Importing under trade policy uncertainty: Evidence from China

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Abstract

This paper empirically explores imports' adjustment to reductions in trade policy uncertainty (TPU) considering that firms may face large sunk costs to purchase foreign goods. We investigate how product-level Chinese imports react to tariff binding connected to China's accession to WTO, through distinguishing both country-related margins and firm-related margins. Our main results suggest that a decline in TPU allows the access to a greater variety of foreign goods, associated also with a higher quality. At the same time, tariff binding leads more Chinese producers and trade intermediaries to start importing, allowing more firms and consumers to enjoy potential gains from imports. Finally, we document heterogeneous TPU effects across firms with different ownership, and products with different end use, revealing interesting insights in a context of global value chains.

Keywords: Trade policy uncertainty, Import behaviour, World Trade Organization, Tariff Binding, China.

JEL: D22, F13, F14.

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1. Introduction

It has been well established in international trade literature that firms need to pay large sunk costs to start exporting (Roberts and Tybout, 1997). Thus, uncertainty over future trade policies may postpone a firm's decision to enter foreign markets. One of the main principles underlying the World Trade Organization (WTO) is the predictability of national trade policies, which would imply a reduction in uncertainty, providing a better environment to make irreversible investments. An instrument to pursue trade policy predictability is binding tariff rates on goods, through which WTO members make enforceable commitments to do not increase *applied tariffs* above certain ceilings (*bindings*). Following the Uruguay Round in 1995, developed countries exhibited a higher share of product lines with bound tariffs than developing countries (99% versus 73%). Moreover, it is worth noting that despite tariff binding, a relevant uncertainty can still persist if the gap between bound and applied tariff (*binding overhang*) is relatively high. This discrepancy is quite common amongst developing countries, whereas in developed countries, applied rate and bound rate tend to be the same.

Recent studies have already highlighted that trade policy uncertainty (TPU) may affect negatively firm's export behaviour. Handley (2014) studies theoretically and empirically how TPU defers firm's entry in the export market (*delay*) and makes firms less sensitive to applied tariff cuts (*caution*). In particular, using product level data from Australia during 1991-2001 period, he estimates that foreign varieties' entry increases by 4% if applied tariffs are reduced to zero, and by 17% if tariffs are also bound by WTO commitments. Similar findings are also confirmed in a context of preferential trade agreements. Using firm-level data on Portuguese exports, Handley and Limão (2015) document that uncertainty reduction arising from Portugal's accession to the European Community (EC) in 1986 implied a significant increase in Portuguese exporting firms' entry to EC markets.

This paper aims at empirically exploring how trade policy uncertainty may influence firm's import behaviour – rather than export behaviour – given that previous works documented that firms also have to face large sunk costs to start importing. Therefore, we expect that the discussions above on TPU and firms' export decisions are even more pertinent for firms' import decisions, since they can imply irreversible changes in production technology, through incorporating foreign intermediate inputs.

Using Chinese (ordinary) trade transaction data during the period 2000-2006, we explore how tariff binding, arising from China's accession to WTO in December 2001, affects imports at the product level. We first make a country-related analysis, differentiating the product-level import value between the number of country-varieties (*country-extensive margin*) and the average imports per country-variety (*country-intensive margin*), focusing especially on the former margin, to check whether a reduction in Chinese TPU positively affects the entry of new foreign varieties in China. In line with Handley (2014)'s findings, our results suggest that following tariff binding, Chinese economy is able to access a greater range of foreign varieties, especially from developed countries, which are typically associated with high-quality. However, we find different results across product groups discerned according to their end use, suggesting that while worldwide firms' decisions to supply final and intermediate goods to China tend to be delayed by China's TPU; their decisions to supply capital goods actually are brought forward. Moreover, while consumers benefit from a greater variety of all foreign final varieties; firms would enjoy the access to both greater variety and higher quality of intermediate varieties.

Next, we carry out a firm-related analysis, differentiating the product-level import value between the number of importing firms (*firm-extensive margin*) and the average imports per firm (*firm-intensive margin*), focusing more on the former margin to see whether a reduction in Chinese TPU positively affects the entry of new Chinese firms in the import market. We document that tariff binding leads more firms to start importing a given product. This effect is confirmed for both production firms and trade intermediaries, and suggests that more Chinese manufacturing firms are able to import directly or indirectly foreign intermediate inputs, and therefore enjoy potential productivity gains from TPU reduction. In other words, it seems that TPU tends to delay firm's decision to import intermediate inputs. At the same time, we also find that TPU would hasten firm's decision to import capital goods. Finally, it appears that tariff binding pushes more foreign-owned manufacturing firms located in China to import intermediate inputs under ordinary trade regime – through which they are not obliged to re-exporting as in the case of processing trade regime – and more foreign-owned intermediaries to be involved in importing final varieties. These results suggest that FDI in China start becoming relatively more market-seeking than resource-seeking following Chinese TPU reduction: i.e. foreign multinationals tend to relocate relatively more the downstream stages of global value chains, rather than the upstream stages in China.

This work is complimentary to two recent studies on trade policy uncertainty and export behaviour in China, carried out respectively by Handley and Limão (2017) and Feng, et al., (2017). Handley and Limão (2017) show theoretically that TPU reduction can lead more firms start exporting and more incumbent exporters upgrade their technology, implying an increase in both number of exporters and the average exports per firm. Then, using 6-digit product level data on Chinese exports to US, they show that uncertainty reduction arising from China's accession to WTO in 2001 implied a significant growth in Chinese exports to US market in the period 2000-2005. Feng, Li, and Swenson (2017) also study theoretically and empirically how Chinese exports to US are affected by reducing trade policy uncertainty following China's accession to WTO. More specifically, by using Chinese firm-product level data, they show that TPU reduction lead the entry of new firms in the export market, and the exit of some incumbent exporters. They also demonstrated that export-starters were associated with lower prices and higher quality than export-stoppers.[2] Unlike both studies, we focus on Chinese firm's import reaction to domestic TPU reduction in a context of multilateral trade rather than on Chinese export reactions to foreign TPU reduction in a context of bilateral trade (US-China), by exploiting the time-varying binding status of product lines rather than the *binding overhang*. It is worth noting that while our country-related results approximately confirm their findings, i.e. that a foreign country's TPU reduction leads more domestic varieties to enter the international market, which are mostly associated with higher quality, our firm-related analysis provides new interesting insights from import perspective in a context of global value chains.[3]

The rest of the paper is organized as follows. Section 2 describes the data used, giving information also about the context. Section 3 sets up the empirical strategy to explore the product level linkage between imports and trade policy uncertainty. Section 4 discusses the results, and Section 5 provides conclusion remarks.

[2] Mau (2017) shows that a reduction in US tariff uncertainty following China's WTO accession also positively affected China's exports to the European Union.

[3] Pierce and Schott (2016) already provide some evidence, amongst other results, that a reduction in domestic TPU can determine an increase in the number of importing firms at home, in addition to an increase in the number of exporting firms abroad. However, their work mainly focuses on the employment effects of a one-time change in domestic TPU in a developed country within a context of a bilateral trade relationship. In particular, they document that following a reduction in US's TPU respect to Chinese imports, arising from China's accession to WTO, led to relevant employment losses in US, in addition to higher imports from China.

2. Data

The analysis is based on a balanced panel of 4,090 6-digit HS manufacturing product lines during the period of 2000–2006. *Import* data are from the database of Chinese Customs Trade Statistics (CCTS), managed by the General Administration of Customs of China; *applied tariff* data are from the World Bank's World Integrated Trade Solution (WITS) database; and *bound tariff* data are from WTO's Consolidated Tariff Schedules database (CTS). We have also included data on non-tariff trade barriers (NTBs) from China's Protocol of the WTO accession available on the WTO's website.

The CCTS database contains all China's monthly trade transactions, but we focus only on imports. For each firm-product-country level import flow, the database provides information on total value, FOB unit value (in US dollars), quantity, and trade regime. It is also possible to distinguish firms according to their macro-sector status – i.e. between producers and trade intermediaries – and ownership – i.e. between foreign-owned (FORs) and domestic-owned firms, which are further split in state-owned (SOEs) and private-owned companies (DPRIVs). Since the main purpose of the paper is to investigate how tariff binding affects imports at the product-level, we dropped all observations concerning a specific trade regime different from the ordinary trade regime and collapsed the data at the 6-digit HS product-year level. Subsequently, the import data were merged with product-level data on applied tariffs, bound tariffs, and NTBs, and all observations where applied tariff was missing were dropped. Finally, we restricted our sample to the balanced panel of product lines.

2.1. Product-level Imports

Table 1 shows that a product on average exhibited an import value around 17.3 USD million in 2000, and was imported from 13 countries (country-extensive margin) with an average import value per country around 1.1 USD million (country-intensive margin), and by 104 Chinese firms (firm-extensive margin), with an average import value per firm around 0.34 USD million (firm-intensive margin). It is worth noting that the two-thirds of source countries were from OECD area. Moreover, about two-thirds of importing firms were producers, mostly foreign-owned and state-

owned firms, whereas the remaining share were trade intermediaries, almost exclusively state-owned firms.

During the period 2000-2006, the product-level import value drastically increased (by about 38.6 USD million), due to both country-related intensive and extensive margins. More specifically, a product was on average imported from additional three developed countries and three developing countries, which suggests an increase in variety of both high-quality goods and low-quality goods.[4] Import growth was also due to an increase in both firm-related intensive and extensive margins. In particular, the increase in the number of importing firms concerned relatively more producers than intermediaries. More specifically, a product on average seems to be imported by more additional private-owned producers (especially FORs) and private-owned trade agents (almost exclusively DPRIVs) and less by state-owned trade agents. These changes confirm the extension of trading rights to all firms, following China's accession to WTO, which allowed more easily both producers and final consumers located in China to access foreign varieties.

When distinguishing across product categories according to the end use, we can notice that the values documented above concern relatively more intermediate goods, as they represent the majority of product lines.[5] However, similar patterns are found for both final and capital goods, with slightly different magnitudes. Thus, more private-owned manufacturers located in China become able to access directly or indirectly – through the increasing presence of private trade intermediaries – a greater variety of both high-quality and low-quality foreign inputs following TPU reduction. This means that they can enjoy potential productivity gains and quality upgrading effects, implying an increase in consumers' welfare. At the same time, Chinese consumers also obtain a greater access to foreign final varieties of both high-quality and low-quality, implying additional potential welfare gains. Finally, it is worth noting that while the presence of state-owned intermediaries drastically fell in importing all product categories – especially, intermediate and capital goods – the number of state-owned importing producers slightly decreased for only final goods, and even increased for capital goods.

[4] Previous studies have highlighted that varieties from developed countries are more likely to have a higher quality than varieties from developing countries (Bas and Strauss-Kahn, 2015).
[5] More specifically, 64% of product lines are classified as intermediate goods, while final goods and capital goods represent only 21% and 15%, respectively.

Table 1 – Imports in China over the 2000-2006 period

	All products		Product categories by BEC classification					
			FINAL GOODS (N=1044)		INTERMEDIATE GOODS (N=2613)		CAPITAL GOODS (N=610)	
Variable	(N=4090) 2000	Change 2000-06	2000	Change 2000-06	2000	Change 2000-06	2000	Change 2000-06
Value of total imports	17.30	38.60	1.63	6.61	19.60	46.60	25.40	37.60
Average value of imports per country	1.11	1.38	0.11	0.26	1.26	1.53	1.80	2.10
Number of countries	13	6	12	8	13	6	14	6
Number of OECD countries	9	3	8	3	9	3	10	3
Number of non-OECD countries	4	3	4	5	4	3	4	3
Average value of imports per firm	0.34	0.29	0.04	0.08	0.38	0.34	0.60	0.40
Number of firms	104	127	57	68	112	135	135	176
Number of producers	66	101	32	38	75	111	77	143
Number of state-owned producers	*16*	*0*	*8*	*-1*	*16*	*0*	*27*	*2*
Number of foreign-owned producers	*40*	*82*	*17*	*27*	*48*	*94*	*36*	*110*
Number of domestic-private-owned producers	*1*	*26*	*1*	*17*	*1*	*26*	*1*	*40*
Number of intermediaries	38	26	25	30	37	24	58	33
Number of state-owned intermediaries	*33*	*-6*	*21*	*-1*	*33*	*-8*	*52*	*-9*
Number of foreign-owned intermediaries	*0*	*2*	*0*	*3*	*0*	*2*	*0*	*2*
Number of domestic-private-owned intermediaries	*0*	*33*	*0*	*30*	*0*	*31*	*0*	*44*

Notes: Values are expressed in USD millions. Source: Author's calculations using data on import transactions under ordinary trade regime from the database of Chinese Customs Trade Statistics (CCTS) managed by the General Administration of Customs of China.

2.2. Trade policy reforms

During the 1990s, China started to implement relevant unilateral measures of trade liberalization in order to become WTO member on December 11, 2001. Through the WTO accession protocol, China committed to apply the MFN duties to all WTO members, to bind and further reduce all tariff rates, to remove several non-tariff barriers, and to extend the trading rights to all firms. According to WTO's China Trade Policy Review (2006), China was implementing seriously all commitments, as scheduled by the protocol.

China's accession to WTO implied not only less uncertainty in exporting to China for World-wide firms, but also a decline in uncertainty in importing for Chinese firms from the rest of the World. It is worth noting that TPU uncertainty reduction occurred at the same time for all products exported from China, as becoming WTO member in 2001, China automatically benefitted from the existing binding status of all WTO members' tariffs. Conversely, reduction in TPU uncertainty occurred in different years for products imported by China, as it was required to gradually bind all tariffs across products over time.

According these WTO commitments, China bound tariffs for all product lines, but the year of ultimate implementation can be different across products along ten-year period after becoming WTO member. This means that the applied tariff was still allowed to be higher than the final bound tariff until the last year of scheduled implementation. **Table 2** shows that the final tariff binding entered in force only for 57.3% of 6-digit product lines upon China's accession to WTO (i.e. since year 2002). This share increases year after year until reaching 97.4% in 2006, i.e. the remaining share of product lines will be subject to final binding in the following years, but no later than 2010.

When splitting the sample between BEC[6] categories, we can notice that intermediate goods exhibited the highest binding share in 2002 (66.0%), followed by capital goods (54.3%), whereas final goods had the lowest binding share (32.6%). However, all BEC categories increased their binding share, reaching a similar status in 2006 (in the range of 96.7-99.2%). Therefore, it seems that protection through tariff uncertainty drastically decreases upon China's WTO accession relatively more for domestic intermediate good producers than for domestic final good producers. This would benefit relatively more the domestic downstream firms (and foreign upstream firms),

[6] BEC stands for Broad Economic Classification, which distinguishes goods considering their end-use in final goods, intermediate goods and capital goods.

as the number of foreign input varieties available will increase relatively more than the number of foreign competing final varieties. In other words, productivity gains from input varieties within downstream firms might be relatively larger than potential market shares losses arising from tougher foreign competition.

Table 2 – Tariff policy reforms in China over the 2000-2006 period: Tariff binding and Applied tariffs

	2000	2001	2002	2003	2004	2005	2006
Applied tariff							
All goods	0.162	0.151	0.118	0.108	0.099	0.095	0.095
Final goods	0.252	0.229	0.195	0.177	0.159	0.150	0.150
Intermediate goods	0.135	0.126	0.097	0.089	0.082	0.079	0.079
Capital goods	0.152	0.147	0.102	0.092	0.086	0.085	0.085
Binding							
All goods	0	0	0.573	0.659	0.835	0.971	0.974
Final goods	0	0	0.326	0.376	0.673	0.992	0.992
Intermediate goods	0	0	0.660	0.727	0.865	0.962	0.967
Capital goods	0	0	0.543	0.764	0.938	0.980	0.980

Notes: Both *applied tariff* rates and the shares of product lines subject to *binding* are expressed in decimals. Source: Author's calculations using data on MFN applied tariffs from World Bank's WITS database, and bound tariff data are from WTO's Consolidated Tariff Schedules database.

As regards applied tariffs, intermediate goods exhibited the lowest applied tariff rate in 2000 (13.5%), followed by capital goods (15.2%), whereas final goods had the highest tariff rate (25.2%). However, all BEC categories declined their tariff rates, almost halving their initial levels in 2006. It is worth noting that while tariffs on final goods constantly decreased over time until 2005 and then remained constant, the decline of tariffs on both intermediate goods and capital goods was more evident upon WTO accession in 2002. Therefore, coherently with the previous discussion, it seems that protection through applied tariffs drastically decreases upon China's WTO accession relatively more for intermediate good production than the final one at home.

3. Empirical strategy

This section aims at exploring the product-level linkage between imports and trade policy uncertainty, by accounting also for changes in applied tariffs. Our baseline specification is given by:

$$\ln(M_{pt}) = \beta_1 Binding_{pt-1} + \beta_1 Tariff_{pt-1} + D_p + D_t + \varepsilon_{pt} \quad (1)$$

where M_{pt} stands for the import outcome for product *p* and year *t*; $Binding_{pt-1}$ is a dummy variable taking value one if the product *p* is subject to the ultimate bound tariff in year *t-1*, and zero otherwise; $Tariff_{pt-1}$ represents the simple average of applied MFN tariff rate of product line *p* in year *t-1*; ε_{pt} is the classical error term. Notice that we also include both product and year fixed effects to control time-invariant product characteristics and common macroeconomic shocks across products. In subsequent specifications, we also include additional control variables, i.e. dummy variables that reflect the presence of non-tariff import barriers (NTBs) for each product *p* in a given year *t*. [7] All standard errors are corrected for clustering at the product level. Notice that our explanatory variables are lagged by one year respect to the dependent variable as import reactions to trade policy changes may be not immediate. Moreover, potential reverse causality problems are reduced, although several works documented that trade policy reforms in China, especially during the WTO accession period, were unlikely to be endogenous, as China's willingness to become a market economy was going beyond the interests of specific groups (Branstetter and Lardy 2008).[8] Indeed, CTPR (2006) documents that China was able to implement all trade policy reforms, as scheduled by the WTO accession Protocol, including tariff binding.

[7] NTB variables are: $quota_{pt-1}$ is a dummy variable taking value one if the product *p* includes at least one 8-digit-HS product subject to the import quota in the year *t−1*; $tendering_{pt-1}$ is a dummy assuming value one if the product *p* includes at least one 8-digit-HS product subject to import tendering in the year *t −1*; and $license_{pt-1}$ is a dummy variable taking value one if the product category *p* includes at least one 8-digit-HS product subject to the import license only in the year *t −1*. All NTB variables are based on the information from the WTO accession protocol of China.

[8] Several empirical studies showed that changes in tariffs or non-tariff barriers were quite exogenous in China, i.e. unlikely to be influenced by sectors' performance or lobbying activities (Brandt, et al., 2017; Bas and Strauss-Kahn, 2015; Imbruno, 2016).

Table 3 - Product-level import changes from tariff binding: country-extensive and country-intensive margins

Dependent variables (log) at time *t*	Value of imports	Average value of imports per country	Number of countries	Value of imports	Average value of imports per country	Number of countries	Number of OECD countries	Number of non-OECD countries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Binding $_{t-1}$	0.066***	0.054***	0.013**	0.066***	0.053***	0.014**	0.017***	0.005
	(0.020)	(0.019)	(0.006)	(0.020)	(0.019)	(0.006)	(0.006)	(0.009)
Tariff $_{t-1}$	-0.910***	-0.446*	-0.463***	-1.016***	-0.585**	-0.431***	-0.570***	-0.318***
	(0.285)	(0.248)	(0.090)	(0.293)	(0.250)	(0.090)	(0.090)	(0.118)
NTB dummies	NO	NO	NO	YES	YES	YES	YES	YES
Product Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	24,540	24,540	24,540	24,540	24,540	24,540	24,360	23,218
R-squared	0.211	0.146	0.172	0.212	0.148	0.174	0.097	0.184
Number of 6-digit products	4,090	4,090	4,090	4,090	4,090	4,090	4,087	4,071

Notes: Standard errors (in parentheses) are corrected for clustering at the product level. Significance at *** p<0.01, ** p<0.05, * p<0.1. Sources: Author's calculations using data from the database of Chinese Customs Trade Statistics (CCTS) managed by the General Administration of Customs of China; World Bank's WITS database; WTO's Consolidated Tariff Schedules database and China's Protocol of the WTO accession available on the WTO's website.

4. Results

This section shows the results related to the specification (1), by analysing alternatively the country-related margins and the firm-related margins of imports (in Section 4.1, and 4.2, respectively). We first explore how home TPU influences the number of country-varieties available within each product line and/or the average imports per country-variety. Then, we also investigate whether domestic TPU also affects the number of importing firms within each product line and/or average imports per firm.

4.1. Country-analysis of product-level imports and trade policy uncertainty

Following the previous discussions on how foreign trade policy uncertainty affects export value and their margins, we expect that a reduction in Chinese trade policy uncertainty should allow China to increase its imports, through an increase in both the number of imported varieties and the average imports per variety, due to the presence of sunk costs faced by foreign exporters (Handley, 2014; Handley and Limão, 2017).

It is worth noting that in our context, a foreign variety refers to 6-digit product/origin country pair, as Handley (2014)'s approach. Consequently, when distinguishing the product-level import value in the number of imported varieties and the average imports per variety, we are essentially disentangling between the number of origin-countries (*country-extensive margin*) and the average imports per origin-country (*country-intensive margin*).

The first three columns of **Table 3** show that tariff binding has a positive effect on product-level import value (by about 6.6%), through an increase in both country-intensive and country-extensive margins (by about 5.3% and 1.4%, respectively). Thus, domestic TPU reduction allows Chinese economy to access additional foreign varieties, as well as purchase more of each foreign variety. The results on country-intensive margin are coherent with and complimentary to Handley and Limão (2017)'s findings, which document that product-level Chinese export value to US drastically increased following a reduction in US trade policy uncertainty. It is worth noting that, like in their evidence, we are not sure whether the domestic TPU reduction really implies the entry of new firm-varieties from a foreign country, as we cannot disentangle the number of firms exporting to China,

and their average export sales. However, unlike Handley and Limão (2017) that focus on US's *bilateral* imports from China, we consider China's *multilateral* imports from all countries, therefore we are able to show further that a reduction in home TPU entails an increase in the number of source countries at the product-level, which reflects without any doubt the entry of new imported firm-varieties to the domestic market. Therefore, our results also confirm other studies' findings that focus more on the firm-extensive margin of exports, which document that a foreign TPU can delay firm's decision to export (Handley, 2014; Handley and Limão, 2015). Applied tariff liberalization effect on import value and the related margins is also positive and statistically significant, coherently with our expectations. These results are robust when including non-tariff trade barriers (NTBs) dummies as additional controls, as displayed in columns 4-6.

In the last two columns (7 and 8), we focus on the extensive margin by discriminating between OECD and non-OECD countries, to see whether TPU effect concerns relatively more suppliers from developed or developing economies. We expect that tariff binding has a larger effect for the former countries, as China was more likely to be involved in a tariff war with advanced economies (such as US and EU) rather than with developing countries. Indeed, our results show that while a reduction in applied tariff leads an increase in the number of country-varieties from both OECD and non-OECD areas, tariff binding allows the access to a greater number of OECD-varieties only. To the extent that products from OECD are associated with higher quality, we can reach the conclusion that a reduction in home trade policy uncertainty leads China to access more varieties of high quality. These results are therefore coherent with and complementary to Feng, et al. (2017)'s findings, which document that TPU reduction arising from China's accession to WTO implied an increase in quality of Chinese exported varieties. Combining our results with theirs, it is possible that trade policy uncertainty reduction allowed Chinese firms to upgrade the quality of their exported varieties, through improving the access to high-quality goods from abroad, either imported final varieties (learning/competition channel) or intermediate varieties (input channel).

In Table 4, we discriminate the tariff binding effect between final goods, intermediate goods and capital goods, following the BEC classification. First, the effects documented above are strongly confirmed for intermediate goods – even with a larger magnitude – and slightly less evident for final goods – as when splitting the extensive margin between OECD and non-OECD, tariff binding's coefficients become statistically non-significant. Therefore, while Chinese final

consumers seem to enjoy greater variety of foreign final goods owing to tariff binding, Chinese producers seem to benefit from both greater variety and better quality of foreign intermediate inputs. These results would suggest that potential quality upgrading of Chinese exported varieties was more likely to occur through the improved access to high-quality intermediate varieties, rather than learning/competition effects from high-quality competing final varieties.

Table 4 - Country-extensive margins of imports and tariff binding: final, intermediate, and capital goods

Dependent variables (log) at time *t*	Value of imports	Average value of imports per country	Number of countries	Number of OECD countries	Number of non-OECD countries
	(1)	(2)	(3)	(4)	(5)
Binding $_{t-1}$ **Final good*	0.089***	0.070**	0.018*	0.015	0.023
	(0.033)	(0.030)	(0.011)	(0.011)	(0.015)
Binding $_{t-1}$ **Intermediate good*	0.130***	0.102***	0.028***	0.031***	0.006
	(0.024)	(0.022)	(0.008)	(0.008)	(0.011)
Binding $_{t-1}$ ** Capital good*	-0.199***	-0.156***	-0.044***	-0.031***	-0.029*
	(0.035)	(0.032)	(0.011)	(0.011)	(0.016)
Tariff $_{t-1}$	-1.093***	-0.643**	-0.450***	-0.601***	-0.303**
	(0.299)	(0.253)	(0.092)	(0.092)	(0.119)
NTB dummies	YES	YES	YES	YES	YES
Product Fixed Effects	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES
Observations	24,492	24,492	24,492	24,312	23,175
R-squared	0.218	0.153	0.176	0.099	0.185
Number of 6-digit products	4,082	4,082	4,082	4,079	4,063

Notes: Standard errors (in parentheses) are corrected for clustering at the product level. Significance at *** p<0.01, ** p<0.05, * p<0.1.
Sources: Author's calculations using data from the database of Chinese Customs Trade Statistics (CCTS) managed by the General Administration of Customs of China; World Bank's WITS database; WTO's Consolidated Tariff Schedules database and China's Protocol of the WTO accession available on the WTO's website.

Interestingly, we find opposite results for capital goods, tariff binding implies a decline in product-level imports, in terms of both intensive and extensive margins, and the reduction in variety of foreign capital goods concerns both OECD and non-OECD areas. This dissimilarity respect to the other BEC product categories may be linked to the difference in the nature of goods: while the consumption in foreign final and intermediate goods requires importing periodically and systematically every year, the consumption of capital goods is associated with less import frequency, since capital goods are long-run investments. Therefore, it seems that China's trade policy uncertainty tended to delay World-wide firms' decisions to export final and intermediate goods to China, and hasten their decisions to export capital goods.

4.2. Firm-analysis of product-level imports and trade policy uncertainty

Previous literature well documented that the access to foreign intermediate inputs enhances firm productivity, through variety, quality and learning channels (Schor, 2004; Amiti and Konings, 2007, Goldberg, et al. 2010). More recent works highlighted that only a small number of firms are able to import intermediate inputs because of large sunk fixed costs of importing (Kasahara and Rodrigue, 2008; Kasahara and Lapham, 2013). Similar discussions are valid not only for producers involved in importing intermediate goods, but also for other kinds of firms (trade intermediaries) and goods (capital and final goods). Indeed, manufacturing firms may use both capital goods and final goods from abroad as inputs in their production process, and trade intermediaries can also face some sunk fixed costs of importing intermediate goods, final goods, and capital goods on behalf of both producers and final consumers.

Thus, this section aims at exploring whether tariff binding affects product-level import value, through the number of importing firms (firm-extensive margin) and the average imports per firm (firm-intensive margin). As regards the former margin, we also check whether there is any firm heterogeneity linked to the macro-sector status and the ownership status: i.e. whether tariff binding differently affects the number of importing producers and importing intermediaries, as well as the number of state-owned firms, foreign-owned firms and private-domestic-owned firms involved in import activities.

The columns 1-3 of **Table 5** show that tariff binding positively affects product-level import value (by about 6.6%), through an increase in both firm-intensive and firm-extensive margins (by about 3.7% and 3.0%, respectively). Thus, Chinese TPU reduction allows more Chinese firms to enter the import markets, as well as more foreign purchases per (incumbent) importing firm. Similar effects are found from a reduction in applied tariffs, coherently with our expectations. These results are robust to the inclusion of NTB controls (columns 4-6).

When discriminating the extensive margin by considering the macro-sector of firms, i.e. between the number of importing producers and the number of importing intermediaries, we can see that both TPU reductions and applied tariff cuts generate positive effects for both firm groups.

Table 5 - Product-level imports changes from tariff binding: firm-extensive and firm-intensive margins

Dependent variables (log) at time *t*	Value of imports	Average value of imports per firm	Number of firms	Value of imports	Average value of imports per firm	Number of firms	Number of producers	Number of intermediaries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Binding $_{t-1}$	0.066***	0.038**	0.029***	0.066***	0.037**	0.030***	0.028***	0.022**
	(0.020)	(0.017)	(0.008)	(0.020)	(0.017)	(0.008)	(0.009)	(0.010)
Tariff $_{t-1}$	-0.910***	-0.384*	-0.525***	-1.016***	-0.495**	-0.521***	-0.479***	-0.909***
	(0.285)	(0.218)	(0.151)	(0.293)	(0.221)	(0.155)	(0.147)	(0.192)
NTB dummies	NO	NO	NO	YES	YES	YES	YES	YES
Product Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Observations	24,540	24,540	24,540	24,540	24,540	24,540	24,322	23,970
R-squared	0.211	0.098	0.275	0.212	0.099	0.276	0.329	0.101
Number of 6-digit products	4,090	4,090	4,090	4,090	4,090	4,090	4,089	4,089

Notes: Standard errors (in parentheses) are corrected for clustering at the product level. Significance at *** p<0.01, ** p<0.05, * p<0.1. Sources: Author's calculations using data from the database of Chinese Customs Trade Statistics (CCTS) managed by the General Administration of Customs of China; World Bank's WITS database; WTO's Consolidated Tariff Schedules database and China's Protocol of the WTO accession available on the WTO's website.

Table 6 - Firm-extensive margins of imports and tariff binding: production firms versus intermediaries firms

Dependent variables (log) at time *t*	Number of state-owned producers	Number of foreign-owned producers	Number of domestic-private-owned producers	Number of state-owned intermediaries	Number of foreign-owned intermediaries	Number of domestic-private-owned intermediaries
	(1)	(2)	(3)	(4)	(5)	(6)
Binding $_{t-1}$	0.020*	0.045***	-0.025*	0.003	0.094***	0.062***
	(0.012)	(0.010)	(0.014)	(0.011)	(0.034)	(0.015)
Tariff $_{t-1}$	-0.317*	-0.372**	-0.707***	-0.593***	0.298	-0.808***
	(0.169)	(0.153)	(0.214)	(0.174)	(0.428)	(0.220)
NTB dummies	YES	YES	YES	YES	YES	YES
Product Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES
Observations	21,956	23,562	19,364	23,591	5,712	18,727
R-squared	0.095	0.348	0.678	0.185	0.532	0.739
Number of 6-digit products	4,058	4,076	4,007	4,083	2,519	3,976

Notes: Standard errors (in parentheses) are corrected for clustering at the product level. Significance at *** p<0.01, ** p<0.05, * p<0.1. Sources: Author's calculations using data from the database of Chinese Customs Trade Statistics (CCTS) managed by the General Administration of Customs of China; World Bank's WITS database; WTO's Consolidated Tariff Schedules database and China's Protocol of the WTO accession available on the WTO's website.

However, it is worth noting that while tariff liberalization benefits drastically more the entry of trade intermediaries to the import market than producers, tariff binding impact is slightly larger for the latter firms (2.8% versus 2.2%), suggesting that manufacturing firms have more incentive to start directly importing following TPU reduction. This is not surprising, as trade intermediaries are usually less-risk averse than producers, due to their greater diversification of the import markets across sectors and countries.

When exploring the ownership status in **Table 6**, we can see that the positive binding effect is confirmed for both foreign-owned (with even larger magnitude) and state-owned producers, whereas the number of domestic-private importing producers appears to shrink following TPU reduction. In compensation, the latter would benefit relatively more from applied tariff reductions than the other producers. Therefore, it seems that foreign-owned manufacturing firms were relatively more risk-averse to start importing than domestic-private ones, and tariff binding would reallocate foreign goods from private-owned to foreign-owned producers. This might be a signal that a TPU reduction leads more foreign-owned producers located in China to serve the local market (importing more under ordinary regime), rather than simply assembling the final output for the global market (importing more under processing regime). As regards trade intermediaries, while tariff liberalization leads more non-foreign-owned intermediaries to enter the import markets (especially private ones), tariff binding allows more non-state-owned intermediaries to start importing (especially foreign ones). Thus, it seems that TPU reduction attracts more FDI in trade services sector.

When examining the end-use nature of goods (**Table 7**), we notice that following tariff binding, product-level import value increases through both firm-intensive and firm-extensive margins for intermediate goods only. Indeed, final good imports increase only through the intensive margin, whereas capital good imports decrease through both margins. Therefore, it seems that TPU reduction allows more Chinese firms to enjoy potential gains from trade in intermediate inputs, reducing however potential gains from importing capital goods across firms. These results confirm the hypothesis that TPU tends to postpone firm's decision to purchase foreign intermediate inputs and brings forward firm's decision to invest in foreign capital goods.

Table 7 - Firm-extensive margins of imports and tariff binding: final, intermediate, and capital goods

VARIABLES	Value of imports	Average value of imports per firm	Number of firms	Number of producers	Number of state-owned producers	Number of foreign-owned producers	Number of domestic-private-owned producers	Number of intermediaries	Number of state-owned intermediaries	Number of foreign-owned intermediaries	Number of domestic-private-owned intermediaries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Binding $_{t-1}$ **Final good*	0.089***	0.090***	-0.001	-0.016	-0.081***	0.005	-0.047*	0.053***	-0.014	0.115**	0.023
	(0.033)	(0.028)	(0.015)	(0.017)	(0.020)	(0.019)	(0.024)	(0.017)	(0.017)	(0.057)	(0.024)
Binding $_{t-1}$ **Intermediate good*	0.130***	0.064***	0.066***	0.054***	0.072***	0.030**	0.010	0.053***	0.038***	0.058	0.102***
	(0.024)	(0.021)	(0.010)	(0.011)	(0.014)	(0.012)	(0.017)	(0.012)	(0.013)	(0.039)	(0.019)
Binding $_{t-1}$ ** Capital good*	-0.199***	-0.144***	-0.055***	0.003	-0.017	0.159***	-0.103***	-0.136***	-0.097***	0.245***	-0.003
	(0.035)	(0.028)	(0.017)	(0.017)	(0.021)	(0.019)	(0.027)	(0.019)	(0.019)	(0.071)	(0.031)
Tariff $_{t-1}$	-1.093***	-0.487**	-0.606***	-0.552***	-0.490***	-0.359**	-0.795***	-0.943***	-0.670***	0.427	-0.906***
	(0.299)	(0.221)	(0.163)	(0.153)	(0.173)	(0.155)	(0.217)	(0.200)	(0.182)	(0.438)	(0.228)
NTB dummies	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Product Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	24,492	24,492	24,492	24,274	21,914	23,531	19,339	23,924	23,545	5,706	18,713
R-squared	0.218	0.103	0.280	0.332	0.100	0.351	0.679	0.107	0.188	0.534	0.740
Number of 6-digit products	4,082	4,082	4,082	4,081	4,050	4,068	3,999	4,081	4,075	2,518	3,972

Notes: Standard errors (in parentheses) are corrected for clustering at the product level. Significance at *** p<0.01, ** p<0.05, * p<0.1. Sources: Author's calculations using data from the database of Chinese Customs Trade Statistics (CCTS) managed by the General Administration of Customs of China; World Bank's WITS database; WTO's Consolidated Tariff Schedules database and China's Protocol of the WTO accession available on the WTO's website.

Furthermore, intermediate goods seem to be imported by more producers (i.e. SOEs and FORs) and more intermediaries (i.e. SOEs and PRIVs), while final goods are imported by more trade agents (i.e. FORs) and less domestic producers (i.e. SOEs and PRIVs). These results further confirm that: *a)* more manufacturing firms are able to import directly or indirectly foreign intermediates, and therefore enjoy potential productivity gains; *b)* more foreign multinationals tend to be market-seeking rather than simply resource-seeking in China (considering the drastic increase in both inward FDI in manufacturing firms associated with importing intermediate inputs under ordinary regime, and inward FDI in distribution firms associated with importing final goods). Finally, the considerations made on imports of capital goods actually concern only domestic firms (i.e. domestic-private owned producers and state-owned trade agents), given that more foreign firms (both producers and trade agents) buy foreign capital goods following TPU reduction.

5. Conclusion

Trade policy uncertainty (TPU) plays an important role in firm's decisions to trade. Recent works have already stressed that firms face sunk fixed costs of exporting, and showed that reducing the fear that trade tariffs may suddenly increase without any limit, firms have more incentive to start exporting. Unlike the existing literature, we focus on import rather than export behaviour, considering that firms also need to pay sunk fixed costs of importing foreign goods, so that TPU reduction may affect firm's decisions to be involved in different stages of global value chains.

Analysing product-level Chinese import adjustments to tariff binding during the period 2000-2006, as scheduled by the China's WTO accession protocol (entered in force in December 2001), our baseline results show that Chinese economy can access more foreign varieties, especially from developed countries, which are typically associated with high-quality. We have also found that tariff binding leads foreign products to be imported by more Chinese firms, involved in either manufacturing production or trade intermediation services, extending potential gains from imports amongst more producers and final consumers located in China.

We have also documented heterogeneity across products associated with different end-use. Our findings suggest that tariff binding in China allows more manufacturing firms to access a greater variety of intermediate inputs, associated also with high-quality, which could partially explain

productivity gains and quality upgrading from trade liberalization documented by former evidences. However, we find opposite results when considering capital goods, which suggest that TPU tends to delay firm's decision to import intermediate inputs, and hasten firm's decision to import capital goods.

Finally, our results highlight that tariff binding pushes more foreign-owned firms located in China to being more market-seeking, rather than resource-seeking. In other words, a decline in Chinese TPU allows multinationals to relocate relatively more the downstream stages of global value chains in China, rather than the upstream stages.

These new stylized facts may represent a call for more future research on trade policy uncertainty and firm's import behaviour, to further explain potential welfare gains from reducing trade barriers.

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