Phase Out Tariffs, Phase In Trade?*

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Abstract

What causes U.S. trade with Mexico and Canada to continue growing faster, for up to a decade, relative to countries with which the U.S. does not have a free trade agreement? Baier and Bergstrand (2007) suggest that tariff phase-outs and delayed pass through of tariffs into import prices could cause such prolonged differential import growth. We examine how tariff cuts negotiated under the Canada-US Free Trade Agreement and North American Free Trade Agreement affected U.S. import growth in 1989–2016 using detailed product-level data on tariff stagings in the original treaties. We find essentially no evidence for the tariff phase-out or delayed pass through explanations.

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1 Introduction

Recently, the U.S., Canada and Mexico signed a revised version of the North American Free Trade Agreement (NAFTA) which is now set to be known, at least in the U.S., as the United States Mexico Canada Agreement (USMCA). This agreement was reached after the U.S. administration repeatedly threatened to terminate NAFTA if the U.S. did not obtain more favorable concessions from Canada and Mexico. After being signed in late 1992 by the three countries, NAFTA came into effect in 1994 and incorporates the earlier US-Canada Free Trade Agreement (CUSFTA) that was implemented in 1989. Being among the world's largest trade agreements, understanding the economic outcomes of NAFTA is important not only in the current political debate, but also for trade policy analysts and economists in general. Indeed, CUSFTA/NAFTA have been extensively studied to determine how FTAs affect their members' trade, output, prices, welfare, and more generally the winners and losers of globalization (e.g. Trefler (2004), Romalis (2007) and Caliendo and Parro (2015)).

However, a simple glance at how CUSFTA/NAFTA's trade flows have evolved over time reveals a well-known puzzle that, to the best of our knowledge, has not yet been addressed in the literature. Figure 1 plots cumulative growth of real U.S. imports from Mexico, Canada, and the Rest-of-the-World (ROW) as of CUSFTA's enforcement in 1989.[1] The figure reveals that U.S. imports from Mexico started growing more rapidly, and more rapidly relative to ROW, once NAFTA came into force in 1994 and this effect does not level off until the early 2010s. A similar story holds for U.S. imports from Canada, although the impact is much less pronounced and only lasts for about 15 years after NAFTA and largely disappears around the great trade collapse in the late 2000s. While the phenomenon of FTAs having delayed effects on trade flows goes back to Baier and Bergstrand (2007), there is no systematic evidence on the roots of why FTAs take so long to fully impact trade flows.

What explains these prolonged differential growth rates of real trade flows, long after

[1] ROW excludes China and countries with which the U.S. formed a free trade agreement over the sample period.

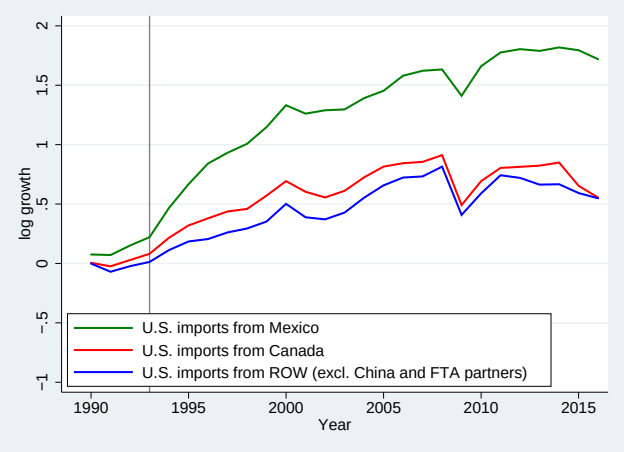


Figure 1: Cumulative real growth of U.S. imports from 1989.
Notes: Rest-of-the-World (ROW) excludes Canada (Mexico) for Mexico (Canada) and countries with a U.S. FTA in the sample period. China is excluded from ROW. Vertical line marks the last year before NAFTA was implemented (1993). Import data from USITC, GDP deflators from World Bank Development Indicators.

CUSFTA/NAFTA came into effect? Baier and Bergstrand (2007) (pp.89-90) suggest two hypotheses. Their first hypothesis revolves around the observation that "... virtually every Free Trade Agreement (FTA) is 'phased-in,' typically over 10 years". They describe that the original EEC agreement of 1958 had a 10-year phase-in and that NAFTA had a similar 10-year provision. As such, one could naturally expect the impact of an FTA on trade flows to play out gradually over time as the FTA slowly removes bilateral tariffs. Their second hypothesis revolves around the possibility that changes in tariffs may only be passed through to lower prices gradually over time. If this is the case, one could again naturally expect the impact of an FTA on trade flows to play out over time as tariff cuts filter through to import prices. This paper, to the best of our knowledge, is the first to explore the relevance of the "tariff phase out" and "delayed pass through" hypotheses as explanations for the delayed impact of FTAs on trade flows.

To empirically examine why FTAs bring delayed growth of trade flows, we examine CUSFTA and NAFTA to determine how different types of tariff phase-outs affect trade flows and, as proxied by unit values, import prices. We do so by confronting the universe of U.S. product-level import data with detailed information about the tariff phase out staging categories originally agreed upon by the U.S. in the CUSFTA and NAFTA agreements.

We use a difference-in-difference-in-difference, or triple difference (DDD), approach from the applied microeconometrics literature dating back to Gruber (1994) who investigated the cost pass through of state-level health insurance mandates regarding maternity benefits on wages of married women. The DDD approach allowed Gruber (1994) to look at the wage impacts on married women in states with mandates vis-à-vis states without mandates and, to control for state specific shocks, relative to the wage impact on a control group of males in states with mandates vis-à-vis states without mandates. The DDD approach has been used more recently, for example, by Kellogg and Wolff (2008) to analyze the impact of daylight saving on electricity usage and Chetty et al. (2009) to examine the impact of tax-inclusive product pricing by supermarkets on consumer spending behavior.

The DDD approach applies naturally in our tariff phase out context. Essentially, our empirical strategy looks at import growth from NAFTA partners vis-à-vis the rest of the world for products whose tariffs are being phased out. But, to control for broader non-tariff related NAFTA effects, our empirical strategy looks at this import growth relative to import growth from NAFTA partners vis-à-vis the rest of the world for products whose tariffs are duty free both pre- and post-NAFTA. More generally, our approach allows us to flexibly control for a myriad of potentially confounding factors because we can use country-year fixed effects (to control for time varying demand and/or supply shocks in exporting countries), country-product fixed effects (to control for country-product specific characteristics such as revealed comparative advantage) and product-year fixed effects (to control for time varying shocks to global product demand and/or supply).

Our central finding is that there is no evidence to support the idea that tariff phase outs or delayed pass through effects can help explain the delayed growth in trade flows typically observed following FTA formation. We do find that products whose tariffs are being phased out grow more. And, comfortingly, the magnitude of the effects that we find, both across products within a country of different phase out duration and across countries for products with the same phase out duration, are consistent with differences in the actual

country-product specific tariff cuts embodied in NAFTA. However, the bulk of the delayed impact comes from products who immediately had their tariff cut to zero and, in the case of Mexico, had their product-level tariff-free access via the GSP program converted into permanent tariff-free access. This contrasts starkly with the expectation from the tariff phase out hypothesis that the bulk of delayed import growth should come from products whose tariff was phased out over 5 year or even 10 years. Further, we find no evidence of delayed pass through effects.

Given we find that neither tariff phase out nor delayed pass through of tariffs to import prices can explain the delayed import growth following NAFTA, what could be explaining this delayed import growth? We present evidence that frictions related to the extensive margin of trade are important, especially for import growth from Mexico. First, for products continuously imported from Mexico over the entire sample period, our overall finding is that NAFTA has very little effect on import growth. That is, the impact of NAFTA on import growth that we find in our baseline analysis, and the delayed impacts therein, are driven by products that were either not imported or only infrequently imported from Mexico before NAFTA. Second, regardless of the specific phase out category, all products see gradual growth in the number of U.S. customs districts that import a given product from Mexico. That is, regardless of the phase out category, Mexican firms making these products slowly start to sell to more places in the U.S. over time. Thus, it seems that building networks of distributors and customers when entering the U.S. market is a slow process that clouds differences in the length of a product's tariff phase out.

The remainder of this paper is structured as follows. Section 2 presents the related literature. Section 3 presents the data, including detailed discussion and description of how CUSFTA and NAFTA phased out tariffs. Section 4 explains our empirical strategy. Section 5 presents the results on the role of phased out tariff cuts, while section 6 presents the results on the role of delayed pass through of tariffs. Section 7 presents evidence on the role of frictions. Finally, Section 8 concludes.

2 Literature

According to Kowalczyk and Davis (1998), the practice of allowing for tariff phase-outs as opposed to full and immediate trade liberalization was first introduced in the General Agreement on Tariffs and Trade (GATT) negotiation rounds—especially during the 1960s and 1970s. While the phase-in periods were generally restricted to 5 years for Most Favored Nation (MFN) tariffs, trade agreements under Article XXIV GATT allowed for considerably longer "adjustment periods". It was only with the "Understanding on the Interpretation of Article XXIV GATT 1994" that parties agreed that the maximum phase-in period in trade agreements should in principle not last longer than 10 years (p. 7-10).

While phase-out tariffs have been familiar to trade economists for decades, incorporation of this practice in empirical work has, somewhat ironically, been delayed. In their seminal article, Baier and Bergstrand (2007) introduce "phase-in" effects for FTAs in the gravity model of international trade. One of their central arguments is that the trade liberalization embodied in FTAs is not immediately and fully effective upon its implementation. Instead, tariffs will only be gradually phased out over a 5-10 year period for most products. Baier and Bergstrand (2007) argue that empirical work with the gravity equation should therefore, in addition to the familiar contemporaneous binary FTA variable, also include one or more lagged FTA variables spanning the entire period in which the FTA will be phased in. In doing so for a sample of 96 countries covering 1960-2000, they find that "on average, an FTA approximately doubles two members' bilateral trade after 10 years" (Baier and Bergstrand (2007) p.74).

By now, inclusion of Baier and Bergstrand (2007)'s lagged FTA terms has become the standard in applied work (see, for example, Baier et al. (2014) and Kohl (2014)) and there is consensus that lagged FTA terms do indeed yield positive and statistically significant effects on bilateral trade for 5-10 years after the FTA enter into force. However, a striking limitation of these studies is that they do not explicitly demonstrate the causal relationship between product-level tariff phase-outs and product-level trade. A major drawback in this

regard is that the product staging categories are extremely detailed and cannot readily be incorporated in studies spanning multiple countries and FTAs. At best, the lagged FTA terms in aggregate studies can be *assumed* to capture the delayed trade growth stemming from tariff phase-outs, but cannot be interpreted as evidence of a causal relationship.

Another explanation for the delayed growth of FTA-induced trade is Baier and Bergstrand (2007)'s reference to "a large literature on delayed terms-of-trade effects" or, equivalently, a delayed pass through of tariff cuts to import prices. The most relevant paper we could find in this regard is McPheters and Stronge (1979). The authors review the literature on the so-called 'J curve', i.e. following a country's currency devaluation (akin to an improvement of the terms of trade following an import tariff reduction), the trade balance will temporarily deteriorate due to fixed short-term contracts before it improves. Consistent with earlier empirical work, their study confirms a lag between price changes and trade balance effects for 2-5 years. While the analogy is not entirely accurate in the context of phase-out tariffs, this literature suggests that a decrease in tariffs will only be followed by a relative change in trade flows after some delay.

More recent literature has explored how FTAs affect the terms of trade. For NAFTA Romalis (2007) finds only modest effects on prices, but does not specifically account for tariff stagings. Anderson and Yotov (2016) provide an extensive review of the growing literature on FTAs and terms of trade effects, finding slight improvements in the terms of trade for all NAFTA members and especially for Mexico. Yet, none of these papers shed light on the exact timing of when the delayed pass through should become effective. The existing literature also does not directly addresses the question whether and how tariff stagings in FTAs affect a country's import prices—a question that we address for CUSFTA and NAFTA.

3 Data

3.1 U.S. import data

For most of our analysis, we use product level U.S. import data from the USITC.[2] These data report bilateral U.S. imports at the 10-digit HS level from each foreign country over the period 1989-2016. The universe of such 10-digit bilateral import observations is $7,738,172$ when disaggregated by import program (e.g. NAFTA, GSP, etc.).We aggregate these 10-digit HS data to 8-digit HS data to match the product level staging categories in the NAFTA tariff schedules.

Before aggregation, we drop four types of observations. First, we drop the $5,371$ observations with an import program of "Unknown country" (0.005% of imports). Second, because our analysis will use unit values, we then drop the 3.69% of observations (8.7% of imports) where, at the exporter-year level, an 8-digit product is measured in different units (e.g. volume and weight) across observations. In all such cases, multiple 10-digit codes lie within a single 8-digit code. Third, again due to our use of unit values, we then drop the 0.9% of observations (0.003% of imports) where, at the exporter level, an 8-digit product is measured in different units across years. In all such cases, there are different 10-digit codes across years that lie within the given 8-digit code. Finally, we then drop the 0.006% of observations (0.003% of imports) with positive quantities even though the USITC quantity description says the product has no quantity dimension. Ultimately, this leaves $7,378,515$ observations.

3.2 Tariff schedules

3.2.1 CUSFTA and NAFTA

To ascribe the effect of tariff phase-outs on trade flows, we extract the product-level staging categories from the original and publicly available CUSFTA and NAFTA treaties. Each

[2]We use the import data provided by the USITC as "imports for consumption".

treaty contains a tariff schedule for each member. For CUSFTA, these tariff schedules are introduced and explained in Chapter 3: *Border Measures* by Article 401: *Tariff Elimination*, but separately attached as Annex 401.2 with the U.S. tariff schedule running 509 pages. For NAFTA, the tariff schedules are introduced in Chapter 4: *National Treatment and Market Access for Goods* by Annex 302.2: *Tariff Elimination of NAFTA*, but they are separately attached to Annex 302.2 with the U.S. tariff schedule running 734 pages. The tariff schedules contain the product-level staging categories that govern how each member phases out tariffs on the other member(s) upon NAFTA entering into force on January 1, 1994.

Table 1 describes these staging categories. As explained by NAFTA Annex 302.2(1), NAFTA contains five standard staging categories used by each NAFTA partner in their respective Annex 302.2 tariff schedule. Staging category A immediately cuts tariffs to 0 while staging category D reflects products that were already duty free pre-NAFTA and, hence, continue duty free post-NAFTA. The other three staging categories phase out tariffs over time in equal annual stages from the "base rate" which is defined as the USHTS Column 1 tariff on July 1, 1991, per General Note 2 of the U.S. tariff schedule in Annex 302.2. Staging category B does this over five years (i.e. a first cut on January 1, 1994, and duty free after the fifth cut on January 1, 1998) while staging categories C and C+ do this over 10 and 15 years respectively. For the U.S. tariff schedule, Columns (3)-(4) of Table 1 show the breakdown of HS8 products across these staging categories. 51.2% of products have their tariff immediately cut to 0 and a further 15.0% of products continue duty free. Additionally, 8.5% of products have a 10 year phase out while only 2.0% have a 5 year phase out and 0.8% have a 15 year phase out. From this perspective, the 10 year phase out products represent the main products that the U.S. actually phased out over time.

Unfortunately, the U.S. NAFTA tariff schedule often breaks a given 8-digit product into various sub-products identified by letters with sub-products having different staging categories. For example, 0707.00.50 represents Cucumbers imported during May-June or September-November but the U.S. tariff schedule assigns staging category C+ to 0707.00.50A

(defined as imports during May or October-November) but staging category B to 0707.00.50B (defined as imports during June or September). Table 1 shows "Mixed" products account for a non-trivial 12.7% of products in the U.S. tariff schedule.

In addition to the five standard staging categories and the "Mixed" category, members have member-specific staging categories. Annex 300-B of the NAFTA treaty governs textile and apparel goods and defines staging category B6 utilized by the US. Specifically, Appendix 2.1.B(b) of Annex 300-B explains that these B6 products have their tariff reduced on January 1, 1994, by "an amount equal, in percentage terms, to the base rate" and then in five equal annual stages beginning on January 1, 1995. Table 1 shows that B6 products represent 8.2% of products in the U.S. tariff schedule. The final staging category used by the U.S. is C10. Specified in the U.S. tariff schedule attached to Annex 302.2, these products have their tariff cut non-linearly to 0 over 10 years: a 20% cut on January 1, 1994, followed by eight equal annual cuts beginning on January 1, 1996. Table 1 shows such products account for only 0.8% of products. Ultimately, Columns (3)-(4) suggest that B6 and C products account for essentially all products, and equally so, where the U.S. phases out tariffs over time.

However, this view changes somewhat when looking at the distribution of total US imports, i.e. including imports from non-NAFTA countries, over the time period 1989-2016 across these staging categories. Columns (9)-(10) in Panel C of Table 1 show that 17.5% of imports fall in staging category C and only 2.7% and 0.8%, respectively, in B6 and B. Thus, 10 year phase outs account for the vast bulk of imports where the U.S. phases out tariffs over time. Additionally, relative to the product distribution in columns (3)-(4) of Panel B, staging category D becomes more important (21.1% of imports versus 15.0% of products) and staging category A less important (41.4% of imports versus 51.2% of products).

While the above discussion suggests that a products' tariff is phased out on U.S. imports from both Mexico and Canada in the same way, pre-NAFTA preferential arrangements of the U.S. with Canada and Mexico imply otherwise. First, Annex 302.2(12) states that the U.S. must apply a product-level tariff on Canada no higher than it specified in its CUSFTA

Annex 401.2 tariff schedule. That is, for U.S. imports from Canada, NAFTA can accelerate but not relax a product's CUSFTA tariff phase out. Second, Annex 302.2(2) states that the base rate for purposes of U.S. tariff phase outs must respect Mexico's status under the U.S. Generalized System of Preferences (GSP). Further, this requirement relates to Mexico's 1991 GSP status with its GSP status removed on January 1, 1994.[3] Since Mexican products eligible for the GSP program enter the U.S. duty free, any U.S. imports on GSP eligible products from Mexico therefore continued duty free after NAFTA.[4] These two features of pre-NAFTA U.S. preferential tariff policy have substantial implications for the allocation of products to staging categories.

In Table 1, columns (5)-(8) of Panel B and columns (11)-(14) of Panel C illustrate. For Mexico, 47.3% of products (accounting for 32.7% of US imports, including from non-NAFTA countries) were GSP eligible. However, the NAFTA U.S. tariff schedule assigns 85.2% of these GSP-eligible products to staging category A, with an immediate tariff cut to zero, and a further 13.4% of these GSP-eligible products to the "Mixed" staging category. In turn, Mexico's GSP eligibility reduces the share of Mexican products with their tariff immediately cut to 0 from a prima facie 51.2% (41.4% of U.S. imports) to 11.1% (18.1% of US imports) and also reduces the 12.7% (14.4% of US imports) of "Mixed" products to 6.3% (5.6% of U.S. imports). In terms of products where NAFTA phases out tariffs on products imported from Mexico over time, 17.3% of U.S. imports fall in staging category C while 2.7% and 1.2% fall in, respectively, B6 and C10 and less than 1% fall in, respectively, B and C+.

To understand the implications of CUSFTA for the U.S. NAFTA staging categories, Columns (1)-(2) of Table 1 first describe the U.S. CUSFTA tariff schedule. More simple than NAFTA, CUSFTA consisted of only the A, B, C and D staging categories. Similar to NAFTA, 15.1% of products continued duty free and 8.7% of products were "Mixed" (i.e. their 8-digit product split was into sub-products identified by letters and different staging

[3]See US CBP and Glick (2010, p.11).

[4]To establish Mexico's 1991 product level GSP eligibility, we use the 1991 USITC tariff data collected by John Romalis and described in Feenstra et al. (2002). This data has an 8-digit product indicator for GSP eligibility and also information on country-product specific exclusions from GSP eligibility.

categories). However, in stark contrast to NAFTA, only 3.7% of products had their tariff immediately cut to 0 while 26.7% and 45.9% of products faced, respectively, 5 and 10 year phase outs. Thus, the U.S. phased out tariffs over time for over 70% of products in CUSFTA.

These CUSFTA phase outs modify the prima facie U.S. NAFTA tariff phase outs on imports from Canada. Table 1 shows that the share of products having their tariff immediately cut to 0 basically falls in half, from 51.2% to 28.7% (from 41.4% of U.S. imports to 18.6%). Indeed, all of the affected products are reclassified as continue duty free: of these reclassifications, over 85% stem from a 5-year CUSFTA phase out implying the product became duty free on January 1, 1993, and nearly 15% stem from CUSFTA immediately cutting their tariff to 0 on January 1, 1989. Additionally, the share of "Mixed" products falls by 4.1 percentage points with these products reclassified as continue duty free because of, largely, 5-year CUSFTA phase outs. Overall, these changes triple the share of continue duty free products from 15% to 43.8% (21.1% to 60.6% of US imports).

CUSFTA also impacts the extent of NAFTA tariffs phased out over time. The vast majority of products receiving 10 year equal annual phase out under NAFTA also had the same staging category under CUSFTA. Thus, CUSFTA would have eliminated their tariffs as of January 1, 1999. In turn, these Canadian imported products face equal annual NAFTA cuts for 5 years beginning on January 1, 1994. This increases the share of staging category B products from 2% to 9% (0.8% to 5% of US imports) but reduces the share of C products from 8.5% to 1.1% (17.5% to 1% of US imports). Thus, in terms of products where NAFTA phases out tariffs on Canadian imports over time, 5% of U.S. imports fall in staging category B while 2.7% and 1% fall in, respectively, staging categories B6 and C. Ultimately, CUSFTA has non-trivial implications for the NAFTA staging categories applied

to Canadian imports.[5,6]

CUSFTA also has implications for the NAFTA tariff cuts received by Canada and Mexico. Given the CUSFTA tariff concessions received by Canada, its subsequent NAFTA tariff concessions are fairly moderate, especially compared to the tariff concessions received by Mexico. Table 2 shows that Canadian products with tariffs immediately cut to zero have an average tariff cut of 2.6% compared to 7.5% for Mexico. For products whose tariff is phased out over 5-6 years, the total tariff cut is around 5-6% for Canada versus around 9-13% for Mexico. In turn, the respective annual average tariff cuts are around 1% compared to around 2%. The 735 Mexican products whose tariff is phased out over 10 years enjoy a total tariff cut of 7.6%, or around 0.76% on average annually. Importantly, even though Mexico enjoys much larger tariff concessions than Canada, products with longer phase outs generally enjoy larger total tariff cuts but smaller annual tariff cuts.

3.2.2 Matching tariff schedules to trade data

Matching issues arise when merging the NAFTA staging category data with the 8-digit USITC import data. On one hand, 91 products from the NAFTA tariff schedule do not appear in the USITC trade data over our sample period of 1989-2016. Of these products, 76 come from Chapter 98 *Special Classification Provisions* and a further 11 come from dairy products in Chapter 4. These products are not included in Table 1; that is, Table 1 only includes products from the NAFTA tariff schedule that also appear in our USITC import

[5]Of the 66 products listed as having a "missing" staging category in Columns (3)-(4) of Table 1, 37 had a non-linear phase out that was not associated with a particular staging category. For example, 0703.90.00 represents "Leeks and other alliaceous vegetables" and had its tariff cut from a base rate of 25% to 14.4% on January 1, 1994, and then, essentially, had its tariff phased out over 5 equal annual cuts. A further 27 products were sets of articles (e.g. tools, textile ensembles, watch parts) where the staging category applied either to each individual item separately or the complete item specified elsewhere. For example, 6103.22.00 which represents "Men's or Boy's cotton suit ensembles". The final two products were articles re-entering after being sent abroad for further processing or assembly out of U.S. parts. For the value of imports here, the tariff applies as if the entire article itself was imported.

In CUSFTA, the 2 "missing" products were phased out in 3 equal annual cuts beginning January 1, 1989.

[6]When we construct Panel C of Table 1 using the number of observations at the exporter-product-year level rather than total imports aggregated from the exporter-product-year level, the distributions across staging categories looks extremely similar to those in Panel B. Thus, asymmetries between the distribution of imports and products across the staging categories drive the different distributions in Panels B and C.

data over our 1989-2016 sample period.

On the other hand, Table 3 shows that not all products in our USITC import data are in the NAFTA tariff schedule. Focusing on 1993 given NAFTA was signed in late 1992, Panel A shows 15 products are not in the U.S. tariff schedule out of the 8,690 products imported into the U.S. That is, 99.83% of imported products in 1993 appear in the U.S. tariff schedule. Panel B shows the match rate is 99.71% when looking at 1993 exporter-product observations and Panel C shows the match rate is 98.85% when looking at import values. These respective match rates are slightly lower in the pre-NAFTA years of 1989-1992. Of the 15 products in the 1993 USITC import data that are not in the NAFTA tariff schedule, five products are not even in the 1993 USHTS. One is a very particular type of citrus or melon peel. Two are particular organic amine-function chemical compounds. Two are particular types of wood doors. One is a type of iron or steel container normally carried by people in pockets or handbags. And, three are magnetic tape-type video recording or reproducing apparatus. As such, these omissions do not look like systematic attempts to exclude politically sensitive sectors or products from eventual tariff elimination.[7]

Naturally, the match rate between the NAFTA tariff schedule and USITC import data falls over time. First, the World Customs Organization (WCO) periodically updates HS codes at the 6-digit level (this happened in 1996, 2002, 2007 and 2012). Second, based on recommendations to the President, the USITC updates 10-digit HS codes each year. In the early post-NAFTA years, these USITC changes were substantial. Panel A of Table 3 shows the 99.83% pre-NAFTA match rate of 1993 falls to 94.42% in 1994 and 82.68% in 1995. Thereafter, the match rates decline noticeably only in years of WCO HS changes, declining to 68.43% in 2002, 62.70% in 2007 and 59.16% in 2012. Panels B and C of Table 3 show similar declines for exporter-product observations and import values. These facts motivate our desire to conduct analyses that focus on either HS codes that remain unchanged over time

[7]The five products not in the initial version of the 1993 USHTS are 2921.42.26, 2921.42.28, 9021.19.85, 9999.00.15 and 9999.95.00. The other 10 products are 0814.00.80 (peel); 2921.42.21, 2921.42.22 and 2922.50.11 (chemical compounds); 4418.20.40 and 4418.20.80 (wood doors), 7326.90.35 (iron or steel container); and 8521.10.30, 8521.10.60 and 8521.10.90 (video apparatus).

or concorded HS codes using an extended concordance based on Pierce and Schott (2012) that we do as robustness checks.

4 Empirical Strategy

Our aim is to identify how the U.S. phase out of product-level tariffs under NAFTA impacts its product-level imports from NAFTA partners. Two intuitive strategies come to mind immediately. First, one could look at phase out products and compare product-level imports from NAFTA partners versus the rest of the world (ROW). Intuitively, any differential import flows in this "NAFTA versus ROW" approach would reflect the tariff phase out on NAFTA partners. Second, one could look at imports from NAFTA partners and compare product-level imports for products whose tariff is phased out (phase out products) versus products whose tariff is zero both pre- and post-NAFTA (continue-duty-free products). Intuitively, any differential import flows in this "phase out versus continue-duty-free" approach would reflect the tariff phase out. However, each of these approaches is problematic.

Both the NAFTA versus ROW and phase out versus continue-duty-free approaches can be implemented as difference-in-difference (DD) specifications. However, the NAFTA versus ROW approach ignores the possibility that, after NAFTA, a product's NAFTA imports grow relative to its ROW imports *regardless* of whether the product's tariff is being phased out. After all, the NAFTA versus ROW approach only looks at phase out products and ignores CDF products. Import growth from NAFTA partners relative to ROW in both phase out and continue-duty-free products could be driven by positive supply shocks in the NAFTA partners or broad effects of NAFTA that go beyond tariff reduction. Conversely, the phase out versus continue-duty-free approach ignores the possibility that, after NAFTA, a phase out product's imports grow relative to a continue-duty-free product *regardless* of the exporting country. After all, the phase out versus continue-duty-free approach only looks at NAFTA imports and ignores ROW imports. Finding import growth of phase out products

relative to continue-duty-free products for both NAFTA imports and ROW imports could be driven, for example, by product-specific supply or demand shocks. To avoid these problems with the intuitive NAFTA versus ROW and phase out versus continue-duty-free approaches, we use a triple difference (DDD) specification.

Specifically, the simplest DDD specification is

$$
\begin{aligned}
(1) \quad \ln M_{pct} \;=\; & \alpha + \beta_1 NAFTA_c + \beta_2 Phase_p + \beta_3 Post_t \\
& + \gamma_1 Phase_p \times Post_t + \gamma_2 NAFTA_c \times Post_t + \gamma_3 NAFTA_c \times Phase_p \\
& + \delta NAFTA_c \times Phase_p \times Post_t + \varepsilon_{pct}.
\end{aligned}
$$

Here, $\ln M_{pct}$ represents U.S. log imports of product p from country c in year t. Further, $NAFTA_c$, $Phase_p$, and $Post_t$ represent dummy variables indicating, respectively, (i) whether the exporting country c is a NAFTA partner, (ii) whether product p is a product whose tariff is phased out under NAFTA, and (iii) whether year t is in the post-NAFTA period of 1993 onwards.[8] In all our analyses, we only include either Canada or Mexico as the single NAFTA country. And, to avoid the phase out of tariffs across multiple U.S. FTAs simultaneously, we always exclude countries that are U.S. FTA partners at any point in time. [9]

The key coefficient of interest is the DDD coefficient δ and it has two equivalent interpretations. First, after controlling (via γ_2) for any post-NAFTA effects that impact imports from NAFTA partners across all products, δ reflects the differential import growth of phase out products from NAFTA countries relative to ROW. Second, after controlling (via γ_1) for any post-NAFTA effects that impact phase out product imports across all exporting countries, δ reflects the differential NAFTA partner import growth in phase out products relative to continue-duty-free products.

[8] While NAFTA was signed in late 1992, it was not implemented until January 1, 1994. Given the text of the agreement, which contains the phase out details, is available when the agreement is signed, we use 1993 as the first "treatment" year. Given the plausibility that trade flows respond once the details of the agreement are known and agreed upon, it seems reasonable to avoid classifying 1993 as a "control" year.

[9] As a robustness check later, we also exclude countries who are FTA partners of Mexico or Canada at any point in time.

Although improving on the intuitive NAFTA versus ROW and phase out versus continue-duty-free approaches, this DDD specification in (1) still omits many potentially relevant variables. Essentially, (1) is a "no controls" DDD specification. First, the standard DDD specification in (1) does, by construction, control for effects that differentially impact import growth of phase out and continue-duty-free products via γ_1. But, it does not allow such effects to vary over time at an annual frequency nor does it allow the effects to vary across the various phase out products or the various continue-duty-free products. Possible relevant factors that could vary at the product-year level include global product-level supply and demand shocks, U.S. production levels, Maquiladora production levels, import shares from US FTA partners or Canada and Mexico's FTA partners (which impact the relative degree of preferential access for NAFTA partners in the US), status under the WTO Multifibre Arrangement, and Chinese import competition in the US.[10] Possible relevant factors that could vary at the country-product level include an exporter's international competitiveness or revealed comparative advantage. Nevertheless, we can control for these potentially relevant factors, among others that vary at the product-year or country-product level, by adding a product-year fixed effect γ_{pt} and a country-product fixed effect γ_{pc} to (1).

Second, the standard DDD specification in (1) does, by construction, control for effects that differentially impact import growth from NAFTA partners versus ROW via γ_2. But, it does not allow such effects to vary over time at an annual frequency nor across the various ROW countries. Possible relevant factors that could vary at the country-year level include bilateral exchange rates between the U.S. and the exporting country and the export country's WTO status. Nevertheless, we can control for these potentially relevant factors, among others that vary at the country-year level, by adding a country-year fixed effect γ_{ct} to (1). Adding these three sets of fixed effects to the standard DDD specification in (1) flexibly controls for various product-year, country-product and country-year variables, including but not limited to the ones described above. We now have the following fixed-effects, or "with

[10]See, for example, Autor and Dorn (2013) and Bloom et al. (2016) for the general economic importance of Chinese import competition and the WTO Multifibre Agreement.

controls,"DDD specification:

$$\ln M_{pct} = \alpha + \delta NAFTA_c \times Phase_p \times Post_t + \gamma_{pt} + \gamma_{ct} + \gamma_{pc} + \varepsilon_{pct}. \tag{2}$$

Nevertheless, one could reasonably expect important heterogeneity in the DDD coefficient δ along two dimensions. First, as described in Section 3.2.1, some products are phased out over longer periods than others. Second, as is well-known in the literature, the effects of tariff cuts affect imports growth over time. Hence, one could reasonably expect the effects of tariff cuts to grow over time and depend on the length of a product's tariff phase out. Thus, we augment (2) in two ways. First, we allow the DDD coefficient to vary over time by replacing the $Post_t$ dummy with a vector of year dummies $\mathbf{Year}_t = (1989, 1990, 1991, 1993, ..., 2016)$ with the omitted year of 1992 serving as the reference year. Second, we redefine $Phase_p$ as a vector $\mathbf{Phase}_p = (GSP_p, Immed_p, 5yr_p, 10yr_p)$ consisting of indicator variables for whether the product continues duty free because of the GSP program (GSP_p), has its tariff cut to zero immediately ($Immed_p$), has its tariff phased out over 5 or 6 years ($5yr_p$) or has its tariff phased out over at least 10 years ($10yr_p$). Our generalized fixed-effects, or "with controls", DDD specification is:

$$\ln M_{pct} = \alpha + \boldsymbol{\delta} NAFTA_c \times \mathbf{Phase}_p \times \mathbf{Year}_t + \gamma_{pt} + \gamma_{ct} + \gamma_{pc} + \varepsilon_{pct}. \tag{3}$$

Now, $\boldsymbol{\delta}$ is a vector of coefficients containing one coefficient for each year and phase out category pair. Given the number of coefficients we are estimating, many of our results will be displayed in figures, where we plot the estimated annual coefficients along with the corresponding 95% confidence interval.

5 Results: Tariff Phase Out

5.1 A simple means-based approach

To illustrate the mechanics of the DDD approach, we begin by presenting Table 4. Ultimately, the standard DDD approach in (1) is just a comparison of mean import growth between phase out and continue-duty-free products and between NAFTA partners and ROW.

Panel A of Table 4 depicts the NAFTA versus ROW approach and also motivates the necessity of a DDD approach over a DD approach. To begin, Panel A1 shows relative import growth of phase out products from a NAFTA partner vis-à-vis ROW. While mean log imports of phase out products from Mexico were 0.345 log points higher in the post-NAFTA period, mean log imports of phase out products from ROW were 0.244 log points *lower* in the post-NAFTA period. Thus, import growth of phase out products from Mexico vis-à-vis ROW was 0.589 log points and represents a DD estimate. A similar story holds for Canada. While mean log imports of phase out products from Canada were 0.335 log points higher in the post-NAFTA period, mean log imports of phase out products from ROW were 0.298 log points *lower* in the post-NAFTA period. Thus, import growth in phase out products from Canada vis-à-vis ROW was 0.633 log points and represents a DD estimate. From these DD perspectives, NAFTA tariff cuts appear to have substantial impacts on NAFTA trade flows.

However, this DD approach overestimates the impact of NAFTA tariff cuts. Specifically, Panel A2 shows that similar DD effects, although quantitatively weaker, emerge when looking at continue-duty-free products. Even though continue-duty-free products did not receive tariff cuts, import growth of continue-duty-free products from Mexico vis-à-vis ROW was 0.326 log points and 0.433 log points for equivalent products from Canada vis-à-vis ROW. The fact that imports from NAFTA partners grow relative to ROW even for continue-duty-free products suggests important NAFTA specific effects on import growth that go beyond tariff cuts.

The DDD estimates take this into account by looking at the "excess" relative import

growth of NAFTA partners vis-à-vis ROW in phase out products relative to continue-duty-free products. That is, the DDD estimates are differences in DD estimates. The DDD estimates say this excess relative import growth is 0.263 log points for Mexico and 0.200 log points for Canada. On one hand, the large DD point estimates in Panel A2 show the importance of controlling for a "NAFTA effect" that goes beyond tariff phase outs and motivates the importance of country-year fixed effects in our later analysis; these effects will allow a "NAFTA effect" to vary across time and ROW partners. Nevertheless, the non-trivial DDD point estimates show that tariff cuts were an important part of the NAFTA induced import growth.

Panel B of Table 4 carries out the analysis performed in Panel A but from the perspective of the phase out products versus continue-duty-free products approach. Panel B1 shows that Mexican import growth of phase out products vis-à-vis continue-duty-free products was actually -0.069 log points. That is, on average, Mexican imports of phase out products actually grew by less than Mexican imports of continue-duty-free products. Similarly, for Canada, import growth of phase out products relative to continue-duty-free products was -0.081 log points. These relative import growth numbers are DD estimates and, in and of themselves, suggest that NAFTA tariff cuts may have actually reduced NAFTA trade flows.

However, these DD effects underestimate the impact of NAFTA tariff cuts. Specifically, Panel B2 shows much larger negative DD effects when looking at ROW import growth of phase out products relative to continue-duty-free products. Defining phase out products based on Mexico's NAFTA staging categories, ROW import growth of phase out relative to continue-duty-free products was -0.332 log points. And, defining phase out products based on Canada's NAFTA staging categories, ROW import growth of phase out relative to continue-duty-free products was -0.281 log points. The DDD estimates take this into account by looking at the "excess" relative import growth of phase out products relative to continue-duty-free products for NAFTA partner imports vis-a-vis ROW imports. That is, the DDD estimates are differences in DD estimates and say this excess relative import growth

is 0.263 log points for Mexico and 0.200 log points for Canada. By construction, these DDD estimates match those from the NAFTA versus ROW approach above. The very large DD point estimates in Panel B2 show the importance of controlling for systematic differences in phase out products versus continue-duty-free products and motivates the importance of product-year and country-product fixed effects in our later analysis. Nevertheless, again, the non-trivial DDD point estimates show that tariff cuts were an important part of the NAFTA induced trade flow growth.

5.2 Regression-based approach

5.2.1 Mexico

Equation (1) is the standard DDD approach and, as just described, can be implemented as a simple means-based approach. Moreover, this means-based approach is very useful for highlighting the key intuition behind the DDD approach. However, as we described in Section 4, this standard DDD approach is essentially a "no controls approach". Moreover, the standard DDD approach ignores heterogeneity in the DDD treatment effect that may be present across time and phase out categories. Given the richness of our data, we can include country-product, country-year and product-year fixed effects to control for a myriad of potentially confounding factors, including but not limited to those described in Section 4. And, we can also allow DDD estimates to vary across time and phase out categories.

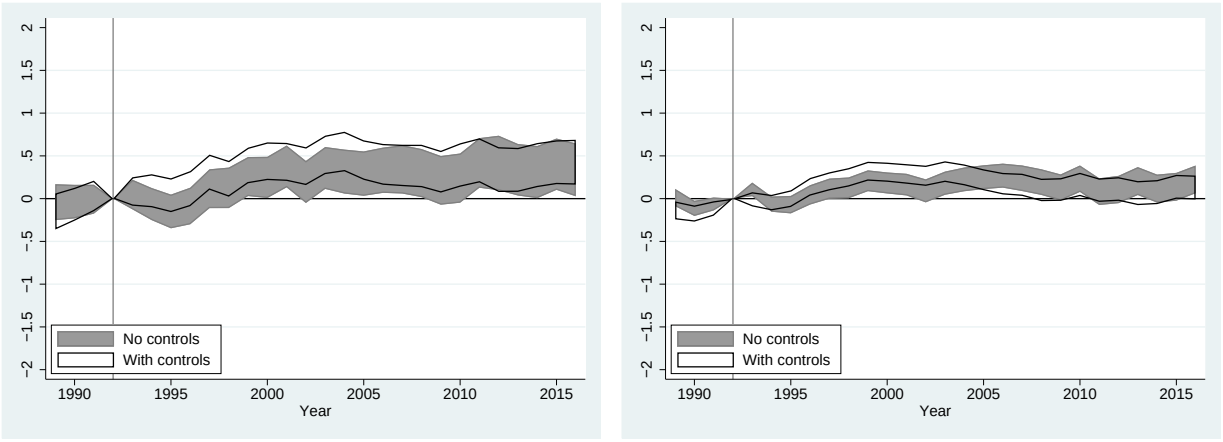
For the remainder of this sub-section, we focus on Mexico as the NAFTA partner. The next sub-section discusses how our results change when focusing on Canada as the NAFTA partner. Putting aside the dimensions of heteroegeneity, Table 5 shows the impacts of moving from the "no controls" specification in (1) to the "with controls" specification in (2). Column (1) show the "no controls" DDD estimates from (1) and, by construction, the DDD point estimates match those from the means-based DDD in Table 4. Columns (2)-(4), respectively, add country-product, country-year and product-year fixed effects so that column (4) represent the "with controls" DDD specification in (2).

Column (2) shows that the DDD point estimate increases by about 40% upon including country-product fixed effects. This is consistent with the notion that the product composition of Mexican exports to the U.S. is quite different than that of ROW exports to the US, perhaps due to differences in comparative advantage. Combining this perspective with the phase out versus CDF products approach, the smaller estimates in column (1) could reflect that, relative to their comparative advantage in continue-duty-free products, Mexico tends to have a weaker comparative advantage in phase out products than ROW. That is, controlling for these country-product effects increases relative import growth of phase out products (i.e. relative to continue-duty-free products) from Mexico vis-a-vis ROW.

Comparing column (4) with column (2), adding the country-year and product-year fixed effects only modestly impacts the DDD estimates. Intuitively, country-year fixed effects control for time varying factors that are common across import growth of phase out and continue-duty-free products of a particular exporter. And, product-year fixed effects control for time varying factors for a particular product that are common across import growth from NAFTA members and ROW. This leaves the DDD estimates largely unchanged because, in the former case, relative import growth (phase out versus continue-duty-free products) remains largely unchanged from a particular exporter and, in the latter case, product-level import growth remains largely unchanged from a NAFTA member vis-a-vis ROW.

We now begin to bring in the dimensions of heterogeneity discussed above and start with the time varying nature of the DDD estimates. Ignoring this dimension of heterogeneity, column (4) from Table 5 said the DDD point estimate was 0.371 log points. But, as one would expect given the tariff phase out argument from Baier and Bergstrand (2007), Table 6 and Figure 2 show considerable time heterogeneity in these estimates. Focusing on the specification with controls (i.e. column (4)), the Mexican DDD point estimates are statistically insignificant before NAFTA and only become statistically significant in 1997. The point estimates continue growing from 0.309 log points in 1997 to a peak, right around the 10 year mark of NAFTA, of 0.551 log points in 2004. While the effects taper-off somewhat

post-2004, the point estimates largely hover in the $0.4 - 0.45$ log points in the post-2000 period and are always statistically significant. Moreover, like our analysis with time-invariant DDD estimates, Table 6 shows that the product-year and country-year fixed effects matter little once the country-product fixed effects are included. Overall, Figure 2 clearly depicts the idea of a gradual and delayed increase in imports from Mexico over the first 10 years of NAFTA that stabilizes in the early to mid 2000s.



(a) US imports from Mexico

(b) US imports from Canada

Figure 2: Time varying DDD estimates.
Notes: DDD point estimates correspond to equation (1), "no controls" and equation (2), "with controls" in main text. Grey clouds represent 95% confidence intervals. Two-way clustered standard errors are used, clustering on both country-year and product-year. See main text for further details.

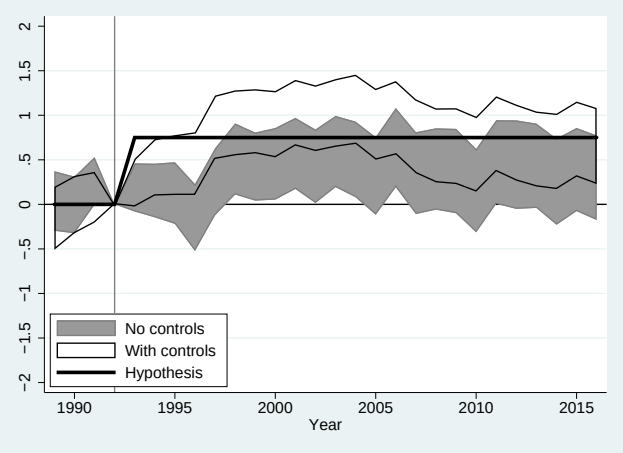
Figure 2 appears to provide some preliminary support for the tariff phase out story in explaining delayed import growth from Mexico after NAFTA. Specifically, when looking at import growth of phase out products relative to continue-duty-free products, this relative import growth from Mexico consistently exceeds that from ROW by around $0.4 - 0.45$ log points from 2000 onwards. While this figure is somewhat smaller than the 0.7 log point stylized fact of Baier and Bergstrand (2007) , our $0.4 - 0.45$ log point estimate is for import growth of phase out products relative to continue-duty-free products and, as we showed above, continue-duty-free products are experiencing their own import growth from Mexico vis-a-vis ROW.

Our highly disaggregated HS8 product-level data allows us to further investigate the

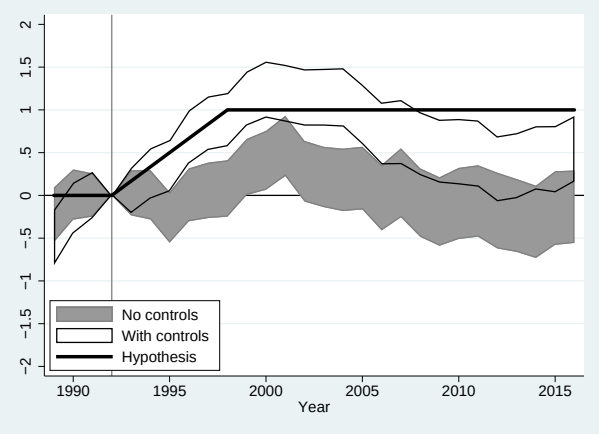
tariff phase out story by looking at the heterogeneity of DDD estimates not only over time but also by phase out category. In particular, products whose tariffs are immediately cut to zero should have a very different time path of import growth than products whose tariffs are phased out gradually over 5 or 10 years. Specifically, we expect to see a rapid increase in import growth of immediate cut products that stabilizes quickly in contrast to a steady and gradual increase in import growth of 5 year and 10+ year phase out products that stabilizes after 5-10 years.

Table 7 and Figure 3 present the time varying DDD estimates from (3) when we split the phase out products into their different categories: immediate cut (A), 5 year phase out (B and B6), 10+ year phase out (C, C10 and C+) and GSP. The black line illustrates our hypothesis. Products whose tariff is cut immediately should see a large immediate growth in trade that remains stable thereafter. Products whose tariff is phased out over 5-6 years should see gradual trade growth that stabilizes after around 5-6 years. Products with a 10+ year phase out should see even more gradual trade growth that stabilizes after 10-15 years. Finally, to the extent that NAFTA removes any uncertainty about future eligibility for, or the existence of, the GSP program, Mexican GSP products should look similar to products whose tariff is immediately cut to zero: an immediate increase in trade that quickly stabilizes. Overall, relative to 1992 when NAFTA is signed, panels (a)-(d) of Figure 3 show statistically insignificant import growth from Mexico over the pre-NAFTA period and also in 1993.

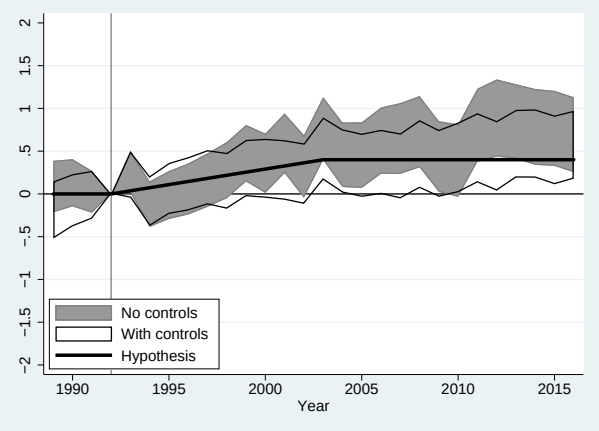
After NAFTA is signed in late 1992, Table 7 and panel (a) of Figure 3 shows statistically significant import growth of immediate cut products beginning in 1994 that reaches around 0.9 log points by the late 1990s and stabilizes shortly thereafter. Table 7 and panel (b) of Figure 3 shows the 5 year phase out products experience even larger import growth that eventually peaks around 1.25 log points in 2000 and stabilizes around 1.15 log points in the early 2000s. At its peak, import growth is nearly 40% larger for the 5 year phase out products than immediate cut products which is consistent with the 25-65% larger tariff cuts of 5 year



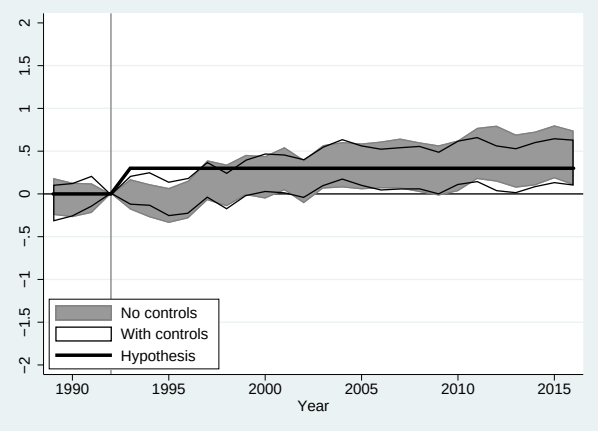
(a) Immediate Cut (A)



(b) 5 year phase out (B, B6)



(c) 10+ year phase out (C, C10, C+)



(d) GSP

Figure 3: Time varying DDD estimates by phase out category: Mexican imports.
Notes: DDD point estimates from eq. (3) for "with controls" eq. (1) for "no controls" after replacing Post and Phase dummies with Year and Phase vectors. Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year.

versus immediate cut products (see Table 2). However, in contrast to the hypothesis that import growth of the immediate cut products should stabilize much sooner than the 5 year phase out products, both seem to stabilize at similar points in time. Further, panel (c) shows the 10+ year phase out products experience very gradual import growth that only becomes statistically significant in the early 2000s and stabilizes at around $0.4 - 0.6$ log points by the late 2000s.

Further evidence that Figure 3 does not provide convincing support for the idea that tariff phase outs are important for understanding delayed import growth comes from analyzing

the extent to which we can detect imports growing over time. Using the DDD results from (2) that underlie Figure 3, Panel A of Table 8 shows the point estimates for annual import growth. While it is rather difficult to detect statistically significant changes in cumulative import growth at an annual frequency, this changes when smoothing annual volatility using multi-year rolling windows.

Using a 3-year rolling window for import growth (i.e. import growth between year t and year $t-3$), Panel B shows import growth for immediate cut products of around 0.3-0.5 log points in all years between 1994 and 1999 with the caveat that we do not see import growth in 1996 relative to 1993. That is, statistically speaking, the post-NAFTA import growth of immediate cut products only stabilizes from 2000. Using this 3-year rolling window for import growth, 5-year phase out products grow about 0.3-0.6 log points beginning in 1995 and continuing every year until 2001. That is, statistically speaking, the post-NAFTA import growth for 5-year phase out products stabilizes from 2002. Ultimately, import growth of immediate cut products starts only one year earlier than 5-year phase out products and stabilizes essentially 7 years after NAFTA was signed which is only 2 years ahead of when 5-year phase out products stabilize. From this perspective, the dynamics of import growth for immediate cut products is remarkably similar to that of 5-year phase out products. This strongly undermines the tariff phase out story for delayed import growth.

While the import growth dynamics of the 5-year phase out products reflect the expected gradual growth of having their tariff phased out, Panel C of Table 1 shows they account for only 3.3% of imports when classifying products per Mexico's staging categories. In contrast, the 10+ year phase out products account for 18.9% of such imports. That is, 85% of imports for products that are actually phased out according to Mexico's staging schedule are the 10+ year phase out products. Thus, to the extent that tariff phase outs help explain delayed import growth from Mexico, it should help explain delayed import growth for the 10+ year phase out products. However, even when looking at import growth over a 3-year rolling window, we can hardly detect import growth for these products. Relative to 3 years

prior, we can only detect import growth in 1993 and 1997 (at the 10% level). This inability to detect robust import growth for the 10+ year phase out products also holds when using 2-year, 4-year or 5-year rolling windows.[11] Together with the magnitude of import growth of around $0.4-0.6$ log points being much smaller than 0.9 log points of immediate cut products despite both experiencing average tariff cuts of around 7.5%, there is essentially no evidence that the 10+ year phase out products grow as one would expect based on a tariff phase out hypothesis.

The import growth dynamics of GSP-eligible products provide more evidence against the tariff phase out explanation for delayed import growth. NAFTA permanently and immediately removes the uncertainty that Mexico faces over tariff-free access on GSP-eligible products by codifying Mexico's GSP-eligible products as staging category D that continue duty free. Thus, as for immediate cut products, we expect an initial burst of import growth for GSP-eligible products with the cumulative growth impact stabilizing quickly.[12] Yet, Panel (d) of Figure 3 suggests GSP import growth after 1992 only kicks in by the late 1990s and only stabilizes by the mid 2000s with Table 7 putting this growth around $0.3-0.4$ log points. Moreover, Panel A of Table 8 says we can only detect annual import growth of GSP-eligible products in 1997, 1999 and 2003 and Panel B says we can only detect 3-year rolling window import growth in 1999, 2001 and 2004. Ultimately, the dynamics of GSP-eligible products look like what we expect from 5-year or 10-year phase out products rather than immediate cut products. Indeed, this gradual import growth in GSP-eligible products is an important part of the overall pattern of gradual import growth from Table 7 and Figure 2 given that Columns (7)-(8) and (13)-(14) of Table 1 show GSP-eligible products represent 47.3% of products and 32.7% of imports using Mexico's staging categories.

[11] For 4-year rolling windows, we detect import growth in 1993. For 5-year rolling windows, we detect import growth in 1999 and 2003.

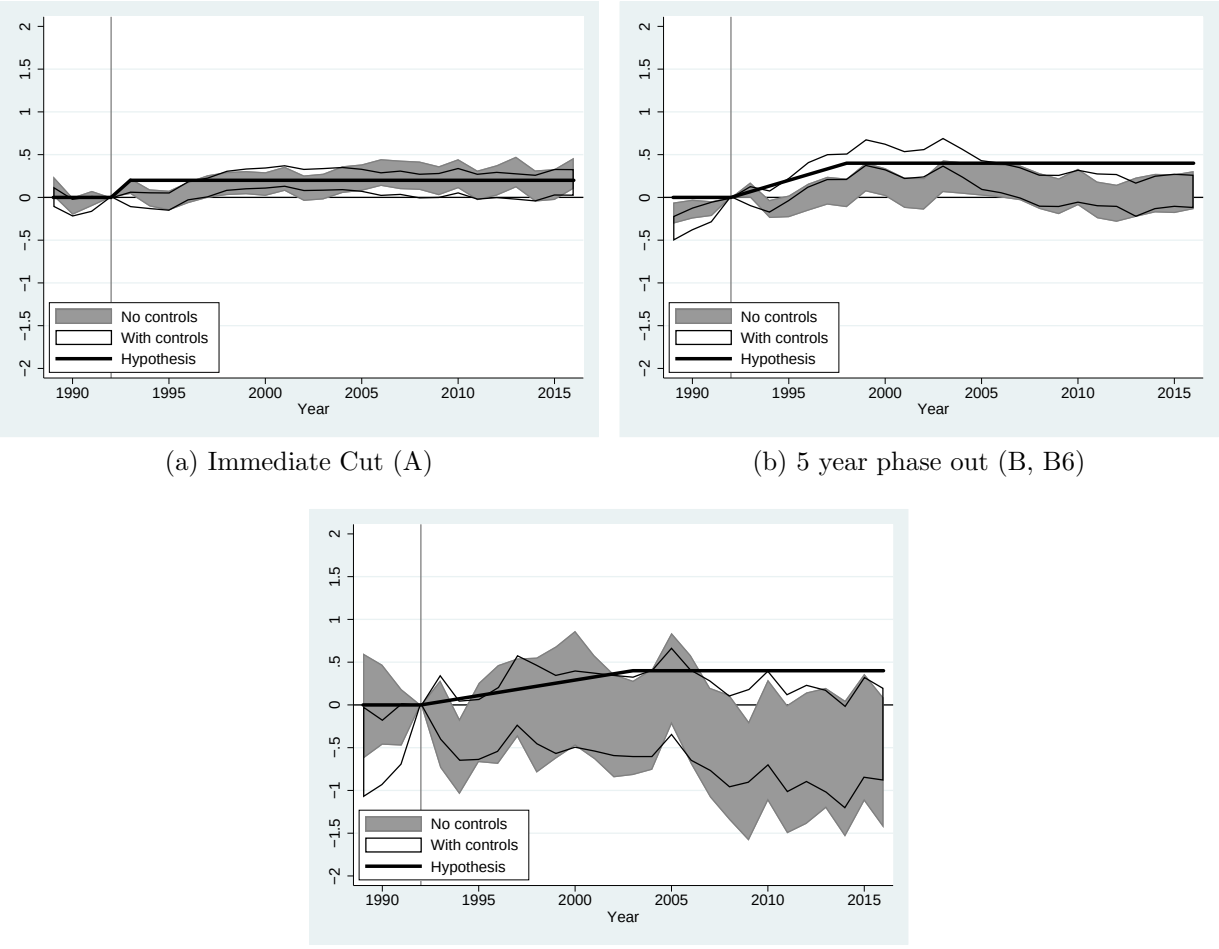
[12] As part of the broader and growing literature on trade policy uncertainty (e.g. Handley (2014), Pierce and Schott (2016) and Handley and Limão (2017)), Hakobyan (2017) documents the inherent legislative uncertainty surrounding GSP renewal and the adverse impact of uncertainty on import growth from beneficiary countries.

5.2.2 Canada

A key reason we have focused on U.S. imports from Mexico rather than from Canada is CUSFTA. Specifically, the U.S. was already phasing out tariffs on Canada under CUSFTA from 1989 until NAFTA was implemented in 1994. As such, one may expect that any effects of tariff phase out on Canadian imports would already be present in the pre-NAFTA period. While we do see evidence of this, which makes us cautious in reading too much into results on Canadian imports, we do see evidence similar to the case of Mexican imports suggesting that tariff phase out is unlikely to be the key explanation for delayed import growth after NAFTA.

Figure 2 shows that, prior to NAFTA being signed in late 1992, Canadian imports were clearly trending up. Yet, relative to 1992, there is no statistically significant import growth until 1996 and then the DDD point estimate stabilizes by the late 1990s and early 2000s by hovering around $0.25 - 0.30\dot{0}$ log points. Yet, Tables 7 and 8 and Figure 4 present similar evidence to that regarding the dynamics of Mexican imports. In panel (a) of Figure 4, post-NAFTA growth of immediate cut products becomes statistically significant and again stabilizes around the late 1990s/early 2000s. At around 0.25 log points, and hence much smaller than the 0.9 log points in Figure 3 for Mexican imports, this is consistent with Table 2 showing Canadian immediate cut products experience tariff cuts one-third as large as Mexican immediate cut products. Similar to Mexican immediate cut products, Panel B of Table 8 shows we can detect 3-year rolling window import growth of 0.10-0.25 log points for immediate cut products in 1993 and each year during 1997-2000. Thus, again, immediate cut products experience the type of delayed import growth one would have expected from 5-year phase out products.

Unlike the Mexican case where the 10+ year phase out products formed the bulk of products and imports whose tariffs were actually phased out over time, Canada's staging categories imply 5-year phase out products (B and B6 products) account for 17.2% of products and 7.7% of imports compared to around 1% of products and imports for 10+ year



(a) Immediate Cut (A)

(b) 5 year phase out (B, B6)

(c) 10+ year phase out (C, C10, C+)

Figure 4: Time varying DDD estimates by phase out category: Canadian imports.
Notes: DDD point estimates from eq. (3) for "with controls" eq. (1) for "no controls" after replacing Post and Phase dummies with Year and Phase vectors. Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year.

phase out products.[13] Indeed, Panel (b) of Figure 4 and Panel B of Table 8 shows import growth from Canada's 5-year phase out products stabilize around the late 1990s/early 2000s at around $0.25 - 0.4$ log points. This is basically double the import growth of Canada's immediate cut products and consistent with the 5-year products experiencing tariff cuts of around 5-6 percentage points rather than the 2.6% tariff cut experienced by Canadian immediate cut products. Yet, like the Mexican case, Canadian immediate cut and 5-year phase out products both stabilize in the late 1990s/early 2000s. Indeed, Panel B of Table 8

[13]This directly follows from the implications of Canada's CUSFTA phase outs for their NAFTA phase outs.

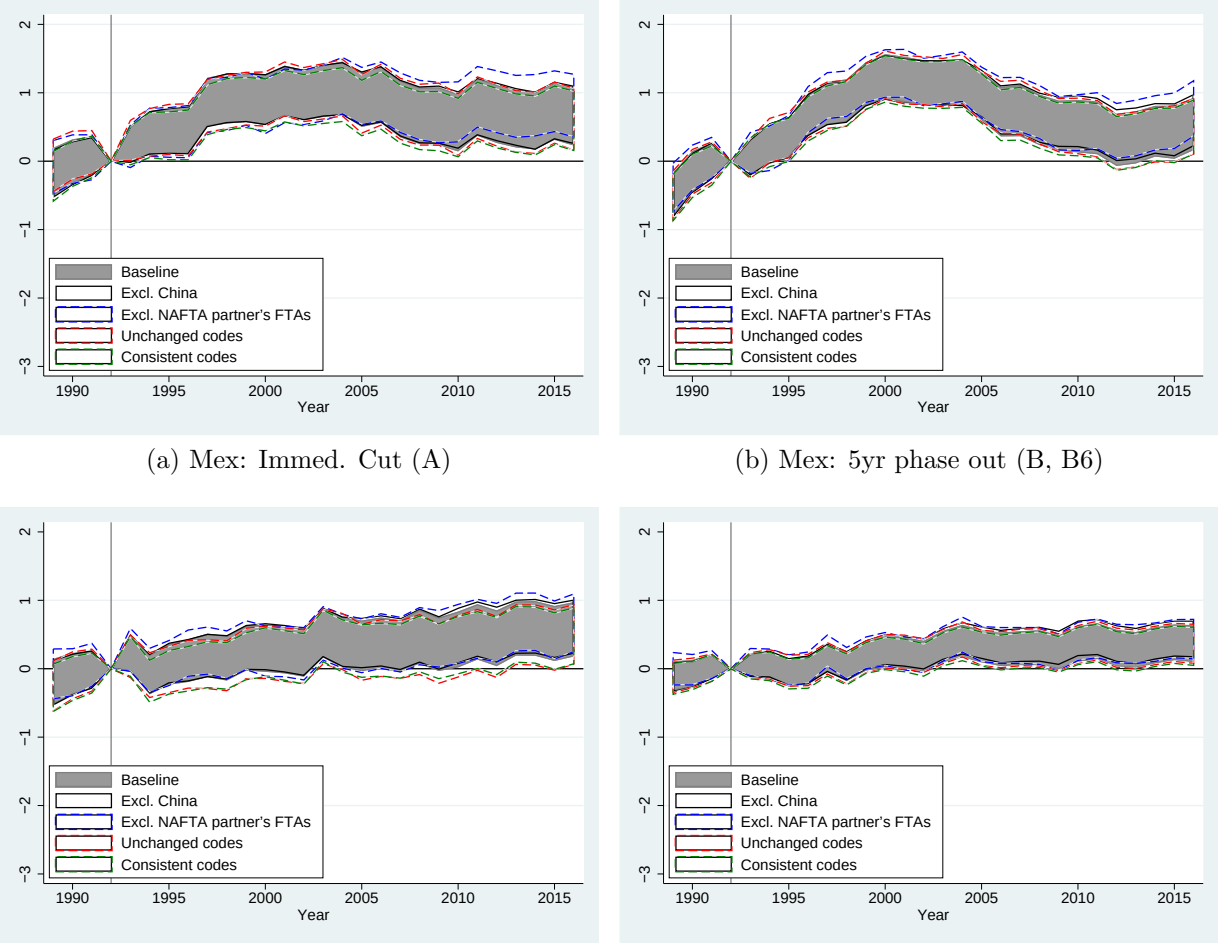
shows that, at the 10% level of significance, we first detect post-NAFTA import growth of immediate cut and 5-year phase out products in 1993 which stops for both types of products in 2000. That is, statistically speaking, immediate cut and 5-year phase out products both stop growing after 2000 which contrasts starkly with expectations based on a tariff phase out driven hypothesis for delayed import growth.

5.2.3 Robustness

We now describe various robustness checks to our results presented above. First, one may be concerned that the growth of well-documented surge in Chinese imports into the U.S. could be affecting our results. Second, while we have excluded U.S. FTA partners from ROW throughout our analyses, one may be concerned with the formation of FTAs by Mexico and Canada during our sample period. Such FTAs, especially if they adopt similar tariff schedules and staging categories, could potentially impact our results. Panels (a)-(d) of Figure 5 and panels (a)-(c) of Figure 6 shows these restrictions on the sample of countries that represent ROW do not affect our results for either Mexico or Canada.

Unfortunately, as described in Section 3, product codes change over time either due to the WCO changing 6-digit HS codes periodically or based on annual USITC updates to 8-digit codes (via their changes to 10-digit codes). In principle, this is problematic given our empirical approach relies on matching 8-digit HS products, whose codes potentially change over time, with their NAFTA staging category. We deal with this problem in two alternative ways. First, we restrict the sample of products to product codes that remain unchanged over our sample period. Second, we take the concordance from Pierce and Schott (2012) and extend it through the end of our sample period in 2016. Panels (e)-(h) of Figure 5 and panels (d)-(f) of Figure 6 shows these restrictions on the sample of products do not affect our results for either Mexico or Canada.

Finally, one may wonder about the extensive versus intensive margin in terms of import growth over time as a result of tariff phase outs. To partly address this issue, Figures 7-8



(a) Mex: Immed. Cut (A)

(b) Mex: 5yr phase out (B, B6)

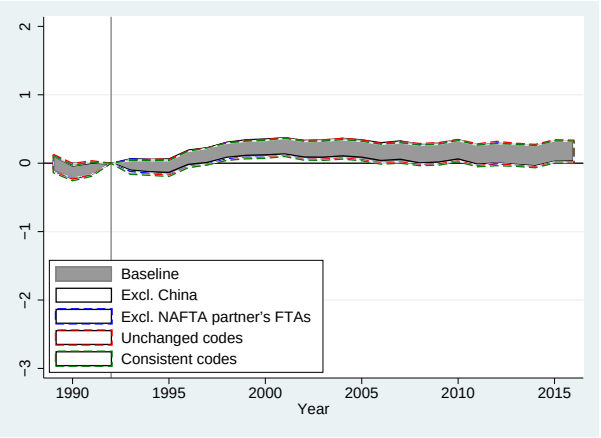
(c) Mex: 10+ yr phase out (C, C10, C+)

(d) Mex: GSP

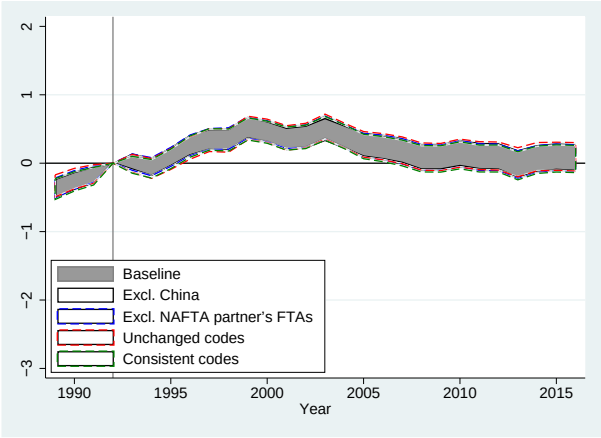
Figure 5: Time varying DDD estimates by phase out category: Mexican imports, robustness.
Notes: DDD point estimates from eq. (3). Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year. See main text for further details.

only use products continuously imported from Mexico or Canada, respectively, in each of the 28 years of our sample window. For Mexican imports, to the extent that systematic differences emerge, Figure 7 shows that the differences suggest that our baseline results are larger, and to a greater degree over time, than for continuously traded products. This is especially true for the 10-year phase out products but is more modest for immediate cut and GSP products.[14] Indeed, with the notable exception of the 5-year phase out products in the early post-NAFTA years, estimates for continuously traded products are generally

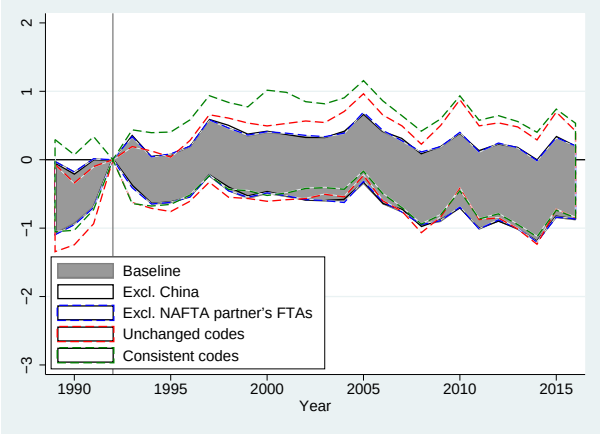
[14]In the short-run, the 5-year phase out products are the exception where the point estimates are larger for the continuously traded products.



(a) Can: Immed. Cut (A)



(b) Can: 5yr phase out (B, B6)

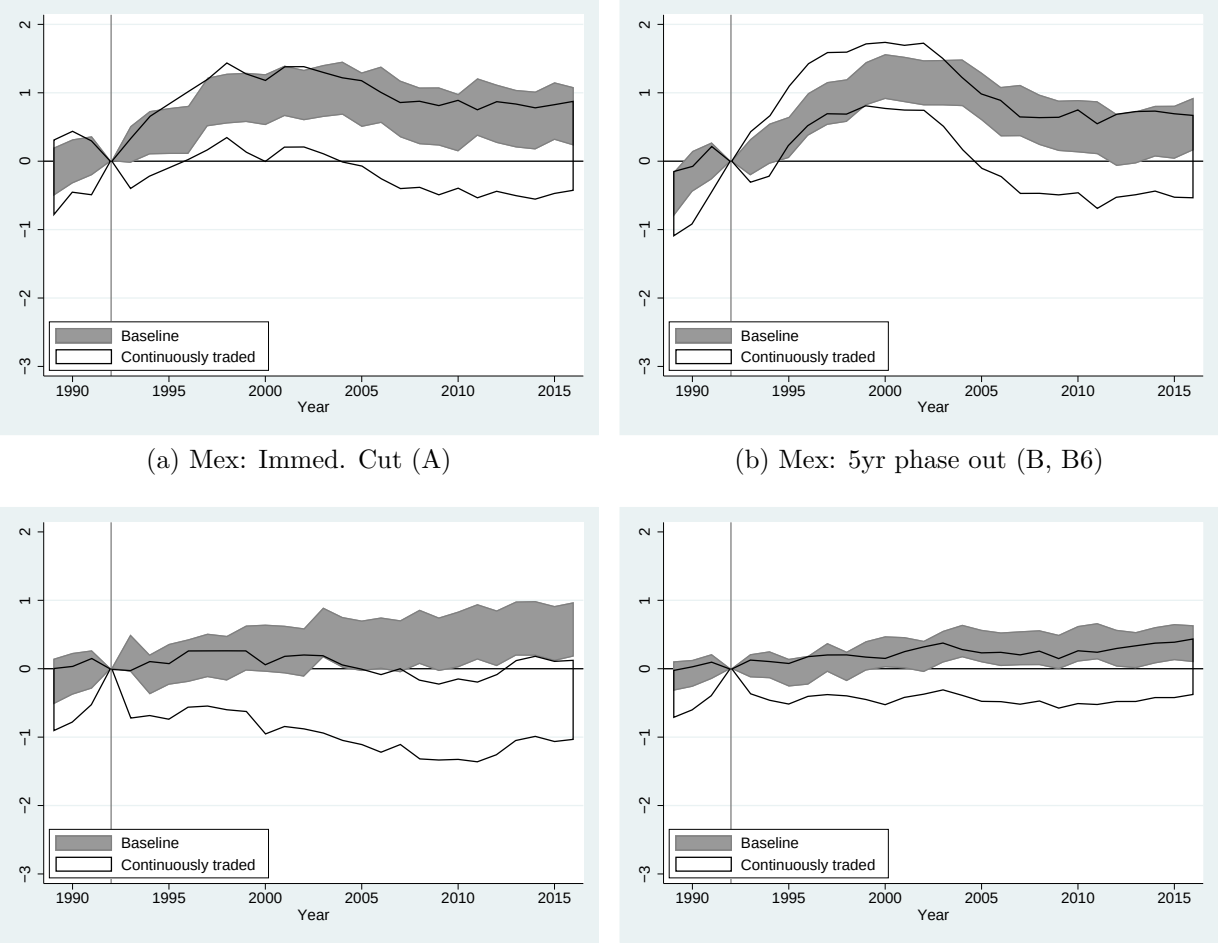


(c) Can: 10+ yr phase out (C, C10, C+)

Figure 6: Time varying DDD estimates by phase out category: Canadian imports, robustness.
Notes: DDD point estimates from eq. (3). Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year. See main text for further details.

statistically insignificant or even negative. For Canadian imports, Figure 8 shows that the differences between our baseline estimates and those for continuously traded products are smaller than for Mexican imports. Thus, the notable differences between our baseline results and those for continuously traded products emerge for Mexican imports.

The interpretation would be that the extensive margin plays a non-trivial and over time growing role in delayed import growth from Mexico after NAFTA. In our context, the extensive margin includes products that were not imported before NAFTA and also products that were only imported in some years before NAFTA. Given the much stronger established



(a) Mex: Immed. Cut (A)

(b) Mex: 5yr phase out (B, B6)

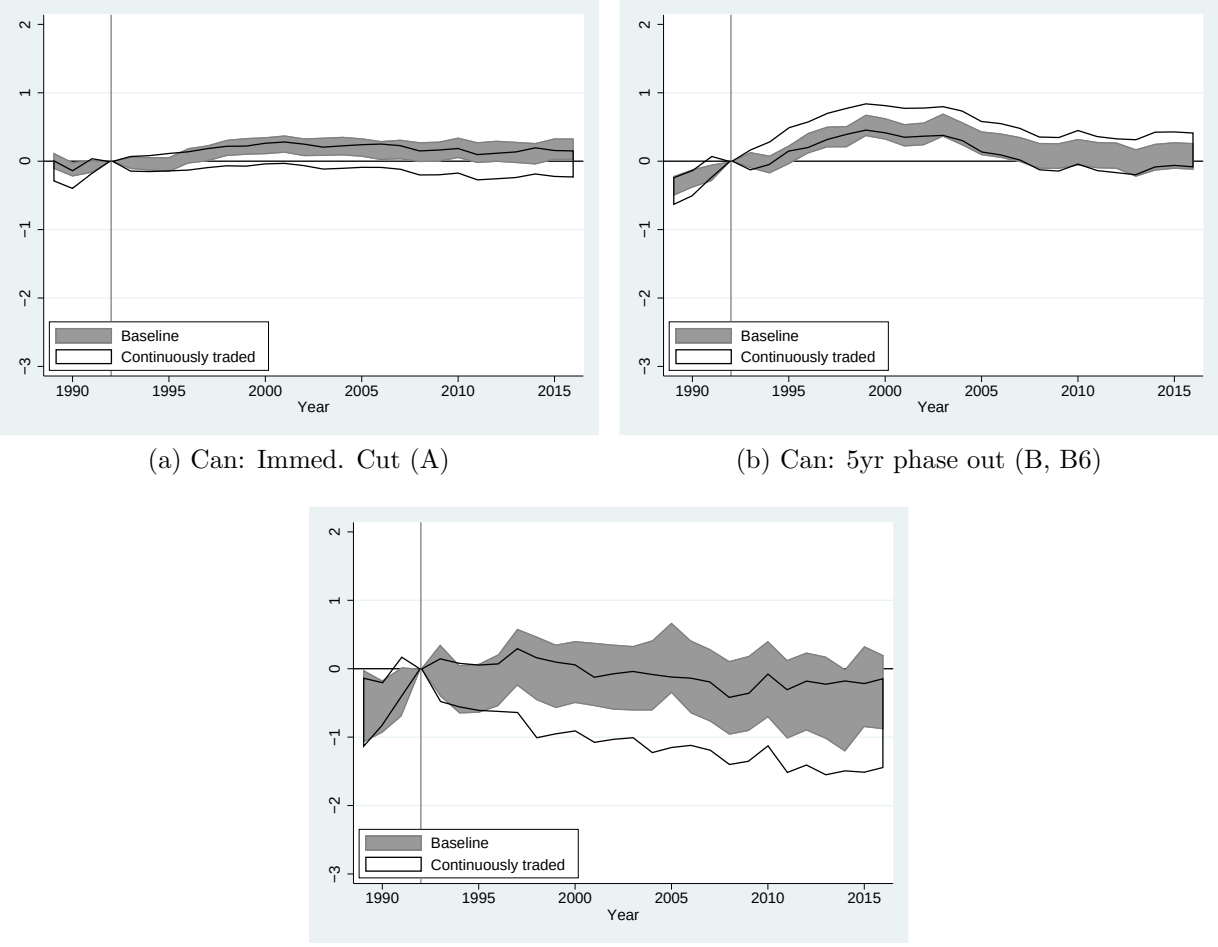
(c) Mex: 10+ yr phase out (C, C10, C+)

(d) Mex: GSP

Figure 7: Time varying DDD estimates by phase out category: Mexican imports, continuously traded

Notes: DDD point estimates from eq. (3). Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year.

trading relationship between the U.S. and Canada before NAFTA, it is also intuitive that the extensive margin plays a much more important role in Mexican rather than Canadian import growth after NAFTA. Moreover, a growing role for the extensive margin over time is consistent with the empirical finding of "intensive-margin effects occurring sooner than extensive-margin effects" from Baier et al. (2014, p.339) in the trade agreement context as well as theoretical (Arkolakis et al. (2012)) and empirical (Bernard et al. (2009)) results in the broader trade literature. Intuitively, extensive margin effects should take longer to play out because of frictions created by fixed cost barriers that firms face when entering foreign



(a) Can: Immed. Cut (A)

(b) Can: 5yr phase out (B, B6)

(c) Can: 10+ yr phase out (C, C10, C+)

Figure 8: Time varying DDD estimates by phase out category: Canadian imports, continuously traded

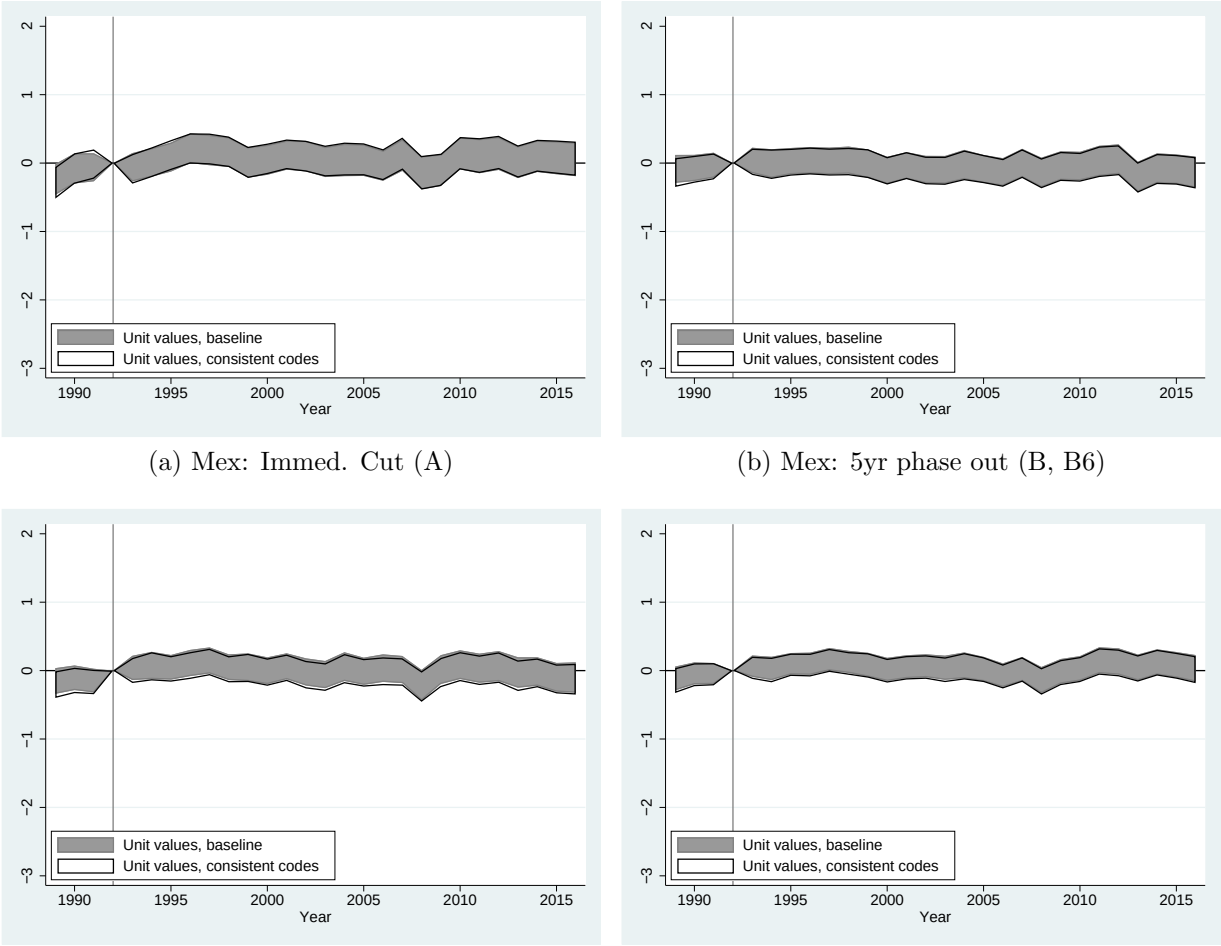
Notes: DDD point estimates from eq. (3). Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year.

markets in terms of, for example, building networks of distributors and consumers. Section 7 explores the role played by the extensive margin in more detail.

6 Results: Delayed Tariff Pass Through

To the extent that tariffs are passed through to import prices, increases in the value of trade could come from increases in quantities or increases in prices. Thus, we now modify (3) by using unit values as the dependent variable and a proxy for import prices. This analysis will

address the second hypothesis from Baier and Bergstrand (2007) that delayed pass through of tariff cuts to import prices, as proxied by unit values in our analysis, can explain the delayed trade flow effects of FTAs.



(a) Mex: Immed. Cut (A)

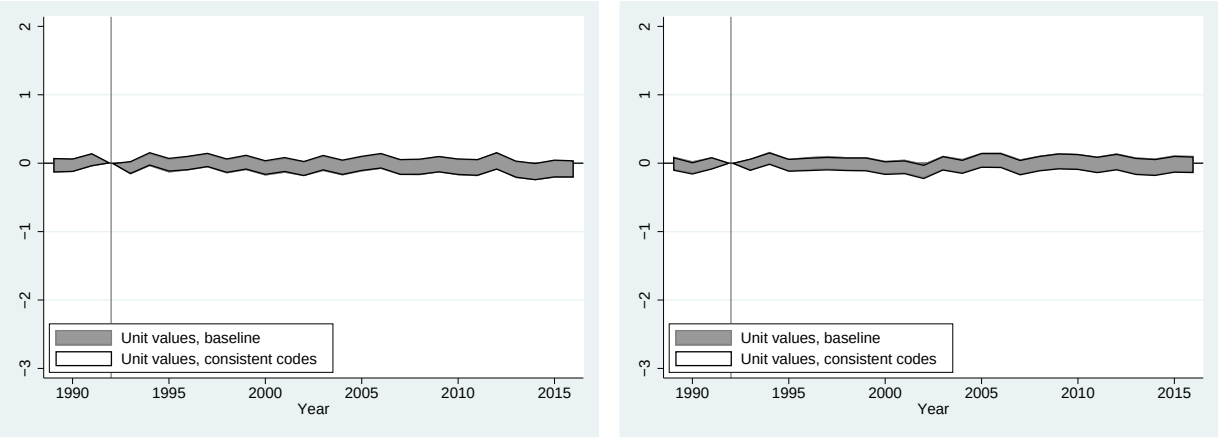
(b) Mex: 5yr phase out (B, B6)

(c) Mex: 10+ yr phase out (C, C10, C+)

(d) Mex: GSP

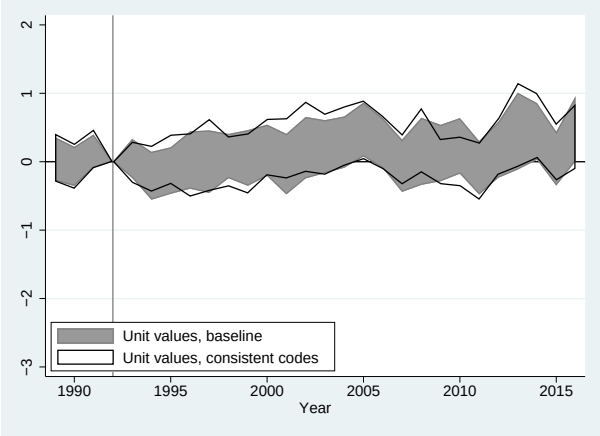
Figure 9: Time varying DDD estimates by phase out category: Mexican imports, unit values.
Notes: DDD point estimates from eq. (3). Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year.

Figures 9-10 present the results. Quite starkly, there is no evidence of delayed pass through effects as there is essentially no impact of tariff phase out on unit values. In turn, the impact on trade values seen in our earlier analysis reflects growth in the quantity of trade rather than the price of imports.



(a) Can: Immed. Cut (A)

(b) Can: 5yr phase out (B, B6)



(c) Can: 10+ yr phase out (C, C10, C+)

Figure 10: Time varying DDD estimates by phase out category: Canadian imports, unit values. Notes: DDD point estimates from eq. (3). Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year.

7 Extensive Margin of Delayed Import Growth

Stemming from Baier and Bergstrand (2007), the folklore in the literature has been that tariff phase out is a key culprit for the delayed growth in trade flows after countries form FTAs. Baier and Bergstrand (2007) also argue that the delayed pass through of tariff cuts to prices could play a role. We have argued that neither of these are convincing explanations. So, what is a possible explanation?

At the end of Section 5.2.3, we described how our baseline results showing delayed import growth after NAFTA were stronger than the results for continuously traded products

and even stronger as time went by. Often, the results for continuously traded products were statistically insignificant. This suggests an important role for the extensive margin, either in terms of products that were not traded before NAFTA or infrequently traded before NAFTA. To further investigate the role of the extensive margin, we now analyze how imported products spread out through the U.S. over time.

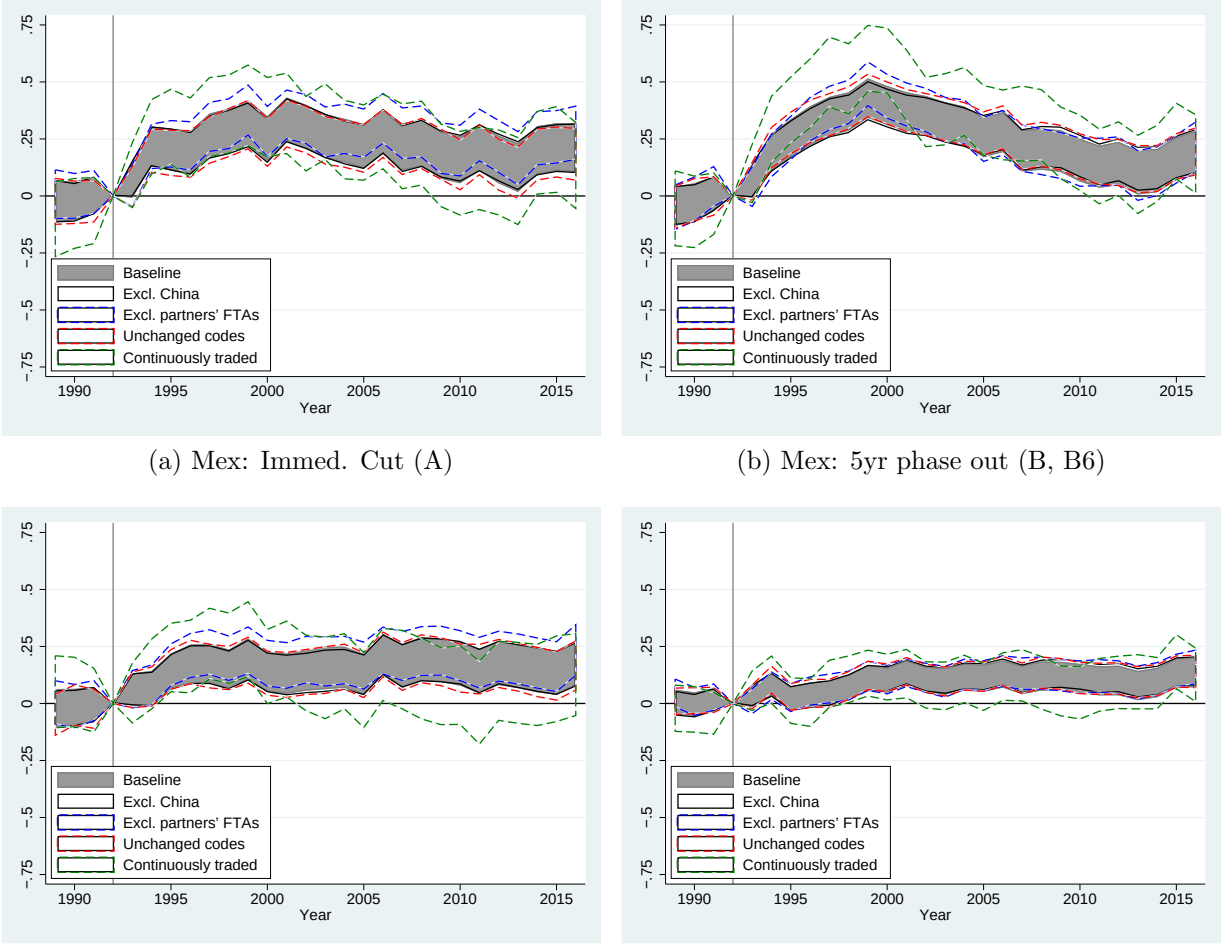
To do so, we use Census data that not only record product-level imports by year and exporting country but also records data for each Customs District in the U.S. There are 47 customs districts in the U.S., with 42 covering the geographic borders of the U.S. (including Alaska and Hawaii), 2 covering Puerto Rico and U.S. Virgin Islands, and 3 special districts that do not conform to geographic boundaries.[15] Our data do not reflect the two customs districts covering Puerto Rico and U.S. Virgin Islands. Customs districts generally correspond to state borders with some covering multiple states (such as the Boston district covering the states of Massachusetts and Connecticut) and some states covered by multiple districts (such as Texas with 5 and California with 3). Census reports two customs districts for imports, the district of unlading and the district of entry. The former reflects the customs district where the imported shipment cleared customs, while the latter reflects the district where it entered consumption channels. We use as the latter district as it reflects the geographic area where the imported product was consumed.

We use this data to trace out how a given product from a particular exporting country spreads out through the U.S. by counting the number of districts where it enters consumption channels. We then replace the product-country-year imports variable $\ln M_{pct}$ in (3) with a product-country-year variable $\ln D_{pct}$ that represents the (log) number of U.S. customs districts where imports of product p from country c in year t entered.

Figure 11 shows the results for Mexican imports. Regardless of the phase out category, there is no statistically significant effect on the number of districts entered in the years before NAFTA is signed. However, once NAFTA is signed, the DDD estimates say that Mexican

[15]The three special districts record data for trade of 'vessels under their own power,' low-valued imports and exports,' and 'mail shipments' which are only used to record exports.

imports of a given phased out product start entering more and more districts over time. The increase is especially pronounced in the early post-NAFTA years for the immediate cut and 5-year phase out products but the increase is slower for the 10-year phase out and GSP products.



(a) Mex: Immed. Cut (A)

(b) Mex: 5yr phase out (B, B6)

(c) Mex: 10+ yr phase out (C, C10, C+)

(d) Mex: GSP

Figure 11: Time varying DDD estimates by phase out category: number of US customs districts entered by

Notes: DDD point estimates from eq. (3) but with number of districts entered as dependent variable. Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year. See main text for more details.

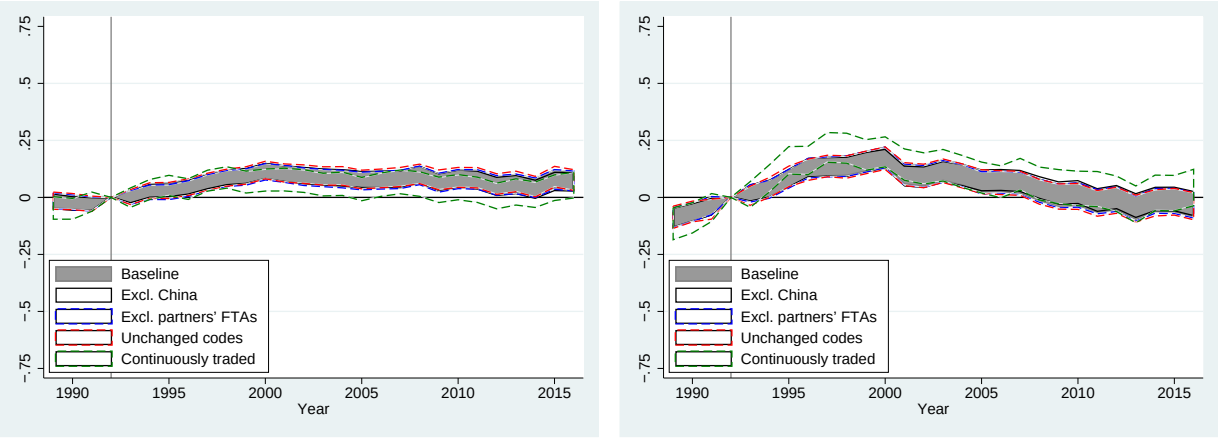
Given that the immediate cut products and 10 year phase out products comprise similar import shares and receive similar tariff cuts (see Tables 1-2), comparing these two phase out categories is instructive given the former tariff cut happens immediately but the latter

over 10 years. In particular, while the immediate cut products see a quicker spike in the number of districts entered, this tapers off slowly thereafter and leaves the long run increase in the number of districts entered very similar for the immediate cut and 10-year phase out products. This suggests that frictions associated with fixed costs of creating networks of distributors and consumers are important and can help explain why the immediate cut products experience a gradual increase in import growth just like the 10-year phase out products.

For Canada, Figure 8 showed a much more subtle role for continuously traded products than for Mexican imports in Figure 7. This suggested that the extensive margin plays a much stronger role for Mexican than Canadian import growth after NAFTA. This smaller role of the extensive margin is also born out in the impact of NAFTA on the number of districts entered by Canadian imports. Figure 12 shows much smaller DDD point estimates for Canadian imports than Mexican imports and these estimates are often statistically insignificant, especially in the long run.

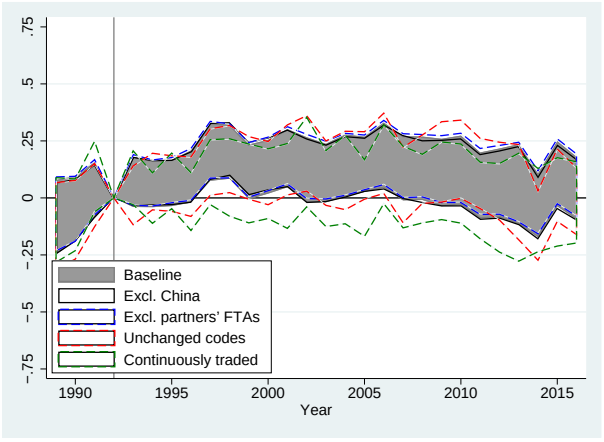
8 Conclusion

Since the seminal work of Baier and Bergstrand (2007) the literature has known that trade flows increase gradually over time following FTA formation with the rule of thumb being that trade flows stabilize after doubling over 10 years. In their paper, Baier and Bergstrand (2007) hypothesize that these effects could naturally arise because FTAs typically phase out tariffs over time or because of delayed pass through of tariff cuts to import prices. However, to the best of our knowledge, there is no empirical evidence attempting to investigate these hypotheses. One reason for this lack of research is that there is no readily and publicly available information of the tariff phase outs embodied in FTAs. Thus, by going to the publicly available texts of the CUSFTA and NAFTA agreement, we collect the necessary data and are the first to investigate the root causes suggested by Baier and Bergstrand (2007)



(a) Can: Immed. Cut (A)

(b) Can: 5yr phase out (B, B6)



(c) Can: 10+ yr phase out (C, C10, C+)

Figure 12: Time varying DDD estimates by phase out category: number of US customs districts entered by

Notes: DDD point estimates from eq. (3) but with number of districts entered as dependent variable. Clouds represent 95% confidence intervals. Two-way clustered standard errors, clustering on country-year and product-year. See main text for more details.

for the delayed import growth following FTA formation.

Our central finding is that there is no evidence to support the idea that tariff phase outs or delayed pass through effects can help explain the delayed growth in trade flows typically observed following FTA formation. When looking at the impact of tariff phase outs on imports, we do find that products whose tariffs are being phased out grow more. And, comfortingly, the magnitude of the effects that we find, both across products within a country of different phase out duration and across countries for products with the same

phase out duration, are consistent with differences in the actual country-product specific tariff cuts embodied in NAFTA. But, crucially, the bulk of the delayed growth in these products comes from products that had their tariff immediately cut to zero or, in the case of Mexico, had pre-NAFTA tariff-free access via the GSP program converted into permanent tariff-free access. Moreover, there is essentially no evidence of delayed pass through effects.

We show that a more likely explanation for the delayed import growth following FTA formation are trade frictions associated with establishment of networks of distributors and consumers, which also may be related to frictions associated with increases in production capacity which may be necessary to achieve an increase in exports taking advantage of FTA benefits. We do so by showing that the increase in imports from Mexico and Canada are associated with delayed increase in the geographic spread of imports across the U.S. for virtually all products. We show that while U.S. imports from NAFTA partners enter more customs districts, there is a notable delay in the increase with it peaking in the early 2000s.

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Appendix

Constructing pre-CUSFTA and pre-NAFTA tariffs

While we can extract staging categories from the CUSFTA and NAFTA texts, it is extremely difficult to extract base rates from these texts. Thus, we construct pre-CUSFTA and pre-NAFTA tariffs according to the following procedure.

As a starting point for pre-CUSFTA tariffs faced by Canada, we take the 1989 U.S. MFN tariffs per John Romalis' data described in Feenstra et al. (2002) (hereafter "Romalis' tariff data"). This is reasonable because adjusting these 1989 U.S. MFN tariffs by a products' CUSFTA staging category nearly always equals the 1989 preferential tariff faced by Canadian imports per Romalis' tariff data. For the 0.69% of products where the difference is more than rounding error (i.e. more than .01% points), we manually check the CUSFTA text and adjust accordingly. We also manually check the CUSFTA text for products whose tariff is immediately cut to zero and their 1989 U.S. MFN tariff is missing per Romalis' tariff data. Additionally, products 2207.10.30 and 2401.30.60 have respective ad valorem equivalent Canadian preferential tariffs per Romalis' tariff data of 673% and 97% (the next highest is 57.5%), so we treat these outliers and exclude them for the purpose of tariff summary statistics. Ultimately, we match 8574 products from the CUSFTA staging schedule to USITC import data and 7827 of these are not in the "Mixed" or "Missing" staging categories. Of these 7827 products, we have an imputed pre-CUSFTA tariff faced by Canada for 7785 products. Of the 42 products with missing pre-CUSFTA tariffs, 5 have specific tariffs but do not have an ad valorem equivalent tariff per Romalis' tariff data and we cannot compute one based on pre-CUSFTA imports because our USITC import data begins in 1989. The remaining 37 products have "complex" base rates that cannot be transformed into an ad valorem equivalent tariff with USITC import data.[16]

For Canada's pre-NAFTA tariff, we initially follow a two-step procedure. First, a prod-

[16]For example, the base rate for product 2613.90.00, which is *other molybdenum ore and concentrate*, depends on the amount of molybdenum content.

uct's pre-NAFTA tariff must be zero if its CUSFTA staging category is either A, D or B. Second, for products phased out over 10 years under CUSFTA with ad valorem tariffs, their pre-NAFTA tariff must be half of their pre-CUSFTA tariff. For remaining products, we use the 1993 Canada preferential tariff per Romalis' tariff data. If this is not available, we compute the an ad valorem equivalent tariff using the CUSFTA base rate, CUSFTA staging category and the last available pre-NAFTA import level from the USITC. Ultimately, we match 8843 products from the NAFTA staging schedule to USITC import data and 8023 of these are not in the "Mixed" or "Missing" staging categories for Canada. Of these 8023 products, we have an imputed pre-NAFTA tariff faced by Canada for 7982 products. Of the 41 products with missing pre-NAFTA tariffs, 5 have complex tariff structures and 2 are specific tariffs but we cannot compute an ad valorem equivalent because they were not imported from Canada before NAFTA per our USITC import data. A further 29 NAFTA products were not in CUSFTA and their tariff is missing per Romalis' tariff data. The final 5 products were part of a CUSFTA "mixed" product and hence we do not know its CUSFTA base rate and, in turn, cannot compute its pre-NAFTA tariff.

For Mexico's pre-NAFTA tariff, the process is much simpler. For Mexico's pre-NAFTA GSP eligible products and for NAFTA staging category D products, the pre-NAFTA tariff is zero. For other products, we first check the U.S. 1993 MFN ad valorem equivalent tariff per Romalis' tariff data. For remaining products, we self-compute an ad valorem equivalent tariff using the NAFTA base rate and the last available pre-NAFTA import level from the USITC. Of the 8876 Mexican products that we can match from the NAFTA schedule or GSP eligibility to USITC import data, 8251 are not in the "Mixed" or "Missing" staging categories. Of these 8251 products, we have pre-NAFTA tariffs for 8228. Of the remaining 23 products, 19 have complex tariff structures and 4 have specific MFN tariffs but we cannot self-compute an ad valorem equivalent tariff because the product was not imported from Mexico before NAFTA per our USITC import data.

Table 1. NAFTA and CUSFTA tariff schedule staging categories

Staging Category		Panel A		Panel B						Panel C					
		CUSFTA: product level data		NAFTA: distribution of products						NAFTA: distribution of import value ($tn)					
				NAFTA		Canada		Mexico		NAFTA		Canada		Mexico	
Code	Description	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
A	Immediate cut to 0	315	3,7%	4.526	51,2%	2.535	28,7%	981	11,1%	$9,81	41,4%	$4,40	18,6%	$4,29	18,1%
B	5 equal annual cuts to 0	2.285	26,7%	179	2,0%	792	9,0%	169	1,9%	$0,18	0,8%	$1,18	5,0%	$0,13	0,6%
B6	1 immediate cut + 5 equal annual cuts to 0			728	8,2%	728	8,2%	726	8,2%	$0,65	2,7%	$0,65	2,7%	$0,64	2,7%
C	10 equal annual cuts to 0	3.932	45,9%	750	8,5%	94	1,1%	737	8,3%	$4,14	17,5%	$0,24	1,0%	$4,09	17,3%
C10	Non-linear cuts to zero over 10 years			71	0,8%	0	0,0%	71	0,8%	$0,28	1,2%		0,0%	$0,28	1,2%
C+	15 equal annual cuts to 0			74	0,8%	3	0,0%	72	0,8%	$0,11	0,5%	$0,00	0,0%	$0,11	0,4%
D	Continue duty free	1.295	15,1%	1.329	15,0%	3.871	43,8%	1.301	14,7%	$4,99	21,1%	$14,37	60,6%	$4,97	21,0%
GSP								4.194	47,3%					$7,75	32,7%
Mixed		745	8,7%	1.120	12,7%	755	8,5%	559	6,3%	$3,42	14,4%	$2,76	11,7%	$1,33	5,6%
Missing		2	0,0%	66	0,7%	65	0,7%	66	0,7%	$0,12	0,5%	$0,11	0,5%	$0,12	0,5%
Total		8.574	100%	8.843	100%	8.843	100%	8.876	100%	$23,70	100%	$23,70	100%	$23,72	100%

Notes: Staging category data comes from CUSFTA Article 401 and Annex 401.2 and NAFTA Annex 302.2. Panels A and B describe the distribution of products in these Annexes across staging categories. Columns (5)-(6) modify the NAFTA staging categories for consistency with CUSFTA staging categories. Columns (7)-(8) modify the NAFTA staging categories for consistency with Mexico's product-level elibibility for the US Generalized System of Preferences (GSP) program. Panel C merges the NAFTA staging category data with 8-digit HS USITC import data at the exporter-product level, including NAFTA and non-NAFTA exporters, for the period 1989-2016. Panels A and B only use products that appear in this USITC import data. Imports are measured in trillions of real 2010 USD using the World Development Indicator GDP deflator. See main text and Table 2 for further details.

Table 2. Tariff cuts by staging categories

Code	Description	CUSFTA tariff cuts on Canada			NAFTA tariff cuts on Canada			NAFTA tariff cuts on Mexico		
		Products	Pre-CUSFTA mean tariff	Mean annual tariff cut	Products	Pre-NAFTA mean tariff	Mean annual tariff cut	Products	Pre-NAFTA mean tariff	Mean annual tariff cut
A	Immediate cut to 0	312	3,6%	3,6%	2.508	2,6%	2,6%	961	7,5%	7,5%
B	5 equal annual cuts to 0	2.284	5,8%	1,2%	791	4,7%	0,9%	168	9,4%	1,9%
B6	1 immediate cut + 5 equal annual cuts to 0				727	6,3%	1,1%	726	12,7%	2,1%
C	10 equal annual cuts to 0	3.894	8,5%	0,9%	85	1,5%	0,2%	735	7,6%	0,8%
C10	Non-linear cuts to zero over 10 years							71	14,1%	1,4%
C+	15 equal annual cuts to 0							72	19,8%	1,3%
D	Continue duty free	1.295	N/A	N/A	3.871	N/A	N/A	1.301	N/A	N/A
GSP								4.194	N/A	N/A
Mixed		745	N/A	N/A	755	N/A	N/A	559	N/A	N/A
Missing		2	N/A	N/A	65	N/A	N/A	66	N/A	N/A
Total		8.532			8.802			8.853		

Table 3. Matching NAFTA tariff schedule to USITC trade data

	Product level data			Exporter-product level data					
	Panel A			Panel B: Products			Panel C: Import values ($tn)		
Year	Trade	Stagings	Match %	Trade	Stagings	Match %	Trade	Stagings	Match %
1989	8.602	8.393	97,57%	131.048	127.390	97,21%	$0,44	$0,43	97,11%
1990	8.677	8.456	97,45%	126.447	122.960	97,24%	$0,47	$0,45	97,22%
1991	8.659	8.523	98,43%	125.963	123.708	98,21%	$0,46	$0,45	97,79%
1992	8.745	8.642	98,82%	129.326	127.600	98,67%	$0,50	$0,49	98,13%
1993	8.690	8.675	99,83%	134.926	134.541	99,71%	$0,53	$0,53	98,85%
1994	8.994	8.492	94,42%	145.319	136.326	93,81%	$0,62	$0,53	85,69%
1995	9.568	7.911	82,68%	151.752	129.641	85,43%	$0,69	$0,55	78,68%
1996	9.770	7.449	76,24%	158.050	125.800	79,60%	$0,74	$0,54	72,37%
1997	9.997	7.461	74,63%	168.033	130.389	77,60%	$0,80	$0,57	71,34%
1998	9.896	7.392	74,70%	168.495	130.903	77,69%	$0,85	$0,59	70,18%
1999	9.876	7.406	74,99%	170.030	132.860	78,14%	$0,94	$0,65	69,72%
2000	9.908	7.412	74,81%	178.080	138.807	77,95%	$1,11	$0,78	70,41%
2001	9.917	7.406	74,68%	178.476	138.543	77,63%	$1,03	$0,76	73,47%
2002	10.163	6.955	68,43%	185.114	134.846	72,84%	$1,05	$0,71	67,79%
2003	10.179	6.953	68,31%	188.279	136.934	72,73%	$1,13	$0,77	67,91%
2004	10.155	6.950	68,44%	191.986	139.445	72,63%	$1,33	$0,90	67,44%
2005	10.172	6.944	68,27%	195.741	141.474	72,28%	$1,52	$1,03	67,60%
2006	10.188	6.951	68,23%	198.368	142.945	72,06%	$1,69	$1,14	67,83%
2007	10.116	6.343	62,70%	197.675	133.373	67,47%	$1,78	$1,15	64,51%
2008	10.095	6.339	62,79%	192.709	130.455	67,70%	$1,92	$1,26	65,64%
2009	10.043	6.326	62,99%	183.535	124.129	67,63%	$1,40	$0,87	62,17%
2010	10.053	6.326	62,93%	189.482	128.011	67,56%	$1,71	$1,09	63,31%
2011	10.098	6.333	62,72%	194.088	131.505	67,76%	$1,99	$1,27	63,89%
2012	10.300	6.093	59,16%	197.081	128.289	65,09%	$2,04	$1,28	62,96%
2013	10.287	6.091	59,21%	193.084	126.253	65,39%	$2,02	$1,27	62,87%
2014	10.299	6.087	59,10%	196.866	128.667	65,36%	$2,08	$1,30	62,30%
2015	10.308	6.096	59,14%	203.138	132.535	65,24%	$1,97	$1,21	61,35%
2016	10.297	6.099	59,23%	204.767	133.760	65,32%	$1,87	$1,15	61,57%

Notes: Staging category data refer to NAFTA US tariff schedule data from NAFTA Annex 302.2. Trade data is 8-digit USITC import data. Panel C aggregates 8-digit exporter-product US imports to the 8-digit level. Imports are measured in trillions of real 2010 USD using the World Development Indicator GDP deflator. See main text for further details.

Table 4. Time-invariant DDD estimates of NAFTA

Panel A: NAFTA vs ROW approach

A1. Phase out products

	Mexico				Canada		
	Pre-NAFTA	Post-NAFTA	Growth		Pre-NAFTA	Post-NAFTA	Growth
NAFTA partner	12,507	12,852	0,345	NAFTA partner	12,335	12,670	0,335
	(0.025)	(0.011)	(0.027)		(0.026)	(0.012)	(0.029)
	[12,690]	[79,918]			[11,612]	[61,642]	
ROW	11,603	11,359	-0,244	ROW	11,389	11,091	-0,298
	(0.005)	(0.002)	(0.005)		(0.006)	(0.002)	(0.006)
	[320,382]	[2,094,494]			[195,882]	[1,380,218]	
Difference-in-difference			0,589	Difference-in-difference			0,633
			(0.027)				(0.030)

A2. CDF products

	Mexico				Canada		
	Pre-NAFTA	Post-NAFTA	Growth		Pre-NAFTA	Post-NAFTA	Growth
NAFTA partner	12,456	12,870	0,414	NAFTA partner	13,134	13,550	0,416
	(0.058)	(0.026)	(0.064)		(0.028)	(0.014)	(0.031)
	[2,281]	[13,524]			[10,897]	[52,998]	
ROW	11,839	11,928	0,088	ROW	11,889	11,872	-0,017
	(0.011)	(0.005)	(0.012)		(0.007)	(0.003)	(0.007)
	[52,487]	[338,494]			[151,147]	[904,627]	
Difference-in-difference			0,326	Difference-in-difference			0,433
			(.064)				(0.030)
DDD			0,263	DDD			0,200
			(0.070)				(0.042)

Table 4 (continued). Time-invariant DDD estimates of NAFTA

Panel B: Phase-out products vs CDF products approach

B1. NAFTA partner

	Mexico				Canada		
	Pre-NAFTA	Post-NAFTA	Growth		Pre-NAFTA	Post-NAFTA	Growth
Phase out products	12,507	12,852	0,345	Phase out products	12,335	12,670	0,335
	(0.025)	(0.011)	(0.027)		(0.026)	(0.012)	(0.029)
	[12,690]	[79,918]			[11,612]	[61,642]	
CDF products	12,456	12,870	0,414	CDF products	13,134	13,550	0,416
	(0.058)	(.026)	(0.064)		(.028)	(0.014)	(0.031)
	[2,281]	[13,524]			[10,897]	[52,998]	
Difference-in-difference			-0,069	Difference-in-difference			-0,081
			(0.075)				(0.045)

B2. ROW

	Mexico				Canada		
	Pre-NAFTA	Post-NAFTA	Growth		Pre-NAFTA	Post-NAFTA	Growth
Phase out products	11,603	11,359	-0,244	Phase out products	11,389	11,091	-0,298
	(0.005)	0.002)	(0.005)		(0.006)	(0.002)	(0.006)
	[320,382]	[2,094,494]			[195,882]	[1,380,218]	
CDF products	11,839	11,928	0,088	CDF products	11,889	11,872	-0,017
	(0.001)	(0.005)	(0.012)		(0.007)	(0.003)	(0.007)
	[52,487]	[338,494]			[151,147]	[904,627]	
Difference-in-difference			-0,332	Difference-in-difference			-0,281
			(0.014)				(0.010)
DDD			0,263	DDD			0,200
			(0.070)				(0.042)

Notes: Cells contain mean log imports for the relevant group of countries, products and years. Phase out products, CDF products, Pre-NAFTA and Post-NAFTA years are defined in the text. Number of observations in square brackets. Standard errors in parentheses. For group means and growth in group means, standard errors from t-test of equivalence of group means. For difference-in-difference (DD) and triple difference (DDD) estimates, standard errors from OLS regression. The DDD estimate in Panels A2 (B2) is the difference between the DD estimate in Panel A1 (B1) less that in Panel A2 (B2).

Table 5. DDD regression: time invariant, homogeneous cumulative treatment effects

	Mexico				Canada			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Post	0,088 [b]	0,255 [c]			-0,017	0,243 [c]		
	(0,03)	(0,02)			(0,02)	(0,01)		
NAFTA	0,617 [c]				1,244 [c]			
	(0,10)				(0,05)			
Phase	-0,236 [c]				-0,500 [c]			
	(0,03)				(0,02)			
Post x NAFTA	0,326 [c]	0,328 [c]			0,433 [c]	0,123 [c]		
	(0,08)	(0,07)			(0,04)	(0,03)		
Post x Phase	-0,332 [c]	-0,060 [c]	-0,072 [c]		-0,281 [c]	-0,132 [c]	-0,160 [c]	
	(0,03)	(0,02)	(0,02)		(0,02)	(0,01)	(0,01)	
NAFTA x Phase	0,287 [b]				-0,299 [c]			
	(0,11)				(0,07)			
Post x NAFTA x Phase	0,263 [b]	0,363 [c]	0,383 [c]	0,371 [c]	0,200 [c]	0,298 [c]	0,328 [c]	0,260 [c]
	(0,09)	(0,08)	(0,08)	(0,07)	(0,05)	(0,04)	(0,04)	(0,04)
Observations	2.914.270	2.825.272	2.825.015	2.816.958	2.769.023	2.686.266	2.686.013	2.678.207
Adjusted R^2	0,013	0,726	0,740	0,763	0,033	0,730	0,744	0,766
Country x Product FE	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Country x Year FE	No	No	Yes	Yes	No	No	Yes	Yes
Product x Year FE	No	No	No	Yes	No	No	No	Yes

Notes: Columns (1) and (3) based on equation (2) from main text. Columns (2) and (4) based on equation (3) from main text. Two-way clustered standard errors are used, clustering on both country-year and product-year. [a] $p < 0.05$, [b] $p < 0.01$, [c] $p < 0.001$.

Table 6. DDD regression: time varying, homogeneous cumulative treatment effects

	Mexico								Canada							
	(1)		(2)		(3)		(4)		(1)		(2)		(3)		(4)	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
1989	-0,041	(0,11)	-0,155	(0,10)	-0,158	(0,10)	-0,151	(0,11)	0,013	(0,05)	-0,113 [a]	(0,05)	-0,127 [a]	(0,05)	-0,137 [a]	(0,05)
1990	-0,035	(0,10)	-0,040	(0,09)	-0,044	(0,09)	-0,066	(0,10)	-0,114 [a]	(0,05)	-0,164 [c]	(0,04)	-0,172 [c]	(0,04)	-0,175 [c]	(0,05)
1991	-0,007	(0,09)	0,054	(0,08)	0,047	(0,08)	0,032	(0,09)	-0,062	(0,04)	-0,102 [b]	(0,04)	-0,111 [b]	(0,04)	-0,115 [b]	(0,04)
1993	0,048	(0,09)	0,110	(0,08)	0,102	(0,08)	0,083	(0,08)	0,108 [b]	(0,04)	-0,000	(0,04)	-0,002	(0,04)	-0,008	(0,04)
1994	-0,064	(0,10)	0,106	(0,09)	0,108	(0,09)	0,092	(0,10)	-0,064	(0,05)	-0,032	(0,04)	-0,032	(0,04)	-0,047	(0,05)
1995	-0,150	(0,10)	0,068	(0,10)	0,079	(0,10)	0,040	(0,10)	-0,070	(0,05)	0,023	(0,05)	0,031	(0,05)	-0,000	(0,05)
1996	-0,086	(0,11)	0,155	(0,10)	0,158	(0,10)	0,117	(0,10)	0,044	(0,06)	0,157 [b]	(0,05)	0,160 [b]	(0,05)	0,138 [b]	(0,05)
1997	0,116	(0,12)	0,306 [b]	(0,10)	0,315 [b]	(0,10)	0,309 [b]	(0,11)	0,117	(0,06)	0,235 [c]	(0,05)	0,241 [c]	(0,05)	0,202 [c]	(0,05)
1998	0,126	(0,12)	0,244 [a]	(0,11)	0,262 [a]	(0,11)	0,232 [a]	(0,11)	0,126 [a]	(0,06)	0,289 [c]	(0,05)	0,303 [c]	(0,05)	0,249 [c]	(0,06)
1999	0,258 [a]	(0,12)	0,375 [c]	(0,11)	0,391 [c]	(0,11)	0,388 [c]	(0,11)	0,209 [c]	(0,06)	0,368 [c]	(0,06)	0,379 [c]	(0,06)	0,321 [c]	(0,06)
2000	0,248 [a]	(0,12)	0,414 [c]	(0,11)	0,428 [c]	(0,11)	0,438 [c]	(0,11)	0,183 [b]	(0,06)	0,327 [c]	(0,06)	0,346 [c]	(0,06)	0,309 [c]	(0,06)
2001	0,376 [b]	(0,12)	0,417 [c]	(0,12)	0,434 [c]	(0,12)	0,429 [c]	(0,11)	0,164 [a]	(0,06)	0,313 [c]	(0,06)	0,336 [c]	(0,06)	0,289 [c]	(0,06)
2002	0,195	(0,13)	0,315 [b]	(0,11)	0,325 [b]	(0,11)	0,380 [c]	(0,11)	0,091	(0,07)	0,270 [c]	(0,06)	0,293 [c]	(0,06)	0,267 [c]	(0,06)
2003	0,359 [b]	(0,12)	0,501 [c]	(0,12)	0,506 [c]	(0,12)	0,511 [c]	(0,11)	0,181 [b]	(0,07)	0,321 [c]	(0,06)	0,340 [c]	(0,06)	0,316 [c]	(0,06)
2004	0,316 [a]	(0,13)	0,501 [c]	(0,12)	0,504 [c]	(0,12)	0,551 [c]	(0,12)	0,225 [b]	(0,07)	0,340 [c]	(0,06)	0,356 [c]	(0,06)	0,278 [c]	(0,06)
2005	0,293 [a]	(0,13)	0,461 [c]	(0,12)	0,459 [c]	(0,12)	0,451 [c]	(0,12)	0,251 [c]	(0,07)	0,312 [c]	(0,06)	0,320 [c]	(0,06)	0,221 [c]	(0,06)
2006	0,332 [a]	(0,13)	0,431 [c]	(0,13)	0,427 [c]	(0,13)	0,401 [b]	(0,12)	0,269 [c]	(0,07)	0,268 [c]	(0,07)	0,271 [c]	(0,07)	0,175 [b]	(0,06)
2007	0,342 [a]	(0,14)	0,420 [b]	(0,13)	0,416 [b]	(0,13)	0,388 [b]	(0,12)	0,238 [b]	(0,08)	0,294 [c]	(0,07)	0,290 [c]	(0,07)	0,162 [a]	(0,07)
2008	0,299 [a]	(0,14)	0,422 [b]	(0,13)	0,413 [b]	(0,13)	0,382 [b]	(0,13)	0,193 [a]	(0,08)	0,230 [c]	(0,07)	0,225 [b]	(0,07)	0,102	(0,07)
2009	0,214	(0,15)	0,374 [b]	(0,13)	0,363 [b]	(0,13)	0,315 [a]	(0,12)	0,131	(0,08)	0,222 [b]	(0,07)	0,225 [b]	(0,07)	0,107	(0,07)
2010	0,240	(0,15)	0,431 [b]	(0,14)	0,424 [b]	(0,14)	0,393 [b]	(0,13)	0,233 [b]	(0,08)	0,302 [c]	(0,07)	0,305 [c]	(0,07)	0,166 [a]	(0,07)
2011	0,418 [b]	(0,15)	0,517 [c]	(0,14)	0,518 [c]	(0,14)	0,448 [c]	(0,13)	0,082	(0,08)	0,216 [b]	(0,07)	0,219 [b]	(0,07)	0,099	(0,07)
2012	0,416 [a]	(0,16)	0,418 [b]	(0,14)	0,425 [b]	(0,14)	0,340 [a]	(0,13)	0,107	(0,08)	0,237 [b]	(0,07)	0,246 [c]	(0,07)	0,113	(0,07)
2013	0,338 [a]	(0,15)	0,387 [b]	(0,14)	0,402 [b]	(0,14)	0,336 [a]	(0,13)	0,205 [a]	(0,08)	0,224 [b]	(0,07)	0,244 [b]	(0,07)	0,064	(0,07)
2014	0,310 [a]	(0,16)	0,426 [b]	(0,14)	0,443 [b]	(0,14)	0,392 [b]	(0,13)	0,117	(0,08)	0,206 [b]	(0,07)	0,225 [b]	(0,07)	0,077	(0,07)
2015	0,403 [b]	(0,15)	0,436 [b]	(0,14)	0,461 [c]	(0,14)	0,426 [b]	(0,13)	0,139	(0,08)	0,255 [c]	(0,07)	0,281 [c]	(0,07)	0,138	(0,07)
2016	0,337 [a]	(0,16)	0,448 [b]	(0,14)	0,477 [c]	(0,14)	0,426 [b]	(0,13)	0,225 [b]	(0,08)	0,257 [c]	(0,07)	0,288 [c]	(0,07)	0,130	(0,07)
Observations	2.914.270		2.825.272		2.825.015		2.816.958		2.769.023		2.686.266		2.686.013		2.678.207	
Adjusted R^2	0,014		0,728		0,740		0,763		0,034		0,732		0,744		0,766	
Country x Product FE	No		Yes		Yes		Yes		No		Yes		Yes		Yes	
Country x Year FE	No		No		Yes		Yes		No		No		Yes		Yes	
Product x Year FE	No		No		No		Yes		No		No		No		Yes	

Notes: Two-way clustered standard errors are used, clustering on both country-year and product-year. [a] $p < 0.05$, [b] $p < 0.01$, [c] $p < 0.001$.

Table 7. DDD regression: time varying, heterogeneous cumulative treatment effects

	Mexico								Canada					
	Immediate Cut		5 year phase out		10+ year phase out		GSP		Immediate Cut		5 year phase out		10+ year phase out	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
1989	-0,157	(0,18)	-0,492 [b]	(0,17)	-0,188	(0,17)	-0,108	(0,11)	0,008	(0,06)	-0,364 [c]	(0,07)	-0,548 [a]	(0,27)
1990	-0,003	(0,16)	-0,148	(0,15)	-0,074	(0,16)	-0,068	(0,10)	-0,120 [a]	(0,05)	-0,252 [c]	(0,07)	-0,553 [b]	(0,20)
1991	0,080	(0,15)	0,004	(0,14)	-0,011	(0,14)	0,032	(0,09)	-0,076	(0,05)	-0,170 [b]	(0,06)	-0,337	(0,18)
1993	0,243	(0,14)	0,057	(0,14)	0,227	(0,14)	0,043	(0,09)	-0,023	(0,05)	0,015	(0,06)	-0,026	(0,19)
1994	0,416 [a]	(0,16)	0,256	(0,15)	-0,084	(0,15)	0,057	(0,10)	-0,038	(0,05)	-0,049	(0,07)	-0,301	(0,18)
1995	0,441 [a]	(0,17)	0,347 [a]	(0,15)	0,064	(0,15)	-0,058	(0,10)	-0,049	(0,06)	0,093	(0,07)	-0,287	(0,18)
1996	0,457 [a]	(0,18)	0,683 [c]	(0,16)	0,118	(0,16)	-0,023	(0,11)	0,078	(0,06)	0,263 [c]	(0,08)	-0,170	(0,19)
1997	0,865 [c]	(0,18)	0,844 [c]	(0,16)	0,194	(0,16)	0,164	(0,11)	0,116	(0,06)	0,354 [c]	(0,08)	0,168	(0,21)
1998	0,915 [c]	(0,19)	0,886 [c]	(0,16)	0,153	(0,17)	0,034	(0,11)	0,194 [b]	(0,06)	0,358 [c]	(0,08)	0,006	(0,24)
1999	0,932 [c]	(0,18)	1,132 [c]	(0,16)	0,302	(0,17)	0,187	(0,11)	0,216 [c]	(0,06)	0,523 [c]	(0,08)	-0,111	(0,24)
2000	0,900 [c]	(0,19)	1,237 [c]	(0,17)	0,300	(0,18)	0,248 [a]	(0,12)	0,226 [c]	(0,06)	0,472 [c]	(0,08)	-0,049	(0,23)
2001	1,028 [c]	(0,19)	1,194 [c]	(0,17)	0,280	(0,18)	0,234 [a]	(0,12)	0,250 [c]	(0,07)	0,378 [c]	(0,08)	-0,084	(0,24)
2002	0,967 [c]	(0,19)	1,145 [c]	(0,17)	0,237	(0,18)	0,180	(0,12)	0,204 [b]	(0,07)	0,399 [c]	(0,09)	-0,124	(0,24)
2003	1,026 [c]	(0,19)	1,148 [c]	(0,17)	0,529 [b]	(0,19)	0,321 [b]	(0,12)	0,211 [b]	(0,07)	0,527 [c]	(0,09)	-0,140	(0,24)
2004	1,067 [c]	(0,20)	1,146 [c]	(0,17)	0,385 [a]	(0,19)	0,404 [c]	(0,12)	0,220 [b]	(0,07)	0,400 [c]	(0,09)	-0,098	(0,26)
2005	0,899 [c]	(0,20)	0,947 [c]	(0,18)	0,335	(0,19)	0,331 [b]	(0,12)	0,200 [b]	(0,07)	0,261 [b]	(0,09)	0,158	(0,26)
2006	0,971 [c]	(0,21)	0,724 [c]	(0,18)	0,374	(0,19)	0,285 [a]	(0,13)	0,156 [a]	(0,07)	0,227 [a]	(0,09)	-0,119	(0,27)
2007	0,764 [c]	(0,21)	0,740 [c]	(0,19)	0,328	(0,19)	0,299 [a]	(0,13)	0,171 [a]	(0,07)	0,169	(0,09)	-0,243	(0,27)
2008	0,662 [b]	(0,21)	0,605 [b]	(0,19)	0,466 [a]	(0,20)	0,307 [a]	(0,13)	0,132	(0,07)	0,078	(0,10)	-0,426	(0,28)
2009	0,654 [b]	(0,22)	0,517 [b]	(0,19)	0,357	(0,20)	0,244	(0,13)	0,140	(0,08)	0,075	(0,10)	-0,362	(0,28)
2010	0,563 [b]	(0,21)	0,511 [b]	(0,20)	0,427 [a]	(0,21)	0,364 [b]	(0,13)	0,195 [a]	(0,08)	0,131	(0,10)	-0,154	(0,29)
2011	0,791 [c]	(0,21)	0,489 [a]	(0,20)	0,539 [b]	(0,21)	0,401 [b]	(0,14)	0,125	(0,08)	0,089	(0,10)	-0,447	(0,29)
2012	0,693 [b]	(0,22)	0,311	(0,19)	0,445 [a]	(0,21)	0,300 [a]	(0,14)	0,145	(0,08)	0,081	(0,10)	-0,334	(0,29)
2013	0,621 [b]	(0,21)	0,348	(0,19)	0,587 [b]	(0,20)	0,272 [a]	(0,13)	0,128	(0,08)	-0,027	(0,10)	-0,424	(0,31)
2014	0,594 [b]	(0,22)	0,438 [a]	(0,19)	0,589 [b]	(0,20)	0,343 [a]	(0,14)	0,109	(0,08)	0,058	(0,10)	-0,609 [a]	(0,31)
2015	0,732 [c]	(0,21)	0,423 [a]	(0,20)	0,515 [a]	(0,21)	0,389 [b]	(0,13)	0,177 [a]	(0,08)	0,083	(0,10)	-0,262	(0,30)
2016	0,655 [b]	(0,22)	0,545 [b]	(0,20)	0,576 [b]	(0,20)	0,366 [b]	(0,14)	0,175 [a]	(0,08)	0,070	(0,10)	-0,344	(0,28)
Observations	2.816.958								2.678.207					
Adjusted R^2	0,763								0,766					
Country x Product	Yes								Yes					
Country x Year FE	Yes								Yes					
Product x Year FE	Yes								Yes					

Notes: Two-way clustered standard errors are used, clustering on both country-year and product-year. [a] $p < 0.05$, [b] $p < 0.01$, [c] $p < 0.001$.

Table 8. DDD regression: time varying, heterogeneous annual treatment effects

Panel A	Mexico								Canada					
	Immediate Cut		5 year phase out		10+ year phase out		GSP		Immediate Cut		5 year phase out		10+ year phase out	
	Estimate	p	Estimate	p	Estimate	p	Estimate	p	Estimate	p	Estimate	p	Estimate	p
1990	0,154	(0,33)	0,344 [a]	(0,03)	0,114	(0,44)	0,039	(0,68)	-0,128 [a]	(0,01)	0,112	(0,09)	-0,005	(0,98)
1991	0,083	(0,59)	0,153	(0,29)	0,064	(0,65)	0,100	(0,27)	0,044	(0,37)	0,082	(0,19)	0,216	(0,18)
1992	-0,080	(0,58)	-0,004	(0,97)	0,011	(0,94)	-0,032	(0,73)	0,076	(0,11)	0,170 [b]	(0,01)	0,337	(0,07)
1993	0,243	(0,08)	0,057	(0,67)	0,227	(0,10)	0,043	(0,62)	-0,023	(0,62)	0,015	(0,80)	-0,026	(0,89)
1994	0,172	(0,24)	0,199	(0,15)	-0,311 [a]	(0,02)	0,015	(0,87)	-0,015	(0,74)	-0,064	(0,29)	-0,276	(0,14)
1995	0,025	(0,86)	0,091	(0,49)	0,148	(0,24)	-0,116	(0,18)	-0,011	(0,81)	0,142 [a]	(0,01)	0,015	(0,93)
1996	0,017	(0,90)	0,336 [b]	(0,01)	0,054	(0,66)	0,036	(0,68)	0,127 [b]	(0,01)	0,169 [b]	(0,01)	0,117	(0,43)
1997	0,408 [b]	(0,00)	0,161	(0,16)	0,076	(0,51)	0,187 [a]	(0,02)	0,038	(0,39)	0,091	(0,12)	0,338 [a]	(0,01)
1998	0,050	(0,68)	0,042	(0,70)	-0,041	(0,73)	-0,130	(0,09)	0,078	(0,07)	0,004	(0,94)	-0,162	(0,26)
1999	0,018	(0,88)	0,246 [a]	(0,02)	0,148	(0,21)	0,154 [a]	(0,05)	0,022	(0,60)	0,165 [b]	(0,00)	-0,117	(0,38)
2000	-0,033	(0,78)	0,105	(0,31)	-0,002	(0,99)	0,060	(0,42)	0,010	(0,80)	-0,051	(0,34)	0,062	(0,65)
2001	0,129	(0,27)	-0,042	(0,69)	-0,020	(0,86)	-0,014	(0,86)	0,024	(0,56)	-0,094	(0,08)	-0,035	(0,77)
2002	-0,062	(0,58)	-0,049	(0,64)	-0,043	(0,72)	-0,054	(0,48)	-0,046	(0,29)	0,021	(0,72)	-0,040	(0,78)
2003	0,059	(0,61)	0,002	(0,98)	0,292 [b]	(0,01)	0,142 [a]	(0,05)	0,007	(0,87)	0,128 [a]	(0,02)	-0,016	(0,89)
2004	0,041	(0,73)	-0,002	(0,99)	-0,144	(0,21)	0,083	(0,28)	0,010	(0,82)	-0,127 [a]	(0,03)	0,042	(0,79)
2005	-0,168	(0,16)	-0,199	(0,07)	-0,050	(0,65)	-0,073	(0,32)	-0,021	(0,63)	-0,139 [a]	(0,02)	0,256	(0,06)
2006	0,072	(0,55)	-0,223 [a]	(0,04)	0,039	(0,71)	-0,046	(0,53)	-0,044	(0,29)	-0,035	(0,56)	-0,277 [a]	(0,03)
2007	-0,208	(0,10)	0,016	(0,89)	-0,046	(0,67)	0,014	(0,86)	0,016	(0,73)	-0,058	(0,34)	-0,124	(0,44)
2008	-0,101	(0,42)	-0,135	(0,25)	0,138	(0,22)	0,008	(0,91)	-0,039	(0,39)	-0,091	(0,12)	-0,184	(0,17)
2009	-0,009	(0,95)	-0,088	(0,45)	-0,108	(0,35)	-0,063	(0,45)	0,007	(0,88)	-0,003	(0,96)	0,064	(0,70)
2010	-0,090	(0,47)	-0,006	(0,96)	0,070	(0,54)	0,120	(0,12)	0,056	(0,25)	0,055	(0,37)	0,208	(0,23)
2011	0,228	(0,06)	-0,022	(0,85)	0,111	(0,32)	0,037	(0,64)	-0,070	(0,14)	-0,042	(0,50)	-0,293	(0,08)
2012	-0,099	(0,40)	-0,178	(0,14)	-0,094	(0,43)	-0,101	(0,23)	0,020	(0,68)	-0,007	(0,90)	0,114	(0,48)
2013	-0,072	(0,55)	0,037	(0,74)	0,142	(0,22)	-0,028	(0,74)	-0,018	(0,71)	-0,108	(0,11)	-0,090	(0,52)
2014	-0,027	(0,82)	0,091	(0,40)	0,002	(0,99)	0,071	(0,36)	-0,019	(0,69)	0,085	(0,21)	-0,186	(0,26)
2015	0,138	(0,25)	-0,015	(0,89)	-0,074	(0,48)	0,046	(0,56)	0,069	(0,17)	0,025	(0,69)	0,348 [a]	(0,05)
2016	-0,078	(0,51)	0,122	(0,30)	0,061	(0,58)	-0,023	(0,78)	-0,002	(0,96)	-0,013	(0,84)	-0,082	(0,61)
Observations	2.816.958								2.678.207					
Country x Product FE	Yes								Yes					
Country x Year FE	Yes								Yes					
Product x Year FE	Yes								Yes					

Table 8 (continued). DDD regression: time varying, heterogeneous annual treatment effects

Panel B	Mexico								Canada					
	Immediate Cut		5 year phase out		10+ year phase out		GSP		Immediate Cut		5 year phase out		10+ year phase out	
	Estimate	p	Estimate	p	Estimate	p	Estimate	p	Estimate	p	Estimate	p	Estimate	p
1990														
1991														
1992	0,157	(0,38)	0,492 [b]	(0,00)	0,188	(0,27)	0,108	(0,33)	-0,008	(0,90)	0,364 [c]	(0,00)	0,548 [a]	(0,04)
1993	0,246	(0,14)	0,205	(0,22)	0,302	(0,06)	0,111	(0,30)	0,096	(0,10)	0,267 [c]	(0,00)	0,528 [a]	(0,01)
1994	0,336	(0,06)	0,252	(0,12)	-0,073	(0,65)	0,026	(0,82)	0,038	(0,50)	0,121	(0,09)	0,036	(0,84)
1995	0,441 [a]	(0,01)	0,347 [a]	(0,02)	0,064	(0,67)	-0,058	(0,57)	-0,049	(0,38)	0,093	(0,19)	-0,287	(0,12)
1996	0,214	(0,21)	0,626 [c]	(0,00)	-0,109	(0,48)	-0,065	(0,54)	0,101	(0,07)	0,248 [c]	(0,00)	-0,144	(0,52)
1997	0,449 [b]	(0,01)	0,588 [c]	(0,00)	0,278	(0,06)	0,107	(0,30)	0,154 [b]	(0,00)	0,403 [c]	(0,00)	0,469 [b]	(0,01)
1998	0,474 [b]	(0,00)	0,539 [c]	(0,00)	0,089	(0,53)	0,092	(0,34)	0,243 [c]	(0,00)	0,265 [c]	(0,00)	0,293	(0,10)
1999	0,475 [b]	(0,00)	0,449 [c]	(0,00)	0,183	(0,19)	0,210 [a]	(0,02)	0,138 [b]	(0,01)	0,261 [c]	(0,00)	0,059	(0,76)
2000	0,035	(0,81)	0,393 [b]	(0,00)	0,105	(0,45)	0,083	(0,37)	0,111 [a]	(0,03)	0,118	(0,07)	-0,217	(0,16)
2001	0,114	(0,40)	0,309 [a]	(0,02)	0,127	(0,35)	0,200 [a]	(0,03)	0,056	(0,26)	0,020	(0,76)	-0,090	(0,56)
2002	0,034	(0,80)	0,013	(0,92)	-0,065	(0,64)	-0,008	(0,93)	-0,012	(0,81)	-0,124	(0,06)	-0,012	(0,95)
2003	0,126	(0,38)	-0,089	(0,48)	0,230	(0,12)	0,074	(0,43)	-0,016	(0,76)	0,055	(0,41)	-0,091	(0,54)
2004	0,039	(0,78)	-0,049	(0,72)	0,105	(0,45)	0,170	(0,08)	-0,030	(0,56)	0,022	(0,75)	-0,014	(0,93)
2005	-0,067	(0,64)	-0,199	(0,14)	0,098	(0,47)	0,151	(0,10)	-0,004	(0,94)	-0,138	(0,05)	0,282	(0,09)
2006	-0,055	(0,70)	-0,424 [c]	(0,00)	-0,155	(0,25)	-0,037	(0,68)	-0,055	(0,29)	-0,300 [c]	(0,00)	0,021	(0,91)
2007	-0,303 [a]	(0,04)	-0,406 [b]	(0,00)	-0,057	(0,67)	-0,105	(0,27)	-0,049	(0,37)	-0,231 [b]	(0,00)	-0,145	(0,49)
2008	-0,237	(0,11)	-0,342 [a]	(0,01)	0,131	(0,34)	-0,023	(0,81)	-0,067	(0,21)	-0,183 [a]	(0,01)	-0,584 [b]	(0,00)
2009	-0,318 [a]	(0,03)	-0,207	(0,13)	-0,017	(0,90)	-0,040	(0,68)	-0,016	(0,78)	-0,151 [a]	(0,04)	-0,243	(0,21)
2010	-0,201	(0,19)	-0,229	(0,10)	0,100	(0,47)	0,065	(0,50)	0,024	(0,67)	-0,039	(0,60)	0,089	(0,67)
2011	0,129	(0,37)	-0,116	(0,41)	0,073	(0,60)	0,094	(0,34)	-0,007	(0,89)	0,010	(0,89)	-0,021	(0,92)
2012	0,039	(0,80)	-0,206	(0,14)	0,088	(0,52)	0,056	(0,57)	0,006	(0,92)	0,006	(0,94)	0,028	(0,90)
2013	0,058	(0,70)	-0,163	(0,22)	0,160	(0,23)	-0,092	(0,33)	-0,068	(0,23)	-0,158 [a]	(0,04)	-0,270	(0,14)
2014	-0,197	(0,17)	-0,051	(0,70)	0,050	(0,70)	-0,058	(0,55)	-0,016	(0,77)	-0,030	(0,68)	-0,162	(0,44)
2015	0,040	(0,78)	0,112	(0,40)	0,069	(0,59)	0,089	(0,35)	0,032	(0,57)	0,002	(0,98)	0,072	(0,72)
2016	0,033	(0,81)	0,197	(0,13)	-0,011	(0,93)	0,094	(0,31)	0,048	(0,39)	0,097	(0,22)	0,080	(0,64)
Observations	2.816.958								2.678.207					
Country x Product FE	Yes								Yes					
Country x Year FE	Yes								Yes					
Product x Year FE	Yes								Yes					

Notes: Estimates are the change in year-to-year coefficients; p-values obtained from testing for equality between year-by-year coefficients. [a] $p < 0.05$, [b] $p < 0.01$, [c] $p < 0.001$.