are inexistent. This renders networks the more important for the matching of illicit-minded traders, identification of corrupt customs agents and enforcement of informal contracts. We find robust evidence that Chinese networks, proxied by ethnic-Chinese migrant populations, increase tariff evasion, i.e. the tariff semi-elasticity of China's missing trade. The network effect is stronger on non-differentiated goods and in countries where corruption is high, highlighting the corruption channel whereby networks bring into play customs officers.

Keywords: tariff evasion, China, illicit trade, migrant networks
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The prevalence of illicit trade has come as the dark side of globalisation, resulting in violence, distorted competition and loss of tariff revenue (Naim 2005, Fisman and Wei 2004, 2009). Despite various campaigns, policies to tackle it have so far proved futile (see for example Yang 2008 and Anson et al. 2005). This paper aims at shedding more light on the determinants of this underground activity.

Recent research (Fisman and Wei 2004, 2009) used discrepancies in official trade statistics to detect smuggling, asserting that imports missing from one country's reports may have been smuggled, misreported or underinvoiced, as noted by Bhagwati (1964). While the missing imports cannot be used to quantify smuggling precisely, they are still relevant to identify correlation patterns and uncover the causes of illicit flows (Fisman 2009), such as bumpy tariff schedules and corrupt environments.

In this paper we argue that another crucial ingredient for smuggling to occur is international networks. Networks have been found to facilitate trade by enforcing contracts and providing market information (Greif 1993, Rauch and Trindade 2002). As smuggling occurs outside the law, market information is hard to find and trust is all the more important to overcome hold-up problems (see Marcouiller 2000). Networks should hence play an important role in illicit trade.

To test for this prediction we study the case of China. There are two main reasons for this focus. The first is that tariff evasion at China's borders is a severe problem authorities have been trying to tackle for many years. According to the General Administration of Customs, customs and police departments have prosecuted more than 90,000 smuggling cases involving goods worth $24.2 billion from 1999 to 2004. But much of it remains undetected. FedEx warns on its website (2010) that Chinese "customs officials still have wide discretion concerning the category in which an import is placed [and have] the flexibility […] to "negotiate" duties." The second reason is the presence of the overseas Chinese business network. As shown in Rauch and Trindade (2002), Chinese networks act as trade catalysts by enforcing contracts and providing market information.

We test whether Chinese networks increase tariff evasion in Chinese trade by combining the analysis of Fisman and Wei (2004), which captures tariff evasion through missing imports, with that of Rauch and Trindade (2002), which shows that overseas Chinese increase trade flows. More precisely, we show that the tariff semi-elasticity of Chinese missing imports, i.e. the log difference of exports reported by exporting countries and imports reported by China, increases significantly in the number of overseas Chinese in the exporting country. This result holds under various specifications, different periods and different indicators of Chinese networks.

As some may argue that missing trade values are too noisy of a measure to capture smuggling, we show that the results also hold when missing imports are measured in quantities. To show that our results are not due to an omitted variable bias, we include variables interacting tariff with various country characteristics that may be correlated with Chinese immigration, such as GDP, distance to China, and trade with China. We find that the interaction with Chinese networks is very robust, losing significance only in two cases out of fourteen, most likely due to collinearity.

We also find that Chinese migrants facilitate tariff evasion in their host countries, and that this effect is highest in corrupt countries, highlighting the bribing role of networks. Moreover, we find that, while tariff evasion is more pronounced in differentiated products which are harder to identify and valuate at borders, Chinese networks appear more useful in evading tariffs when it is hardest, i.e. for non-differentiated goods. This reinforces the corruption channel whereby networks are most useful to bring into play corrupt customs officers.

To check whether tariff evasion occurs through misreporting, i.e. the declaration of imports as similar goods with lower tariffs, we follow Fisman and Wei (2004) and include the average tariff on similar goods as an explaining variable as lower tariffs on similar goods increase the incentive to disguise products. We also add its interaction with the tariff spread within similar product categories as bigger spreads also increase the incentive to misreport. In partner countries, we find

evidence of Chinese networks increasing misreporting, but only when the tariff spread across similar products is of at least 10 percentage points.

We also estimate our baseline model for four Southeast Asian countries and find some evidence, though less robust, of an Indonesian and a Philippine network, suggesting the results may not be specific to overseas Chinese.

In the next section we review the literature. Section 2 presents the theoretical framework. Section 3 describes the data and empirical strategy. Section 4 discusses the results and the last section concludes.

I. LITERATURE REVIEW

The idea that discrepancy in trade statistics could be attributed to smuggling dates back to Bhagwati (1964). In theory, what one country reports as imports should be equal to what its partner reports as exports, (or plus cost of freight and insurance (cif) if values are reported, rather than quantities). In practice, this is rarely the case. Tariff evasion may be one of the reasons. Goods may be undervalued or misreported at import customs or may circumvent customs altogether.

Fisman and Wei (2004) looked at the missing trade between Hong Kong and China. They found that an increase in tariff (plus VAT) of one percentage point resulted in a 3% increase in evasion on average. They also argued that tariff evasion happened through misreporting in similar categories. For example, frozen chicken breasts are passed as turkeys' to avoid high tariffs (Fisman and Miguel 2008). Javorcik and Narciso (2008) confirmed the tariff evasion result, using data on trade between Germany and 10 Eastern European countries. They also argued that a higher level of product differentiation increases tariff evasion as it increases the difficulty in ascertaining prices and classifications, and hence in detecting misreporting or underinvoicing. Mishra, Subramanian and Topalova (2008) confirmed these tariff evasion results for India and found a higher tariff semi-elasticity of missing imports for products where enforcement of customs law, proxied by the mode of entry, was laxer. More recently many studies have confirmed the tariff evasion result for various

African countries (Arndt & Van Dunem 2006, Bouet & Roy 2009, Levin & Widell 2007), North America (Stoyanov 2009), Brazil (Kume et al. 2010), and for a cross section of 74 countries (Jean & Mitaritonna 2010).

Yet very little research has gone further to identify the determinants of tariff evasion beyond high tariffs and corruption. Two notable exceptions are Yang (2008), who studied the effect of customs reforms on tariff evasion in the Philippines, and Anson et al. (2006), who examined whether pre-shipment inspection in Indonesia, the Philippines and Argentina were effective in decreasing tariff evasion. Both pre-shipment inspection schemes and customs reforms had mixed results. Another exception is Fisman, Moustatersky and Wei (2008), who underlined the role of experts' knowledge in facilitating smuggling. They provided evidence that China's indirect trade through Hong Kong's warehouses, which involves agents specialized in processing and distribution, is not only a quality sorting and business matching process (Feenstra and Hanson 2004) but also a tariff evasion process.

Another branch of international trade focuses on the role of migrant networks in facilitating trade. Greif (1993) pioneered this field studying how Maghribi trading networks of the 11th century could promote trade by providing community enforcement of sanctions that deter violations of contracts. Similarly, Rauch and Trindade (2002) showed that ethnic-Chinese trade networks help to match buyers and sellers in the international marketplace by providing market information and enforcing contracts. Dunlevy (2006) found that migrant networks were most important for trade in corrupt environments, where trust is most necessary as a substitute to formal contract enforcement. These mechanisms should hence also be at work for tariff evasion and might have even stronger impacts.

II. THEORETICAL FRAMEWORK

There are at least two reasons why migrant networks should also be at work for illicit trade and might have even stronger impacts than on legal trade. The first is that trade matching in an underground activity is even more complicated. Market information does not flow freely and this makes it difficult to learn about illegal and highly profitable opportunities. Overseas Chinese may

know exactly which businessmen are ready to engage in tariff evasion transactions and which varieties are in supply and demand in both China and their host countries. Besides market information, they may know how to package the goods to disguise them and how to fill export declarations appropriately, and which customs agents are corrupt, both in China and in their host country, and thus smooth the process of evasion. Indeed, an OECD report (2009) on foreign bribery through intermediaries explains how, when family, friends and other third persons act as intermediaries, *"the principal company knows the identity of the foreign public official who receives the bribe"*.

Second, the total absence of a legal contract-enforcement mechanism means mutual trust is crucial for traders wishing to evade tariffs. Chinese networks provide this trust notably through interpersonal relationships known as *guanxi* formed by members with a common background. Lee (2010) states that, in China, a *guanxi* based on loyalty "may be crucial in determining business successes or at least in pursuing business opportunities since the rules of law have long been absent for the protection of private property rights and economic interests".

These two mechanisms, i.e. mutual trust and information, should reduce the costs of tariff evasion. Similarly to Mishra et al. (2008) who assume that the benefits of evasion increase in the tariff rate while the costs increase in the quality of enforcement, we can model the cost of evasion as a decreasing function of the size of the overseas networks. Following the assumptions in Mishra et al. (2008)[2], an increase in the size of the network increases the tariff elasticity of evasion. The empirical analysis aims at testing this prediction.

[2] The required assumption is that the marginal cost of smuggling is increasing in the fraction smuggled. As explained by Mishra et al. (2008), convex smuggling costs have been assumed commonly in the prior literature. One explanation is that authorities devote more effort to detecting larger smugglers (Yang 2008). Also, we need to assume that the bigger the network, the less rapidly the marginal cost of smuggling rises with the amount smuggled.

III. DATA AND EMPIRICAL STRATEGY

We use 2005 trade data from Comtrade to compute, for each HS6 product (about 5000 products) and around 160 trade partners, missing imports as log (1+exports to China declared by exporting countries) – log (1+imports declared by China). We use both values and quantity data[3]. We dropped from our dataset all countries that did not report any exports (and any imports when testing the prediction on the partners' side). A list of remaining countries is in the appendix.

We use tariff data from TRAINS (simple averages of applied tariffs), corruption data from the Worldwide Governance Indicators of the World Bank and population data, to calculate Chinese networks as a share of total population, from CEPII. Data on overseas Ethnic Chinese, i.e. foreign-born migrants from China, Hong Kong, Taiwan and Macau, are from the Global Migrant Origin Database, which extends the UN migrants stock data based on the 2000 round of censuses (i.e., taken between 1995 and 2004; see Parsons et al. (2007) for a detailed description). Summary statistics are in Table 1.

Table 1

We use 2005 tariff and trade data for two main reasons. The first is that it maximises data availability. The second is that, as explained by Ahn et al. (2010), by 2005, any Chinese firm that wished to directly trade with foreign partners was free to do so, as WTO accession in 2001 implied a progressive removal of trading license and firm size requirements. This freedom to trade for all businesses should increase the relevance of overseas networks.

It is important to note that missing trade is a noisy measure that captures much more than smuggling activities. Import values include cost-insurance and freight (cif) costs whereas export values are free on board (fob), so the difference in reports also include some trade costs. It may also be noisy because of exchange rates miscalculations, lax custom statisticians and indirect trade

[3] We replace missing trade values and quantities with zeros when one side was reporting. For quantities we use all reported quantities except when reported units do not match.

confusing reports. Nitsch (2009) discusses in detail the various reasons for discrepancies in bilateral trade statistics. Still, as Fisman (2009) reminds us, while the trade gap cannot be used to quantify smuggling precisely, it is still relevant to identify correlation patterns and uncover the causes of illicit flows.

Asymmetric trade policies such as tariffs allow us to observe smuggling in missing trade. This is illustrated in Figure 1a. Missing trade is white noise when there are no trade barriers. But when imports restrictions are high, i.e. when their tariff is above the 95th percentile (20%), missing imports are almost strictly positive, in other words, missing from the importer's reports (Figure 1b gives the distribution of Chinese tariffs). In the appendix we provide the values of missing imports by partner country and at the two levels of tariffs. In more than 75% of the cases, missing import values are greater when tariffs are high.

Figure 1

Before testing our main prediction, we estimate the effect of tariffs on Chinese as well as four Southeast Asian missing imports using the following model:

$$(1) \qquad \text{missing imports}_{ik} = \alpha_i + \beta\ \text{tariff}_{ik} + \varepsilon_{ik}$$

where α_i is a partner fixed effect and k is a product (HS6-digit tariff line) indicator[4]. Table 2 summarizes the results. We find that a 10 percentage point increase in tariff increases missing imports by about 32%, which is very close to the 30% estimated by Fisman and Wei (2004) for trade with Hong Kong. This effect is more than twice as high as in Southeast Asia, where it lies around 13%.

Table 2

[4] Besides import tariffs, VAT rates can create incentives to underreport imports. China's VAT rates vary from 13% to 17% (besides exemptions). In their paper on tariff evasion in trade between Hong Kong and China, Fisman and Wei (2004) add VAT rates to import tariffs at the HS8-digit level, but they report that their results are unchanged if VAT rates are dropped.

We then estimate the tariff semi-elasticity of Chinese missing imports per partner country, dropping countries with too few observations (less than 70), and plot it against the size of the overseas Chinese community (Figure 2). We find a positive relationship suggesting migrant networks may increase tariff evasion[5].

Figure 2

To examine the role of migrant networks more carefully and test our main prediction we interact the migrant network variable with tariffs and estimate:

$$(2) \qquad \text{missing imports}_{ik} = \alpha_i + \beta_1 \text{tariff}_{ik} + \beta_2 (\text{tariff}_{ik} * \log (1 + \text{Chinese}_i)) + \varepsilon_{ik}$$

Our theoretical framework suggests that the tariff semi-elasticity of missing imports should increase with the (log) number of Chinese in the exporting country, i.e. $\beta_2 > 0$. We also estimate the model using Chinese migrants' share of population instead of the size of the Chinese community. As suggested by Rauch and Trindade (2002), the number of Chinese migrants may indicate the number of potential Chinese connections with the partner country, while the share of the country's population may proxy the probability of picking a Chinese business partner in the foreign country.

IV. RESULTS

Results are presented in Table 3. For both values and quantities we find evidence of a positive and significant coefficient on the interaction of Chinese networks and tariffs, which also holds when including partner-industry (HS4) fixed effects (not shown). This confirms our prediction that Chinese networks increase tariff evasion in Chinese imports. We also adopted a specification with product and partner fixed effects, controlling for all product and partner level characteristics in order to reduce further possible omitted variable bias. The coefficient on the interaction term remains positive and significant, though at the 11% level for values.

[5]Plotting Chinese migrants as a share of the total partner's population on the horizontal axis does not alter the figure. Furthermore, a similar, though less pronounced, figure is found using quantities instead of values.

Table 3

Figure 3 summarizes the results of column (1) in Table 3, showing how the effect of tariff on missing imports increases as the ethnic-Chinese overseas population increases. In trade with the US, where there is more than 1.5 million Chinese-born, an increase in tariff from 10% to 20% would increase the value of missing imports by almost 40%. However, in trade with France, where only about 40,000 Chinese migrants live, the same tariff change would increase evasion by less than 25%.

Figure 3

We also estimate the same regression for four Southeast Asian countries. We find a positive and significant effect of migrant networks on tariff evasion for Indonesia and the Philippines, suggesting the results may not be specific to overseas Chinese (Table 4). But these become insignificant when quantities are used instead of values and when we include partner and product fixed effects (results not shown). This indicates that overseas Chinese may be exceptional and may also contribute to tariff evasion in Southeast Asian countries, where Chinese communities are large and usually involved in business (Rauch and Trindade 2002). We thus run the same regression adding overseas Chinese populations in the Southeast Asian regression. A positive coefficient would suggest that, for example, Indonesia's tariff evasion increases on imports from countries with large Chinese communities. As seen in Table 5, this is not the case. We find no indication that international Chinese networks play a role in tariff evasion in any of the four Southeast Asian countries.

Table 4 and 5

A possible concern about our estimation is that the results are just applicable to a specific time period. To check for this possibility, we use the data on overseas Chinese population from Rauch and Trindade (2002) that refers to a period around 1990. Trade and tariff data are from 1994 (previous years have very little Chinese data)[6]. As reported in Table 6, the main result still holds, as

[6] The correlation between the logs of Chinese in circa 1990 and circa 2000 is 0.61.

the interaction of tariff and Chinese is significant at the 99% level, despite the more limited coverage of the dataset (only 43 countries could be used in the estimation)[7].

Table 6

As overseas Chinese could be capturing other country characteristics or bilateral affinity that could affect tariff evasion in China, we add variables interacting tariff with the logs of GDP, GDP per capita, total bilateral trade, distance, a measure of corruption and a shared border dummy. The results are in table 7. Only the interactions with border and corruption show up positive and significant, and that only for quantities. The interaction of tariff with Chinese network loses significance only in two cases out of fourteen, i.e. when trade is included in the missing values regression. This may be because of too high collinearity, as the correlation between the interaction of tariff with trade and the interaction of tariff with Chinese is higher than 95%. The results hold when using Chinese share rather than populations. Overall, these tests suggest that the effect of Chinese networks on tariff evasion is not channelled through other partner country characteristics related to trade or income.

Table 7

Different modes of tariff evasion

To take our analysis further, we examine whether tariff evasion occurs through misreporting in similar categories or simply through underinvoicing and if Chinese networks have different effects on these practices. As outlined above, Chinese migrants might know how to package the goods to disguise them and how to fill export declarations appropriately to smooth the misreporting process.

We first replicate the misreporting tests of Fisman and Wei (2004) who include the average tariff on similar goods (within the same HS4 category) on the right hand side of our benchmark regression

[7] We also run a specification in first-differences, but failed to find a statistically significant correlation between the difference in missing imports and the difference in applied tariff in 2005 and 1994 (after having ensured that both data were classified according to the HS1992 system).

model (equation 1) to capture incentives to misclassify imports[8]. The idea is that the lower the average tariff on similar products; the higher will be the amount of misreported imports, and hence the higher the missing imports. A negative and significant coefficient on the average tariff on similar products would thus provide evidence of tariff evasion through misreporting. As seen in columns (1) and (4) of table 8 and unlike Fisman and Wei (2004), we first do not find any evidence of misreporting as the coefficient on tariffs on similar goods is positive and significant. This is in line with Javorcik and Narciso (2008) who find insignificant coefficients on misreporting. However, misreporting may depend on the tariff spread between similar goods. The lower is the tariff on similar goods and the higher is the tariff dispersion, the higher the incentives to misreport. To test for this, we interact tariff on similar goods with the spread of tariffs within HS4 categories. For quantities, we find a negative and significant coefficient on this interaction suggesting misreporting may occur but only when the tariff spread is of at least 15 percentage points, which represent few cases[9]. We then investigate whether Chinese networks increase the misreporting results but do not find any such evidence (results not reported).

Table 8

This test cannot capture all types of misreporting. Misreporting may occur in similar goods at the 6-digit level, or in any type of service. For example, a portion of the true value of chicken imports might be declared as marketing services. We leave these questions to further research as our data

[8] In their paper, Fisman and Wei (2004) use a weighted average tariff on similar products, with the export values as weights. Their (implicit) assumption is that exports are reported truthfully. This assumption becomes more problematic in our setting with a cross-section of exporters. We nevertheless ran the misreporting tests also with the weighted average in both values and quantities (results not reported) and find similar results.

[9] Less than 3% of the "partner country-HS4" observations have a tariff spread larger than 15%. Following the same logic, we use the tariff deviation from the average tariff on similar products (within the same HS4 category) as a measure of misreporting incentives. In presence of misclassification, high deviation should lead to high missing imports. However, we fail to find any evidence in that direction (the coefficient turns out to be negative and significant or insignificant).

does not allow computing average tariffs of similar products within 6-digit categories and does not cover trade in services.

Finally, as both Javorcik and Narciso (2008) and Mishra et al. (2008) argue that a higher level of product differentiation increases tariff evasion due to a greater difficulty in ascertaining product price and hence in detecting false reports, we check if this is also the case for Chinese tariff evasion. We use the Rauch (1999) classification and identify products as non-differentiated when either the liberal or the conservative classification indicate that the product is traded on organized markets or listed in trade publications. Results in table 9 indicate that, as found in previous research, for both values and quantities, a higher degree of product differentiation increases the tariff semi-elasticity of missing imports, hence tariff evasion. However, product differentiation decreases the role of Chinese networks as the coefficient on the interaction of Chinese networks, tariff and the non-differentiated dummy is positive and significant. This result is robust to the inclusion of product and partner fixed effects. This suggests Chinese networks are all the more necessary when evasion is hardest, i.e. for homogenous commodities, and that corruption at borders is surely at play.

Table 9

Tariff evasion in partner countries

We now look at tariff evasion in partner countries, verifying whether the results hold when looking at missing imports from China. Anecdotal evidence suggests this might indeed by the case. In a 2007 press release, the European Anti-Fraud Office (2007) revealed a large-scale fraud scheme in imports of textiles and shoes from China involving overseas Chinese:

> *The cover was blown off a band of Chinese, Hungarian and Austrian citizens who have smuggled large quantities of textiles and shoes from China into the EU by means of heavily undervalued and false invoices. The investigation revealed that mainly small customs clearance agents were used to do the customs clearance on behalf of Asian citizens. The overall quantity of textiles and footwear affected by this type of fraud until now can be estimated at around 600,000 tons.*

Here, the missing import variable is the log difference between exports reported by China and imports reported by partner countries. The tariffs are those imposed on Chinese imports in partner

countries. We also add corruption to the specification as it captures the borders' bribe-friendliness. Following our theoretical framework, corruption should reduce the cost of evasion as tariff dodgers are less likely to face legal penalties in corrupt countries when offering a bribe. Results are in table 10.

Table 10

We find evidence, for both values and quantities, that Chinese communities increase tariff evasion on goods from China[10]. While their expertise is found to be most useful in the most corrupt countries, it remains so in countries with moderate levels of corruption. This is illustrated in Figure 4, which shows how the effect of tariff on missing imports is highest when corruption is high and when Chinese communities are biggest. The statistical significance of the coefficients can be verified in the lower panel. This result confirms the theoretical prediction on the roles of network communities and corruption in lowering the probability of being caught. It also confirms that corruption is an instrument of choice for tariff evasion by Chinese networks.

Figure 4

We also carry out the misreporting tests. The interaction of average tariff on similar goods with the tariff spread is again negative and significant (columns 2 and 5 of table 11). We find strong evidence of misreporting in quantities. The marginal effect of the average tariff on similar goods is negative for all tariff spreads. We also find that misreporting might be at its highest not only when the tariff spread is high but also when corruption and Chinese networks are big (last row of table 11), suggesting the latter play a role in tariff evasion through misreporting.

Table 11

[10] However, this results is not as robust as in the China case as it does not hold when using product and partner fixed effects and Chinese share, i.e. columns 4 and 8)

V. CONCLUSIONS

This paper argues that a crucial ingredient for smuggling to occur is the presence of international networks. As tariff evasion occurs outside the law, market information is scant and formal institutions inexistent, rendering networks the more important. Combining the analysis of Fisman and Wei (2004) with that of Rauch and Trindade (2002), we find strong evidence that international Chinese networks, proxied by ethnic-Chinese migrant populations, play a role in tariff evasion in Chinese trade. More precisely, we show that the tariff semi-elasticity of Chinese missing imports increases significantly in the number of overseas Chinese in the trade partner. Our baseline estimates suggest that a 10% increase in 2005 import tariffs by China would have increased tariff evasion by 25% in trade from countries like France with around 40,000 Chinese-born migrants, while it would have led to a 40% increase in trade from countries with much larger Chinese communities like the US (about 1.5 million Chinese migrants). We suggest the effects take place through matching of illicit-minded traders, identification of corrupt customs agents and enforcement of informal contracts. The role of corruption is confirmed in China's trade partners where a combination of high corruption and large Chinese communities maximizes tariff evasion.

While this paper provides evidence of a role of networks in tariff evasion through underinvoicing and sometimes, misreporting in similar goods, tariff evasion can take many other forms, such as transhipment via third countries and misreporting of goods as services, where networks might play even stronger roles. Identifying these practices makes for promising future research.

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Table 1. Summary statistics

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
Chinese missing imports						
export_value	90822	4063.568	10.425	61449.26	0	8220975
import_value	90822	5394.819	44.6685	81955.29	0	9691029
missing_import_value	90822	-0.96651	-0.56361	2.392711	-15.485	11.21912
export_quantity	90404	7302144	166.5	5.10E+08	0	1.17E+11
import_quantity	90404	9578847	2075	4.96E+08	0	1.11E+11
missing_ import_ qty	90404	-2.30187	-1.33947	4.415649	-23.3962	17.03606
China tariff	90822	9.316977	8.5	6.077339	0	65
Partners' missing imports						
export_value	254614	2575.408	22.3255	52404.12	0	8777217
import_value	254619	3485.119	48.661	64221.57	0	1.13E+07
missing_import_value	254614	-0.71904	-0.50501	2.133677	-12.4739	11.87726
export_quantity	248870	5638173	3795	1.55E+09	0	7.71E+11
import_quantity	250342	3344950	7684	6.13E+08	0	3.00E+11
missing_ import_ qty	248812	-1.36066	-0.59695	4.725222	-26.4271	22.99488
Partner tariff	254619	8.731757	5	10.53337	0	991.49
Chinese immigrants and corruption						
Chinese	144	48130.26	1152	2.38E+05	0	2.27E+06
Chinese share	141	0.004214	0.000169	0.029146	0	0.340163
corruption	141	-0.13928	0.177225	0.9881	-2.52976	1.385773

Summary statistics are computed on the datasets that are used for the main estimations. Statistics for Chinese, Chinese share and corruption are calculated using the dataset with variables for tariff evasion in China.

Table 2. Effect of tariffs on missing import values

	China	Indonesia	Malaysia	Philippines	Thailand
Tariff	.0321***	.0137***	.0142***	.0113***	.0129***
	(.00231)	(.00177)	(.00160)	(.00347)	(.00093)
Obs	90822	46448	59754	40041	76597
R2	0.047	0.088	0.191	0.113	0.124

Partner fixed effects (least square dummy varibles - LSDV) regressions. Standard errors clustered at the product level . *** denote statistical significance at the 1% level.

Table 3. The role of Chinese networks in tariff evasion in China

	Missing imports values				Missing import quantities			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tariff	.00740		.0454***		.000665		.0587***	
	(.0066)		(.0053)		(.0159)		(.0100)	
Tariff × Chinese	.00239***	.000951†			.00346***	.00227**		
	(.0006)	(.0006)			(.0013)	(.0011)		
Tariff × Chinese share			.00183***	.000879			.00293**	.00237*
			(.0007)	(.0007)			(.0014)	(.0012)
Obs	90822	90822	87022	86896	90404	90285	86613	86486
R2	0.048	0.000	0.049	0.000	0.069	0.0001	0.072	0.0001
Fixed effects	partner	partner, product	Partner	partner, product	partner	partner, product	Partner	partner, product

Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% level. † indicates a p-value of 0.106. All partner FE regressions are estimated through least square dummy variable (LSDV). Regressions with partner and product fixed-effects are estimated taking "within" product deviations and adding partner dummies.

Table 4. Effect of migrant networks on tariff evasion

	China	Indonesia	Malaysia	Philippines	Thailand
Tariff	.00740	-.0124**	.0147***	-.00235	.0242***
	(.0066)	(.00497)	(.00417)	(.00896)	(.00248)
Tariff × migrants	.00239***	.00345***	-6.41e-05	.00136*	-.00137***
	(.0006)	(.000649)	(.000417)	(.000823)	(.000256)
Obs	90822	46328	59746	40037	76589
R2	0.048	0.087	0.191	0.113	0.125

Partner fixed effects (LSDV) regressions. Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% level

Table 5. Effect of migrant and Chinese network on tariff evasion

	China	Indonesia	Malaysia	Philippines	Thailand
Tariff	.00740	.0132	.0146***	.00492	.0234***
	(.0066)	(.0118)	(.00565)	(.0108)	(.00332)
Tariff × Chinese	.00239***	-.00244**	2.08e-05	-.00127	.000151
	(.0006)	(.00105)	(.000580)	(.00109)	(.000309)
Tariff × migrants		.00379***	-7.63e-05	.00204**	-.00145***
		(.00112)	(.000517)	(.001000)	(.000281)
Obs	90822	46206	59741	40036	76588
R2	0.048	0.086	0.191	0.113	0.125

Partner fixed effects (LSDV) regressions. Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% level

Table 6. Effect of Chinese networks on tariff evasion – 1994 vs. 2005

	Missing imports values		Missing imports quantities	
	2005	1994	2005	1994
Tariff	.00740	0.00315	.000665	-0.0390***
	(.0066)	(0.0025)	(.0159)	(0.0104)
Tariff × Chinese in 2000	.00239***		.00346***	
	(.0006)		(.0013)	
Tariff × Chinese in 1990		0.000577***		0.00318***
		(0.0002)		(0.0007)
Obs	90822	48160	90404	47132
R2	0.048	0.044	0.069	0.088

Partner fixed effects (LSDV) regressions. Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% level

Table 7. The role of GDP, GDPPC, distance, contiguity, corruption and trade in tariff evasion in China

	Missing imports values							Missing import quantities						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Tariff	.0314	.0200	.0104	.00786	.00701	.00492	.0143	.149***	.0494*	.0164	.00277	-.000806	.0318	.0905
	(.0284)	(.0140)	(.00887)	(.00668)	(.00658)	(.0096)	(.0381)	(.0512)	(.0262)	(.0186)	(.0159)	(.0158)	(.0229)	(.0660)
Tariff	.00245***	.00226***	.00233***	.00230***	.00256***	.00107	.000175	.00490***	.00315**	.00317**	.00309**	.00407***	.00532***	.00444**
× Chinese	(.00079)	(.00065)	(.00062)	(.00062)	(.00060)	(.00104)	(.00112)	(.0016)	(.0014)	(.00132)	(.00132)	(.00130)	(.0019)	(.00209)
Tariff	-.000897						-.00418**	-.0060***						-.00637**
× GDP	(.0012)						(.00181)	(.00204)						(.00324)
Tariff		-.00111					4.15e-05		-.00453*					.00104
× GDPPC		(.0014)					(.00273)		(.00233)					(.00475)
Tariff			-.000301				.00693**			-.00161				.00559
× distance			(.00056)				(.00274)			(.00105)				(.00515)
Tariff				.00441			.0572**				.0200**			.0558
× border				(.00504)			(.0232)				(.00938)			(.0441)
Tariff					.00146		.00140					.00484*		.00371
× corruption					(.00166)		(.00313)					(.00287)		(.00550)
Tariff						.00175	.00723***						-.00503*	.00179
× trade						(.0015)	(.00240)						(.00296)	(.00463)
Obs.	86977	86977	90822	90822	90802	86970	86937	86568	86568	90404	90404	90384	86562	86529
R2	0.049	0.049	0.048	0.048	0.048	0.049	0.049	0.072	0.071	0.069	0.069	0.069	0.072	0.071

Partner fixed effects (LSDV) regressions. All country-level variables except border and corruption are in natural logarithm. Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% levels.

Table 8. Misreporting tests for tariff evasion in China

	Missing import values		Missing import quantities	
	(1)	(2)	(3)	(4)
Tariff	.0165***	.0143***	.00769	-.0105
	(.0043)	(.0044)	(.0096)	(.0101)
Avg. tariff on similar goods	.0218***	.0248***	.0376***	.0670***
	(.0044)	(.0056)	(.0102)	(.0132)
HS4 tariff spread		.0139**		.112***
		(.0065)		(.0159)
Avg. tariff on similar goods ×		-.000588		-.00533***
HS4 tariff spread		(.00044)		(.0011)
Obs.	75554	75554	75266	75266
R2	0.052	0.052	0.071	0.075

Partner fixed effects (LSDV) regressions. Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% level

Table 9. Product differentiation and tariff evasion in China

	Missing import values			Missing import quantities		
	(1)	(2)	(3)	(4)	(5)	(6)
Tariff	.0325***	.0491***		.0436***	.108***	
	(.00281)	(.0142)		(.00608)	(.0224)	
Non-differentiated	.00242***	.00982***		.0112***	.0301***	
	(.000271)	(.00135)		(.000547)	(.00281)	
Tariff × non-differentiated	-3.37e-05*	-.000468***		-.000221***	-.00117***	
	(1.84e-05)	(.000123)		(3.36e-05)	(.000209)	
Tariff × log Chinese		-.00114	-.000147		-.00531***	-.000777
		(.00118)	(.000645)		(.00186)	(.00116)
Tariff × log Chinese × non-differentiated		3.53e-05***	3.50e-06***		7.86e-05***	4.20e-06*
		(9.54e-06)	(1.31e-06)		(1.61e-05)	(2.29e-06)
Log Chinese × non-differentiated		-.000616***	-2.16e-05		-.00158***	.000131***
		(.000105)	(2.11e-05)		(.000212)	(3.64e-05)
Obs.	88138	88138	88017	87728	87728	87606
R2	0.051	0.052	.000	.086	.087	.001
Fixed effects	Partner	Partner	Partner and product	Partner	Partner	Partner and product

Partner FE regressions are estimated through least square dummy variable (LSDV). Regressions with partner and product fixed-effects are estimated taking "within" product deviations and adding partner dummies. Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% level. "Non-differentiated" equals 1 if both the liberal and conservative classifications of Rauch (1999) indicate that the product is either traded on organized markets or listed in trade publications and 0 otherwise.

Table 10. The role of Chinese networks in tariff evasion in trading partners

	missing import values				Missing import quantities			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Tariff	-.000779		.0201***		-.0263***		.0272***	
	(.00209)		(.00304)		(.00570)		(.00628)	
Tariff × Chinese	.00155***	.00141***			.00278***	.000706***		
	(.000237)	(9.70e-05)			(.000568)	(.000156)		
Tariff × Chinese share			.000974***	-.00121***			.00377***	-.00059***
			(.000326)	(.000101)			(.000718)	(.000160)
Tariff × corruption	-.00547*	-.000760	.00701***	.00110	-.0141**	-.00827*	-.00608	-.00824**
	(.00290)	(.00254)	(.00260)	(.00251)	(.00637)	(.00455)	(.00570)	(.00344)
Tariff × corruption × Chinese	.000897***	.000519**			.00128**	.000430		
	(.000267)	(.000251)			(.000627)	(.000453)		
Tariff × corruption × Chinese share			.000587**	3.77e-05			-.000876	-.000332
			(.000299)	(.000342)			(.000728)	(.000477)
Obs.	252286	252185	248790	248687	246661	246559	243294	243190
R2	0.076	0.083	0.076	0.083	0.123	0.161	0.120	0.157
Fixed effects	partner	partner, product	partner	partner, product	partner	partner, product	partner	partner, product

Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% level. All partner FE regressions are estimated through LSDV. Regressions with partner and product fixed-effects are estimated taking "within" product deviations and adding partner dummies.

Table 11. Misreporting tests à la Fisman and Wei (2004) – partners

	Missing imports values			Missing imports quantities		
	(1)	(2)	(3)	(4)	(5)	(6)
Tariff	.00718***	.00588***	.00161	.00561	-.00119	-.0121
	(.00216)	(.00217)	(.00440)	(.00366)	(.00393)	(.00996)
Tariff Chinese			.00101**			.00186*
			(.000490)			(.00105)
Tariff × corruption			-.00861			-.0316**
			(.00564)			(.0123)
Tariff × Chinese × corruption			.00129**			.00318***
			(.000558)			(.00119)
Avg tariff on similar goods	.00579***	.00746***	-.00348	-.0151***	-.0128***	-.0391***
	(.00221)	(.00241)	(.00465)	(.00461)	(.00496)	(.0112)
HS4 tariff spread		.00157	-.000415		.0223***	.0404***
		(.00145)	(.00352)		(.00320)	(.00805)
Avg tariff on similar goods × Chinese			.000918*			.00284**
			(.000524)			(.00115)
Avg tariff on similar goods corruption			.000443			.0139
			(.00580)			(.0132)
Avg tariff on similar goods × HS4 tariff spread		-2.20e-05**	7.66e-05		-8.13e-05***	-7.07e-05
		(8.74e-06)	(4.81e-05)		(2.20e-05)	(9.63e-05)
HS4 tariff spread × Chinese			.000198			-.00175**
			(.000367)			(.000776)
HS4 tariff spread × corruption			.0118***			.0372***
			(.00379)			(.00840)
Avg tariff on similar goods × Chinese x corruption			-.000497			-.00148
			(.000592)			(.00128)
Avg tariff on similar goods × Chinese x HS4 spread			-1.31e-05***			-9.48e-06
			(4.74e-06)			(8.71e-06)
Avg tariff on similar goods × corruption x HS4 spread			-2.77e-05**			-.000104***
			(1.29e-05)			(2.84e-05)
Avg tariff on similar goods × corruption x HS4 spread*Chinese			-.00101***			-.00271***
			(.000371)			(.000778)
Obs.	225313	225313	223246	220273	220273	218371
R2	.077	.077	.077	.120	.121	.122

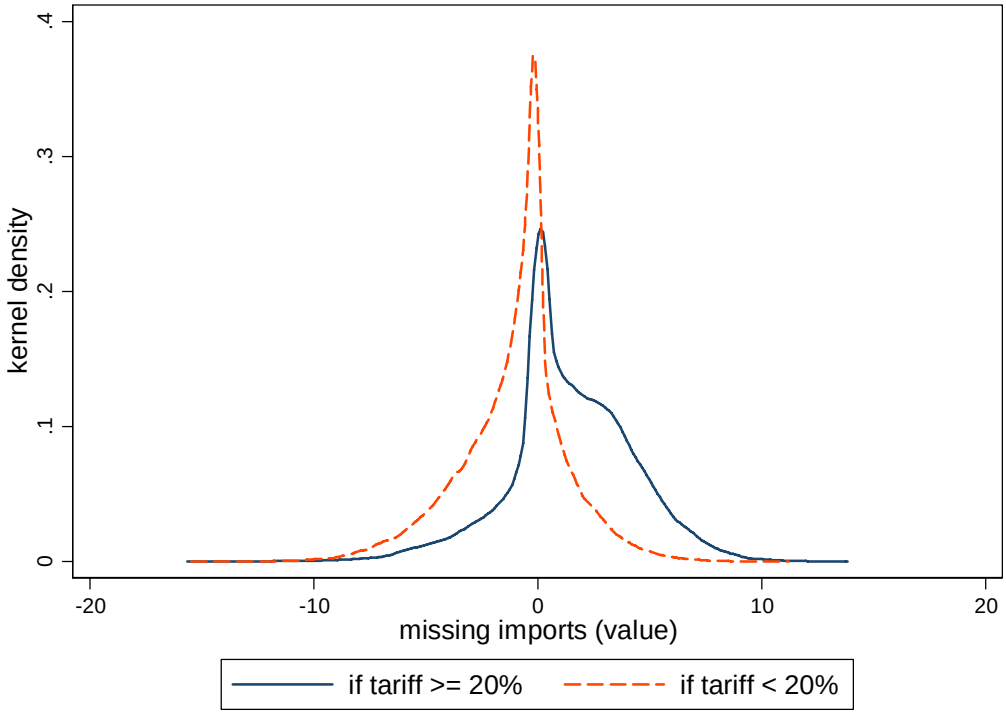
Partner fixed effects (LSDV) regressions. Standard errors clustered at the product level. ***, **, * denote statistical significance at the 1%, 5% and 10% level

Appendix. China's missing imports ($ '000)

Partner	tariff >= 20%	tariff < 20%
Albania		-4110.734
Algeria	76.574	-96195.24
Andorra		-9.046
Argentina	-2605.849	-655306.8
Armenia		-334.638
Australia	-392227.6	-5748226
Austria	29582.04	-238727.6
Azerbaijan	-480.763	74469.24
Bahrain		-39718.72
Bangladesh	-103.872	-10210.86
Barbados		-181.111
Belarus	-186.02	-67108.98
Belgium	-20287.91	-864737.3
Belize		-205.036
Benin	-22485.9	-13015.15
Bhutan		-1.631
Bolivia	-5.682	-13497.84
Bosnia & Herz.	-10.947	-103250.2
Botswana	-0.212	-3712.411
Brazil	20725.7	-3184573
Bulgaria	-245.177	-15374.35
Burkina Faso	-163265.7	-0.741
Burundi		-327.082
Cameroon	8027.554	-10235.72
Canada	-164168	-1543406
Chile	-4653.809	-221658.5
Colombia	629.784	30889.94
Cook Islands		-3699.311
Costa Rica	-49.341	-12957.66
Cote d'Ivoire	3226.014	-8379.759
Croatia	-5.734	-39183.51
Cuba	-34783.92	-90459.88
Cyprus	-0.253	2988.119
Czech Republic	-266.2538	-89216.77
Denmark	-4691.322	-247133
Dominican Rep.	-8.448	-570.5634
East Timor		-0.716
Ecuador	-37.026	-36100.38
El Salvador	-8582.115	-218.961
Estonia	-426.589	-24704.75
Ethiopia	-0.106	-5486.268
Fiji	64.204	-689.105
Finland	-15450.04	-815976.9
France	-36787	-1687879
French Polynesia	889.338	1512.07
Gabon	355.83	-150947.8
Gambia, The		-170.378
Georgia	-6.18	2930.553
Germany	-243015.8	-5165026
Ghana	-901.375	-58820.33
Greece	-4471.771	6908.388
Greenland		-28437.32
Guatemala	-32466.36	-26292.36
Guinea	-1017.198	-1962.435
Guyana		-4002.209
Honduras	-1392.711	-2389.86
Hong Kong,	-284300.5	-5094703
Hungary	1492.123	15462.4
Iceland	-190.722	-23780.42
India	28043.02	-2748456
Indonesia	-131905.3	-2522551
Iran	-8621.238	-5930898
Ireland	377.934	-361715.6
Israel	-2536.81	-448151.8
Italy	121586.2	-1183111
Jamaica	-1.035	-114753.3
Japan	-511396.9	-1.87E+07
Jordan	-6.947	-64324.05
Kazakhstan	414.4912	-757668.7
Kenya	-2876.656	-1851.337
Kiribati		-21.483
Korea, Rep.	470351.7	-6985325
Kyrgyz Republic	-1812.516	-59447.42
Latvia	14.07799	2438.899
Lebanon	-1.644	20241.84
Lithuania	633.614	-1939.478
Luxembourg	-3.874	-12196.54
Macao	-114.563	-232620.9
Macedonia, FYR		-2814.449
Madagascar	-100.87	13645.48
Malawi	-1547.534	-519.719
Malaysia	168006.9	-3218346
Maldives	-0.204	-17.472
Mali	-16708.06	-401.813
Malta	-6.49	15427.83
Mauritania		-4057.233
Mauritius	-41.942	-7856.824
Mexico	14355.18	-882656.3
Moldova		-129.825
Mongolia	-88.99901	-79631.95
Morocco	-3581.217	-90120.44
Mozambique	907.2878	-54323.05
Namibia		-32944.64
Netherlands	8853.254	-95332.53
Neth. Antilles		-744.299
New Caledonia		-16420.32
New Zealand	1068.089	-259993.5
Nicaragua	-6850.385	-56.987
Niger		-0.65
Norway	-86961.77	-284749.2
Oman	98.84601	966823.2
Pakistan	-4664.338	-399268.1
Panama	-1.361	-12223.99
Paraguay	13208.59	-5084.257
Peru	-619.82	-452541.2
Philippines	-145906.4	-1255521
Poland	-162.645	-51688.07
Portugal	325.176	-196814
Qatar	-0.294	-116721.7
Russia	-68157.85	-4721156

Rwanda		-9388.952
Samoa		-40.724
Saudi Arabia	-45.627	-1535852
Senegal	-2270.448	-964.4841
Seychelles		-9.776
Singapore	32422.27	1646119
Slovak Republic	-25346.35	-45539.16
Slovenia	-232.719	-23492.59
South Africa	-7608.69	-1677722
Spain	-20905.93	-356613.6
Sri Lanka	-2880.938	-8688.327
St. Lucia		-61.141
Sudan	-2045.467	-2573009
Sweden	-126222.8	-634299.1
Switzerland	-14387.9	-534356.6
Syria	-2143.136	-239.541
Taiwan	-220792	-1.86E+07
Tanzania	-25091.74	-124946.6
Thailand	-112410.9	-3544930
Togo	-20319.44	-4353.386
Trinidad & Tobago	-0.016	-16382.13
Tunisia	-18043.63	-10316.74
Turkey	164.9601	-219118.3
Uganda	-12388.62	-3355.782
Ukraine	-11217.65	-170150.2
UAE	130.992	-1754829
United Kingdom	-76137.48	-577421.4
United States	-619410.6	-8285654
Uruguay	-217.0482	-53232.03
Venezuela	-5.021	-837606.4
Vietnam	412276.4	-65957.01
Yemen	-38.59399	-665175
Zambia	-30950.12	-171495.8
Zimbabwe	423.929	69641.24

Figure 1a. Missing imports



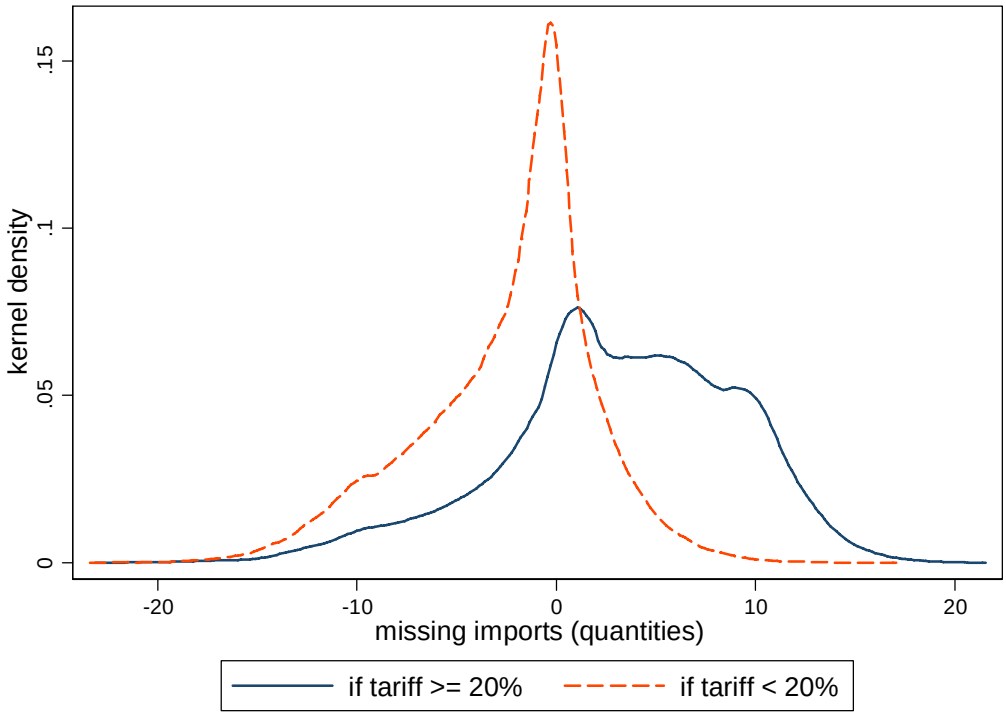


Figure 1b. Chinese MFN tariffs

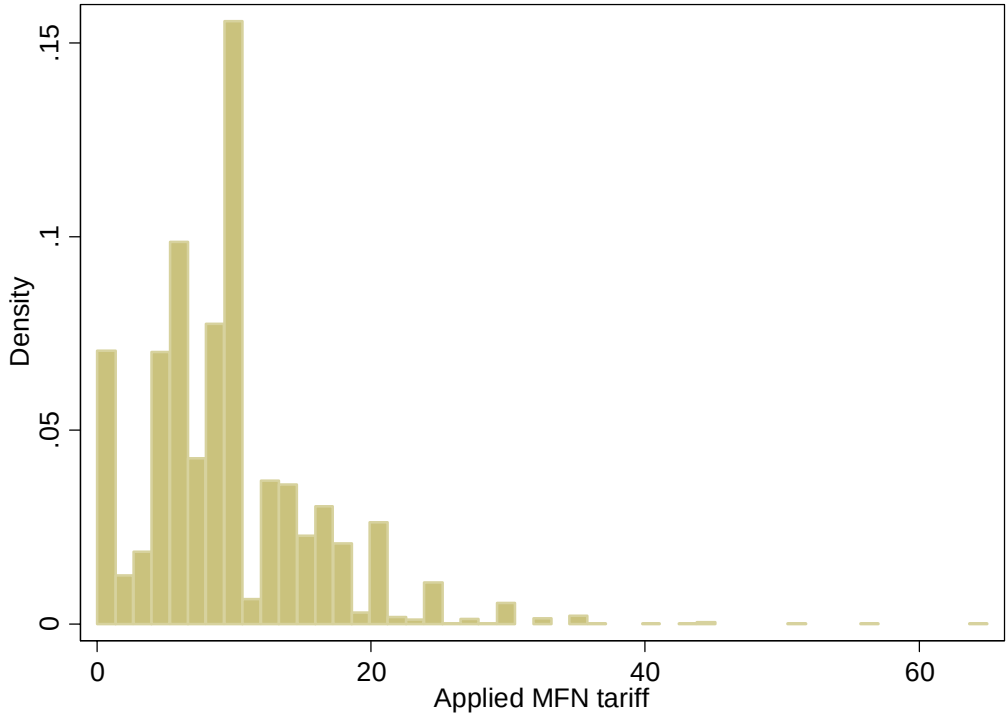


Figure 2. Tariff semi-elasticity of missing import values and ethnic-Chinese migrants

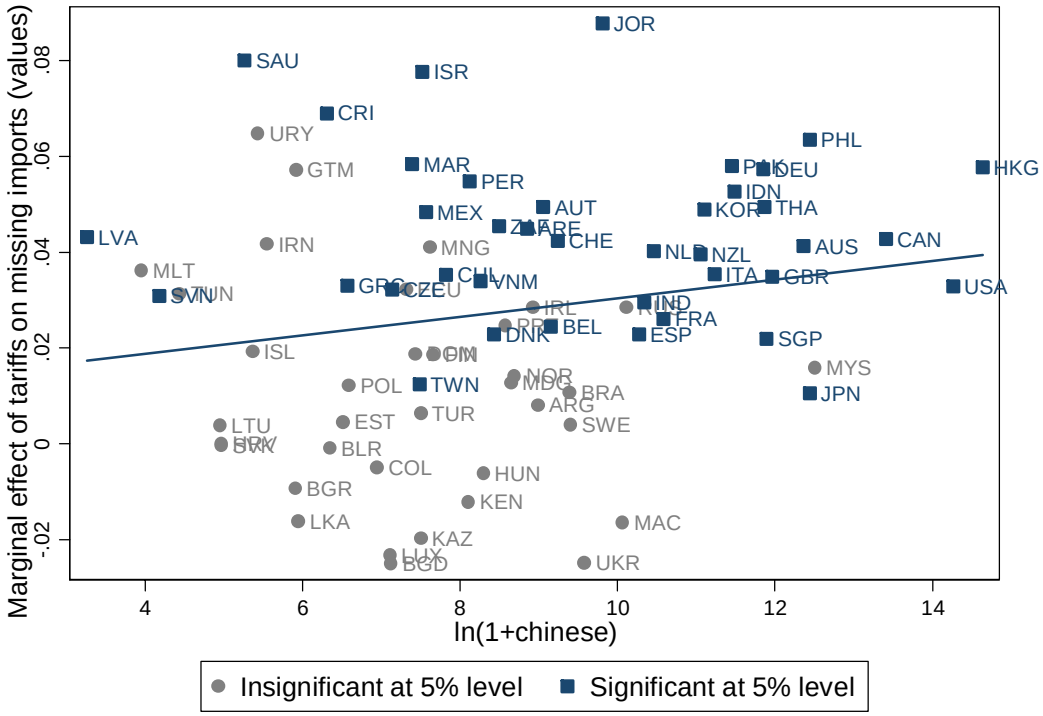
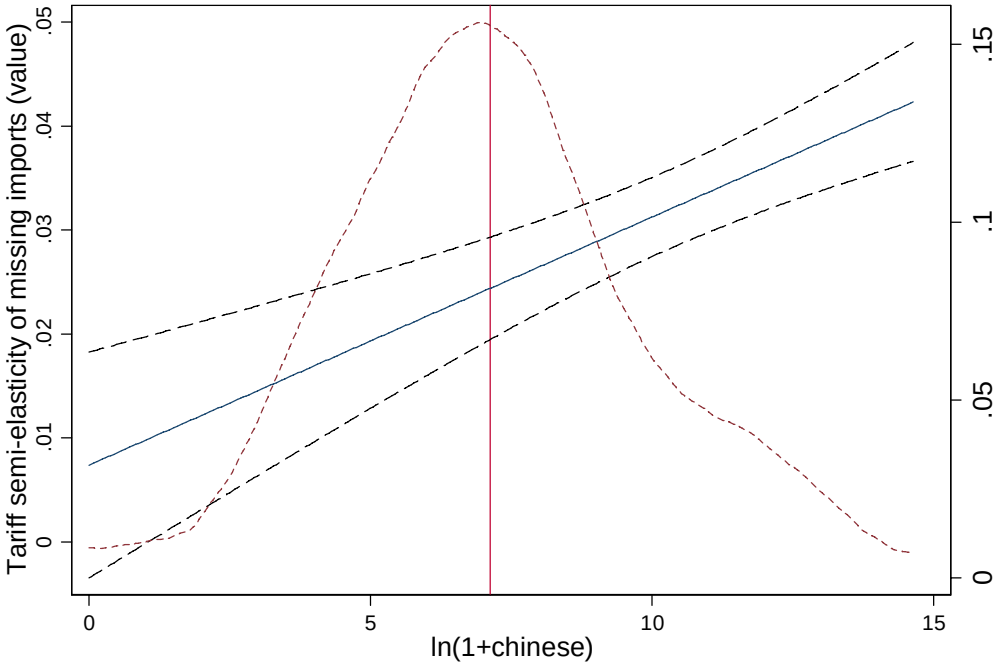
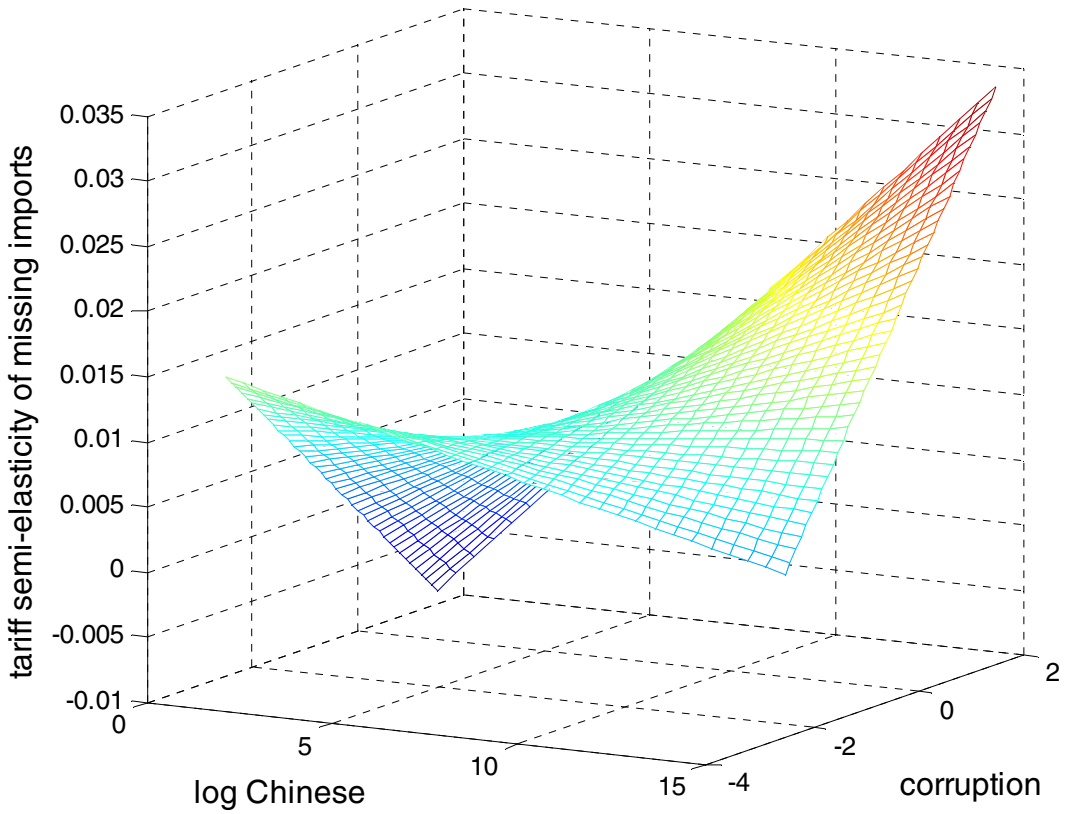


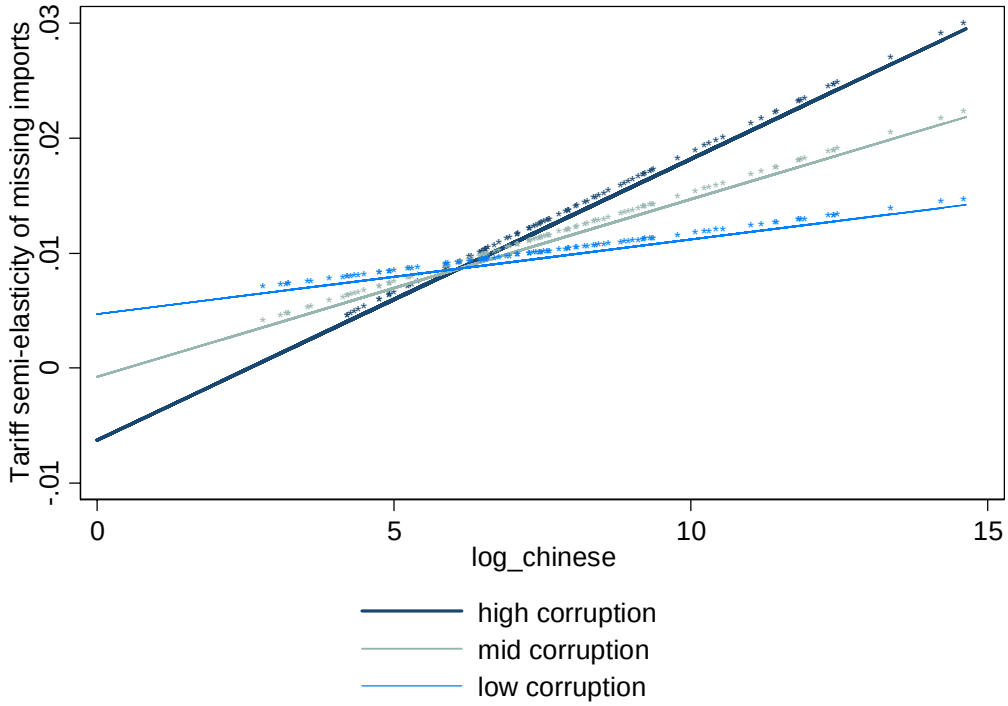
Figure 3. Tariff evasion and ethnic-Chinese networks



Thick dashed lines give 90% confidence interval using product clustered s.e.
Thin dashed line is a kernel density estimate of ln(1+chinese).

Figure 4. The impact of corruption and Chinese networks on tariff evasion





stars indicate statistical significance at the 95% level