THE GRADUATE INSTITUTE | GENEVA
INSTITUT DE HAUTES ETUDES
INTERNATIONALES ET DU DÉVELOPPEMENT
GRADUATE INSTITUTE OF INTERNATIONAL
AND DEVELOPMENT STUDIES

Graduate Institute of International and Development Studies
Working Paper No: 12/2010

Race-to-the-bottom tariff cutting

Pierre-Louis Vézina
Graduate Institute of International and Development Studies

Abstract

This paper provides an empirical assessment of race-to-the-bottom unilateralism. It suggests that decades of unilateral tariff cutting in Asia's emerging economies have been driven by a competition to attract FDI from Japan. Using spatial econometrics, I show that tariffs on parts and components, a crucial locational determinant for Japanese firms, converged across countries following a contagion pattern. Tariffs followed those of competing countries if the latter were lower, if FDI jealousy was high, and when competing countries were at a similar level of development.

RACE-TO-THE-BOTTOM TARIFF CUTTING

Pierre-Louis Vézina[1]

First version: April 2009
This version: July 2010

Abstract: This paper provides an empirical assessment of race-to-the-bottom unilateralism. It suggests that decades of unilateral tariff cutting in Asia's emerging economies have been driven by a competition to attract FDI from Japan. Using spatial econometrics, I show that tariffs on parts and components, a crucial locational determinant for Japanese firms, converged across countries following a contagion pattern. Tariffs followed those of competing countries if the latter were lower, if FDI jealousy was high, and when competing countries were at a similar level of development.

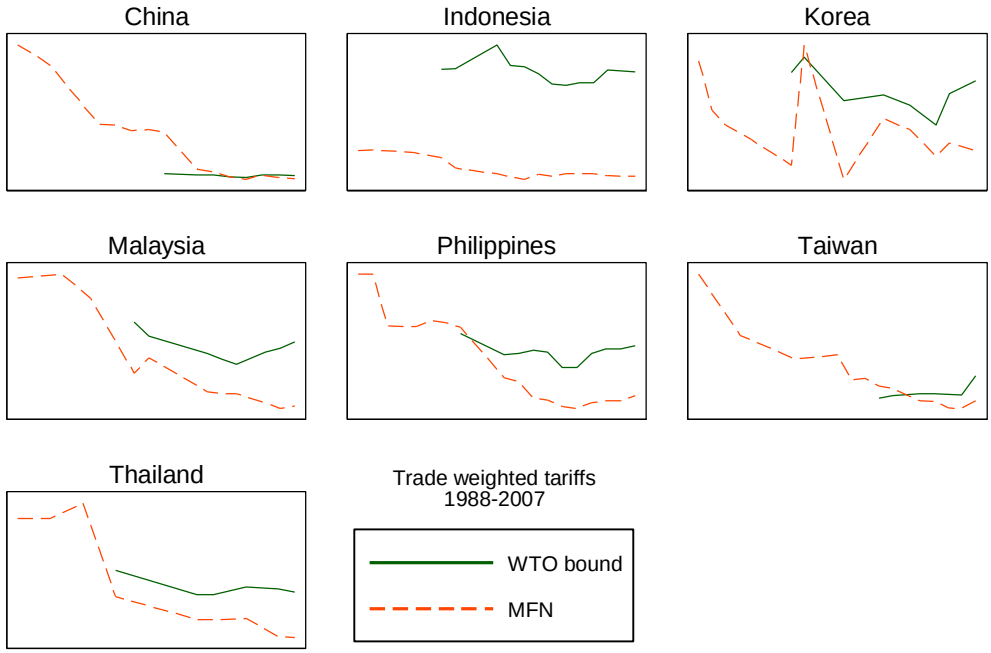
Keywords: Trade policy, political economy, unilateralism
JEL classification: F13 - Trade Policy; F15 - Economic Integration; N75 - Asia

[1] Graduate Institute of International and Development Studies, Geneva, pierre-louis.vezina@graduateinstitute.ch.
I thank Richard Baldwin, Marius Bruhlhart, Marco Fugazza, Marcelo Olarreaga, Matthias Rieger, Veysel Asvar, and Erdal Yalcin as well as seminar participants at the SMYE 2010 conference in Luxembourg on 16 April 2010, GEP conference in Nottingham on 29 April 2010, and ProDoc workshop in Geneva on 11 June 2010 for very helpful comments.

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 unilateral trade liberalization 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. Moreover, the two decades of unilateral tariff-cutting in emerging economies 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[2] have been fostered by unilateral rather than preferential trade liberalisation (see Figure 1). Understanding what drove this liberalization is therefore crucial to our understanding of the process of economic development.

Figure 1. Unilateral trade liberalization in Factory Asia



While some political economy theories have been developed to explain unilateral trade liberalization, e.g. soft unilateralism (Coates and Ludema 2001, Richardson 2001), IMF pressure, ideological leadership (Edwards and Lederman 1998), and preferential tariff complementarity (Estevadeordal et al. 2008, Calvo-Pardo et al. 2009), none seem appropriate

[2] 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).

to explain what happened in the emerging economies of East Asia from the end of the 1980s until the mid 2000s.

One exception is race-to-the-bottom unilateralism, which suggests tariff cuts were driven by a competition for FDI (Baldwin 2006). More precisely, it suggests East Asian governments started cutting tariffs in the 1980s as they knew they were facing serious competition in attracting Japanese FDI and low tariffs were perceived as a decisive locational determinant by Japanese firms which relied on imports of components for local processing. The desire for FDI, driven by the job creation and political support that came with FDI, would have led governments to cut tariffs to obtain marginal locational advantages over similar countries. Eventually, this led to bottom levels of tariffs across countries.

This paper provides, to the best of my knowledge, the first empirical assessment of race-to-the-bottom unilateralism. Focusing my analysis on seven Asian emerging economies, and using tools from spatial econometrics, I show that tariffs on parts and components followed those of competing countries if the latter were lower, if FDI *jealousy* was high, and if competing countries were at a similar level of development, hence competing more intensively at the tariff level. As a counterfactual I show that these results do not hold when using tariffs on finished products nor when estimating the model for countries that are not part of the sliced-up supply chain, such as Australia.

Nevertheless, I also find a role for regionalism in MFN liberalization, though there is no indication that it is any stronger than nor substitute for the competitive emulation effect of the race to the bottom. Moreover, I find no indication that IMF programs' conditions, which followed the Asian crisis of 1997 in Thailand, Indonesia and Korea, explain the tariff cutting in parts and components.

The next section reviews the literature on unilateral liberalisation, races-to-the bottom and policy diffusion and describes the theoretical framework. In a third section I provide empirical evidence that tariffs were indeed racing to the bottom. A last section concludes.

2. Literature review

2.1 Unilateral liberalisation

While some theories have emerged to explain unilateral trade liberalisation, 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 evidence from Chile, where tariffs were cut during Pinochet's regime, as the dictator was driven by the ideas of the Chicago

school. Another branch of theory views unilateral tariff cuts as a strategy for a large and influential country to obtain reciprocal liberalisation or a trade agreement. This is described as soft unilateralism by Richardson (2001). To analyze this leadership in trade policy, Coates and Ludema (2001) developed a model where one country's unilateral liberalization lowers the political stakes associated with trade liberalization in the foreign country, lowering the political cost of reaching a successful trade agreement. Similarly, Krishna and Mitra (2005) built a model in which unilateral liberalization by a large country raises the world price of the small country's exportable good, increases the incentives for the export business community to lobby, and induces reciprocal tariff cuts in the partner country.

Another theory explaining unilateral cuts is that of preferential tariff complementarity (Estevadeordal et al. 2008, Calvo-Pardo et al. 2009). Here, the logic is that with high external tariffs, the possibility of costly trade diversion resulting from an RTA could provide governments with an incentive to liberalize at the MFN level, or that a shrinking import-competing sector could realign political interests away from protection.

None of these theories seem appropriate to explain what happened in the emerging economies of East Asia from the end of the 1980's until the mid 2000's. Ideological leadership may apply only to dictatorships and does not fit with progressive tariff cutting in multiple countries. 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 while a causal link from regionalism to unilateralism may exist in ASEAN countries, it cannot be applied to the entire region studied here as regional trade agreements, apart from the ASEAN agreement, started only at the end of the period studied.

2.2 Races-to-the bottom and policy diffusion

Hence, the most promising theory is that of race-to-the-bottom unilateralism, stylised by Baldwin (2006) but also mentioned by Kimura (2003) and Ando and Kimura (2005), where countries are cutting tariffs in a competition to attract 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 for a recent analysis). The model has been applied to many locational determinants of FDI. Barros and Cabral (2000) have looked at subsidies, Mehmet and Tavakoli (2003) at wages, and various other studies have looked at labour and environmental standards. However, providing empirical evidence for such races-to-the-bottom has not been an easy task, partly because of inappropriate methods, and partly because they often do not happen due to conflicting forces. For example, Mendoza and Tesa (2005)

argue that Europe has not seen any race to the bottom in taxes due to wealth distribution and fiscal solvency issues.

In race-to-the-bottom unilateralism, tariffs are the locational determinant of choice. The relevance of this policy instrument is due to the specific nature of FDI in Factory Asia. In the 1980s, East Asia's emerging economies started applying new development strategies which consisted in attracting FDI in manufacturing plants that relied on imports of components for local processing. As they knew they were facing serious competition in attracting FDI, especially from Japan[3] (Lamy et al. 2006), they all started to reduce import barriers and cut tariffs, especially on parts and components, to provide the best location advantages to Japanese multinationals (Ando and Kimura 2005, Sally 2008). 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. This is because imports of intermediates are crucial to Japanese firms. In 1996, Japanese firms accounted for almost 30% of all of Thailand's imports, worth around $22 billion (Kimura 2003).

Moreover, since emerging economies started hosting massive FDI before local indigenous firms were well developed, the industrial organization of the manufacturing sector was characterized by a heavy dependence on foreign affiliates (Kimura 2003). Thus, the tariff cuts were critical to creating new industry jobs. Tariff cutting contagion picked up as governments were affected by tariff cuts in competing countries that attracted FDI, missing out on job creation and political support.

Race-to-the-bottom unilateralism can also be seen as yardstick competition (Besley and Case 1995) in which incumbents care about what other incumbents are doing since voters compare the FDI performance of their country to that of their neighbours when electing their government. The idea is also reminiscent of Ethier's framework (1998) explaining the spread of regionalism, where regional arrangements, instead of unilateral tariff cuts, give a small country a marginal advantage over similar countries in attracting export-platform FDI because of favourable access to a large market. Finally, it can also be seen through political science's policy diffusion theory, according to which policy choices in one country affect those in neighbours either because they alter the material payoffs or because they disseminate new info about the impact of these policies (Elkins and Simmons 2005).

[3] From 1980 to 1987, Japanese FDI grew by 21.6% per year as the yen was appreciating and Japan could no longer use GSP to access US and EU (Hyun and Whitmore 1989). Moreover, in 1989 Japan was the biggest foreign investor in the world with $44.2 billion (Tejima 1992).

3. Did tariffs really race to the bottom?

If tariffs indeed raced to the bottom, we should observe convergence in tariffs across countries. Also, the race should affect mostly parts and components, rather than finished products, as these were critical to Japanese firms. Last but not least, tariffs should be correlated in competitive space, i.e. they should follow a policy contagion pattern, following those of neighbours in reaction to missed opportunities to attract FDI. I first describe the data used to test these predictions.

3.1 Data

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 Japanese FDI over the 1989-2006 period. I look at tariff data for 125 parts and components product lines, defined as all HS 6 digit tariff lines whose definitions contain the words "parts" or "components", as in Ando and Kimura (2005), and aggregated at the HS 4-digit level. Examples include bases and covers for sewing machines, carbon electrodes, carbon brushes, lamp carbons, or watch cases. The data is from UNCTAD's TRAINS database. I also build a counterfactual of random finished products aggregated in 125 HS4 categories.

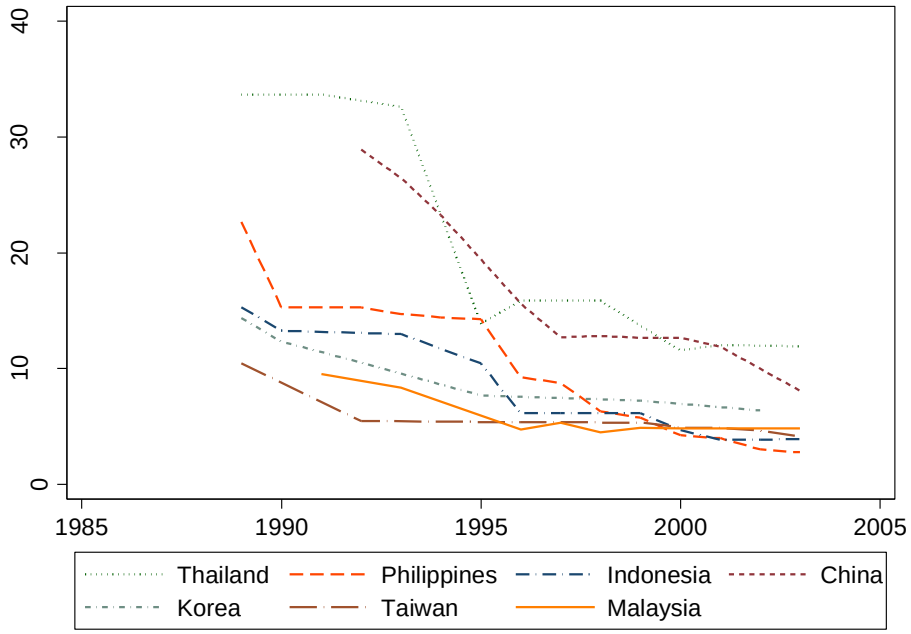
Since my analysis requires a balanced panel and some observations were missing, I aggregated the data into six time periods as in Calvo-Pardo et al. (2009). The six periods are: 1. the pre-ASEAN Free Trade Agreement period (before 1993); 2. the early years of the agreement (1993-1995); 3. the Asian crisis period (1996-1998); 4. the post-crisis period (1999-2001); 5. (2002-2004); 6. further liberalization by all members (2005-2006).

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 from 1989 to 2003.

3.2 Convergence in tariffs

As can be seen in Figure 2, tariffs in parts and components were on average repeatedly cut from 1989 till 2003. After 1995, when the WTO was set up and as competition with China intensified, MFN tariffs continued to go down in all countries, while bound rates remained flat.

Figure 2. Tariffs on parts and components racing to the bottom



To further investigate the convergence in tariffs associated with the race to the bottom, I first test for beta convergence. Table 1 gives the beta convergence estimate across countries, within product-period. The significant result suggests that, for every product in every period, cuts were systematically deeper (in percentage terms) in countries that had a higher applied MFN tariff. On average, a tariff one percentage point higher led to a cut 0.486% deeper for parts and components. However, while I find that tariffs on parts and components were on average about 4.5% deeper than cuts on finished products, I find no significant difference in beta convergence between parts and components and finished products.

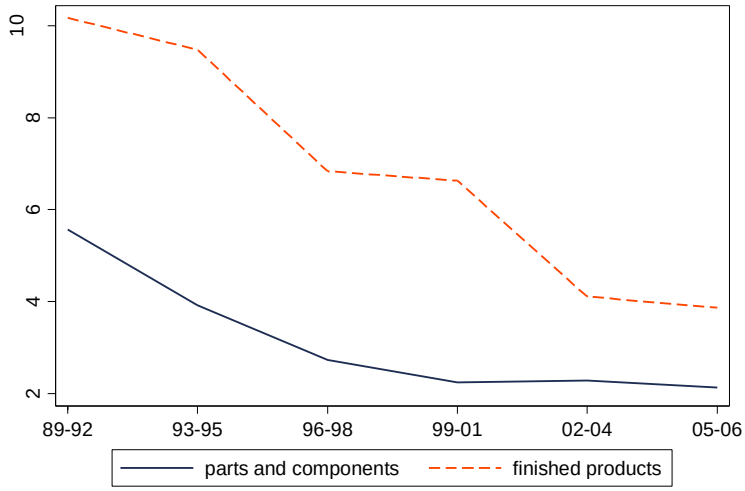
Table 1. Beta convergence in MFN tariffs (within product-period, across countries)

	Parts	Non-parts
Tariff (at t=0)	-0.486***	-0.465***
	(0.08)	(0.06)
Constant	-14.02***	-8.38***
	(1.24)	(1.28)
R2	0.24	0.19
N	3882	4029

OLS regressions within product-period across countries. Dependent variable is tariff growth. Robust standard errors in parenthesis.

Moreover, tariffs across countries were converging to similar levels as the standard deviation fell from 5.57 to 2.13 over the 25 years covered (figure 3). This sigma convergence is sharper for parts and components than for finished products, suggesting more intense competition.

Figure 3. Sigma convergence in MFN tariffs (across countries)



The data so far is indicative of tariffs racing to the bottom, as countries with higher tariffs were cutting deeper, trying to catch-up on their competitors, and as tariffs came to closer and closer levels across countries. But the question of who cut, when, and why, remains. According to the theory, governments were reacting to lower tariffs and FDI employment gains in competing countries, feeling FDI *jealousy*. I now turn to this question.

3.3 Are tariffs correlated in competitive space?

Racing-to-the-bottom, tariffs should be correlated in competitive space. More precisely, tariffs should follow tariffs of competing countries if the latter are lower, if FDI *jealousy* is high, i.e. if Japanese FDI employment gains in competing countries are big, and if competing countries are at a similar level of development. To test for such *spatial* dependence in competitive space, I estimate the following model,

$$\tau_{ijt} = \alpha_{ij} + \upsilon_t + \rho W \tau_{ijt_{-1}} + \varepsilon ,$$

where τ_{ijt} is the tariff of product i, in country j in period t, α_{ij} is a country-product fixed effect, υ_t is a period dummy, which accounts for the general downward trend and region-wide shocks, and W a the weighting matrix that accounts for the competitive distance between countries. This approach is similar to that of Bordignon et al (2003) and Swank (2006).

The choice of weighting matrix determines the type of *spatial* correlation. The first prediction of the race-to-the-bottom theory is that tariffs follow their competitors' only if the latter were

lower. Hence, I define W_1 as a matrix that gives weight only to competing countries' tariffs that are lower[4].

The second prediction is that Japanese FDI employment in competing countries is seen as "lost" employment, creating FDI jealousy. If competing countries had lower tariffs *and* "stole" FDI employment, it is even more likely for tariffs to follow these competitors'. Hence I build W_2 whose elements contain the amounts of Japanese FDI employment in each country in each period to give more weights to tariffs of countries that received more FDI employment. I also build a more "extreme" version of W_2 where employment gains in neighbouring countries only matter if they are superior to those at home. The idea is that a country that benefits from the biggest employment gains might not be *jealous* of modest employment gains in competing countries.

Finally, if countries at similar levels of development have similar wage structures and labour force qualifications, they might be competing more intensively at the tariff level. Hence I also construct W_3, whose elements are the inverted GDP per capita differences between countries, giving more weight to tariffs of countries at closer levels of development.

The *spatial* weighting matrix, W, can thus be computed as $W= W_1 \circ (W_2 + W_3)$. For each period, τ_i will therefore be regressed on the lag of the row-normalized form of

$$\left(\sum_{j \neq i; \tau_j < \tau_i}^{n} \tau_j * FDI\_employment_j + \sum_{j \neq i; \tau_j < \tau_i}^{n} \tau_j * \left| GDPPC_i - GDPPC_j \right|^{-1} \right).$$

I use OLS to estimate the coefficients as the period lag on the right-hand side takes away the endogeneity (Egger and Larch 2008) and estimate the model for parts and components and for finished products separately.

3.3.1 Results

The first row of table 2 gives the results using W as described above, using the less "extreme" version of W_2. The first line gives estimates for parts and components while the second line gives the estimate for finished products. For parts and components, I obtain a significant and positive ρ of 0.852 which indicates a strong and positive dependence in competitive space, as predicted by theory. Standard errors clustered at the country level as well as bootstrapped standard errors confirm the overall significance of the result[5]. As expected, the size of the

[4] More details on the construction of the matrices are given in the appendix.
[5] Heteroskedasticity robust standard errors imply significant coefficients in all cases.

coefficient is smaller for finished products, at 0.385, as is the adjusted R^2 at 71.2% compared to 74%, suggesting the model provides a better fit for parts and components.

Table 2. Do tariffs follow "competitors'" lower tariffs?
Tariffs on parts and components vs. finished products

Weighting matrix	ρ estimate	Country clustered s.e.	Bootstrapped s.e.	Adjusted R2	Obs.
Inverted difference in GDP per capita + "lost"	.852	.27**	.10***	.7399	3207
Japanese FDI employment	.385	.15**	.06***	.7120	3457
Inverted difference in GDP per capita + "lost"	.448	.20*	.08***	.7116	3207
Japanese FDI employment (only if they got less FDI)	.271	.19	.07***	.7102	3457
"Lost" Japanese FDI employment	.816	.29**	.13***	.7335	3207
	.243	.13	.05***	.7016	3457
Inverted difference in GDP per capita	.764	.21**	.09***	.7360	3207
	.417	.14**	.05***	.7205	3457
Simple average	.143	.19	.10	.6723	3207
	.231	.24	.12*	.6986	3457
Inverted distance	-.129	.12	.12	.6722	3207
	-.084	.22	.15	.6955	3457

Within country-product regressions with period dummies. Dependent variable is MFN tariff. Explaining variable is weighted sum of tariffs of competing countries in previous period. First line is for parts and components; second line for finished products.

3.3.2 Robustness checks

I proceed to a number of robustness checks. First, I check if the results change when using the more "extreme" version of W_2, where only the tariffs of countries that received more FDI employment matter. The estimates in the second row of table 2 indicate that, while the results still hold, they are not as strong. This provides support to the idea that all FDI employment that goes to competing countries is viewed as "lost", no matter how much one receives.

Second, to verify if similar levels of development really matter, I use only $W_1 \circ W_2$ as a weighting matrix, omitting the importance of GDP per capita differences. The results, given in the third row, are again very convincing, with a ρ of 0.816 and an R^2 of 73.35% for parts and components, suggesting tariff competition is intense even between countries at different levels of development. But the lower adjusted R^2 and coefficient indicate that the full weighting matrix derived from theory provides a better fit.

In the fourth row I show results using only $W_1 \circ W_3$, where only GDP per capita similarity would drive the correlation in tariffs. Again, the "competitive space" correlation still holds, but the fit is not as good as when including FDI employment *jealousy*, again reinforcing support for the race-to-the-bottom theory.

As one might object that these results hold no matter what weighting matrix is used and hence do not provide much evidence of a race to the bottom in tariffs, in the fifth row I provide the

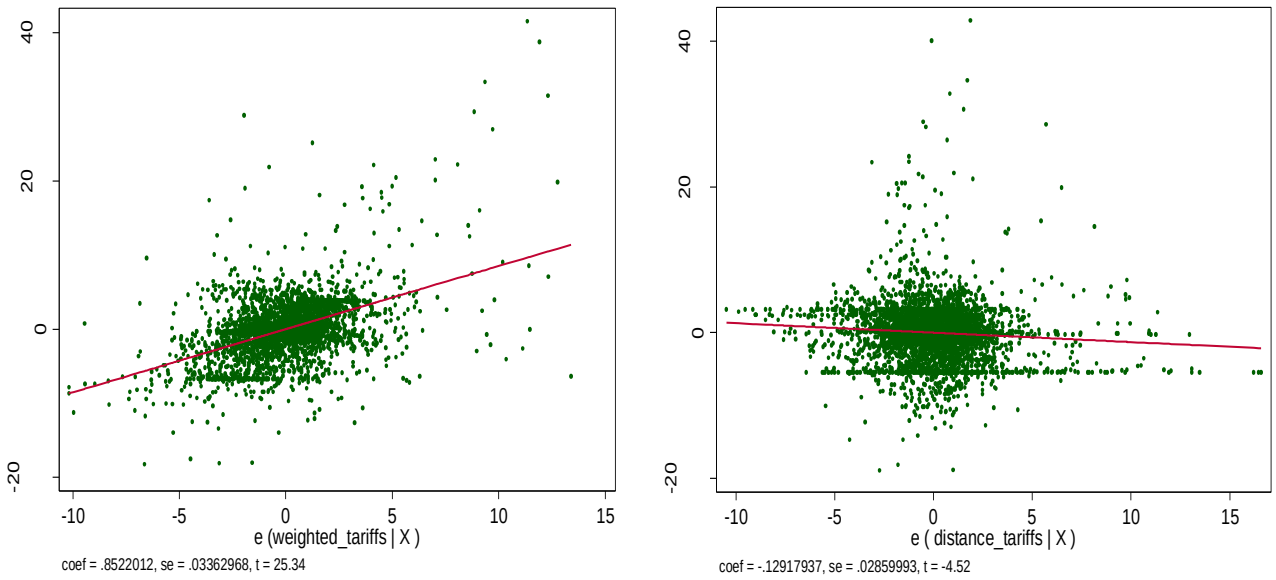
results using a placebo, non-theory based, explaining variable, i.e. the simple average of competitor's tariffs. I fail to find similar results. Not only does this model fit better tariffs of finished products, but the estimated ρ are very low and statistically insignificant.

Finally, inspired by traditional spatial economics, I also test the model using a weighting matrix giving more weight to geographically close countries, i.e. using inverted distance between countries' main cities as weights using data from CEPII. The coefficient, on the sixth row, is now negative and insignificant, once again providing support for consequential previous results. Graphically, this can be seen in figure 4 which compares the *competitive spatial correlation* of 0.85 obtained using the theory based weighting matrix (first row of table 2) to the -0.12 spatial correlation obtained when using geographic distances (sixth row).

No weighting matrix provides a spatial correlation fit as high as the theory based one, strongly supporting the race-to-the-bottom story.

Figure 4. Competitive space correlation vs. geographic space correlation

Competitive spatial correlation **Geographic spatial correlation**



Note: Both tariffs and weighted tariffs are taken as deviations from the country-product mean and period mean.

Another placebo test is to estimate the model on Australia, a country that is not part of Factory Asia and did not participate in the tariff race to the bottom. I check for a spatial correlation between the tariffs on parts and components in Australia and in the countries of Factory Asia. I weight Factory Asia's tariffs by FDI employment and find a coefficient as low

as 0.08, indicating a quasi inexistent relationship. As predicted, the model provides no predictive power when estimated on Australia.

3.3.3 Could tariff cuts be the result of regionalism?

Another hypothesis explaining unilateral tariff cuts is the advent of regional trade agreements. Indeed, Calvo-Pardo et al. (2009) suggest that the preferential tariff cuts in ASEAN caused the cuts in MFN tariffs. One might therefore ask whether this is the case for all countries of Factory Asia.

Firstly, while countries in Factory Asia are now increasingly active in forming trade agreements, this was not the case during the period of study. China may now have sealed 14 trade agreements but it started only in 2002 when signing with ASEAN. 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. Thailand signed a limited one with China including only agriculture in 2003. Hence, only ASEAN preferences could have mattered for the period studied in this paper.

I test for this by looking at whether tariff cuts in the four concerned ASEAN countries are explained by preferential margins. To do so, I regress tariff cuts on a dummy indicating whether or not the product has a preferential margin. For parts and components, about 55% of products (HS4 level) do. For finished products, the share is as high as 70%. I look across products within country-period to check whether MFN cuts were deeper for products with preferences.

Results in table 3 suggest cuts were significantly deeper for products with preferential margins, confirming the result of Calvo-Pardo et al. (2009). More precisely, tariffs on parts and components were cut by 13.1% more if a preferential rate existed. Moreover, using the margin itself as an explaining variable I find that MFN cuts were deeper for products with larger preferential margins, indicating that regionalism did most likely have a positive effect on unilateral tariff cutting.

Table 3. Do preferential margins explain tariff cuts in ASEAN?

	Parts	Non-parts	Parts	Non-parts
Tariff (at t=0)	- 1.23***	-0.58***	-1.19***	-0.52***
	(0.12)	(0.06)	(0.12)	(0.06)
Preferential margin dummy (at t=0)	-13.1***	-1.47		
	(3.24)	(2.31)		
Preferential margin (%) (at t=0)			-0.34***	-0.17**
			(0.04)	(0.08)
N	2059	2248	2059	2248
R2	.147	.139	.156	.150

OLS regressions with country-period fixed effects. Dependent variable is tariff growth. Robust standard errors in parenthesis. *** denote statistical significance at the 1% level.

I also look at the *spatial* correlation in tariffs in the presence of preferential margins. Firstly I include the preferential tariff scheduled at negotiations in 1993 as an explaining variable of tariffs, using data from the ASEAN secretariat. The idea here is that the preferential tariffs determined during ASEAN negotiations are behind the following unilateral cuts. Results in the first column of table 4 indicate that, while the preferential tariff schedule is significant in explaining tariff levels, it does not provide more explanatory power than the race-to-the-bottom effect. Indeed, the two coefficients are statistically indistinguishable (Chow test p-value of 0.24). Hence, controlling for regionalism does not make the race-to-the-bottom forces insignificant. I then include the current preferential margin or preference dummy as a determinant of tariffs on parts and components and look at whether preferences affect the spatial dependence. I thus estimate

$$\tau_{ijt} = \alpha_{ij} + \upsilon_t + \rho W\tau_{ijt_{-1}} + \beta m_{ijt} + \theta W\tau_{ijt_{-1}} * m_{ijt} + \varepsilon ,$$

where m_{ijt} is the preferential margin (in percentage points) (or the preference dummy) on product i in country j in period t, W is the weighting matrix defined as including the inverted difference in GDP per capita and the "lost" Japanese FDI employment. Results in columns 2 and 3 of table 4 indicate that, if anything, regionalism may accentuate the competitive pressure on tariffs.

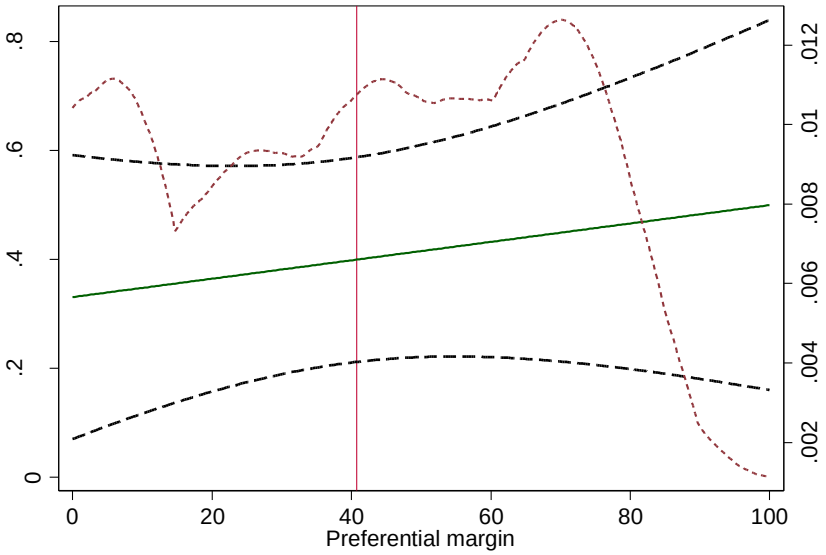
Table 4. Do tariffs on parts and components follow Factory Asia's tariffs even in the presence of regionalism?

(Inverted difference in GDP per capita + "lost" Japanese FDI employment) weighted lagged tariffs	0.267*** (0.06)	0.352*** (0.06)	0.33** (0.15)
Preferential tariff scheduled in 1993	0.377*** (0.05)		
Preferential dummy (at t=0)		-3.31*** (0.76)	
Interaction		0.208* (0.11)	
Preferential margin (%) (at t=0)			-0.09*** (.011)
Interaction			0.001 (.002)
Adj R2	0.78	0.77	0.77
Obs	1704	1723	855

Within country-product with period dummies. Dependent variable is MFN tariff. Robust standard errors in parenthesis. *** denote statistical significance at the 1% level.

In figure 5 I show that the *spatial* correlation increases slightly, though not significantly, for products with higher preferential margins. This suggests that regionalism and the competitive forces that trigger unilateral trade liberalization may be complement. This would suggest that the perceived cooperation within ASEAN resulted in more intense competition and uncoordinated unilateral tariff cutting.

Figure 5. Race-to-the-bottom unilateralism vs. regionalism



3.3.4 Could tariff cuts be the result of IMF pressure?

One last 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. I therefore regress tariff growth on a dummy that takes the value of one for South Korea, Thailand and Indonesia for periods 3 and 4, as well as for periods 1 to 4 for the Philippines which were under an IMF programme even before the crisis. Based on regressions in table 1, I include also tariff levels on the right hand side. I run regressions both within product-period and within country-product. As reported in table 5, IMF pressure seems to matter only for finished products as the coefficient is positive and insignificant for parts and components, suggesting cuts were less deep in countries affected by IMF conditions. This suggests that IMF pressure played no role in the tariff cuts on parts and components, what constitute the deepest liberalization gains (table 1).

Table 5. IMF pressure?

	Parts	Non-parts	Parts	Non-parts
Tariff (at t=0)	-0.49**	-0.457**	-1.66*	-.97**
	(0.19)	(0.19)	(0.78)	(0.12)
IMF programme (t=0)	5.01	-8.85***	11.85	-8.14
	(14.1)	(3.61)	(19.6)	(8.26)
Adjusted R2	0.10	0.04	0.01	0.04
N	3882	4029	3882	4022
Fixed effects	product-period		country-product	

OLS regressions. Dependent variable is tariff growth. Country-clustered s.e. in parenthesis. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

4. Conclusion

This paper provides, to the best of my knowledge, the first empirical assessment of race-to-the-bottom unilateralism. It suggests that the two decades of unilateral tariff cutting in Asia's emerging economies have been driven, at least in part, by a competition to attract FDI 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 and IMF pressure may also have played a role in Factory Asia's unilateral trade liberalization, I find no evidence that these forces outweighed those of FDI competition.

As Sally (2008) observes, in an increasingly integrated region with supply chains spread across countries, unilateral measures and competitive emulation, rather than WTO negotiations, are likely to be the main vehicle for future liberalisation. As for development policy, the Factory Asia model reveals that FDI competition can provide the right political incentives for unilateral liberalization and trade integration. This has indeed happened in Mauritius, where in 2005, in reaction to foreign competition and massive job losses in factories, the government cut taxes, slashed red tape and dropped tariffs (The Economist 2008).

References

Ando, M. (2006), 'Fragmentation and Vertical Intra-industry Trade in East Asia', *North American Journal of Economics and Finance*

Ando, M. and F. Kimura (2005), 'The Formation of International Production and Distribution Networks in East Asia', in T. Ito and A. Rose (eds.), *International Trade in East Asia*, *U*niversity of Chicago Press, 2003

Baldwin, Richard E. 2006. "Multilateralising Regionalism: Spaghetti Bowls as Building Blocs on the Path to Global Free Trade," The World Economy, Blackwell Publishing, vol. 29(11), pages 1451-1518, November.

Barros, Pedro P & Cabral, Luis, 2000. "Competing for Foreign Direct Investment," Review of International Economics, Blackwell Publishing, vol. 8(2), pages 360-71, May.

Besley, Timothy & Case, Anne, 1995. "Incumbent Behavior: Vote-Seeking, Tax-Setting, and Yardstick Competition," American Economic Review, American Economic Association, vol. 85(1), pages 25-45, March.

Bordignon, Massimo & Cerniglia, Floriana & Revelli, Federico, 2003. "In search of yardstick competition: a spatial analysis of Italian municipality property tax setting," Journal of Urban Economics, Elsevier, vol. 54(2), pages 199-217, September.

Calvo-Pardo, Hector & Freund, Caroline & Ornelas, Emanuel, 2009. "The ASEAN free trade agreement : impact on trade flows and external trade barriers," Policy Research Working Paper Series 4960, The World Bank

Coates, D., and Ludema, R., 2001, "A Theory of Trade Policy Leadership", Journal of Development Economics 65(1)

Devereux, Michael P. & Lockwood, Ben & Redoano, Michela, 2008. "Do countries compete over corporate tax rates?," Journal of Public Economics, Elsevier, vol. 92(5-6), pages 1210-1235, June.

Edwards, Sebastian and Lederman, Daniel, "The Political Economy of Unilateral Trade Liberalization: The Case of Chile" (April 1998). NBER Working Paper W6510.

Egger, Peter and Mario Larch (2008), Interdependent preferential trade agreement memberships: An empirical analysis, Journal of International Economics, Volume 76, Issue 2, December

Elkins, Zachary and Beth A. Simmons. 2005. “On Waves, Clusters and Diffusion: A Conceptual Framework” Annals of the American Academy of Political and Social Science, 598: 33-51.

Estevadeordal, Antoni & Caroline Freund & Emanuel Ornelas, 2008. "Does Regionalism Affect Trade Liberalization toward NonMembers?," The Quarterly Journal of Economics, MIT Press, vol. 123(4), pages 1531-1575, November

Ethier, Wilfred J. 1998. "Regionalism in a Multilateral World," Journal of Political Economy, University of Chicago Press, vol. 106(6), pages 1214-1245, December

Hyun, JT and K Whitmore (1989) “Japanese direct foreign investment: Patterns and implications for developing countries” Washington DC, World Bank, Industry Series 1, Feb.

Inui, T., Matsuura, T. and Poncet, S. (2008) The Location of Japanese MNC affiliates: agglomeration, spillovers and firm heterogeneity, The Institute of Economic Research, Hitotsubashi University, Discussion Paper Series A No.506

Kimura, Fukunari. (2003) “Development Strategies for Economies under Globalisation: Southeast Asia as a New Development Model.” In Tran Van Hoa and Charles Harvie, eds., New Asian Regionalism: Responses to Globalisation and Crises, London: Palgrave

Krishna, Pravin & Mitra, Devashish, 2005. "Reciprocated unilateralism in trade policy," Journal of International Economics, Elsevier, vol. 65(2), pages 461-487, March

Lamy, P., H. Dieter, J. Defraigne and R. Higgott (2006), ‘Report on East Asian Integration: Opportunities and Obstacles for Enhanced Economic Co-operation’, (Paris: Notre Europe).

Mehmet, Ozay and Tavakoli, Akbar (2003) 'Does foreign direct investment cause a race to the bottom?', Journal of the Asia Pacific Economy,8:2,133 — 156

Mendoza, Enrique G. and Linda L. Tesa (2005) Why hasn’t tax competition triggered a race to the bottom? Some quantitative lessons from the EU, Journal of Monetary Economics, Volume 52, Issue 1, January 2005, Pages 163-204

Richardson, Martin (2001) Unilateral Liberalisation in a Multilateral World, University of Otago Economics Discussion Papers No. 0102, February 2001

Sally, Razeen (2008) Globalisation and the Political Economy of Trade Liberalisation in the BRIICS, working paper

Swank, Duane (2006) "Tax Policy in an Era of Internationalization: An Assessment of a Conditional Diffusion Model of the Spread of Neoliberalism." International Organization, November.

Tejima, S. (1992) “Japanese FDI in the 1980s and its prospects in the 1990s”, EXIM review, Jul.

The Economist, Beyond beaches and palm trees, Oct 18th 2008 print edition

World Bank (2005) Global economic prospects 2005: Trade, Regionalism and Development, Washington, D.C.

Appendix - Building the *spatial* matrix (*One period, one product case)*

Consider the tariff vector at time t $\tau_t = \begin{bmatrix} \tau_{i_t} \\ \vdots \\ \vdots \\ \vdots \\ \tau_{nt} \end{bmatrix}$

where τ_{it} is the applied average MFN tariff of country i at time t.

The first prediction of the race-to-the-bottom theory is that tariffs follow their competitors’ only if the latter were lower. Hence, I define W_1 as a matrix that gives weight only to competing countries’ tariffs that are lower. To compute W_1 I first define Γ, a column vector

one ones, as $\Gamma = \begin{bmatrix} 1 \\ \vdots \\ \vdots \\ \vdots \\ 1 \end{bmatrix}$, I then compute $\Gamma' \otimes \tau_{t_{-1}} - \Gamma \otimes \tau'_{t_{-1}}$ which gives a skew-symmetric matrix whose elements are the differences in tariffs between countries:

$$\begin{bmatrix} 0 & \tau_{it-1} - \tau_{jt-1} & \vdots & \tau_{it-1} - \tau_{nt-1} \\ \tau_{jt-1} - \tau_{it-1} & 0 & \vdots & \vdots \\ \vdots & \vdots & 0 & \vdots \\ \tau_{nt-1} - \tau_{it-1} & \vdots & \vdots & 0 \end{bmatrix}$$

To obtain W_1, I replace negative values, which correspond to a higher tariff in competing countries, with zero, and I replace positive values with ones. For example, if $\tau_{i_{t-1}} > j_{jt-1}$ and $\tau_{i_{t-1}} < \tau_{nt-1}$,

$$W_1 = \begin{bmatrix} 0 & 1 & \vdots & 0 \\ 0 & 0 & \vdots & \vdots \\ \vdots & \vdots & 0 & \vdots \\ 1 & \vdots & \vdots & 0 \end{bmatrix}.$$

The second prediction of the theory is that Japanese FDI employment in competing countries is seen as "lost" employment, creating FDI jealousy. Hence I build W_2 whose elements contain the amounts of Japanese FDI employment in each country.

$$W_2 = \begin{bmatrix} FDI_{i\,t-1} & FDI_{j\,t-1} & \vdots & FDI_{nt-1} \\ \vdots & \ddots & \vdots & \vdots \\ \vdots & \vdots & \ddots & \vdots \\ FDI_{i\,t-1} & \vdots & \vdots & FDI_{nt-1} \end{bmatrix}$$

Finally, since countries at similar levels of development might compete more intensively at the tariff level, I also construct W_3, whose elements are the inverted absolute GDP per capita differences between countries.

$$W_3 = \begin{bmatrix} 0 & \vdots & \vdots & \left|GDPPC_{it-1} - GDPPC_{nt-1}\right|^{-1} \\ \left|GDPPC_{jt-1} - GDPPC_{it-1}\right|^{-1} & 0 & \vdots & \vdots \\ \vdots & \vdots & 0 & \vdots \\ \vdots & \vdots & \vdots & 0 \end{bmatrix}$$

The *spatial* weighting matrix can thus be computed as the row-standardized sum of the Hadamard product of W_1 and the sum of W_2 and W_3, i.e. $W= (W_1 \circ (W_2 + W_3))$. τ_{it} will therefore be regressed on the row-normalized form of

$$\left(\sum_{j \neq i; \tau_j < \tau_i}^{n} \tau_{jt-1} * FDI\_employment_{jt-1} + \sum_{j \neq i; \tau_j < \tau_i}^{n} \tau_{jt-1} * \left| GDPPC_{it-1} - GDPPC_{jt-1} \right|^{-1} \right)$$