Race-to-the-bottom tariff cutting*

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Abstract

Unilateral tariff liberalization accounts for the lion's share of trade liberalization since the 1980s and has accompanied the most successful trade-led development model of the past 50 years, "Factory Asia". Understanding what drove this liberalization is therefore crucial to our grasp of the process of economic development. This paper provides an explanation for Asia's emerging economies' tariff cutting from 1988 to 2006, arguing it has been driven by a competition for FDI. Using spatial-econometric methods used to identify tax competition combined with an instrumental-variable strategy , I show that tariffs on parts and components and capital goods, crucial locational determinants for assembly firms, followed a strategic-interaction pattern whereby tariffs are caused by corresponding tariffs in competing countries. I show this interaction is strongest in years and sectors where competitors received more FDI and is inexistent for consumer goods. This supports the FDI envy behind the tariff race to the bottom.

JEL CODES: F13, F15
Key Words: Trade policy, Factory Asia, tariff.

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1 Introduction

One aspect of trade liberalization that has received too little attention in the economic literature is that of unilateralism. This is puzzling as it accounts for the lion's share of trade liberalization since the 1980s. The World Bank (2005) estimates that it accounts for as much as two thirds of the 21 percentage-point cuts in tariffs in developing countries between 1983 and 2003, an episode Krugman and Obstfeld (2006, p. 250) refer to as the big trade policy story of the past two decades. Moreover, the two decades of unilateral tariff-cutting accompanied the most successful trade-led development model of the past 50 years, i.e. "Factory Asia". Indeed, Baldwin (2006) writes that most of the rapid expansion of trade and the fragmentation of the supply chain across countries in East Asia[1] from the end of the 1980s onwards have been fostered by unilateral, rather than multilateral or preferential, trade liberalization. In a recent study of vertical specialization trade, Bridgman (2012) argues specifically that falling tariffs on manufactured parts lead to offshoring while falling freight costs alone do not. Understanding what drove this liberalization (Figure 1) is therefore crucial to our understanding of the process of economic development.

While some political-economy theories have been developed to explain unilateral trade liberalization, e.g. soft unilateralism (Coates and Ludema 2001, Richardson 2001), ideological leadership (Edwards and Lederman 1998), and preferential tariff complementarity (Estevadeordal et al. 2008, Calvo-Pardo et al. 2009), economists usually answer the question the other way around, i.e. "why do countries impose tariffs in the first place?". There is much evidence (e.g. Goldberg and Maggi 1999) that points to the role of special interests lobbying for protection (Grossman and Helpman 1994). Lobbying can also be pro-liberalization, for example when foreign companies lobby for market access (Gawande and Krishna 2006) or when importers lobby for tariff suspensions (Ludema et al. 2010). With a focus on Factory Asia, Ando and Kimura (2005) and Baldwin (2010) argue tariff cuts can also be driven by an international competition for foreign direct investment (FDI) as low tariffs are a decisive locational determinant for foreign firms that rely on imports of components for local

[1] First in electronics and then in sport footwear, televisions and radio receivers, office equipment, electrical machinery, power and machine tools, cameras and watches, and printing and publishing (Sally 2008).

processing.[2]

This paper tests empirically for the presence of such competition-driven liberalization, which I will refer to as race-to-the-bottom tariff cutting, focusing on seven Asian emerging economies following the conjecture of Ando and Kimura (2005) and Baldwin (2010). In this competition-driven liberalization, the desire for FDI leads governments to cut tariffs, mostly on the inputs of assembly firms, to obtain marginal locational advantages over similar countries, in the same way corporate-tax competition can lead to races to the bottom (e.g. Zodrow and Miezkowski 1986 and Wilson 1986).

But tariff liberalization is a situation where a government finds it politically optimal to remove a tariff that it previously found optimal to impose (Baldwin and Baldwin 1996). So a shock must have trigged this race to the bottom. Baldwin (2010) argues it was the revolution in information and communication technologies that made it possible to organize complex tasks across countries and hence led to production fragmentation. Other factors specific to Japan explain the rise of Japanese offshoring (Figure 2), which was the main source of competition between emerging Asian economies (Lamy et al. 2006). Hyun and Whitmore (1989) argue that the appreciation of the yen, the rise in wages, as well as the end of tariff preferences in the US and EU explain why Japanese firms were becoming less competitive and in need of offshoring. Japanese FDI grew by 21.6% per year from 1980 to 1987 and by 1989 Japan was the biggest foreign investor in the world (Tejima 1992).

To test empirically for the presence of competition-driven tariff cutting, I follow a recent empirical literature that aims at identifying races to the bottom (e.g. Devereux et al. 2008, Davies and Voget 2011). I use tools from spatial econometrics to show that tariffs on parts and components, intermediates, and capital goods, i.e. the locational determinants of assembly firms, are explained by a weighted average of tariffs in competing countries, which is a necessary condition for a race to the bottom and is consistent with tariffs being strategic complements. I use the normalized inverses of the absolute differences in GDP per capita between countries as weights. The idea is that countries that are at a similar level of

[2]Inui et al. (2008), using a firm-level dataset, show that the level of tariffs does play an important role in the location choices of foreign affiliates by Japanese firms. According to Ramstetter (2011), of the 25 mainly Japanese multinationals operating in Thai machinery in 1994, 15 identified import regulation as an important problem, but only six identified infrastructure bottlenecks.

development compete more intensely against each other.[3] As a counterfactual I show that this correlation is inexistent in consumer goods, which is consistent with a race to the bottom driving tariff cuts only on imported inputs. I then show that the spatial correlation is robust to various specifications including a lagged-dependent model and an instrumental-variable model where the spatial lag is instrumented using predetermined ASEAN preferential tariffs agreed during negotiations in 1992.

As Devereux et al. (2008) explain, an observed strategic interaction can be due to competition or simply to common intellectual trends. To show that tariff cutting is the not due to common intellectual trends, I show that a simple average of tariffs in competing countries does not lead to a significant spatial correlation. Moreover, since the pattern does not hold for consumer goods, it is unlikely to be due strictly to free-trade intellectual trends. Finally, I show that the spatial correlation is highest in years and sectors where Japanese FDI created more jobs in competing countries than at home. In other words, I show that FDI jealousy increased the tariff contagion.

The next section reviews the literature on race-to-the-bottom models and unilateral liberalization, exploring what could be behind emerging Asia's tariff cutting. In a third section I describe the data and present some descriptive evidence on race-to-the-bottom tariff cutting. A fourth section presents my empirical strategy. A fifth provides empirical evidence that tariffs were indeed strategic complements. A last section concludes.

2 Literature review

2.1 Unilateral liberalization

While some theories have emerged to explain unilateral trade liberalization, its causes are yet to be fully understood. According to Edwards and Lederman (1998), unilateral liberalization can be the result of ideological leadership. They provide narrative evidence from Chile, where tariffs were cut during the regime of Pinochet, a dictator driven by the ideas of the Chicago School. Another branch of theory views unilateral tariff cuts as a strategy for a large and

[3] I also use the normalized inverse of the absolute differences in distance to Japan as a robustness check.

influential country to obtain reciprocal liberalization or a trade agreement (Richardson 2001, Coates and Ludema 2001, Krishna and Mitra 2005). A third theory explaining unilateral cuts is that of preferential tariff complementarity (Estevadeordal et al. 2008, Calvo-Pardo et al. 2009). Here, the logic is that preferential trade agreements lead to cuts in external tariffs to avoid costly trade diversion or because a shrinking import-competing sector realigns interests away from protection.

None of these theories seem ideal to explain what happened in Asian emerging economies from the end of the 1980s until the mid-2000s. Considering the size of East Asia's emerging economies, their tariff cuts are very unlikely to have been part of a soft leadership strategy. And their timing does not follow liberalization in the big economies, i.e. the US, EU, and Japan. Ideological leadership does not fit with progressive tariff cutting in multiple countries. And while a causal link from regionalism to unilateralism may exist in countries part of the ASEAN trade agreement, it cannot be applied to the entire region during the period studied.

Another hypothesis explaining unilateral tariff cuts is that the liberalization was imposed by the IMF as a condition for its loans after the Asian crisis of 1997. According to the data collected by Wei and Zhiwei (2010), only Indonesia has been imposed trade reform conditions in its program, which lasted from 1997-2000. Hence it is unlikely that IMF programs are behind the tariff cuts in all countries in Factory Asia which started before 1997.

The reason why so little is known about the causes of unilateral liberalization is that economists usually ask the question the other way around, i.e. "why do countries impose tariffs in the first place?" The widely-accepted answer is that governments bow to special interest groups lobbying for protection (Grossman and Helpman 1994, Goldberg and Maggi 1999). But lobbying can also be pro-liberalization, for example when foreign companies lobby for market access (Gawande et al. 2006, Kee et al. 2007) or when domestic firms seeking to avoid paying duties on imported intermediates lobby for tariff suspensions (Gawande et al. 2005 and Ludema et. al. 2010). Governments bowing to special interests could be one reason behind Asia's liberalization and this would fit into the race-to-the-bottom setting which I describe below.

2.2 Races to the bottom

Another way of explaining tariff liberalization is through the theory of race-to-the-bottom unilateralism, stylized by Baldwin (2010) but also mentioned by Kimura (2003) and Ando and Kimura (2005). In its simplest form, "developmental state" governments interested in fostering industrialization per se (Johnson 1982) cut tariffs in a competition to attract or retain FDI.

The race-to-the-bottom model is well-known in international economics. In its most famous application, countries competing for FDI reach an uncooperative Nash equilibrium with bottom levels of corporate tax rates (see Devereux et al. 2008 and Davies and Voget 2011 for recent empirical analyses). The model has been applied to many other locational determinants of FDI such as subsidies (Haaland and Wooton 1999), wages (Mehmet and Tavakoli 2003), labor standards (Davies and Vadlamannati 2011) and environmental standards (Levinson 2003). Here, tariffs on assembly firms' inputs are the locational determinant of choice. The relevance of this policy instrument is due to the specific nature of FDI in Factory Asia, i.e. vertical FDI in manufacturing plants that relied on imports of components for local processing. While, as in lobbying for tariff suspensions (Ludema et. al. 2010), it is the import requirements of firms that urge governments to cut tariffs, the mechanism is somewhat different. In race-to-the-bottom unilateralism, governments cut tariffs to attract or retain FDI in an international competition where other countries' tariffs matter.[4]

Races to the bottom could also be the result of yardstick competition (Besley and Case 1995) in which governments care about what other governments are doing since voters compare the FDI performance of their country to that of their neighbors when voting. This is a possibility but democracy was present to varying degrees in the countries and period studied.[5] Finally, it can also be seen through political science's policy diffusion

[4]Governments may be of the developmental-state type, maximizing welfare, or maximizing lobbying revenue. In both cases countries compete to attract or retain FDI.

[5]According to the Polity IV project (systemicpeace.org/polity/polity4.htm) South Korea, the Philippines, Taiwan, and Thailand became democracies at the beginning of the 1990s, and only Thailand went back to anocracy in 2005. And while Indonesia made the transition to democracy in 1999, China has been an autocracy since 1945 and Malaysia an anocracy since 1970.

theory, according to which policy choices in one country affect those in neighbors either because they alter the material payoffs or because they disseminate new information about the impact of these policies (Elkins and Simmons 2005). Empirical evidence of such policy diffusion includes Bordignon et al. (2003) and Swank (2006).

3 Data and descriptive statistics

Following the conjectures of Baldwin (2010) and Ando and Kimura (2003), I focus on seven Asian emerging economies that constitute Factory Asia, i.e. Thailand, Indonesia, Malaysia, the Philippines, South Korea, Taiwan, and China as they were all competing for FDI over the 1989-2006 period, mostly from Japan which targeted this region intensely with investment and aid packages under "regional guidance" from the Ministry of International Trade and Industry (Lamy et al. 2006).

Tariff data, which is from UNCTAD's TRAINS database, is at the HS 6-digit level. Each tariff line is then matched with its Broad Economic Category (BEC), i.e. consumer goods, capital goods, or intermediates using the World Bank's concordance table. I also identify which tariff lines are "parts and components" using Schott's (2004) classification which defines a tariff line as a "part or component" if its description contains the words "parts" or "components".

Applied most-favored-nation (MFN) tariffs were on average repeatedly cut from 1989 till 2006. These cuts went much deeper than the upper bound agreed to during WTO negotiations. What's more, as seen in Figure 3, in each country-year, tariffs on parts and components were on average 10 percentage points lower than on consumer goods.

In Figure 4 I show that tariffs were converging to similar levels across countries. The average within-product standard deviation in tariffs on parts and components across countries fell from 15 to 5 percentage points over the 14 years covered. This sigma convergence is more pronounced for parts and components, intermediates, and capital goods than for consumer goods, which is indicative of a race to the bottom in inputs.

I use Japanese FDI employment data from the Japanese Research Institute of Economy,

Trade and Industry Foreign Direct Investment Database which contains estimates on employment for Japanese foreign affiliates by country and industry from 1989-2003 (see Figure 2).[6]

4 Empirical strategy

The descriptive data analysis so far is indicative of a race to the bottom as tariffs on inputs came to closer and closer levels across countries. But the question of strategic complementarity remains. Recent studies aimed at identifying tax competition have focused on estimating tax reaction functions using spatial econometrics. In the workhorse specification of Devereux et al. (2008), also adopted by Davies and Voget (2011), tax rates across countries act as strategic complements, i.e. a key requirement for a race to the bottom.

I thus use the specification of Devereux et al. (2008) and regress tariffs on a weighted average of lagged tariffs in competing countries. I estimate the following model,

$$\tau_{ijt} = \alpha_{ij} + \upsilon_{it} + \rho W_t \tau_{ijt-1} + \epsilon$$

where τ_{ijt} is the tariff of product i, in country j in period t, α_{ij} is a country-product fixed effect, υ_{it} is a country-year fixed effect, which accounts for any country-wide policy, and W_t a weighting matrix. The choice of weighting matrix determines the type of spatial correlation. I choose weights as to measure the competition intensity between countries. Hence, a first weight is the normalized absolute value of the inverted difference in GDP per capita, suggesting that countries at a similar level of development compete more intensely against each other. The right-hand side variable can thus be computed for each year as:

$$\sum_{j \neq i}^{n} \tau_j \times \frac{|GDPPC_i - GDPPC_j|^{-1}}{\sum_{j \neq i}^{n} |GDPPC_i - GDPPC_j|^{-1}}$$

Likewise, a second possible weight is the inverted difference in distance to Japan. Here the

[6]The industries are textiles, chemicals, transport equipment, precision instruments, general machinery, electrical machinery equipment, ICT equipment, base metal and metal products, and other manufacturing.

logic is that since Japan was the main source of FDI competition, being close to Japan provided an advantage and hence countries at a similar distance from Japan were competing more intensely at the tariff level. To compute these weights, I use GDP per capita data from the IMF and geographic distance from CEPII. If the tariff cutting is the result of common intellectual trends rather than competitive interaction, the weighting matrix should not matter.

The race should affect mostly parts and components, intermediates and capital goods rather than consumer goods, as these were critical to Japanese firms. I estimate the model for different types of products separately and for various year lags. I first use OLS to estimate the coefficients as in Egger and Larch (2008). I then proceed to various robustness checks which include a lagged-dependent-variable model and an IV model based on pre-determined preferential tariff path set by ASEAN negotiations in 1992.

5 Results and robustness checks

Table 1 gives the spatial correlation results obtained using OLS. The three horizontal panels give the results using 1-, 2-, and 3-year lags of the spatial lag. Using 1-year lags and the GDPPC-based weights (columns (1), (3), (5) and (7)), I find a significant spatial correlation in capital goods, intermediates, and parts and components, while I find none in consumer goods. This is consistent with the idea of a competition that involves only locational determinants of FDI. These results are consistent to using 2- or 3-year lags on the right-hand side. Columns (2), (4), (6) and (8) add tariffs weighted by the inverted difference in distance to Japan as well as a simple average of tariff in competing countries as controls. Across lag structures only GDPPC-based weights provide consistently positive and significant spatial correlations for tariffs on capital goods, intermediates, and parts and components. Hence, GDPPC-based weights seem to provide the most consistent way to capture the spatial correlation in tariffs. Overall, I find that the simple average of tariffs to have no explaining power for any type of good. This suggests that the downward trend in tariffs cannot be explained by common intellectual trends. I also try using random-weights

as a placebo and found no spatial correlation (not shown).

I proceed to a number of robustness checks. First I estimate a lagged-dependent-variable model rather than a country-product fixed effect model to bound the effect, as suggested by Angrist and Pischke (2008, Section 5.3). Results in Table 2 confirm a positive spatial correlation that doesn't appear in consumer goods. Again, the spatial correlation is highest in parts and components even though the coefficients are not significantly different across capital goods, intermediates and parts and components. What's more, the lagged-dependent-variable model estimates are smaller than when using the fixed-effect model, providing a lower bound to the competition effect.

More importantly, even though reverse causality can be ruled out due to the time lag, it can be argued that the tariff and the year-lagged spatial lag are both correlated with a product-specific omitted variable, and this renders the spatial lag endogenous. To make sure the spatial correlation I identify is the causal effect of competitors' tariffs, I instrument the spatial lag using the tariff path predetermined by ASEAN preferential tariff negotiations in 1992, using data from the ASEAN secretariat. The idea here is that the preferential tariffs agreed during ASEAN negotiations caused some of the MFN tariff cuts, as argued by Calvo-Pardo et al. (2009). While countries in Factory Asia are now increasingly active in forming trade agreements, this was not the case until the mid-2000s except for the ASEAN trade agreement that concerned four of the countries analyzed here, namely Indonesia, Malaysia, the Philippines and Thailand and was signed in 1992. Korea and China both have an agreement with ASEAN countries but these came into force in 2006 and 2010, respectively.[7]

I thus split my sample into two country groups, the ASEAN four and the three others, China, Korea, and Taiwan (CKT). For both country groups, the spatial lag is instrumented by the weighted sum of 1992-determined preferential tariffs in the ASEAN four, where the weights are GDPPC-based as in the spatial lag. This identification strategy assumes that preferential tariffs in competing countries did not affect a neighbor's tariffs through any other

[7] China now has sealed 15 trade agreements but it started only in 2003 when one including only agriculture with Thailand came into force. South Korea signed its first with Chile in 2004. Malaysia signed its first with Japan in 2005, while the Philippines did the same in 2006 and Indonesia in 2007. Hence, only ASEAN preferences could have mattered for the period studied in this paper.

channel than through ASEAN negotiations or tariff competition. For ASEAN countries, the preferential tariff must thus also be included on the right-hand side. The latter is instrumented by its 1992-predetermined path. For both country groups the instruments pass the Kleibergen-Paap under-identification test and the Cragg-Donald weak identification tests, but not for consumer goods. Hence only the estimates for the other types of goods can be interpreted. The IV estimates presented in Table 3 confirm previous results and suggest a causal effect of spatial competition in both ASEAN and non-ASEAN countries.

To go deeper into the mechanism I interact the tariff spatial lag with a FDI jealousy dummy. I define FDI jealousy as equal to one when the number of jobs created at home by Japanese FDI is smaller than the weighted average of jobs created by Japanese FDI in competing countries in the corresponding industry and year (the weights are inverted absolute differences in GDP per capita). The idea is that FDI jealousy increases the tariff competition. The results, summarized in Figure 5 suggest that the spatial correlation is indeed highest and significant only when FDI jealousy was present (this corresponds to 77% of observations). When most jobs were created at home, I find no significant spatial correlation.[8]

I also check whether yardstick competition could be behind this spatial dependence. To test for this I interact the spatial lag with a dummy equal to one for country-years where election occurred. The idea is that if it is indeed electoral pressure that pushed the competition, the spatial correlation should be highest in election years. I find no indication of such interaction (not shown).

6 Conclusion

In this paper I applied the econometric methods used to identify tax competition to tariff liberalization and provided empirical evidence of a tariff race to the bottom. This suggests that the two decades of unilateral tariff cutting in Asia's emerging economies have been

[8]The figures are based on estimates in table 4. Unexpectedly, I also find a positive spatial correlation for consumer goods when FDI jealousy is present. Note however that this effect remains statistically smaller than for parts and components.

driven, at least in part, by a competition to attract FDI, mostly from Japan. Racing governments were cutting tariffs to obtain marginal locational advantages in attracting multinationals that relied on imports of parts and components for local processing. While regionalism may also have played a role in Factory Asia's unilateral trade liberalization, I find no evidence that its forces overshadowed those of FDI competition. Lobbying by implanted firms may also have played a role in liberalization in the region studied. Indeed, the development of Factory Asia may have progressively increased the size of the importing export-oriented sector and hence the liberalization lobbying forces. Yet, the presence of such lobbying would not rule out the spatial correlation identified in this paper. Quite to the contrary, such forces may have reinforced the international-competition pressure to retain FDI jobs at home. As Sally (2008) observes, unilateral measures and competitive emulation, rather than WTO negotiations, may to be the main vehicle for future liberalization, especially as more countries join the competition, in Asia and beyond.

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Figure 1
Tariffs racing to the bottom

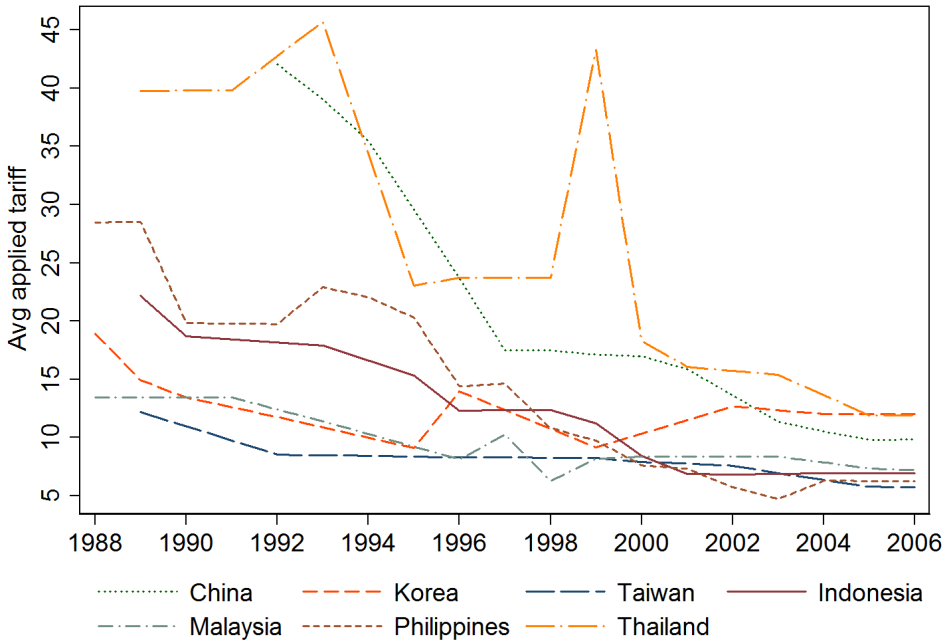


Figure 2
Japanese-FDI jobs

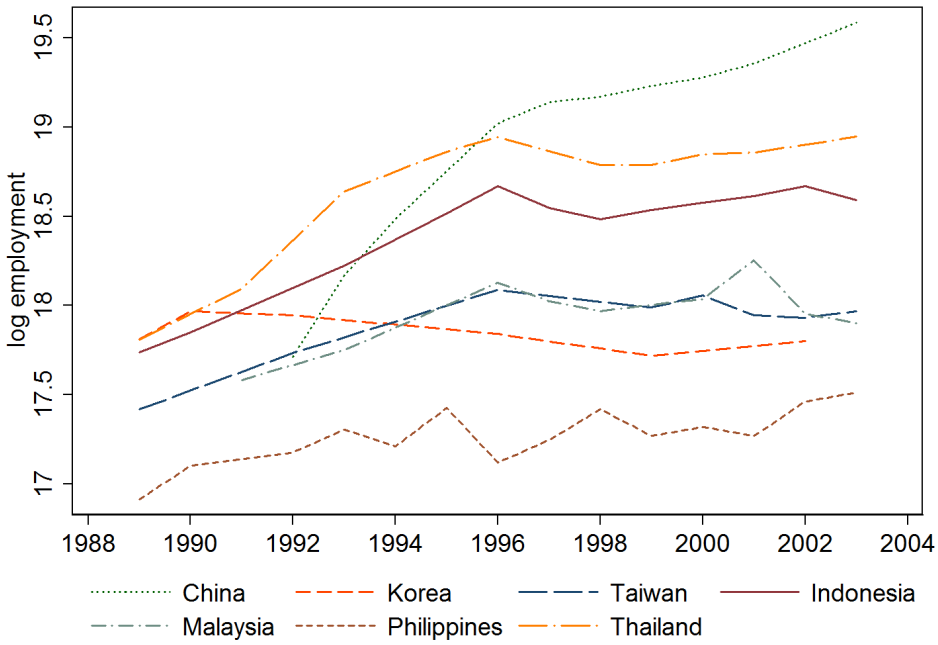


Figure 3
Tariff cutting in Factory Asia

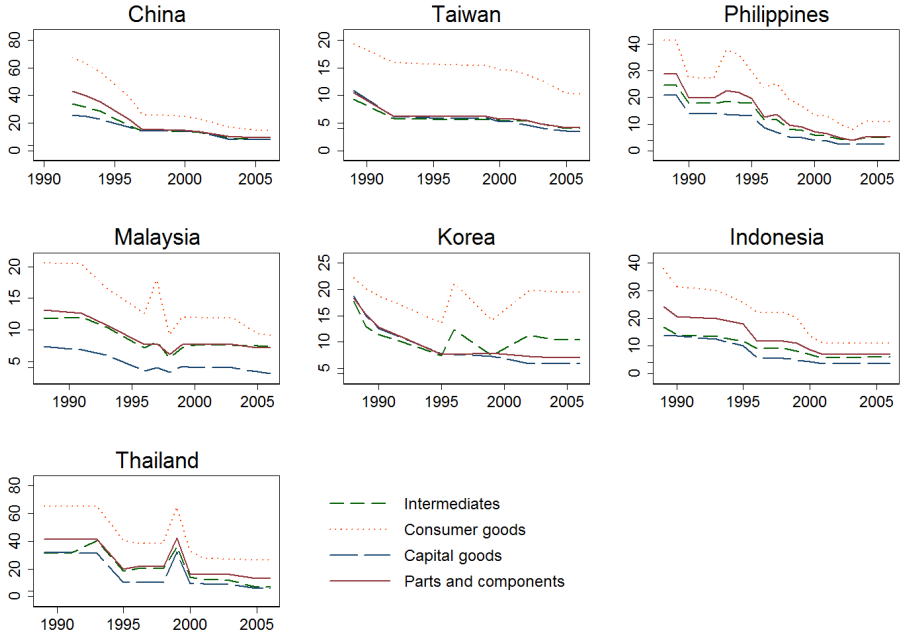


Figure 4
Sigma convergence in tariffs

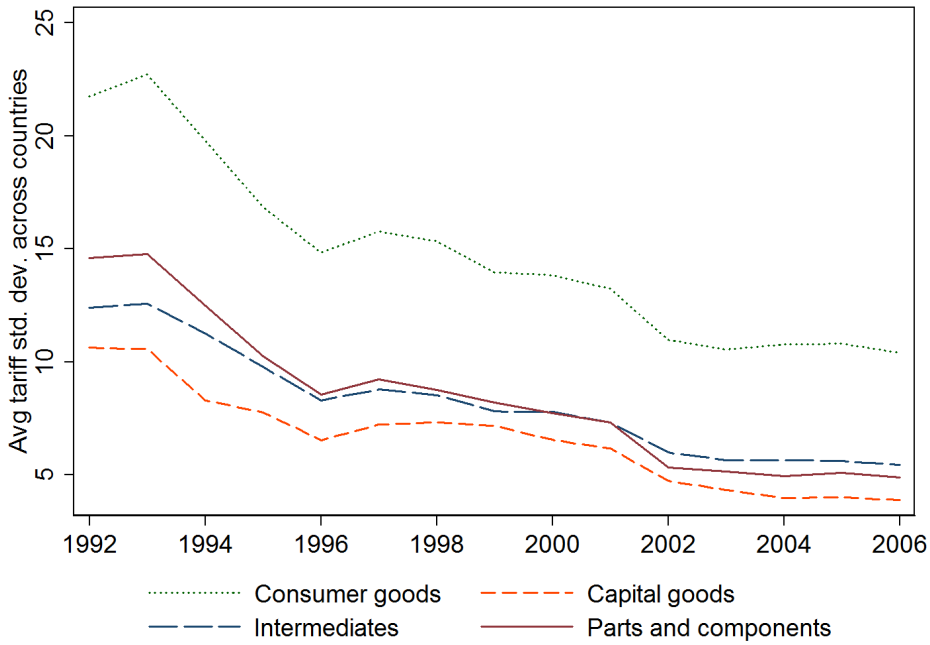
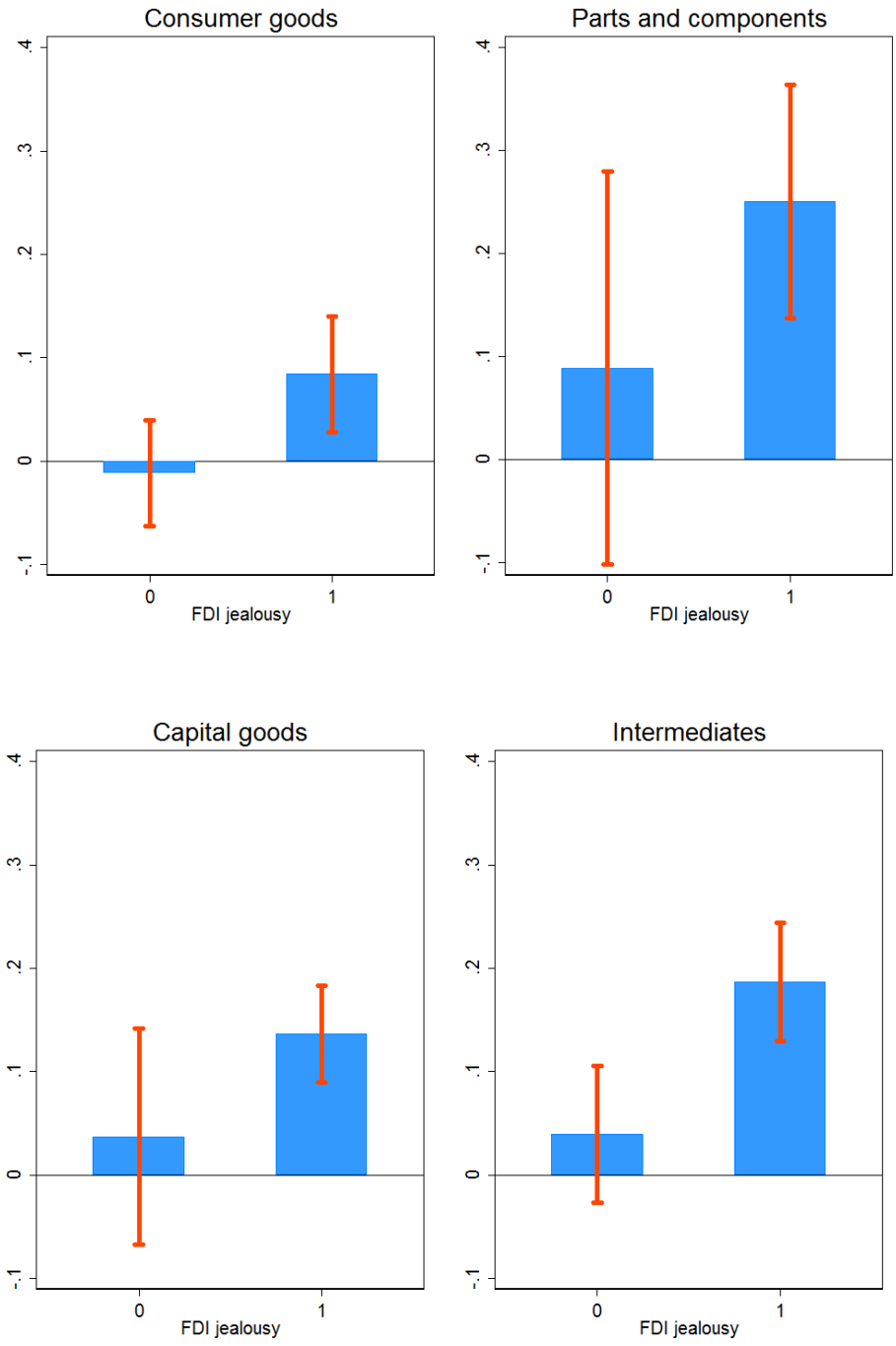


Figure 5
Spatial correlation in tariffs



Note: The blue bars indicate the level of spatial correlation. The red lines indicate the 95% confidence interval. Results are based on regressions in Table 4 where the spatial lag is interacted with FDI jealousy. The latter is a dummy equal to one if the number of jobs created by Japanese FDI at home in the concerned sector and year is smaller than the weighted average of jobs created in competing countries.

Table 1
Spatial correlations in tariffs

	consumer goods		capital goods		intermediates		parts and components	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				1-year lags				
L.tariff_GDPPC	0.0348	0.013	0.122***	0.130***	0.123***	0.115**	0.234***	0.238***
	(0.0259)	(0.0280)	(0.0232)	(0.0326)	(0.0422)	(0.0454)	(0.0600)	(0.0865)
L.tariff_simple		-0.0701		-0.114		0.014		-0.404**
		(0.0500)		(0.0952)		(0.0358)		(0.193)
L.tariff_distance		0.110*		0.102*		0.00222		0.375**
		(0.0553)		(0.0601)		(0.0342)		(0.146)
Constant	12.63***	12.37***	6.433***	7.869***	8.603***	10.11***	5.501***	8.285***
	(0.426)	(0.558)	(0.278)	(0.435)	(0.591)	(0.612)	(0.598)	(1.292)
Observations	74,276	74,276	38,076	38,076	169,575	169,575	23,950	23,950
R-squared	0.537	0.539	0.56	0.56	0.367	0.367	0.658	0.665
Nb of cty_prod	9,444	9,444	4,869	4,869	22,037	22,037	2,995	2,995
				2-year lags				
L2.tariff_GDPPC	0.0467	0.0706**	0.0896***	0.0945***	0.108***	0.122***	0.153***	0.249***
	(0.0286)	(0.0310)	(0.0186)	(0.0286)	(0.0269)	(0.0269)	(0.0438)	(0.0776)
L2.tariff_simple		-0.113**		-0.0758		-0.0266		-0.26
		(0.0488)		(0.0951)		(0.0360)		(0.187)
L2.tariff_distance		0.0876**		0.072		0.00725		0.129
		(0.0367)		(0.0661)		(0.0306)		(0.133)
Constant	26.39***	26.38***	11.65***	10.17***	10.16***	11.94***	15.85***	14.50***
	(0.922)	(0.861)	(0.277)	(0.328)	(0.318)	(0.327)	(1.028)	(0.945)
Observations	74,677	74,677	38,645	38,645	169,512	169,512	24,367	24,367
R-squared	0.491	0.493	0.655	0.655	0.377	0.377	0.62	0.623
Nb of cty_prod	9,558	9,558	4,959	4,959	22,428	22,428	3,003	3,003
				3-year lags				
L3.tariff_GDPPC	0.0196**	0.0178*	0.0760***	0.0766***	0.0652***	0.0589**	0.162***	0.193***
	(0.00868)	(0.00943)	(0.0157)	(0.0221)	(0.0193)	(0.0232)	(0.0261)	(0.0469)
L3.tariff_simple		-0.0264		-0.0822		0.0069		-0.124
		(0.0216)		(0.0496)		(0.0266)		(0.0857)
L3.tariff_distance		0.0353*		0.0841**		0.00762		0.0802
		(0.0193)		(0.0347)		(0.0269)		(0.0673)
Constant	22.78***	22.64***	6.395***	6.934***	9.900***	9.215***	5.923***	7.786***
	(0.300)	(0.398)	(0.272)	(0.410)	(0.408)	(0.379)	(0.442)	(0.822)
Observations	73,808	73,808	37,867	37,867	167,468	167,468	23,940	23,940
R-squared	0.388	0.389	0.485	0.487	0.245	0.245	0.556	0.557
Nb of cty_prod	9,578	9,578	4,959	4,959	22,445	22,445	3,003	3,003

Dependent variable is the applied MFN tariff. tariff_GDPPC is the weighted average of tariff where the weights are the inverted absolute differences in GDP per capita. For tariff_distance the weights are the inverted absolute differences in distance to Japan. Distances to Japan are between countries' main cities weighted by population. tariff_simple is a simple average of tariffs in competing countries. L. is for 1-year lag, L2. for 2-year lag, L3. for 3-year lag. Country-year and country-product fixed effects are included in all regressions. Country-year clustered standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Table 2
Lagged-dependent-variable model

	consumer goods	capital goods	intermediates	parts and components
	(1)	(2)	(3)	(4)
L.tariff_GDPPC	0.0191	0.0434***	0.0294**	0.0701**
	(0.0194)	(0.0162)	(0.0133)	(0.0325)
L.tariff	0.879***	0.863***	0.862***	0.823***
	(0.0295)	(0.0276)	(0.025)	(0.0302)
Constant	0.588	0.0738	0.417	0.226
	(0.621)	(0.195)	(0.276)	(0.425)
Observations	74,276	38,076	169,575	23,950
R-squared	0.731	0.896	0.673	0.918

Dependent variable is the applied MFN tariff. tariff_GDPPC is the weighted average of tariff where the weights are the inverted absolute differences in GDP per capita. L. is for 1-year lag. Country-year fixed effects are included in all regressions. Country-year clustered standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Table 3
Instrumental-variable model

	consumer goods		capital goods		intermediates		parts and components	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CKT	ASEAN	CKT	ASEAN	CKT	ASEAN	CKT	ASEAN
L.tariff_GDPPC	-0.173	-0.337	0.124***	0.128***	0.335***	0.281***	0.143***	0.193***
	(0.401)	(3.723)	(0.029)	(0.0362)	(0.0629)	(0.0272)	(0.0521)	(0.034)
L.pref		0.0502		0.231*		-0.158***		0.189***
		(2.223)		(0.118)		(0.0562)		(0.0573)
L.tariff	0.538***	0.864	0.535***	0.460***	0.499***	0.684***	0.782***	0.607***
	(0.0471)	(0.699)	(0.0249)	(0.0662)	(0.0322)	(0.0215)	(0.0337)	(0.0415)
Observations	41,646	28,892	21,082	18,866	94,188	74,126	13,395	11,740
R-squared	0.253	0.456	0.387	0.394	0.269	0.549	0.741	0.664
Nb of cty_year	33	32	33	32	33	32	33	32
Cragg-Donald F	5.354	0.00629	97.73	24.33	165.8	17.7	54.97	19.56
Kleibergen-Paap LM	3.305	0.0129	11.99	14.64	12.62	14.99	11.88	14.18
Pvalue of K-P test	0.0691	0.909	0.000535	0.00013	0.000382	0.000108	0.000567	0.000166

Dependent variable is the applied MFN tariff. tariff_GDPPC is the weighted average of tariff where the weights are the inverted absolute differences in GDP per capita. Pref is the applied preferential tariff within ASEAN countries. Country-year fixed effects are included in all regressions. IVs for tariff_GDPPC and pref are pref92_GDPPC and pref92, respectively, i.e. the 1992-negotiations determined preferential tariffs and their weighted average. CKT is China, South Korea and Taiwan. ASEAN is Indonesia, Malaysia, the Philippines and Thailand. L. is for 1-year lag. Country-year clustered standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.

Table 4
Spatial correlation and Japanese FDI jobs

	consumer goods	capital goods	intermediates	parts and components
	(1)	(2)	(3)	(4)
L.tariff_GDPPC	-0.0120	0.0369	0.0393	0.0888
	(0.0262)	(0.0535)	(0.0337)	(0.0973)
L.FDI jealousy	-3.545**	-1.307**	-2.119***	-2.301*
	(1.330)	(0.551)	(0.736)	(1.289)
L.tariff_GDPPC × L.FDI jealousy	0.0960***	0.0996*	0.147***	0.162**
	(0.0326)	(0.0549)	(0.0377)	(0.0793)
Constant	14.01***	9.714***	10.86***	6.919***
	(0.606)	(0.474)	(0.620)	(0.836)
Observations	74,276	38,076	169,575	23,950
R-squared	0.539	0.562	0.373	0.664
Number of cty_prod	9,444	4,869	22,037	2,995

Dependent variable is the applied MFN tariff. tariff_GDPPC is the weighted average of tariff where the weights are the inverted absolute differences in GDP per capita. FDI jealousy is a dummy equal to one if the number of jobs created by Japanese FDI at home in the concerned sector and year is smaller than the weighted average of jobs created in competing countries. L. is for 1-year lag. Country-year and country-product fixed effects are included in all regressions. Country-year clustered standard errors are in parenthesis. *** p<0.01, ** p<0.05, * p<0.1.