Firm export responses to tariff hikes

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Abstract

We study how firms react to unexpected increases in import tariffs. We identify our results from a sudden removal of American preferential tariffs applied on Argentine imports under the Generalized System of Preferences, which reflected American retaliation to a dispute over intellectual property between the two countries. Critical for identification, the tariff hike affected a third of Argentine exports enjoying preferential access in the American market, but did nothing to the other two thirds. We find that the higher tariffs reduced export participation of affected Argentinian firms in the US market, whereas resilient exporters dealt with the cost increase by reshuffling their export baskets away from the products whose tariffs increased. In fact, affected firms were more likely both to drop suspended products from their export basket and to start exporting new (non-suspended) products to the US. Remarkably, the extensive margin effects carry over to third markets, where policy did not change: after the policy shock, affected firms selling to the US were less likely to export to other markets. This happened only for firms that also exited the American market. We develop a simple framework to rationalize the observed export interdependencies: while the extensive margin and third-country effects require country and product specific fixed costs, the effect on the sub-extensive and sub intensive (firm-product) margins require diseconomies of scope, where exporting a product increases the marginal cost of exporting other products in the export mix.

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Non-Technical Summary

This paper studies how exporting firms react when the tariffs they face in a major foreign market suddenly increase. This question is highly relevant for policy today, as governments increasingly use tariffs, trade preferences, and retaliatory trade measures as instruments of economic and political strategy. Yet we still have limited evidence on how firms actually adjust when access to an important market becomes more costly.

The paper provides such evidence by examining a clear policy shock: the United States' 1997 suspension of preferential tariff treatment for a group of Argentine products under the Generalized System of Preferences. The suspension was linked to a dispute between the United States and Argentina over intellectual property protection. As a result, some Argentine products that had previously entered the US market duty-free suddenly faced positive tariffs. Importantly, the policy affected only a subset of products, while other Argentine exports to the United States were not directly affected.

This makes it possible to compare affected and unaffected firms and products, and to identify how exporters respond to tariff increases.

The first finding is that higher tariffs reduce export participation in the affected market. Some firms exposed to the tariff increase stopped exporting to the United States altogether. This shows that even relatively targeted tariff changes can affect the extensive margin of trade: not only how much firms export, but whether they export at all. For policymakers, this matters because firm exit from export markets can have lasting consequences if rebuilding foreign relationships is costly.

The second finding is that firms that remained active in the US market adjusted by changing what they exported. Rather than simply reducing total exports, resilient exporters reshuffled their product baskets away from products whose tariffs increased and toward products that were not affected by the suspension. Affected firms became more likely to drop suspended products and more likely to introduce new non-suspended products in the US market. This suggests that multiproduct exporters have some flexibility to respond to trade-policy shocks, but that this flexibility operates through changes in product composition.

The third finding is particularly important: the effects of the tariff increase were not confined to the US market. Firms affected by the US tariff shock also became less likely to export to other foreign markets, even though trade policy in those markets did not change. This third-market effect was concentrated among firms that exited the US market. The result shows that export decisions across markets are interconnected. A tariff increase in one major destination can therefore spill over to firms' global export strategies.

The paper explains these patterns through a framework in which firms face fixed costs of exporting and interdependencies across products and destinations. When a tariff increase makes one product less profitable in one market, the firm may adjust its entire export strategy. Some firms may exit the affected market because remaining active no longer covers the relevant fixed costs. Others may reallocate effort and sales across products. In some cases, losing a major destination may also make it less profitable to keep exporting to other markets.

These findings have direct policy implications. Evaluating tariffs by only looking at affected products in the targeted market misses part of the story. Tariff increases can reshape firms' export baskets, reduce firm participation, and generate spillovers to markets where tariffs have not changed. For governments considering tariff hikes, preference withdrawals, or retaliatory measures, the paper highlights the need to account for firm-level adjustment and market interdependencies. For countries whose firms face tariff increases abroad, the results underline the importance of policies that help exporters adapt, diversify products, and maintain access to alternative markets.

Firm Export Responses to Tariff Hikes*

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Abstract

We study how firms react to unexpected increases in import tariffs. We identify our results from a sudden removal of American preferential tariffs applied on Argentine imports under the Generalized System of Preferences, which reflected American retaliation to a dispute over intellectual property between the two countries. Critical for identification, the tariff hike affected a third of Argentine exports enjoying preferential access in the American market, but did nothing to the other two thirds. We find that the higher tariffs reduced export participation of affected Argentinian firms in the US market, whereas resilient exporters dealt with the cost increase by reshuffling their export baskets away from the products whose tariffs increased. In fact, affected firms were more likely both to drop suspended products from their export basket and to start exporting new (non-suspended) products to the US. Remarkably, the extensive margin effects carry over to third markets, where policy did not change: after the policy shock, affected firms selling to the US were less likely to export to other markets. This happened only for firms that also exited the American market. We develop a simple framework to rationalize the observed export interdependencies: while the extensive margin and third-country effects require country and product specific fixed costs, the effect on the sub-extensive and sub-intensive (firm-product) margins require diseconomies of scope, where exporting a product increases the marginal cost of exporting other products in the export mix.

Keywords: Tariffs; export interdependencies; GSP; exporting firms; multiproduct firms; third-market effects

JEL classification: F13, F14, F55, F63, O19, O24

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1 Introduction

How do exporters react to sudden increases in import tariffs? Do firms avoid markets where tariffs have increased? When tariff changes vary across products, do firms adjust their export basket composition? Does a tariff change in one market influence a firm's export participation in other markets? Answering these questions is crucial for understanding the consequences of trade policies and for shedding light on how multiproduct firms, operating across different markets, respond to an increase in the variable cost of selling certain goods in specific destinations.

These questions are especially relevant in the context of a global shift towards protectionism, where higher trade barriers are becoming more common. They are particularly timely as the United States—the world's largest importer—considers a new wave of unilateral tariff increases. Such measures raise important concerns about how exporters respond to US-specific shocks: Do they exit the American market, absorb the cost, or seek other markets? Given the central role of the US in global trade networks, these changes may have large spillover effects.

We carry out our analysis in a context that allows us to credibly identify these effects. We find that tariff hikes on specific products reduce firm export participation, but have little impact on aggregate foreign sales of resilient exporters. This occurs because of the reshuffling of products within firms. Interestingly, firms that are affected by the tariff hike and are sufficiently exposed to the impacted market are also likely to exit other markets, even though tariffs do not change there. The effect of tariff changes carrying over to exports in other countries provides well-identified evidence of market interdependencies that are often overlooked in analyses of trade policy changes.

To identify the effect of tariff hikes on firm export decisions, we exploit a mid-1990s dispute between the US and Argentina over the enforcement of foreign intellectual property rights—specifically, the application of patent law to pharmaceuticals. In 1997, the US suspended the General System of Preferences (GSP) on roughly one-third of Argentina's exports, affecting over 100 non-pharmaceutical products.[1] As a result, Argentine products that previously enjoyed duty-free entry into the American market began facing higher export costs due to an average tariff increase of nearly 4 percentage points. This exogenous tariff shock provides an opportunity to identify the causal effect of country-specific tariff hikes on firm-level export outcomes.

Before conducting the firm-level analysis, we first confirm that, at the product level, the policy shock had a significant impact on trade flows. Specifically, we find that exports of suspended goods from Argentina to the US declined after the shock, both in absolute terms and relative to non-suspended goods. As a result, the share of suspended goods in total exports decreased between 34% and 54%, depending on the estimation specification, relative to the pre-shock period.

To understand the export decisions of multiproduct firms with multiple export destinations, we develop a simple theoretical framework that incorporates different types of fixed costs (at the production, destination, and firm levels) and diseconomies of scope. This model shows how these

[1] Since the 1970s, signatories of the General Agreement on Tariffs and Trade (GATT)—which later evolved into the World Trade Organization in 1995—have been permitted to offer nonreciprocal trade preferences to developing countries under the General System of Preferences. These exceptions to GATT's nondiscrimination principle have become pervasive over time.

features create interdependencies across export decisions for products and markets and clarifies under what conditions an increase in tariffs on a particular product in one market affects exports of other products and exports to other markets.

In the firm-level empirical analysis, comparing the reactions of firms more and less exposed to the suspension, we find that the tariff increases induced some firms to stop exporting to the US market altogether, even when they initially exported non-suspended products, consistent with firm-level or market-level fixed costs (scale economies). Among those that continued to serve the US, there is no clear evidence that their total export volume declined. This is explained by a reallocation of exporting products within firms, shifting away from suspended goods toward non-suspended ones. Importantly, this reshuffling process involved both the 'sub-extensive' and 'sub-intensive' margins: the probability of exporting suspended products decreased, while it increased for non-suspended products; export volumes reacted similarly. The observed reshuffling is consistent with firm-level diseconomies of scope.

Perhaps even more surprising is our finding that the extensive margin effects observed in the American market extends to third markets, where no policy changes regarding imports from Argentina occurred. Exit from third markets driven by the shock happened even in cases where firms exported only non-suspended products to the third market. Furthermore, we find that suspended products became less likely to be exported to other markets after the US-driven shock. According to our model, such a third-market interdependence reflects firm- and product-level scale economies, and should be restricted to firms that exited the US market or stopped selling suspended products there. Our empirical findings are consistent with this prediction.

Our results help us understand how firms define their global export strategies. On the one hand, tariffs can deter firms from participating in foreign markets. The exit of multiproduct exporters that included unaffected products in their mix suggests the presence of fixed exporting costs at the firm level. The fact that this effect extends to other markets indicates firm-level product complementarity across markets—implying that if the variable cost of exporting a certain product to one market rises, some firms will halt exports of that product not only to the affected market, but also to markets where export costs remain unchanged. On the other hand, more resilient exporters can partially circumvent heterogeneous tariff increases by reallocating resources across products. This suggests firm-level product substitutability—implying that increasing exports of one product may require reducing foreign sales of others. Taken together, these results reveal that interdependencies are a prevalent feature of export decisions, demonstrating how changes in trade policies in export destinations lead firms to redefine their global export strategies.

To our knowledge, our findings are new both in the literature exploring the effects of GSP and in the broader literature on the export behavior of multiproduct firms. Of course, they are drawn from a specific trade policy change, and one needs to be cautious before generalizing the conclusions to other settings. Nevertheless, it is worth stressing that our environment provides a rather clean opportunity to infer the causal effects of tariff changes on firm behavior. Most existing studies rely either on across-the-board programs of unilateral liberalization or sweeping liberalization in the context of free trade agreements.[2] By design, those tariff changes are endogenous. Moreover, they usually shift the whole spectrum of tariffs. Both features impose a series of identification challenges. In our case, one can reasonably claim that the tariff increase in the American market was exogenous for the affected Argentinian firms. And while the products were surely chosen non-randomly by the US government, we find no evidence that the product selection reflected pre-shock import levels or import growth from Argentina. In fact, while some suspended products were relatively important in the context of Argentina's GSP, others were not—some were not even exported by Argentina to the US right before the shock. The finding that pre-shock Argentinian export levels and growth do not explain the product selection may reflect the fact that American imports from Argentina under GSP are tiny from the US's perspective.

The policy shock we exploit shares key features with the US–China trade war initiated during the first Trump administration, as well as with the ongoing upsurge in protectionist rhetoric and action under his second term—a turning point in recent trade policy marked by sharp, unilateral tariff hikes. The first phase of this trade war was characterized by sudden and largely unanticipated tariff increases, applied selectively across products and targeted at a specific trading partner. Like in that case, in our analysis the market directly affected is the United States, the policy involves tariff increases rather than reductions (contrasting with the typical focus on trade liberalization studies), tariffs were imposed on a product-by-product basis rather than across the board, and the measures were introduced abruptly, leaving firms with little time to anticipate or adjust. As political discourse in the US signals a possible intensification of this protectionist approach, understanding firm-level responses to such shocks becomes increasingly relevant.

More broadly, what began as a bilateral trade conflict increasingly reflects a shift toward a new mode of protectionism, characterized by the re-imposition of tariffs across a growing number of markets. This suggests a structural reversal of the trade liberalization trends that defined previous decades. Unlike earlier periods, where trade reforms centered on opening relatively disconnected economies, the current wave of protectionism unfolds in an environment of deep global integration. As more countries face the prospect of targeted or retaliatory tariffs, the costs associated with accessing international markets rise. In this context, understanding how exporters adjust—whether by reconfiguring their product mix, reallocating sales across destinations, or exiting specific markets altogether—is more important than ever for assessing the micro- and macroeconomic implications of protectionist shocks.

Naturally, the policy shock we study and recent US trade policy changes differ significantly in both magnitude and timing. The former is relatively small in scale from the perspective of the US economy, and its effects have already fully materialized. In contrast, the latter is far more substantial, with its consequences still unfolding. The ability to observe the complete aftermath of the shock offers a clear analytical advantage. Moreover, the relative "smallness" of the shock provides a methodological benefit, as it enhances the transparency of the econometric identification of its effects on affected firms.

[2] See, for example, the survey by Goldberg and Pavcnik (2016).

1.1 Related literature

We contribute to three broad research agendas. One studies interdependencies across markets. We add to this research by showing how an exogenous policy shock in a destination affects firms' entry decisions across markets. This relates to the literature that studies how export interdependencies emerge from the accumulation of experience in foreign markets—see, for example, Albornoz, Calvo-Pardo, Corcos and Ornelas (2012, 2023), Albornoz, Fanelli and Hallak (2016), Morales, Sheu and Zahler (2019), and Alfaro-Urena, Fanelli, Castro-Vincenzi and Morales (2023).[3] An important message from this growing literature is that the consequences of a policy (or demand) shock are best viewed at the *firm* level, instead of the firm-destination or the firm-product levels. Our results corroborate that message, providing well-identified evidence consistent with complementarities of export activities across products and foreign markets.[4]

Other papers explore demand shocks to investigate firms' choices between serving the domestic market and exporting. Blum, Claro and Horstman (2013) provide initial evidence supporting the existence of substitutability between domestic sales and exports. Almunia, Antràs, Lopez-Rodriguez and Morales (2021) study the reaction of Spanish firms to the Great Recession and find that, due to increasing marginal costs, firms redirected sales to foreign markets as a reaction to the slump in the domestic market. Medina (2024) finds similar results when examining how Peruvian apparel producers reacted to rising domestic competition from China, exporting more and better products. Those results contrast with the findings of Berman, Berthou and Heriocut (2015); identifying foreign demand shocks at the firm-level, they show that exogenous positive demand shocks in export markets induce French firms to increase their sales in the domestic market too, suggesting complementarity between domestic and foreign sales.

A second related line of research studies interdependencies across products within a firm. In much of the literature on multiproduct exporters, when product interdependencies arise, it is usually due to demand-side effects, triggered by cannibalization effects within the firm, as for example in Eckel and Neary (2010) and Dhingra (2013). An important exception is Eckel, Flach and Meng (2023), who allow products within a firm to be linked through both supply and demand channels. While important in some contexts, where firms are large in a market, demand/cannibalization forces are unlikely to play a meaningful role in our context, where Argentinian firms selling to the US are very small and fit best the "atomistic" assumption adopted, for example, by Bernard, Redding and Schott (2011) and Mayer, Melitz and Ottaviano (2014, 2021). Indeed, our results indicate that

[3] Alessandria, Arkolakis, and Ruhl (2021) offer an insightful recent survey on firm export dynamics, where they stress that a better understanding of firms' decisions across multiple destinations is needed.

[4] In a related analysis, Defever and Ornelas (2019) study how the elimination of quotas on some textile and clothing products in the US and the EU in 2005 affected Chinese exports of those products to other markets. Despite their completely different context, they also find a positive third-market effect at the extensive margin, but not at the intensive margin. A similar message arises from the counterfactual analysis of Cherkashin, Demidova, Kee and Krishna (2015), who study the impact of trade preferences to Bangladesh's garment exports and find that better preferences in the European market would induce more sales to that market and also to the US. At the product level, Bown and Crowley (2010) find that China's exports to third countries fell after increases in restrictions in the European and American markets, prior to China WTO accession, a result that corroborates our firm-level results at the product level. On the other hand, Bown and Crowley (2007) find that Japanese sales to other markets increased following the imposition of extra US trade barriers on Japanese imports.

increasing the variable cost of exporting a product to a market positively affects the profitability of exporting other products to that market. This suggests the presence of decreasing returns to scope at the firm-market level.[5] Overall, our results on the sub-extensive and sub-intensive margins reveal novel and subtle channels through which tariffs can affect firms' product scope within a market, as well as their presence in different markets.[6]

The third broad research agenda to which our paper contributes is on the impacts of trade policy. Within that extensive literature, we contribute in particular to the understanding of the effects of nonreciprocal preferences. Despite the apparent benefit of such preferences for developing countries, there are numerous criticisms to the institutional design of the system, which make it difficult to establish how important GSP is as a springboard for growth in developing economies (Bagwell and Staiger, 2014; Ornelas, 2016). The verdict is necessarily empirical, but so far the literature is inconclusive.[7] In fact, as pointed out by Ornelas (2016), there has not been yet any estimate of how nonreciprocal preferences affect firm-level behavior. Furthermore, to infer causality one needs plausibly exogenous variation in GSP status. This is what we provide in this paper. Our results indicate that nonreciprocal preferences can be an effective policy instrument to stimulate entry not only in markets that offer preferential access, but also in markets that do not offer them.

The policy shock we study also shares several features observed in the recent tariff changes in the United States. A first wave of studies focused on the short-run effects of those tariff increases (and of the subsequent retaliation of its affected trade partners) on prices and the associated welfare consequences (Amiti, Redding and Weinstein, 2019 and 2020; Cavallo, Gopinath, Neiman and Tang, 2021; Fajgelbaum, Goldberg, Kennedy and Khandelwal, 2020; Flaaen, Hortaçu and Tintelnot, 2020). We provide a complementary analysis of how tariff hikes affect exporters, focusing instead on how they adjust to the tariff shock, with emphasis on product substitutability within markets and on third-market effects.[8]

[5] Diseconomies (or economies) of scope could potentially manifest in different parts of the production/exporting process. Diseconomies of scope at the firm level naturally emerge if products are ranked in terms of marginal production costs. As shown by Arkolakis, Ganapati and Muendler (2021), expanding the export mix by introducing products for which the firm has relatively lower production competence reduces overall efficiency. With a focus on export entry, they introduce economies of scope by assuming that fixed (market access) costs decrease with the the number of exported products. Qiu and Zhou (2013) develop a related analysis. Nocke and Yeaple (2014) consider that firms are endowed with a stock of organizational capital, which can be used either to lower marginal cost of existing products or to increase the number of goods produced.

[6] Such interdependencies across markets and products within a firm are highlighted in the broad model developed by Bernard, Jensen, Redding, and Schott (2018). In their setting, "global firms" choose the markets to serve, the products to sell in each of those markets, the markets where to source inputs, and the inputs to source in each of those markets. Indirect cross-cost effects arise through the firms' sourcing strategies, potentially generating economies of scope. Our findings indicate that cross-cost effects can arise even for firms that are small in foreign markets.

[7] There are mainly two branches of the literature estimating the trade effects of nonreciprocal preferences. One relies on country-level gravity estimations to evaluate the aggregate effect of the preferences—e.g., Herz and Wagner (2011), Gil-Pareja, Llorca-Vivero and Martínez-Serrano (2014) and Ornelas and Ritel (2020)—with conflicting results due to data and methodological issues. The other estimates the trade effects of specific nonreciprocal agreements at the product level—e.g., Frazer and Van Biesebroeck (2010) study the African Growth and Opportunity Act; Hakobyan (2020) exploits periods in which the American GSP program expired (to be later reinstated); Gnutzmann and Gnutzmann-Mkrtchyan (2022) study the EU's withdrawal of GSP preferences from Belarus in 2007; Forge, Garred, and Kwon (2024) assess the expansion of unilateral preferences in OECD economies since the late 1990s. Those studies generally find positive, but relatively small, effects of preferences on the exports of beneficiaries.

[8] Flaaen, Hortaçu and Tintelnot (2020) look at related dimensions, but from a very different angle: the price effects

In the next section, we detail the institutional setting of the policy shock and provide evidence that it affected exports at the aggregate product level. In section 3, we discuss a theoretical framework that allows for interdependencies in firm decisions across products and markets. In section 4, we develop the firm-level empirical analysis and explore the consequences of the policy shock. We conclude in section 5.

2 The policy shock and its product-level impact

2.1 The policy shock

The American Generalized System of Preferences, established in January 1975, offered duty-free access on over 3,500 tariff lines to 119 developing countries by the end of 2020, when it was lastly in force.[9] Although these imports accounted for less than 1% of total US imports (https://ustr.gov/sites/default/files/gsp/GSPnumbers2021.pdf), the program had significant value for most beneficiary countries. The program specifies 15 criteria that a developing country must meet to qualify (e.g., respecting internationally recognized worker rights, providing intellectual property protection, combating child labor). Countries that do not meet those criteria may be taken out, permanently or provisionally, fully or partially, from the recipients' list. The trade policy shock we exploit is one of such partial suspensions.

Specifically, on April 15, 1997, the US government partially withdrew duty-free treatment offered to Argentina under GSP. The decision followed a conflict between the two countries regarding the application of patent laws to pharmaceutical production in Argentina. As a consequence, several products exported from Argentina to the US, which had previously benefited from free entry under GSP, lost the preferential treatment and began to incur import tariffs.[10] That unilateral change in trade policy provides a sizeable variation in export variable costs, exogenous from the perspective of the affected Argentinian firms, which saw the duties on some of their products rise from zero to the Most Favored Nation (MFN) tariff in the American market.

Table 1 clarifies the importance of the suspended products for Argentina. It shows exports from Argentina to the US in 1996, the year before the suspension. Out of 1340 8-digit products that were exported, 595 were eligible for the American GSP program, amounting to US$388 million of exports entering the US free of duties. That value corresponds to 17 percent of total Argentinian exports to the US in that year. The average MFN tariff of the eligible products, weighted by import share in 1996, was 3.7 percent. The tariff preference was claimed in 90% of the eligible exports. The vast majority of those exports were in manufacturing (the bottom panel of the table).

on complementary products within a market, and third-market effects due to changes in production patterns within multinational firms.

[9] The program has been reauthorized 14 times in the past. In the previous 10 times when it was reauthorized after expiring, Congress retroactively reinstated the program, refunding import duties paid during the gap (https://www.congress.gov/crs_external_products/IF/PDF/IF11232/IF11232.8.pdf).

[10] See Blanchard and Hakobyan (2015) for a rich account of the potential and the observed discretion exercised by the US government when deciding eligibility of countries, products and country-product pairs. As they stress, the system is far from a 'generalized' system.

In 1997, 123 products were suspended from GSP (120 of them in manufacturing). Of those products, 91 recorded positive exports in 1996; the remaining suspended products were not exported by Argentina to the US in 1996. In Appendix A.2, we provide the list of suspended products. Observe that, in the list there are no pharmaceutical goods. That was not a choice; pharmaceutical goods were not eligible for GSP in the first place, and therefore could not be suspended. The list has products from related industries, like chemicals, but also many other goods from entirely different industries, like agriculture, apparel and furniture. In terms of export value, products suspended in 1997 account for 5.5% of total exports and for 32.5% of GSP exports from Argentina to the US in 1996. The average MFN tariff of the suspended products was 3.6 percent, very close to the average MFN tariff of all products eligible for preferences. The figures are very similar if we consider only manufacturing products.

Importantly, the policy shock was largely unanticipated by the Argentinian firms. To recover the timeline of the patent dispute and its escalation to the partial GSP suspension, we have searched, using a variety of key terms, through the main daily newspaper in Argentina, *La Nacion*. The controversy started in December 1995, but at that moment it was restricted to the suitability of Argentina's new patent law, which was challenged by US authorities—apparently under the pressure of American pharmaceutical multinationals. The US government raised the possibility of taking the case to the World Trade Organization, but never did (according to some Argentinian authorities, because the US anticipated losing it). Without the backing of a favorable WTO resolution, the options for trade sanctions were limited. The possibility of suspending Argentina from GSP was then publicly raised on January 1997. At first, the US indicated a suspension of 50% of the products, but ended up including fewer products than that. On the other hand, there was no presumption that the suspension would be revoked any time soon. In fact, the suspended products were never granted preferential treatment in the American market again. In Appendix A1, we provide a more detailed account of the events leading to the policy shock.

Finally, it should be noted that our sample period encompasses the years of Argentina's economic crisis under a currency board. Yet it is unlikely that the crisis affected our analysis for at least two reasons. First, it started in late 1998, which is around 1.5 year after the policy shock. Thus, the decision of the suspension, and the choice of products to include in the list, were surely not affected by the crisis. Second, as the following analysis indicates, the set of suspended products is wide and unrelated with trade flow variables. Thus, it seems implausible that the Argentinian macro crisis around the end of the century affected the trade flows of the group of suspended and non-suspended products in systematically different ways.

2.2 Selection of products

The rationale for the choice of products was not made public and remains unclear. First, we note that, while exports under GSP were significant for Argentina (17% of their total exports to the US), from the American perspective they were very small, corresponding to only 0.05 percent of its total imports in 1996. If we consider only the products suspended, their share in American total imports in 1996 was less than 0.02 percent. Since those shares are tiny, it is plausible that the choice of products to suspend by the American government was not directly linked to their importance in the American market.

To verify whether that was indeed the case, we use USITC data to assess whether it was possible to predict which products were suspended based on pre-1997 import levels and import growth. We also include the level of the MFN tariff in our estimation, since it is a variable that the American policymakers may plausibly consider when deciding which products should have their tariff reversed to the MFN rates. The equation we estimate is

$$SUSP_j = \beta_1 M96_j + \beta_2 \Delta M(96/93)_j + \beta_3 MFN_j + \varepsilon_j, \tag{1}$$

where $SUSP_j$ is an indicator variable that takes the value of one if product j was suspended and zero otherwise; $M96_j$ denotes American imports of good j in 1996, $\Delta M(96/93)_j$ represents the growth of imports of good j between 1993 and 1996, defined as the log difference between the sum of imports in 1995 and 1996 and the sum of imports in 1993 and 1994, and MFN_j indicates good j's MFN tariff rate.[11] The sample is composed of all products exported by Argentina under GSP in 1996. We estimate equation (1) as a linear probability model.

Table 2 shows the results. Since in principle the decision to include a product can be based on overall imports or on imports from Argentina alone, columns 1-3 consider only imports from Argentina, whereas columns 4-5 also include imports from the rest of the world (ROW). Column 1 reports the estimation on the import level and MFN tariff only; column 2 replicates that estimation, but in a restricted sample of product observations for which growth can be computed. Column 3 adds import growth; column 4 includes import level and growth from the rest of the world. Finally, column 5 adds industry-fixed effects at the 4-digit level. The results do not indicate that previous trends or levels in imports from Argentina or from ROW, or the MFN tariff level, were key factors in the decision to suspend a product. Hence, the rationale for the selection of products seems to have been based on factors unrelated to the economic variables on which we focus in our analysis.

2.3 The product-level impact

If the policy had any effect, it should have reduced the importance of suspended products from Argentina in US imports. To verify that, we use USITC data from 1996 to 1999, leaving aside 1997, the year where the suspension was implemented. We calculate product-level shares of goods exported to the US from Argentina and investigate how the suspension affected them. Specifically, we estimate the following regression specification:

$$sh_{jt} = \alpha SUSP_j \times POST_t + \phi_j + \phi_t + \epsilon_{jt}, \tag{2}$$

[11] We generate 2 two-year periods to be more flexible and mitigate problems with missing values generated by the sparsity of imports at the HS8-digit level.

where j indexes products and $t = 1996, 1998\text{-}1999$ indexes period and where we aggregate the post-suspension years to have a single period both before and after the shock. The dependent variable sh_{jt} corresponds to the share of 8-digit product j in total exports from Argentina to the US in period t: $sh_{jt} \equiv M_{jt}/M_{Arg,t}$, where M_{jt} denotes American imports of product j from Argentina in period t and $M_{Arg,t}$ indicates total American imports from Argentina in period t. $SUSP_j$ is defined as in equation (1), while $POST_t$ is an indicator taking the value of one when $t =$ 1998-1999. The $\{\phi\}$ variables correspond to product and year fixed effects.

One concern with specification (2) is that there may be shocks that affect all foreign sales of suspended products in the American market. For that reason, it is useful to also consider imports from markets other than Argentina in the regression. We therefore estimate as well the following triple-difference specification:

$$sh_{jmt} = \alpha SUSP_{jm} \times POST_t + \phi_{jm} + \phi_{jt} + \phi_{mt} + \epsilon_{jmt}, \tag{3}$$

where we keep the same definitions as in (2) but add a third dimension by considering exports from the rest of the world to the US. Specifically, the dependent variable sh_{jmt} now corresponds to the share of 8-digit product j in total exports of market m to the US in period t: $sh_{jmt} \equiv M_{jmt}/M_{mt}$, where M_{jmt} denotes American imports of product j from market m in period t and M_{mt} indicates total American imports from m in period t, where $m =$ *Argentina, ROW*. The indicator $SUSP_{jm}$ takes the value of one for suspended products when $m = Argentina$ and zero otherwise. In turn, the $\{\phi\}$ variables now correspond to product-origin, product-year and origin-year fixed effects.

Under the assumption that ROW exports to the US are not directly affected by the GSP suspension of Argentina's preferences in the American market, the triple-difference coefficient α gives us the effect of the suspension on the relative Argentinian sales of those products to the US. Or put differently, it gives us the extent of the relative loss of importance (if $\alpha < 0$) of those products in Argentina's exports to the American market. It has an analogous interpretation in the double-differences specification.

Table 3 shows the results. We consider four samples: only imports from Argentina (columns 1 and 2), following regression equation (2), and imports from both Argentina and ROW (columns 3 and 4), following regression equation (3). Columns 1 and 3 consider all products with strictly positive imports from Argentina before and after 1997. Columns 2 and 4 restrict the sample to products granted GSP to Argentina in 1996 and redefine the dependent variable as the share of each product over total imports of GSP products from Argentina and from ROW.

The results indicate that the suspension of GSP preferences reduced the importance of the affected products in Argentina's export basket to the US. Although the average share of a single suspended product in Argentina's exports pre-1997 is obviously small (0.058%), in relative terms the changes are large: on average, the suspension reduced the share of a product in Argentina's exports by 43, 54, 34 and 43 percent across the four specifications.[12] Those findings are broadly

[12] When we consider the double-differences specification in column 1, the percentage impact is computed as $\hat{\alpha}/\textit{average share} = -.025/.058 \sim -43\%$. Percentage impacts for columns 2 to 4 are computed analogously.

consistent with the results of other detailed product-level analyses of the concession of nonreciprocal preferences, as discussed in the Introduction.

The purpose of the triple-difference (relative to the double-difference) is to control for product-specific American import demand shocks. Since the results with the double and triple differences are very similar, they suggest that on average the suspended products were subject to about the same type of demand shocks as other products, so this is not what drives the changes in Argentina's exports basket.

3 A framework with product interdependence

We want to identify possible interdependencies in the behavior of exporters. Argentinian firms decide whether and how much to produce and export to the US and to other destination markets. If firm decisions to sell different products in different markets were independent, the consequences of tariff hikes would be straightforward. But if that independence assumption were violated, then tariff hikes should influence firm decisions about products and markets not directly affected by the policy. Here we provide a simple framework that allows for such interdependencies in firm decisions. To keep the exposition intuitive, we adopt a verbal and graphical approach to illustrate the complexities arising from two types of interdependencies. However, all the results we present are formally derived and proved in Appendix A3, which complements the analysis developed in this section.

Consider that there are two products exported by Argentinian firms, product 1 and product 2, and two possible destination markets, the US and the rest of the world (ROW). Products are differentiated and there is a large number of varieties of each of them. Each variety, which can be domestic or imported, is produced by a different firm in a monopolistically competitive setting.[13] Residual demand for each variety of product j in the US and in ROW is

$$q_{j,us}(A_j, p_{j,us}),\ \ j = 1, 2, \tag{4}$$

$$q_{j,row}(\theta A_j, p_{j,row}),\ \ j = 1, 2, \tag{5}$$

where q and p denote quantity and price, and A and θA are idiosyncratic demand shifters for the US and ROW markets. We assume that demands are independent across products and across markets, and that varieties are not differentiated across markets. That is, a firm that chooses to export product j to both markets sells the same variety to the US and to ROW, although it may choose different prices for each market. To keep notation compact, we do not use a variety-firm index. Parameters $\{A_1, A_2, \theta\}$ vary across firms.

We assume that idiosyncratic shocks are the same across markets except for a multiplicative parameter θ. This parameter captures differences between the US and ROW that are common to all firms, such as market size and geographical and cultural distances between Argentina and

[13] Argentina is very small relative to the US and to world markets; therefore, we assume that changes in prices of Argentinian firms do not affect residual demands.

those markets, as well as differences between the US and ROW that vary across firms, such as idiosyncratic demand shocks that affect the ability of each firm to penetrate in each of the two markets. Differences in θ help to explain why destination export shares differ across firms.

In order to export, firms need to incur a fixed cost, F; furthermore, they face fixed costs of developing and maintaining each product, F_1 and F_2, and market specific export fixed costs, F_{us} and F_{row}. Variable costs are given by function $C(\phi, q_1, q_2)$, where ϕ is a cost shifter and q_1 and q_2 represent total exports of each product, given by the sum of the quantities exported to each destination: $q_1 = q_{1,us} + q_{1,row}$ and $q_2 = q_{2,us} + q_{2,row}$. The total cost of producing and selling goods 1 and 2 in the American and ROW markets is therefore

$$C(\phi, q_1, q_2) + F + F_1 + F_2 + F_{us} + F_{row}. \tag{6}$$

Parameters ϕ, F, F_1, F_2, F_{us} and F_{row} vary across firms.

The production technology may exhibit diseconomies of scope. Specifically, the variable cost function satisfies

$$C(\phi, q_1, q_2) \geq C(\phi, q_1, 0) + C(\phi, 0, q_2) \tag{7}$$

for all levels of q_1 and q_2. The cost function exhibits diseconomies of scope if the inequality above is strict. That is, producing goods 1 and 2 within the firm is more costly than producing each of them in independent production units.[14] Diseconomies of scope may arise from different sources, such as capacity or financial constraints, adjustment costs, and rigidities in organizational structure. Since we are agnostic about its precise nature, we keep this reduced-form approach without imposing additional structure.[15]

Fixed costs are a source of complementarities across products and markets, as they imply increasing returns to scale. Specifically, the fixed costs F_1 and F_2 create product-level economies of scale across markets, the fixed costs F_{us} and F_{row} create market-level economies of scale across products, whereas the fixed cost F creates firm-level economies of scale across markets and across products.[16] In contrast, variable costs could be a source of complementarities and/or substitutabilities. For ease of exposition, we restrict our specification of variable costs to the latter. Specifically, we let the marginal costs of producing q_i be independent of the level of q_i: $MC_i(\phi, q_i^{'}, q_j) = MC_i(\phi, q_i^{''}, q_j)$

[14]See Panzar (1989) for a broader discussion. A similar condition on marginal costs (MC), which implies (7), is that

$$MC_i(\phi, q_i, q_j') \geq MC_i(\phi, q_i, q_j'')$$

for any $q_i > 0$ if $q_j' > q_j''$, $i \neq j = 1, 2$. In that case, the marginal cost of a product within a firm is increasing in the amount produced of the other product.

[15]Given the diseconomies of scope in production at the firm level, one may wonder why a firm that wanted to produce both goods does not disintegrate to avoid the diseconomies of scope. We simply assume that possibility away, but there are many possible explanations for that. One is that there may be complementarities in the development of the two goods. Another, simpler explanation is that there may be a sunk cost for a firm to exist on top of the firm and market specific fixed costs to export.

[16]A more general cost function would be $C(\phi, q_1, q_2) + F + F_1 + F_2 + F_{us} + F_{row} + F_{1us} + F_{2us} + F_{1row} + F_{2row}$. This function adds four market-product fixed costs, $\{F_{1us}, F_{2us}, F_{1row}, F_{2row}\}$. While market-product fixed costs affect market-product entry decisions, they do not create interdependencies across products or markets and do not affect testable implications in ways that are meaningful for our analysis. For that reason, we do not include these terms in our parsimonious cost function, equation (6).

for any $q_i^{\cdot}$, $q_i^{\cdot\cdot}$. This rules out economies or diseconomies of scale stemming from variable costs. Instead, we define variable costs as the only possible source of substitutability across products and markets, through diseconomies of scope. Thus, in our setting possible complementarities come from fixed costs, whereas possible substitutabilities come from variable costs.

There are specific import tariffs in the US and in ROW given by the vector $\tau = (\tau_{1,us},\ \tau_{2,us},\ \tau_{1,row},\ \tau_{2,row})$. Product 1 is a typical product directly affected by the policy shock. At first, it belongs to the US GSP program, so that for Argentinian firms, $\tau_{1,us} = 0$. Later, it is included in the group of products for which the preference is suspended. Thus, the policy shock can be interpreted as an increase in $\tau_{1,us}$ from zero to the MFN level. In turn, product 2 is a typical product not directly affected by the policy shock. It could be a good from the GSP program that was not included in the list of suspended products, or a good that does not receive any preference. Import tariffs in ROW do not change with the policy shock.

Firms choose the product bundle that they export to each destination market as well as the destination-specific export prices to maximize global profits. They may also choose to exit one or both markets. Let $I_{1,us}$, $I_{2,us}$, $I_{1,row}$, $I_{2,row}$ denote indicator variables for strictly positive exports of product j to destination d, summarized by the 4×1 vector $\mathbf{I}$. And let $\mathbf{p}$ denote the 4×1 vector of prices of the two products in the two destination markets. Firms choose $\mathbf{I}$ and $\mathbf{p}$ to maximize the sum of revenues across products and markets net of variable and fixed costs, as follows:

$$\begin{aligned} \max_{\mathbf{I},\mathbf{p}} \quad & \sum_{j,d} (p_{jd} - \tau_{jd})\, q_{jd}(\cdot) - C\left(\phi, q_{1,us}(\cdot) + q_{1,row}(\cdot), q_{2,us}(\cdot) + q_{2,row}(\cdot)\right) - \\ & -F\left(\textstyle\sum_{j,d} I_{jd}\right) - F_1\ \left(\textstyle\sum_d I_{1,d}\right) - F_2\ \left(\textstyle\sum_d I_{2,d}\right) - F_{us}\left(\textstyle\sum_j I_{j,us}\right) - F_{row}\left(\textstyle\sum_j I_{j,row}\right). \end{aligned} \tag{8}$$

We denote the vector of idiosyncratic random variables as $\zeta \equiv (A_1, A_2, \theta, \phi, F_1, F_2, F, F_{us}, F_{row})$. The vector is drawn over the parameter space $\mathcal{Z}$ from a joint known distribution that is independent across firms. The solutions to the profit maximization problem, $\mathbf{I}(\tau, \zeta)$ and $\mathbf{p}(\tau, \zeta)$, are a function of the tariffs and the idiosyncratic random variables.

A key point to note is that elements of the cost function create interdependencies in firm decisions. Without diseconomies of scope and without economies of scale, firm decisions would be independent across products and across markets. In contrast, diseconomies of scope and economies of scale create different patterns of within-firm interdependencies. We discuss these possibilities below. Before doing so, it is worth noting that our goal is not to identify the precise sources of product complementarity and substitutability within firms, but rather to allow them to coexist. Other sources of complementarity (say, more efficient division of labor) and substitutability (e.g., due to product cannibalization) may be present as well.

3.1 Participation decisions in the US: Interdependencies across products

We want to characterize firm decisions that can be evaluated empirically. We start by analyzing the export bundle to the American market. Firms choose between four entry modes: export only product 1 (option 1), export only product 2 (option 2), export both products (option B), or export neither product (option 0). Firms with high demand shifters and low cost parameters choose to export. We define firm-level parameter sets, or "zones," that lead to different export modes as

$$\begin{aligned} D_0(\tau) &= \{\zeta \in \mathcal{Z} : I_{1,us}(\tau,\zeta) = 0, I_{2,us}(\tau,\zeta) = 0\} \\ D_1(\tau) &= \{\zeta \in \mathcal{Z} : I_{1,us}(\tau,\zeta) = 1, I_{2,us}(\tau,\zeta) = 0\} \\ D_2(\tau) &= \{\zeta \in \mathcal{Z} : I_{1,us}(\tau,\zeta) = 0, I_{2,us}(\tau,\zeta) = 1\} \\ D_B(\tau) &= \{\zeta \in \mathcal{Z} : I_{1,us}(\tau,\zeta) = 1, I_{2,us}(\tau,\zeta) = 1\}, \end{aligned} \tag{9}$$

where D_0 is the exit zone, D_1 and D_2 are the single-product zones, and D_B is the multiproduct zone.

Although our framework is economical in several ways, fully characterizing entry (as well as price and productions decisions) is not straightforward. The reason is the tension between complementarity forces (represented here by the economies of scale in the US market created by the fixed costs $F + F_{us}$) and substitutability forces (represented here by the diseconomies of scope embedded in the variable cost function). The qualitative impact of changes in trade costs on firm export behavior depends on which force dominates.

To illustrate the consequences of each force, Figure 1 shows benchmark cases. Graphs on the left display the situation before the policy shock, while graphs on the right show the situation after the increase in τ_1. In each figure, the zones are defined over pairwise combinations of the demand shifters A_1 and A_2 while for expositional purposes the cost parameters are kept constant across firms. The parameterization is such that the two products are symmetric except that product 1 does not incur tariffs in the US, because of the GSP preference.[17]

Figure 1, panel (a), shows the case of product independence, where $F_{us} = F = 0$, and inequality (7) specializes to an equality. The decision zones are simple rectangles: given other parameters, a firm sells product i in the US if and only if its idiosyncratic demand shifter for i is sufficiently high. The exit zone D_0 corresponds to low levels of A_1 and A_2 (bottom left corner). Firms with low demand shifters in both products choose to exit as their export revenue cannot compensate for the fixed cost to develop either product (F_1 and F_2).[18] Single-product zones D_1 and D_2 occur when one demand shifter is high and the other is low. In that case, firms export only the product for which revenue is high enough to compensate paying its fixed cost. Finally, multiproduct zone D_B corresponds to cases where firms have high enough demand shifters in both products (upper right corner). Those firms can afford to pay both product fixed costs and make positive profits selling each of them.

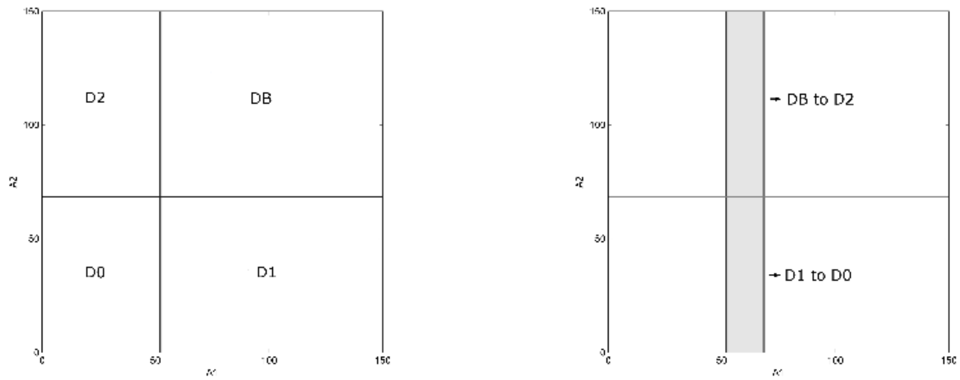
On the right side, the graph shows both the original export zones under the tariff preference and the new export zones without preferences. The changes in the zones are represented in light

[17]In the figures, the demand and cost functions are defined as $q_1 = A_1 p_1^{-\alpha}$, $q_2 = A_2 p_2^{-\alpha}$, and $C = \phi(q_1 + q_2)^{\beta}$, with $\alpha = 1.5$ and $\phi = 1$. The value of β varies across panels to illustrate the different cases, as does the value of F_{us}. In all cases we keep $F = 0$, since this parameter plays the same role as F_{us} while we study participation decisions solely in the US market.

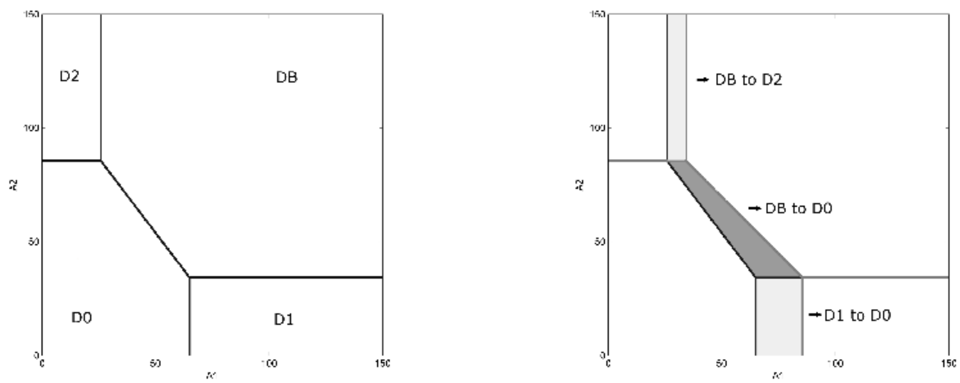
[18]Observe that, because product 2 incurs a tariff but product 1 does not, the height of the D_0 rectangle is greater than its width.

Fig. 1: The roles of fixed costs and diseconomies of scope

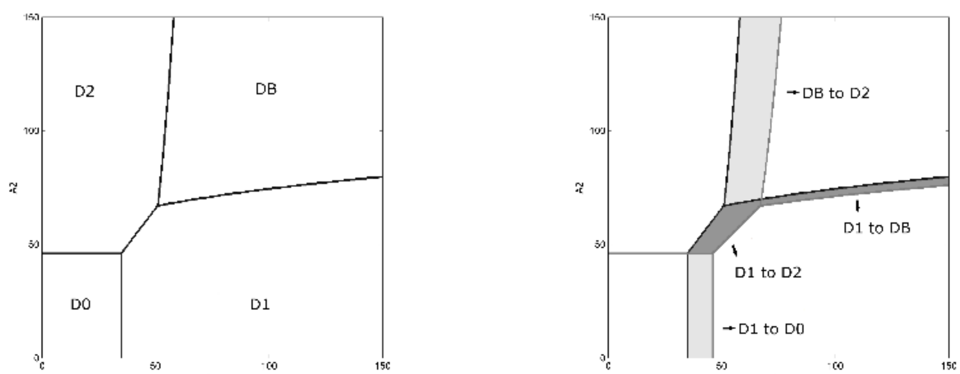
(a) No fixed costs, no diseconomies of scope



(b) With fixed costs, no diseconomies of scope



(c) No fixed costs, with diseconomies of scope



Notes: The figure illustrates export decision zones for different firm-level values for the demand shocks A_1 and A_2 and under different assumptions regarding interdependence across products. The graphs on the left plot cases of GSP preference on product 1, while the graphs on the right plot an increase in the tariff of product 1 (a suspension of preferences). Export decision zones are denoted by D_0, D_1, D_2, D_B. MFN tariffs are 20 percent on both goods. The demand and cost functions are defined as $q_1 = A_1 p_1^{-\alpha}$, $q_2 = A_2 p_2^{-\alpha}$, and $C = \phi(q_1 + q_2)^{\beta}$, with $\alpha = 1.5$ and $\phi = 1$. In Panels (a) and (b), $\beta = 1$, whereas $\beta = 3$ in panel (c). In panel (a) $F_1 = F_2 = 20$, while in panels (b) and (c) $F_1 = F_2 = 10$. In turn, $F_{us} = 0$ in panels (a) and (c), while $F_{us} = 15$ in panel (b). In all panels, $F = 0$.

gray. The suspension of preferences for good 1 makes it less profitable to export that product. The limits of the export zones without preferences are shifted to the right, as a higher A_1 cutoff is required to compensate for the increase in the cost of exporting product 1 with $\tau_1 > 0$. On the other hand, the horizontal line, which defines the cutoff to sell product 2, is unchanged. There are effects at the extensive margin, as some firms exit (D_1 to D_0); and there are effects at the subextensive margin, as some firms stop exporting product 1 and keep exporting product 2 (D_B to D_2). It is important to highlight that under these cost assumptions firm-level decisions regarding product 2 are unchanged.

Figure 1, panel (b), shows the situation where market fixed costs are introduced ($F_{us} > 0$). The figure on the left indicates that regions D_0 and D_B are now adjacent to each other along a range of parameters, with a negatively sloped boundary between the two sets. This occurs because for some values of ζ (in this case sufficiently low A_1 and A_2) revenue from both products is necessary to cover the firm- and market-level fixed costs. The graph on the right shows the changes in the export zones due to the suspension. There are, as in panel (a), firms that stop exporting product 1 and whose decisions regarding product 2 remain unchanged (firms in the light gray areas). In addition, there is now a new group of firms, in the dark gray area below the negatively sloped boundary, that export both products before the suspension but exit the US market after the suspension (D_B to D_0). This is a zone of product interdependency. The interdependency occurs when, after the suspension, firms drop product 1 and the revenue from product 2 is not enough to cover the fixed cost to sell in the US, so they drop both products. This is an effect that affects firms that export both products before the suspension. By contrast, in panel (a), no firm that exports product 2 before the suspension exits the market afterwards.

In Figure 1, panel (c), we add diseconomies of scope, as in equation (7) satisfied with strict inequality, while removing the economies of scale given by $F_{us} > 0$. The diseconomies of scope are reflected in that the zones D_1 and D_2 are now adjacent, while D_0 and D_B are not. The boundary between D_1 and D_2 has a positive slope, reflecting product substitution, and the shape of the D_B contour forms a less-than-90-degree angle. Product substitution occurs because for a given range of parameters (in this case sufficiently low A_1 and A_2), producing one product raises the marginal cost of the other, so that production of both goods is not profitable. The right panel shows the situation in which preferences on product 1 are suspended and firms face tariff $\tau_1 > 0$. As in panel (a), there is a group of firms whose decisions regarding product 2 remain unchanged (firms in the light gray areas). In addition, there is a new group of firms, represented by the dark gray area, that stop exporting product 1 and as a result start exporting product 2 (D_1 to D_2). This is an interdependency that occurs because, due to the diseconomies of scope, the marginal cost of product 2 falls for firms that stop exporting product 1.[19]

A natural question is what happens when there are both scale economies and diseconomies of scope. Our framework with heterogeneous firms allows for differences across firms in the relative

[19]There is an additional group of firms that start exporting good 2 (also in dark gray) and keep exporting product 1 (D_1 to D_B). This is a group of firms that have high enough A_1. After the suspension, there is a reduction in exports of product 1 and consequently a reduction in the marginal cost of product 2 that makes exporting it profitable.

importance of the two forces. For firms with high scale economies, export decision zones look like those in panel (b), while for firms with strong enough diseconomies of scope, export decision zones look like those in panel (c). Examples are given in Appendix A.4, Figure A1.

Summing up, in all cases after the preference suspension there is an expansion in zones D_0 and D_2 and a contraction in zones D_1 and D_B. There are single-product firms that exit the US market and there are multiproduct firms that drop good 1 from that market. There are also interdependencies: scale economies drive the exit of firms that export both products before the suspension (D_B to D_0), while diseconomies of scope drive the substitution from product 1 to product 2 (D_1 to D_2 and D_1 to D_B). In Appendix A.3, we provide a formal proof that changes in decisions about products not directly affected by the policy shock (product 2) require product interdependence of some form. We formalize these results as follows.

Result 1. Argentinian firms increase exports of non-suspended products and introduce new non-suspended products in the US because of the policy shock only in the presence of firm-level diseconomies of scope.

Result 2. Argentinian firms that previously exported suspended and non-suspended products to the US exit that market because of the policy shock only in the presence of firm-level or market-level scale economies.

Testable implications of Results 1 and 2 are—in the context of this theoretical framework—as follows. Empirical verification of a causal relationship between the policy shock and product substitution in favor of non-suspended products is evidence of diseconomies of scope. In contrast, empirical verification of a causal relationship between the policy shock and the exit of firms that exported non-suspended products to the US before the suspension is evidence of fixed cost driven scale economies ($F > 0$ or $F_{us} > 0$). The cost function (6) allows for both to happen at the same time.

3.2 Participation decisions, all markets: Interdependencies across destinations

Let us now characterize interdependencies across markets. When could a policy circumscribed to a (large) market have implications for firm export behavior toward other foreign markets?

Firms decide which markets to export to, which products to export to each of those markets, and the prices for each product-market combination. This is a complex problem. We again seek to characterize firm decisions that can be evaluated empirically, thus allowing us to derive conclusions related to interdependencies; in this case, interdependencies across markets. With that in mind, we focus on the destination level of decision making. We consider four entry modes: export only to the US (option 1), export only to ROW (option 2), export to both markets (option B), or not export at all (option 0). We define parameter sets that lead to different export entry modes as

$$\begin{aligned} E_0(\tau) &= \{\zeta \in \mathcal{Z} : I_{1,us}(\tau,\zeta) + I_{2,us}(\tau,\zeta) = 0, I_{1,row}(\tau,\zeta) + I_{2,row}(\tau,\zeta) = 0\} \\ E_1(\tau) &= \{\zeta \in \mathcal{Z} : I_{1,us}(\tau,\zeta) + I_{2,us}(\tau,\zeta) > 0, I_{1,row}(\tau,\zeta)) + I_{2,row}(\tau,\zeta) = 0\} \\ E_2(\tau) &= \{\zeta \in \mathcal{Z} : I_{1,us}(\tau,\zeta) + I_{2,us}(\tau,\zeta) = 0, I_{1,row}(\tau,\zeta) + I_{2,row}(\tau,\zeta) > 0\} \\ E_B(\tau) &= \{\zeta \in \mathcal{Z} : I_{1,us}(\tau,\zeta) + I_{2,us}(\tau,\zeta) > 0, I_{1,row}(\tau,\zeta) + I_{2,row}(\tau,\zeta) > 0\}, \end{aligned} \tag{10}$$

where E_0 is the exit zone, E_1 is the export-only-to-the-US zone, E_2 is the export-only-to-ROW zone, and E_B is the export-to-both-markets zone. Note that, unlike in section 3.1, where we define export decision zones based on which products are exported, here we define the zones based on which foreign markets are served.

Relative to the situation considered in section 3.1, now many more scenarios can arise depending on the combinations of export fixed costs, product fixed costs, and diseconomies of scope. In particular, firm-level and product-level fixed costs F, F_1 and F_2 create scale economies across markets, in the sense that revenue from all destination markets can be used to cover the fixed costs.

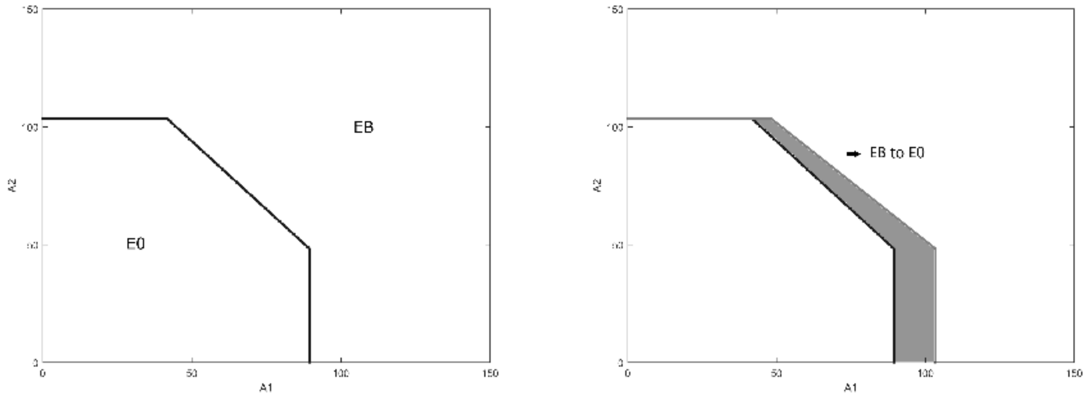
Figure 2 illustrates three scenarios that show the relevant trade-offs. Panel (a) plots a symmetric case where tariffs are the same across countries (except for the preference), the US and ROW have the same market size and require the same fixed costs of entry. In the left-hand side, there are only two active zones: firms choose to export to both markets simultaneously (E_B) or to exit (E_0).[20] Because of firm- and product-level scale economies (F, F_1, F_2), the exit zone is not a rectangle; instead, one of its boundaries is downward sloping. This mimics the effects of firm- and market-level scale economies of the US export basket decision plotted in Figure 1. The right-hand side plots the optimal choices after the suspension of preferences. After the suspension, revenue in the US falls for product 1 and firms with low demand shifters are not able to cover the fixed costs. As a consequence, they exit both the US *and* ROW markets (dark gray area). While the primary reason to leave the American market is the direct effect of the tariff hike, it is its indirect effect through scale economies stemming from firm- and product-level fixed costs (F and F_1) that pushes some firms out of the ROW market.

Panel (b) illustrates an asymmetric situation in which tariffs are relatively high in the US for product 2 and relatively high in ROW for product 1. In this case, Argentinian firms with high A_1 and low A_2 export to the US (and specialize in product 1) and firms with high A_2 tend to export to ROW (and specialize in product 2). Firms with high A_1 and high A_2 tend to export both products to both markets. The shape of the exit zone (E_0) is the same as in the previous case, with a downward sloping boundary with the E_B zone. After the suspension, some firms exit the US market. There is a group of firms that stop exporting to the US but keep exporting to ROW (light gray area E_B to E_2). There is another group of firms that export only to the US prior to

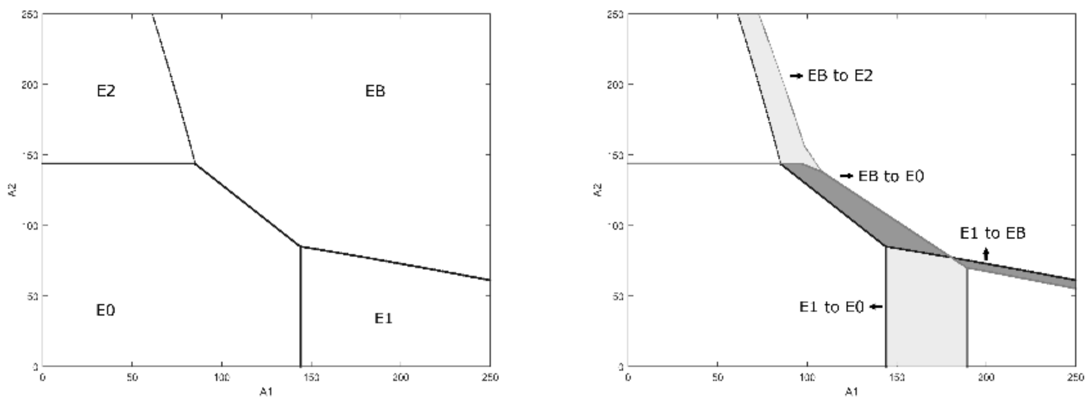
[20] Because of the symmetry, firms that export to only one country are indifferent between the US and ROW after the preference is removed. To avoid confusion with the indifference situation, we select parameter values so that firms choose either to exit or to export to both markets.

Fig. 2: Spillovers across markets

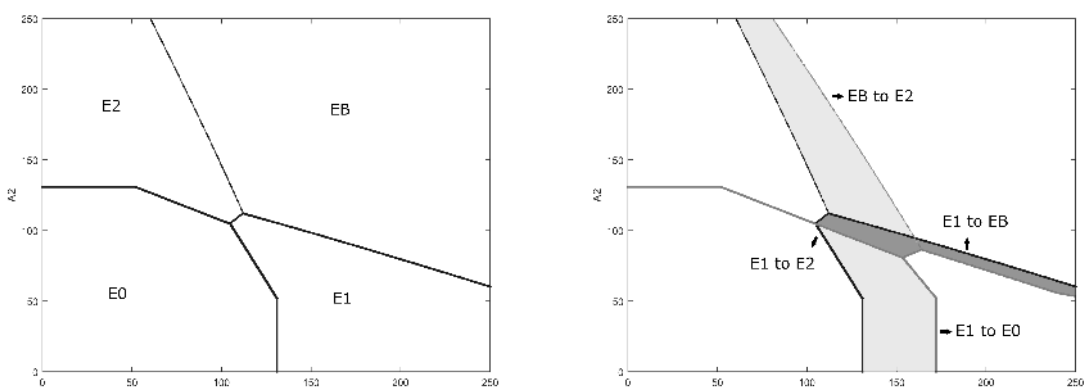
(a) Symmetric case



(b) Asymmetric case. Large fixed costs



(c) Asymmetric case. Large diseconomies of scope



Notes: The figure illustrates export decision zones for different firm-level values for the demand shocks A_1 and A_2. The graphs on the left plot cases of GSP preference on product 1 in market 1, while the graphs on the right plot an increase in the tariff of product 1 in market 1 (a suspension of preferences). Export decision zones are denoted by $E0, E1, E2, EB$. The demand and cost functions are as in Figure 1, with the following parameters. Panel (a): $\beta = 3$, $F_1 = F_2 = 10$, $F_{us} = F_{row} = 10$. MFN tariffs of 20 percent on both goods in both markets. Panel (b): $\beta = 2$, $F_1 = F_2 = 8$, $F_{us} = F_{row} = 23$. MFN tariffs are 20 and 60 percent in the US and 60 and 0 percent in ROW. Panel (c): $\beta = 2.5$, $F_1 = F_2 = 4$, $F_{us} = F_{row} = 23$. Same MFN tariffs as Panel (b). In all panels F=0.

the suspension and decide to exit after the removal of the preference on good 1 (light gray area E_1 to E_0). The interdependence is given by the dark gray area (E_B to E_0), which is analogous to the dark area in Panel (a). These are firms that stop exporting to the US *and* to ROW, for the same reasons as in the previous panel.[21]

Panel (c) shows a situation similar to Panel (b) except that the parameter governing diseconomies of scope is higher and prevails over the economies of scale. The initial equilibrium in the left-hand side looks akin to panel (c) of Figure 1, with disjoint zones E_0 and E_B, and with a positively sloped boundary between E_1 and E_2 that indicates substitution across destinations. The substitution is driven by the product-market specialization given by the asymmetry in tariffs, and by the substitution across products due to the diseconomies of scope. With the removal of the tariff preference on good 1 in the US, the light gray areas, where firms exit the US but do not change their decisions regarding entry in ROW, are qualitatively analogous to the situation depicted in the previous panel. On the other hand, there is no longer a region where firms exit both markets. Instead, there is now a central region where firms replace the US with ROW. This happens precisely because in this case diseconomies of scope are strong relative to scale economies, and as firms exit the US and stop producing good 1, their marginal cost of producing good 2 decreases enough to make it worthwhile to incur F_2 and F_{row} to sell it to ROW.

Summing up, after the preference suspension there is an expansion of zones E_0 and E_2 and a contraction of zones E_1 and E_B. Interdependencies are given by scale economies—there are firms that exit the US and ROW markets—and by diseconomies of scope and product-market specialization—there are firms that replace the US market with ROW. We formalize these results as follows (see Appendix A.3 for their formal analysis).

Result 3. Argentinian firms exit or drop products from third markets because of the policy shock in the US only if there are firm- or product-level scale economies. This can happen only for firms that also exit or drop products in the US after the shock.

The testable implications of Result 3 are as follows. Empirical verification of a causal relationship between the policy shock and exit in third markets suggests the presence of either firm-level or product-level scale economies. Specifically, if firms discontinue certain products in response to increased US tariffs but continue exporting, this would indicate the presence of product-level scale economies ($F_1 > 0$). On the other hand, if firms halt exports to other foreign markets due to the shock, despite previously selling unaffected products there, that would indicate the presence of firm-level scale economies ($F > 0$).

[21] There is also a group of firms that keep exporting to the US and *add* ROW (dark gray area E_1 to E_B). These are firms that have a high demand shifter A_1 and, for that reason, keep exporting good 1 to the US after the tariff increase. However, as they now sell less of good 1 in the US, their marginal cost of other product-market combinations falls, making it worthwhile to serve ROW. This happens because of diseconomies of scope at the firm-level.

4 Firm reactions to the tariff shock

Empirical results in section 2 show that the suspension from the American GSP program reduced Argentinian exports of the affected products to the US. Having discussed possible interdependencies across products and markets in section 3, we now turn to the firm-level empirical analysis.

4.1 Data and descriptive statistics

Our primary source of data is Argentina's customs data, which contain information on the universe of Argentinian export transactions. The dataset covers every firm-product-destination export combination. Each record contains the firm's unique tax code; the exported good, identified at the 8-digit level using the Nomenclatura Comun del Mercosur (NCM); the destination; and the value and quantities exported. From the USITC we have information on preferences granted to Argentina in the American market at the 8-digit level using the Harmonized Tariff Schedule of the United States (HTSUS); on claimed GSP imports; and on American MFN tariffs.

One difficulty is that the NCM and HTSUS product classifications do not match at the 8-digit level. For that reason, we work at the 6-digit level, since at that level of aggregation both systems adopt the harmonized system (HS) of classification.[22] Another difficulty is that there was a change in the HS classification in 1996. We follow the concordance methodology used by the United Nations Trade Statistics to make the correspondence.[23] Overall, 24 percent of the products suspended were affected by the reclassification in one way or another.

The dataset spans 1994 to 2001, so it allows us to observe Argentinian firm-level exports both before and after the partial cancellation of GSP in the American market. Since the policy took place in the middle of 1997, we eliminate 1997 from the analysis, so that the periods before and after the shock are clearly defined.

Table 4 shows descriptive statistics during the period 1994–2001 for firms that exported to the US in the years prior to the shock. There are 3,267 firms in the sample. On average, 1988 firms per year exported at least one product under GSP, and 732 firms exported at least one product that was suspended from the GSP in 1997. The panel is not balanced, there is firm entry and exit into export markets, and there are firms that export intermittently. On average, firms exported 4.3 years during our 8 year long sample. The median number of years with positive exports at the firm level is 5; the median number of products and destinations is 4 for both. The median number of product-destination combinations is 8. The distribution of the firm-level total export value is heavily skewed, with an average of 9,058 thousand dollars per year, which is substantially above the 75th percentile (2,535 thousand dollars). On average, the share of the US in firm total exports is 30 percent, and the share of GSP and suspended products in firm-level exports to the US is 46 and 12 percent, respectively.[24]

[22] We define a product at the 6-digit level as "suspended" if at least one HS8 product within the HS6 product is suspended. We define "GSP products" at the 6-digit level as a continuous variable between 0 and 1. It is computed from USITC data by calculating the share in export value of HS8 GSP products within an HS6 product.

[23] The concordance is available at https://unstats.un.org/unsd/trade/classifications/correspondence-tables.asp.

[24] Averages are computed as the unweighted mean across firm-year observations.

A natural concern is whether the firms affected by the suspension were growing at a different pace relative to other Argentinian exporters. If that were the case, our results could capture a pre-suspension trend that persisted after the suspension. We address that concern in Table 5. We look at pre-1997 export growth (between 1995 to 1996 and between 1994 to 1996). In the table, "suspended firms" are defined as those that exported at least one suspended product to the US in 1996, whereas "non-suspended GSP firms" are those that exported GSP-eligible goods but not suspended ones to the US in 1996. As the t-test on the equality of means indicates, there is no statistical difference between the export growth of firms affected and unaffected by the suspension. Those results indicate that our findings do not reflect pre-shock trends in the affected firms.

4.2 Firm-product level analysis in the American market

We begin the analysis by studying the effects of the suspension on exports to the American market. We define observations at the firm-product-year level. Our sample are Argentinian firms with positive exports to the US for at least one year between the pre-suspension period 1994–1996. The benchmark specification has the following form:

$$y_{ijt} = \alpha_1 SProd_{jt} + x'_{ijt}\beta + \phi_{ij} + \phi_t + \epsilon_{ijt}, \tag{11}$$

where i, j, t index firms, products and years, respectively. The dependent variable y_{ijt} is an indicator for positive exports to the US of product j by firm i in year t. The key independent variable is the difference-in-differences interaction $SProd_{jt}$, which is zero before 1997 and positive after afterwards if product j was suspended. The coefficient α_1 captures the effect of the suspension on the conditional probability of exporting suspended products (the sub-extensive margin). The regression includes firm-product fixed effects that control for time invariant firm-product characteristics, and year fixed effects. Other controls (x_{ijt}) are differential trends according to firm initial observable characteristics interacted with time effects (initial firm characteristics are exports of product j, total firm exports, total number of exported products, and total number of export markets in the pre-suspension period). We cluster standard errors at the firm-product level.

Our strategy identifies the effect of the suspension by using non-suspended products as a control group. We consider two alternative control groups: all non-suspended products, and non-suspended products that are part of the GSP program. We also use two possible definitions of the shock variable $SProd$: an indicator variable that takes the value of 1 if product j was suspended and $t > 1997$, and a variable that represents the magnitude of the loss in preference. We therefore work with four specifications for the baseline regression, as follows:

S1. The sample is a balanced panel that includes all pairwise combinations of firms and products with positive exports to the US in 1994–1996. The shock variable $SProd$ is a dummy variable that indicates whether product j was suspended and the year is after 1997.

S2. The sample is restricted to products that received preferences under GSP before 1997. We refer to these products as "GSP products." Since GSP products may be the most relevant with respect to the policy shock, both as treatment and as control, it is worthwhile to have specifications that focus on them. This sample is a balanced panel and includes the same firms as in S1. The firm-product pairwise combinations are restricted to GSP products. The definition of $SProd$ is the same as in S1.

S3. The shock variable $SProd$ is the MFN tariff of product j, interacted with whether product j was suspended, and interacted with whether the year is after 1997. This specification allows the intensity of the shock to be different across suspended products according to the different tariff increase that applies after the suspension, which goes from zero (before the suspension) to the MFN tariff level (after the suspension). The sample is the same as in S1.

S4. The definition of $SProd$ is the MFN tariff, as in S3, and the sample is restricted to GSP products, as in S2.

Results are reported in Table 6. Columns (1) to (4) correspond to specifications S1 to S4, respectively. Panel A shows that for both the full and the GSP samples, the suspension has a precisely estimated negative effect on the conditional probability that a firm exports a suspended product to the American market. In terms of magnitudes, if a firm exported a suspended product to the US prior to 1997, then on average the suspension reduced the probability of exporting that product to the US after 1997 by twenty-three percentage points. This compares to an afterward conditional probability of exporting a product to the US in 1998 of thirty percentage points.[25] The effect is larger in absolute value, the greater the tariff increase due to the suspension (columns 3 and 4). When we allow for differential effects by year (Panel B), the results show that the effect is stable and long-lasting.

Put together, the results in Table 6 indicate, as expected, that the suspension of tariff preferences had a meaningful negative effect on the product-level extensive margin for Argentinian firms exporting to the US. This is the direct effect of the suspension on the sub-extensive margin at the firm-product level. One could consider it a "litmus test" for the relevance of the shock, although it cannot reveal anything about interdependencies. We now study whether this effect propagates to other products exported by exposed firms.

To explore whether firms react to the shock by substituting products, we estimate the following specification:

$$y_{ijt} = \alpha_1 SProd_{jt} + \alpha_2 (SFirm_i \times NSProd_{jt}) + x'_{ijt}\beta + \phi_{ij} + \phi_t + \epsilon_{ijt}, \tag{12}$$

where $NSProd_{jt}$ is an indicator that is one for non-suspended products and $t > 1997$, and zero otherwise. The indicator variable $SFirm_i$ takes the value of 1 if firm i exported any suspended product to the US between 1994–1996. It captures whether a firm was exposed to the suspension. Coefficient α_2 shows whether firms that exported a suspended product prior to the shock altered their decisions about other, non-suspended products.

[25] The effects on the unconditional probability of exporting a firm-product combination is also positive and significant, albeit by definition very small as the balanced panel includes all possible firm-product combinations.

Table 7 shows the results. The specifications in each column are the same used in the corresponding columns of Table 6. Panel A shows that the impact of the suspension on the probability of exporting a given non-suspended product is low, 0.02 percentage points (column 1), but it is positive and statistically significant. The effect increases to 0.05 percentage points once we restrict the sample to GSP products (column 2). Those results are corroborated in columns 3 and 4, where we display the marginal effect of increasing the tariff for suspended products.

Now, considering substitutability across all possible products is probably too wide. In panels B and C, we then focus on products that are ex-ante more likely to be considered substitutes for the suspended products. We explore two ways to define "more relevant" products for the firm. First, we define as "relevant" the non-suspended products that were exported by the firm to other markets prior to the shock. Panel B shows the results. The coefficients associated with $Sfirm \times NSRelevant$ are positive, significant, and represent an additional effect of around 2 percentage points, which is two orders of magnitude larger than the baseline. Second, we define as "relevant" the non-suspended products with the same first 2 digits as the suspended products exported by the firm prior to the shock. The results are shown in Panel C. We see that these "relevant" products exhibit an additional positive effect that is about five times larger than the baseline estimates when considering the full sample (columns 1 and 3).[26]

On the whole, Table 7 shows that the loss of tariff preferences induced firms to rearrange their baskets of products sold in the American market. Firms tend to stop exporting suspended products, as expected, but they also tend to introduce non-suspended products to their export mix. These results show interdependencies across products and are consistent with firm-level diseconomies of scope, as explained in Result 1. In terms of the cost function, the results are consistent with the assumption that $C(\phi, q_1, q_2) > C(\phi, q_1, 0) + C(\phi, 0, q_1)$—i.e, equation 7 satisfied with strict inequality.

4.3 Firm-level analysis in the American market

A natural question is whether, or how much, the within-firm changes in the product export mix matters at the firm level. The theoretical discussion highlights situations where the effect of the suspension is such that firms can no longer cover the fixed cost of exporting and exit the market. The analysis also shows how the presence of diseconomies of scope can induce entry and expansion of non-suspended products.

We now define observations at the firm-year level and work with a balanced panel of firms with positive exports to the US for at least one year during the pre-suspension period. Our benchmark specification turns into the following form:

$$y_{it} = \alpha_1 FirmExposure_{it} + x'_{it}\beta + \phi_i + \phi_t + \epsilon_{it}. \tag{13}$$

The dependent variable y_{it} indicates positive firm exports to the US in year t. The key independent

[26]When we consider the reduced sample of GSP products (columns 2 and 4), the set of possible relevant products shrinks, and thus the possibilities of substitution are reduced.

variable is the difference-in-differences interaction $FirmExposure_{it}$ that we describe below. The regression includes firm (ϕ_i) and year (ϕ_t) fixed effects, and firm initial characteristics interacted with year effects (x_{it}). We cluster standard errors at the firm level.

As in the firm-product specifications, we display the estimations for four different specifications. For the first two, we define $FirmExposure_{it}$ as the average share of suspended products in total firm exports to the US between 1994–1996 when $t > 1997$ and zero otherwise. This definition is intuitive: the greater the share of products suspended in a firm's total exports to the US, the more exposed to the policy shock the firm was.

In the last two specifications, the key independent variable is the average tariff increase for the firm, calculated as

$$\sum_{t=1994}^{1996} \sum_{j} \left(MFN_{jt} \times sh_{jit} \times I_i \right) /3,$$

where MFN_{jt} denotes the American MFN tariff rate for product j in year t, sh_{jit} is the share of product j in firm i's exports to the US in year t, and I_j is an indicator for whether product j was suspended in 1997. Under this definition, $FirmExposure_{it}$ allows for different intensities of treatment even for firms that exported the same share of suspended products before 1997. It is designed to capture more accurately the value of the lost preferential treatment. For example, if a firm exported mostly products that were suspended but whose MFN tariffs were minuscule, then the loss of preferential treatment would be meaningless. Conversely, if a firm exported suspended products whose MFN tariffs were very high, then the policy shock would presumably have a sizeable impact on its behavior even if the share of those products in its total American exports were relatively small.

Table 8 reports results on the extensive margin effects. In columns 1 and 3, we include all firms that exported to the US before 1997. In columns 2 and 4, we restrict the sample to firms for which at least 80 percent of export value to the US prior to 1997 was of products that received preferences under GSP; we term them "GSP firms." Panel A shows that, for both the full and the GSP samples, the suspension has a precisely estimated negative effect on the probability of exporting to the American market. In terms of magnitudes, if a firm exported only suspended products to the US prior to 1997, then on average the suspension would reduce the probability that this firm would export to the US after 1997 by four percentage points. This compares to a baseline probability of exporting to the US after 1997 of 30.5 percentage points. Moreover, the effect is larger in absolute value, the greater the tariff increase due to the suspension (columns 3 and 4). These results indicate that the suspension of tariff preferences had an important negative effect at the extensive margin of Argentinian firms exporting to the US. The more exposed to the shock a firm was, the more likely it would exit the American market after the shock.

Now, this effect may conceivably be driven by firms that only export suspended products, in which case the results would not reflect interdependencies. In Panel B, we then restrict the sample to firms that exported at least one non-suspended product. We find that results remain qualitatively unchanged in that case. Thus, we conclude that the suspension triggers exit even of firms that also exported non-suspended goods. As stated in Result 2, this reflects firm-level or market level scale economies. In terms of the cost function, results are consistent with $F > 0$, with $F_{us} > 0$, or with both.

We now look for evidence on product substitution using the firm-level sample to complement results from the previous subsection. Results are reported in Table 9. The regression design is the same as in equation (13), but with different definitions of the dependent variable y_{it}. Panel A shows how firm exposure to the suspension affects the probability of exporting at least one suspended product. We find that the effect is negative and precisely estimated. This is unsurprising, but extends the findings of Table 6 to the firm level. Panel B shows instead that the shock also induced firms to start exporting non-suspended products. This extends the findings of Table 7 to the firm level, further backing up the presence of firm-level diseconomies of scope (Result 1).

Finally, in Table 10 we turn to the intensive margin. In Panel A, the dependent variable is the log of exports of firm i to the US. We consider all firms that exported in at least one year before the policy shock and one year after it, aggregating firm exports over all years before and all years after the shock. This allows for a flexible definition of intensive margin that accounts for firms that export often but not every year. In that specification, the difference-in-differences coefficient is not estimated precisely, except when we consider only GSP firms in column (2), where there is mild statistical evidence that the suspension decreased the volume of sales of exporting firms to the American market.

In panels B and C, we then split firm sales between suspended and non-suspended goods. When we consider just the former (Panel B), we find that the policy shock did reduce exports of suspended products by firms that kept serving the US market. The effect at this sub-intensive margin is sizeable. For example, considering a firm for which half of its exported value to the US was composed of suspended products, the estimated coefficient is column (1) would imply a reduction of 35 percent in export value of suspended products to the US after the shock.[27]

More interestingly, when we consider only sales of non-suspended goods (Panel C), we obtain the opposite result: the shock induced an *increase* in the exports of those goods to the US by the firms that kept serving that market. The effect is sizeable as well. Again, considering a firm for which half of its exported value to the US was composed of suspended products, the estimated coefficient is column (1) would imply an increase of 66 percent in export value to the US after the shock.[28] The results from panels B and C reveal that the imprecise estimates for the intensive margin effects in Panel A reflect intra-firm product reallocation. This is further evidence, at the firm level, of diseconomies of scope (Result 1).[29]

[27]For that hypothetical firm, $FirmExposure = 0.5$. Thus, comparing before and after the suspension, we obtain $\log(y^{susp}_{after}) - \log(y^{susp}_{before}) = 0.5\widehat{\beta_1} = -0.43$, so that $y^{susp}_{after}/y^{susp}_{before} = \exp(-0.43) = 0.65$.

[28]For that hypothetical firm, $FirmExposure = 0.5$. Thus, comparing before and after the suspension, we obtain $\log(y^{non-susp}_{after}) - \log(y^{non-susp}_{before}) = 0.5\widehat{\beta_1} = 0.505$, so that $y^{non-susp}_{after}/y^{non-susp}_{before} = \exp(0.505) = 1.66$.

[29]Another way of looking at firms' product basket adjustment at the firm level is to consider whether the policy shock affected product hierarchy within firms. We do so in Appendix A.4, Table A1. We find that the suspension reduced the probability that a product will feature prominently within a firm's export basked to the US, regardless of the definition.

4.4 Summary of results in the American market

We find that the elimination of tariff preferences for some Argentinian exports to the US had a negative extensive margin effect, with some firms stopping exporting altogether to the US because of the higher variable costs—even when they exported unaffected products before the shock. On the other hand, the policy shock did not generate sizeable firm-level intensive margin effects. That is, if a firm kept exporting to the US after the tariff hike, it did not change its export volume in a significant way. But this is not because the shock was ineffectual; rather, the reason is that firms partially offset the cost of the tariff hikes by reshuffling products within their export baskets to the US.

Indeed, within firms that kept serving the American market, there was significant product substitution. As the trade cost of some products increased, firms shifted the composition of their export basket away from those products and toward others whose trade cost had not changed. Moreover, firms were more likely to drop products that had lost preferential tariff treatment and to add products that did not incur such a cost increase. The impacts of the suspension on exports to the American market allow us to infer that there are relevant diseconomies of scope and scale economies at the firm level. The former must work through variable costs, while in our model the latter stem from fixed costs at the firm-level ($F > 0$) or market-level ($F_{us} > 0$).

Finally, as firms react to the suspension by reshuffling their export baskets, we have to consider the possibility that this process was not just a reclassification of the same products into different HS codes as a way to elude the increase in tariffs of suspended products. This concern is mitigated by acknowledging that the US Customs and Borders has enough control over how different products enter the American market—or else the whole structure of the American tariffs would be called into question. Still, we can check whether the unit values of the new products added by a firm after the suspension are similar to the unit values of the products dropped by the same firm after the suspension. If they were very similar, it could be a sign of relabeling. In Appendix A.4, Table A2, we report the correlation between the unit value of products exported in 1996, hit by the suspension and dropped, and the unit value of products added in 1998 as a replacement.[30] As the table shows, the correlation between unit values of dropped and added products is very small (and negative).

4.5 Impacts on exports to ROW

We now proceed to empirically evaluate interdependencies across destinations. To study whether tariff hikes trigger third-country effects, we focus on the impact of the suspension in the US on the probability of exporting to the rest of the world. We proceed analogously to our analysis of the extensive margin in the American market.

First, we carry out an analysis at the firm-product level, as in equation (11), but including the destination dimension. There are two possible destinations: the American market and the

[30] As firms may drop or add more than one product, we also report the correlation between the unit values of the products with the minimum, maximum and median value among the products dropped and added. See notes in Table A2 in Appendix A.4.

rest of the world, which aggregates all other foreign markets. Observations are defined at the firm-product-destination-year level. We estimate the following regression:

$$y_{ijdt} = \alpha_1 SProd_{jdt} + \alpha_2 SProdRow_{jdt} + x'_{ijt}\beta + \phi_{ijd} + \phi_t + \epsilon_{ijdt}, \tag{14}$$

where i, j, d index firms, products and destination markets (US and ROW), respectively. The variable *Sprod* takes a value of one for suspended products, for observations after 1997, and for destination US. The variable $SProdRow$ is defined analogously to $SProd$, with the difference that it takes a value of zero for exports to the US and it is activated for exports to ROW. The two variables capture the effects of the suspension on exports to the US and to ROW, respectively.

Table 11, Panel A, shows that the probability of exporting a suspended product to ROW decreases after the shock. Predictably, the magnitude of the effect is smaller than (around a fifth of) the magnitude of the effect in the US. This third-market effect is also increasing in the preferential margin enjoyed before the shock. Hence, there is a positive externality to other markets; since the shock is negative (a reduction of market access), it affects negatively export participation in the rest of the world.

Although the literature does not usually investigate such effects, this result follows directly from our theoretical framework. Specifically, this positive interdependence across markets is generated by scale economies within firms or products. Diseconomies of scope work in the direction of creating negative interdependences, which in our context would imply starting to export to ROW because of the shock. The empirical findings in Table 11 support the idea that *on average* firm- and product-level scale economies dominate diseconomies of scope across destinations (Result 3).

To help uncover the channel, in Panel B we interact the treatment variable with a dummy ($Drop_{ij}$) that is one if the product is dropped from exports to the US by the firm after the shock. The results show that the negative effect at the extensive margin in ROW is present only for those firm-product pairs. In principle, this could reflect economies of scale at either the firm ($F > 0$) or product level ($F_1 > 0$), or both. To distinguish between them, in Panel C we add a second interaction, with a dummy ($Exit_i$) that is one if the firm exited the American market after the shock. The interactions with both variables are negative and statistically significant. Since $Drop_{ij} = 1$ whenever $Exit_i = 1$, but not necessarily the reverse, some firms stop exporting suspended products to ROW even when they remain active in the US with other products. This reveals that product fixed costs F_1 must be driving this effect (although firm export fixed costs F may be present as well).

Second, we carry out an analysis at the firm level. In Table 12, we consider Argentinian firms that exported to the US before the policy shock (so they could have been directly affected by the shock) and to markets other than the US at some point during our sample. As in Table 8, the key independent variable is $FirmExposure_{it}$, defined as before (i.e., it reflects firm exposure to the shock *in the US*).

The results in Panel A show that firms that are more exposed to the suspension of preferential treatment in the American market become less likely to export to other markets. In terms of magnitudes, if a firm exported only suspended products to the US prior to 1997, then on average the suspension would reduce the probability that this firm would export to ROW after 1997 by just over four percentage points. This compares to a baseline probability of exporting to ROW after 1997 of 48 percent. The effect is larger for firms whose exports are concentrated on GSP products.

With scale economies, exit in ROW can be triggered by exit in the US. This is illustrated by the dark gray areas in Figure 2, panels (a) and (b). Basically, if a firm leaves the American market, recovering the fixed costs by selling only in ROW may not be possible, in which case the firm stops exporting altogether. On the other hand, if a firm kept serving the American market after the increase in the tariff, because of the diseconomies of scope the profitability of selling to ROW would rise, not fall. In that case, we would not observe exit from ROW, and possibly even entry in ROW.

In Panel B, we interact our main variable with a dummy ($Exit_i$) that is one if the firm exits the American market after 1997. The results show that firms that keep exporting to the US do not alter their export presence in third markets and confirms that exit from other markets stems solely from economies of scale (Result 3).

Now, once again, such economies of scale can stem from either F of F_1. To help isolate the effects from each type of fixed cost, in Panel C we restrict the analysis to firms that export only non-suspended products to at least one non-US destination prior to the shock. In that case, if the firm exits ROW, it must reflect $F > 0$, because F_1 is irrelevant for the firm in the foreign market where it did not export suspended products. The results in Panel C confirm that to be the case, highlighting the importance of the firm-level fixed cost to export (F). As an alternative specification, Panel D further restricts the sample to firms that export only non-suspended products to their main non-US destination pre-shock; results are similar.

It is important to understand that while results in Table 12 confirm the presence of firm-level scale economies (F), they are not incompatible with product-level scale economies (F_1). Indeed, results in Table 11 support product-level scale economies. We conclude this section by noting that there are positive spillover effects from the American market to third markets, triggered by firm- and product-level scale economies (which is negative because the shock manifests as a *reduction* in the probability of exporting to ROW).

4.6 Multiple destination markets

In our last specification, we refine the analysis of third-market effects by considering each destination country separately, rather than aggregating them into ROW. In the previous section, we find that the average effect of the suspension on participation in third markets is negative. We now look for heterogeneous effects across destination markets according to whether, for firms exposed to the suspension, the pre-suspension export basket to each destination was similar to the US, in the sense of including suspended products. Observations are defined at the firm-destination-year level, with a balanced panel. The dependent variable $FirmExposure_i$ is defined as before. We further interact $FirmExposure_i$ with two dummies: $SuspD_{id}$, which is one for firms that exported at least one suspended product to destination d prior to the suspension; and $NSuspD_{id}$, which is the complement of $SuspD_{id}$.

Results are in Table 13. Panel A shows that indeed results differ by destination. The probability of exporting to third markets to which no suspended products were exported prior to the suspension *increases*, implying that there is substitution across destinations due to diseconomies of scope. A reduction of exports to the US lowers the marginal cost of exporting *non-suspended products* to other markets. This reflects the dark gray area in Figure 2, panel (c), and is compatible with an asymmetric case in which different products are exported to different destinations (in the sense that the pre suspension export basket did not include suspended products). On the other hand, the probability of exporting to destinations to which firms ship suspended products *decreases*, even though the suspension only occurs in the US, reflecting economies of scale at the firm and product level, and being compatible with the symmetric case of Figure 2, panel (a).

To study the economies of scale in more detail, in Panel B we restrict the sample to firms that do not stop exporting entirely during the sample period, and to firm-destination combinations to which the firm exports at least one non-suspended product before the suspension. The negative results from Panel A remain present, that is, there is exit of firms from destinations to which they exported suspended products. This last result means that there are indeed market-level fixed costs ($F_d > 0$).[31] This is because: (i) firms do not exit all markets and thus keep paying F, and (ii) firms export non-suspended products to the destination and thus the reason for exiting is not merely to save on the fixed cost of suspended products F_1. Having excluded F and $F1$ as an explanation for this finding, we conclude that exit by this group of firms is driven by F_d.

4.7 Summary of third-market effects

The tariff suspension in the US triggered the exit of some affected firms not only from the American market, but also from other foreign markets. We find evidence that this happened because of economies of scale linking the US to other markets from the perspective of Argentinian exporting firms. The scale economies stem from fixed costs at the firm level (a fixed cost to export), at the firm-product level (a fixed cost to export a given product), and at the firm-market level (a fixed cost to export to a given market). We also find evidence of economies of scope in third markets. This is reflected by a higher probability of exporting to markets to which the firm did not export suspended products prior to the shock, which contrasts with the lower probability of exporting to markets to which the firm exported suspended products prior to the shock.

5 Conclusion

We evaluate how tariff hikes affect firm export behavior. A key advantage of our approach is the identification strategy, which is particularly clean. It relies on unanticipated tariff increases

[31] In the model and in the previous empirical sections, we pool all non-US destinations into ROW, and thus define market level fixed costs as F_{us} and F_{row}. In this empirical subsection, we split ROW into multiple destinations d so it becomes more accurate to refer to market-level fixed costs as F_d.

by the United States, which affected only imports coming from Argentina, and only a subset of the products exported by Argentina to the American market. The US could impose the tariff hikes without any institutional restriction because they happened in the context of the Generalized System of Preferences, which is offered to developing countries on a unilateral basis. To guide our empirical analysis, we develop a simple framework that rationalizes export interdependencies.

We find that the suspension of preferences, which represented an increase in tariffs from zero to its MFN level for the Argentinian firms previously benefiting from them, had a negative effect on the extensive margin: firms more affected by the increase in tariffs became less likely to export to the US after the shock. On the other hand, intensive margin effects were largely mute: firms that kept serving the American market did not experience a clear drop in total sales to that market.

The lack of clear intensive margin effects is explained by changes in the "sub-extensive" and "sub-intensive" margins, reflecting the reallocation of firm resources across products. Specifically, affected firms reduced the share of suspended products in their export baskets to the US. This happened for two reasons. First, they decreased the volume and exported less often the products suspended from the preference list. Second, and more remarkably, affected firms also increased the volume and started to export other, non-suspended products.

At least as surprising is the finding that our extensive margin results extend to third markets, where policy did not change. We find that firms reduced exports of US-suspended products also to third markets. Furthermore, the firms more affected by the policy shock in the American market not only became more likely to exit that market; they also became more likely to exit other markets and to stop exporting altogether.

Interpreting the results in light of our theoretical framework, we conclude that the extensive margin and third-country findings require increasing returns emanating from firm, firm-destination and firm-product fixed costs. We also show how the effects of tariff changes on the sub-extensive and sub-intensive margins require diseconomies of scope, where halting the exports of a product decreases the marginal cost of exporting other products. Clearly, these uncovered interdependencies in exporting have important implications for quantifying the consequences of changes in import tariffs and of trade cost more generally.

On the policy front, we find that nonreciprocal preferences can be an effective policy instrument to stimulate foreign market entry, consistent with the GSP goal of promoting export-led growth. Furthermore, since similar effects are observed also in third markets, it follows that preferences to one market can have global consequences. Naturally, our results are drawn from a specific institutional environment, and generalizations must be considered carefully. Nevertheless, it is worth mentioning that our policy shock shares several characteristics with recent changes in tariffs, especially in the US: tariffs rise (rather than fall) suddenly, following unilateral decisions (and not because of bilateral or multilateral negotiations), affecting specific countries and sectors (instead of most trade partners and most goods). Of course, our "tariff shock" is much smaller than both the tariff changes implemented and those threatened during the beginning of the second Trump Administration. On the other hand, its limited scope allows for a precise identification, and as such it can offer useful insights to assess the larger and broader implications of contemporary trade policy changes.

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Table 1: Argentine exports to the US, product level, 1996

	All Products (1)	GSP Products (2)	Suspended Products (3)
All Products			
Value (millions of 1996 USD)	2278.4	388.1	126.1
Number of 8-digit products	1340	595	123
Percentage of total exports		17.0%	5.5%
Percentage of GSP exports			32.5%
GSP claimed		90.0%	95.4%
Average MFN tariff	2.4%	3.7%	3.6%
Manufacturing			
Value (millions of 1996 USD)	1987.2	373.3	118.9
Number of 8-digit products	1235	568	120
Percentage of total exports		18.8%	6.0%
Percentage of GSP exports			31.8%
GSP claimed		93.7%	96.8%
Average MFN tariff	2.4%	3.8%	3.9%

Notes: Data from USITC.

Table 2: Selection of suspended products

	(1)	(2)	(3)	(4)	(5)
Imports ARG 1996	0.259	0.085	0.077	0.061	0.170
	(0.359)	(0.217)	(0.213)	(0.199)	(0.165)
Import Growth ARG			0.011	0.011	0.007
			(0.007)	(0.007)	(0.011)
Imports ROW 1996				0.007	0.012
				(0.006)	(0.008)
Import Growth ROW				0.020	−0.102
				(0.064)	(0.080)
MFN tariff	0.279	1.160	1.163	1.302	1.316
	(0.662)	(0.992)	(0.995)	(1.002)	(1.933)
Product effects (4 digits)					Yes
Conditional on growth sample		Yes	Yes	Yes	Yes
Observations	610	395	395	395	395
R-squared	0.002	0.005	0.008	0.014	0.334

Notes: Data from USITC. Standard errors in parentheses. No estimate is statistically significant. Imports ARG and Imports ROW refer to imports for the year 1996. Import growth is computed as the log change in imports between 1995–1996 and 1993–1994. Columns (1) and (2) differ in that column (2) conditions on the sample of columns (3) to (5), which contains product observations for which the growth rate can be computed.

Table 3: Change in the share of suspended products

	Double Difference		Triple Difference	
	All products	GSP products	All products	GSP products
	(1)	(2)	(3)	(4)
$SUSP \times POST$	-0.025^{**}	-0.204^{**}	-0.022^{**}	-0.173^{**}
	(0.010)	(0.081)	(0.011)	(0.071)
Observations	1906	912	1906	912
Products	953	456	953	456
Average share susp	0.058	0.374	0.058	0.374
Year effects	Yes	Yes		
Product effects	Yes	Yes		
Year-origin effects			Yes	Yes
Product-year effects			Yes	Yes
Product-origin effects			Yes	Yes

Notes: Regressions at the 8-digit product level. Data from USITC between 1996 and 1999, excluding 1997. Dependent variable: share of 8-digit product in total exports of source country m to the US, with $m = \{\text{Argentina}\}$ in double difference, and $m = \{\text{Argentina, rest of the world}\}$ in triple difference. SUSP: binary variable that takes the value of one for products that were suspended from the GSP in 1997 and originated from Argentina. POST: binary variable that takes the value of one for the years 1998-1999. Columns (1) and (3): sample of all products with strictly positive exports from Argentina before and after 1997. Columns (2) and (4): sample of all products granted GSP in 1996 and with strictly positive exports from Argentina before and after 1997. Average share is the average share of suspended products in 1996, defined between 0 and 100. Standard errors clustered at the product level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table 4: Argentine exports to the US, firm level

Number of firms	3267			
Number of firms exporting to the US under GSP	1988			
Number of firms exporting suspended products to the US	732			
	Mean	p25	p50	p75
Years with positive exports	4.3	2	5	6
Number of products (HS6)	9.7	2	4	9
Number of destinations	6.2	2	4	8
Number of product-destination combinations	21.0	3	8	21
Export value (Thousands of 2000 USD)	9058.7	42.7	330.7	2535.0
Share of US in exports	0.3	0.00	0.07	0.61
Share of GSP products in US firm exports	0.46	0.00	0.32	1.00
Share of suspended products in US firm exports	0.12	0.00	0.00	0.01

Notes: Data from customs. Sample of firms with positive exports to the US in 1996.

Table 5: Pre-suspension comparison of firms

	Suspended firms			Non-suspended GSP firms			Difference	
	Mean	Std.Dev.	Obs.	Mean	Std.Dev.	Obs.	Diff	SE
Exp growth 96-95	0.02	0.042	1,538	0.03	0.037	2,148	-0.01	0.127
Exp growth 96-94	0.07	0.057	1,188	0.08	0.048	1,656	-0.01	0.067

Notes: Data from customs. Table compares export growth to the US between 1995 and 1996 and between 1994 and 1996, of two groups of firms depending on whether they were affected by the change in policy of 1997: suspended firms and non-suspended GSP firms. Suspended firms are defined as those that exported at least one suspended product in 1996. Non-suspended GSP firms correspond to those that exported at least one GSP-eligible good, but not a suspended one, in 1996. Columns (1) and (4) report the mean, columns (2) and (5) the standard deviation, and columns (3) and (6) the number of observations for the two groups of firms. Column (7) reports the difference in means (difference between columns 1 and 4) and column (8) the standard error of the difference.

Table 6: Probability of exporting to the US. Firm-product regressions

	Suspension dummy		Tariff increase	
	All products (1)	GSP products (2)	All products (3)	GSP products (4)
Panel A				
$SProd$	-0.2349***	-0.2324***	-2.7714***	-2.7733***
	(0.0151)	(0.0160)	(0.1055)	(0.1055)
Panel B				
$SProd \times 1998$	-0.1643***	-0.1579***	-2.2799***	-2.2821***
	(0.0175)	(0.0184)	(0.1186)	(0.1186)
$SProd \times 1999$	-0.2385***	-0.2359***	-2.6850***	-2.6868***
	(0.0180)	(0.0191)	(0.1237)	(0.1237)
$SProd \times 2000$	-0.2558***	-0.2515***	-2.8218***	-2.8236***
	(0.0175)	(0.0188)	(0.1246)	(0.1246)
$SProd \times 2001$	-0.2810***	-0.2843***	-3.2991***	-3.3006***
	(0.0172)	(0.0182)	(0.1198)	(0.1198)
Obs.	92505105	15345099	92505105	15345099
Firm-products	13215015	2192157	13215015	2192157

Notes: Regressions at the firm-product-year level. Data from Argentine customs. Products defined at the 6-digit level. Dependent variable: indicator variable for positive firm-product exports to the US. Treatment variable: indicator variable for products that were suspended in 1997 (columns 1 and 2) and product MFN tariff during 1994-1996 (columns 3 and 4), both interacted with a POST indicator variable that is equal to one for observations after 1997. Panel B: analogous to Panel B with the POST variable defined yearly. Sample: all possible combinations of firms with positive exports to the US in 1994-1996 and all products with positive exports by at least one firm in 1994-1996 (columns 1 and 3); alternatively only products under GSP in 1994-1996 (columns 2 and 4). Regressions include trends based on firm and product characteristics in the pre-treatment period. Standard errors are clustered at the firm-product level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table 7: Product substitution. Firm-product level regressions

	Suspension dummy		Tariff increase	
	All products (1)	GSP products (2)	All products (3)	GSP products (4)
Panel A: Spillovers to non-suspended products				
$SProd$	-0.2346***	-0.2320***	-2.7674***	-2.7697***
	(0.0204)	(0.0209)	(0.1892)	(0.1885)
$SFirm \times NSProd$	0.0002***	0.0005***	0.0018***	0.0040**
	(0.0000)	(0.0001)	(0.0006)	(0.0020)
Panel B: Spillovers to relevant non-suspended products (exported to ROW)				
$SProd$	-0.2345***	-0.2320***	-2.7673***	-2.7696***
	(0.0204)	(0.0209)	(0.1892)	(0.1885)
$SFirm \times NSProd$	0.0002***	0.0004***	0.0014**	0.0027*
	(0.0000)	(0.0001)	(0.0005)	(0.0016)
$SFirm \times NSRelevant$	0.0199***	0.0173**	0.1963**	0.1649
	(0.0052)	(0.0085)	(0.0816)	(0.1102)
Panel C: Spillovers to relevant non-suspended products (same first 2 digits)				
$SProd$	-0.2345***	-0.2320***	-2.7674***	-2.7697***
	(0.0204)	(0.0209)	(0.1892)	(0.1885)
$SFirm \times NSProd$	0.0001***	0.0004***	0.0013***	0.0036**
	(0.0000)	(0.0001)	(0.0005)	(0.0017)
$SFirm \times NSRelevant$	0.0009**	0.0008	0.0088*	0.0038
	(0.0004)	(0.0007)	(0.0047)	(0.0078)
Obs.	92505105	15345099	92505105	15345099
Firm-products	13215015	2192157	13215015	2192157

Notes: Regressions at the firm-product-year level. Dependent variable, products, and sample defined as in Table 6. Right-hand side variables in Panel A: same treatment variable for suspended products as in Table 6; an additional treatment variable for non-suspended products exported by firms affected by the suspension (i.e. firms that have at least one suspended product). Panel B: adds an interaction for non-suspended products that are relevant to the firms affected by the suspension in the sense that they are exported to ROW prior to the suspension. Panel C: adds an interaction for non-suspended products that are relevant to the firms affected by the suspension in the sense that they share the same first two digits as suspended products exported by the firm prior to the suspension. Standard errors are clustered at the firm-product level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table 8: Extensive margin. Firm-level regressions

	Share of suspended products		Average tariff increase	
	All firms	GSP firms	All firms	GSP firms
	(1)	(2)	(3)	(4)
Panel A: All firms				
$FirmExposure$	-0.0421***	-0.0467***	-0.5766***	-0.5465**
	(0.0122)	(0.0160)	(0.1811)	(0.2137)
Obs.	22869	5803	22869	5803
Firms	3267	829	3267	829
Panel B: Firms that export at least one non-suspended product				
$FirmExposure$	-0.0647***	-0.0790***	-0.7701***	-0.7027**
	(0.0193)	(0.0224)	(0.2242)	(0.2756)
Obs.	21469	4690	21469	4690
Firms	3067	670	3067	670

Notes: Regressions at the firm-year level. Data from Argentine customs. Dependent variable: indicator variable for positive firm exports to the US. Treatment variable: initial firm share of suspended products in total exports during 1994-1996 (columns 1 and 2) and firm weighted average MFN tariff of suspended products during 1994-1996 (columns 3 and 4), both interacted with a POST indicator that is equal to one after 1997. Suspended products are those suspended from GSP from Argentina in 1997. Sample: All firms with positive exports to the US in 1994-1996 (Columns 1 and 3) and firms with more than 80 percent of exports under GSP in 1994-1996 (Columns 2 and 4). Standard errors are clustered at the firm level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table 9: Product substitution. Firm-level regressions

	Share of suspended products		Average tariff increase	
	All firms	GSP firms	All firms	GSP firms
	(1)	(2)	(3)	(4)
Panel A: Probability of exporting at least one suspended product				
$FirmExposure$	-0.3636***	-0.3405***	-3.8882***	-3.1024***
	(0.0160)	(0.0167)	(0.2949)	(0.2702)
Panel B: Probability of exporting at least one non-suspended product				
$FirmExposure$	0.2431***	0.2676***	2.3908***	2.2183***
	(0.0164)	(0.0177)	(0.2501)	(0.2684)
Obs.	22869	5803	22869	5803
Firms	3267	829	3267	829

Notes: Analogous to Table 8 with dependent variables: indicator variable for positive exports of suspended products (Panel A); indicator variable for positive exports of non-suspended products (Panel B). Standard errors are clustered at the firm level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table 10: Intensive margin. Firm-level regressions

	Share of suspended products		Average tariff increase	
	All firms	GSP firms	All firms	GSP firms
	(1)	(2)	(3)	(4)
Panel A: Log total exports (balanced panel)				
$FirmExposure$	-0.2077	-0.5051*	0.0773	-2.2838
	(0.1915)	(0.2684)	(2.4929)	(3.0387)
Obs.	2962	728	2962	728
Firms	1481	364	1481	364
Panel B: Log exports of suspended products				
$FirmExposure$	-0.8639**	-1.0962**	-4.0868	-3.8835
	(0.3580)	(0.5391)	(2.9297)	(2.8368)
Obs.	585	259	585	259
Firms	402	158	402	158
Panel C: Log exports of non-suspended products				
$FirmExposure$	1.0100**	1.3027**	16.0552***	13.3163**
	(0.4290)	(0.5568)	(5.6793)	(6.6034)
Obs.	2156	458	2156	458
Firms	1280	282	1280	282

Notes: Regressions at the firm-year level. Data from Argentine customs. Dependent variable: Log total exports (Panel A); Log exports of suspended products (Panel B); Log exports of non-suspended products (Panel C). Treatment variables and definitions of columns are analogous to Table 8. Time periods are collapsed into before and after 1997 and only firms with positive exports in both time periods are kept in the sample. All regressions include firm and year fixed effects, and firm-year dummies for firm size as controls. Standard errors are clustered at the firm level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table 11: Probability of exporting to third markets. Firm-product level regressions

	Suspension dummy		Tariff increase	
	All products	GSP products	All products	GSP products
	(1)	(2)	(3)	(4)
Panel A: Probability of exporting to destination d = US, ROW				
$SProd$	-0.2348***	-0.2327***	-2.7700***	-2.7753***
	(0.0150)	(0.0160)	(0.1055)	(0.1056)
$SProdRow$	-0.0442***	-0.0543***	-0.5193***	-0.5245***
	(0.0137)	(0.0145)	(0.0860)	(0.0860)
Panel B: Drop product in US after suspension				
$SProd$	-0.2348***	-0.2327***	-2.7700***	-2.7753***
	(0.0150)	(0.0160)	(0.1055)	(0.1055)
$SProdRow$	0.0405**	0.0325	0.2065	0.2004
	(0.0205)	(0.0214)	(0.1379)	(0.1379)
$SProdRow \times Drop$	-0.1562***	-0.1642***	-1.2772***	-1.2756***
	(0.0269)	(0.0284)	(0.1750)	(0.1750)
Panel C: Drop product or exit the US after suspension				
$SProd$	-0.2348***	-0.2327***	-2.7700***	-2.7753***
	(0.0150)	(0.0160)	(0.1055)	(0.1055)
$SProdRow$	0.0405**	0.0325	0.2065	0.2004
	(0.0205)	(0.0214)	(0.1379)	(0.1379)
$SProdRow \times Drop$	-0.1016***	-0.1124***	-0.6691***	-0.6685***
	(0.0360)	(0.0396)	(0.2082)	(0.2082)
$SProdRow \times Exit$	-0.0862**	-0.0795**	-1.0891***	-1.0872***
	(0.0365)	(0.0401)	(0.2149)	(0.2149)
Obs.	185010210	30690198	185010210	30690198
Firm-products	26430030	4384314	26430030	4384314

Notes: Regressions at the firm-product-destination-year level, with two possible destinations: US and ROW (rest of the world). Products and dependent variable defined as in Table 6. Sample includes all possible firm-product combinations of exports to the US and of exports to ROW thus duplicating the number of observations from Table 6. Right-hand side variables: same treatment variable for suspended products exported to the US as in Table 6; an additional treatment variable for suspended products exported to ROW. Panel B: treatment variable interacted with an indicator for products that are dropped from exports to the US after the suspension. Panel C: treatment variable is interacted with an indicator for firms that exit the US after the suspension. Regressions include trends based on firm and product characteristics in the pre-treatment period. Standard errors are clustered at the firm-product level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table 12: Probability of exporting to third markets. Firm-level regressions

	Share of suspended products		Average tariff increase	
	All firms	GSP firms	All firms	GSP firms
	(1)	(2)	(3)	(4)
Panel A: Probability of exporting to ROW				
$FirmExposure$	-0.0435**	-0.0778***	-0.6817***	-0.9438***
	(0.0184)	(0.0250)	(0.2564)	(0.2885)
Obs.	18116	4487	18116	4487
Firms	2588	641	2588	641
Panel B: Firms that exit the US after the suspension				
$FirmExposure$	0.0129	-0.0085	0.0060	-0.2428
	(0.0209)	(0.0265)	(0.2675)	(0.2697)
$FirmExposure \times Exit$	-0.1221***	-0.1465***	-1.9194***	-1.9338***
	(0.0353)	(0.0397)	(0.5681)	(0.6106)
Obs.	18116	4487	18116	4487
Firms	2588	641	2588	641
Panel C: At least one ROW destination without susp products				
$FirmExposure$	-0.0131	-0.0101	-0.2324	-0.2855
	(0.0182)	(0.0250)	(0.2623)	(0.2831)
$FirmExposure \times Exit$	-0.1123***	-0.1253***	-2.0135***	-2.2425***
	(0.0381)	(0.0480)	(0.6072)	(0.6504)
Obs.	15288	3234	15288	3234
Firms	2184	462	2184	462
Panel D: Main ROW destination without susp products				
$FirmExposure$	0.0580	0.0280	0.2916	-0.4752
	(0.0428)	(0.0556)	(0.7691)	(0.7577)
$FirmExposure \times Exit$	-0.1516**	-0.1411*	-2.6820*	-3.0600*
	(0.0649)	(0.0848)	(1.4988)	(1.6702)
Obs.	12404	2149	12404	2149
Firms	1772	307	1772	307

Notes: Regressions at the firm-year level. Dependent variable: indicator variable for positive exports to non-US markets. The treatment variables and columns are defined as in Table 8. Samples condition on positive exports to the US for at least one year between 1994 and 1996 and to a non-US market for at least one year between 1994 and 2001. Panel B: indicator variable for firms that exit the US after the suspension. Panel C: sample defined by firms that export only non-suspended products to at least one non-US destination. Panel D: sample defined by firms that export only non-suspended products to the non-US destination with largest share in total exports before 1997. Standard errors are clustered at the firm level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table 13: Probability of exporting to third markets. Firm-destination level regressions

	Share of suspended products		Average tariff increase	
	All firms	GSP firms	All firms	GSP firms
	(1)	(2)	(3)	(4)
Panel A: Probability of exporting to destination D				
$FirmExposure \times NSuspD$	0.0048***	0.0034***	0.0565***	0.0513***
	(0.0006)	(0.0008)	(0.0103)	(0.0116)
$FirmExposure \times SuspD$	-0.2392***	-0.2494***	-2.3622***	-2.3587***
	(0.0241)	(0.0250)	(0.4382)	(0.4730)
Obs.	5191263	1317281	5191263	1317281
Firm-destinations	741609	188183	741609	188183
Panel B: Firms that do not exit all markets				
$FirmExposure \times NSuspD$	0.0053***	0.0037***	0.0582***	0.0573***
	(0.0010)	(0.0013)	(0.0155)	(0.0177)
$FirmExposure \times SuspD$	-0.1838***	-0.1976***	-1.8220***	-1.8096***
	(0.0231)	(0.0246)	(0.3927)	(0.4229)
Obs.	3235204	802445	3235204	802445
Firm-destinations	462172	114635	462172	114635
Panel C: Firms that do not exit all markets and that export at least one non-suspended product to market D				
$FirmExposure \times NSuspD$	0.0052***	0.0035***	0.0549***	0.0488***
	(0.0010)	(0.0013)	(0.0155)	(0.0176)
$FirmExposure \times SuspD$	-0.2042***	-0.2118***	-2.0636***	-2.0452***
	(0.0255)	(0.0296)	(0.4489)	(0.4874)
Obs.	3228533	798462	3228533	798462
Firm-destinations	461219	114066	461219	114066

Notes: Regressions at the firm-destination-year level, excluding the US. ROW is split into one observation per country of destination. Dependent variable: indicator variable for positive firm exports to destination D. The columns and baseline treatment variable are defined as in Table 8. The baseline treatment variable is interacted with complementary indicator variables for non-positive and positive exports of suspended products in destination D. Sample conditions on positive exports to the US for at least one year between 1994 and 1996 and to a non-US market for at least one year between 1994 and 2001. Panel B: Sample of firms that do not exit all destination markets. Panel C: Sample of firms that do not exit all markets and that export at least one non-suspended product to destination D. Regressions include trends based on firm characteristics in the pre-treatment period. Standard errors are clustered at the firm-product level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

A Appendices

A.1 List of Suspended Products

03037700	Sea bass, frozen, excluding fillets, other meat portions, livers and roes
04049010	Milk protein concentrates
07032000	Garlic, fresh or chilled
16041610	Anchovies, whole or in pieces but not minced, in oil, in airtight containers, th
17011110	Cane sugar, raw, in solid form, w/o added flavoring or coloring, subject to add.
28054000	Mercury
28139050	Sulfides of nonmetals, excluding carbon disulfide and sulfides of arsenic or pho
28323010	Sodium thiosulfate
28399000	Silicates and commercial alkali metal silicates, excluding those of sodium and p
28413000	Sodium dichromate
28415000	Chromates and dichromates except of sodium, potassium, lead or zinc; peroxochrom
28433000	Gold compounds
28491000	Calcium carbide
28500050	Hydrides, nitrides, azides, silicides and borides other than of calcium, titaniu
29021100	Cyclohexane
29051200	Propan-1-ol (Propyl alcohol) and Propan-2-ol (isopropyl alcohol)
29051300	Butan-1-ol (n-Butyl alcohol)
29052250	Acyclic terpene alcohols, other than geraniol and isophytol
29061400	Terpineols
29141200	Butanone (Methyl ethyl ketone)
29141300	4-Methylpentan-2-one (Methyl isobutyl ketone)
29157000	Palmitic acid, stearic acid, their salts and esters
29171450	Maleic anhydride, except derived in whole or in part from benzene or other aroma
29182150	Salicylic acid and its salts, not suitable for medicinal use
29182210	O-Acetylsalicylic acid (Aspirin)
29182250	Salts and esters Of O-acetylsalicylic acid
29291015	Mixtures of 2,4- and 2,6-toluenediisocyanates
29329990	Nonaromatic heterocyclic compounds with oxygen hetero-atom(s) only, nesoi
29334030	Pesticides of heterocyclic compounds with nitrogen hetero-atom(s) only, cont. a
29339055	Aromatic or modified aromatic analgesics, etc., affecting the CNS, of heterocycl
32099000	Paints and varnishes based on synthetic polymers or chemically modified natural
33011910	Essential oils of grapefruit
33019010	Extracted oleoresins consisting essentially of nonvolatile components of the nat
33021010	Mixtures of odoriferous substances, mixtures with a basis of these substances, u
33021020	Mixtures of or with a basis of odoriferous substances, used in the food or drink
33029010	Mixtures of or with a basis of odoriferous substances, used in other than the fo
33030030	Perfumes and toilet waters, containing alcohol
33042000	Eye make-up preparations
33049950	Beauty or make-up preparations & preparations for the care of the skin, excl. m
33051000	Shampoos
33059000	Preparations for use on the hair, nesoi
33072000	Personal deodorants and antiperspirants
33074900	Preparations for perfuming or deodorizing rooms, including odoriferous preparati
34011110	Castile soap in the form of bars, cakes or molded pieces or shapes
35040050	Peptones and their derivatives; protein substances and their derivatives, nesoi;
35069900	Prepared glues and other prepared adhesives, excluding adhesives based on rubber
37011000	Photographic plates and film in the flat, sensitized, unexposed, of any material
37021000	Photographic film in rolls, sensitized, unexposed, for X-ray use; of any materia
37061030	Sound recordings on motion-picture film of a width of 35 mm or more, suitable fo
37079032	Chemical preparations for photographic uses, nesoi

Notes: List of products with suspended preferences in 1997.

38220050	Composite diagnostic or laboratory reagents, nesoi
39019090	Polymers of ethylene, nesoi, in primary forms, other than elastomeric
39021000	Polypropylene, in primary forms
39022050	Polyisobutylene, other than elastomeric, in primary forms
39029000	Polymers of propylene or of other olefins, nesoi, in primary forms
39039050	Polymers of styrene, nesoi, in primary forms
39044000	Vinyl chloride copolymers nesoi, in primary forms
39061000	Polymethyl methacrylate, in primary forms
39069050	Acrylic polymers (except plastics or elastomers), in primary forms, nesoi
39073000	Epoxide resins in primary forms
39076000	Polyethylene terephthalate in primary forms
39079900	Polyesters nesoi, saturated, in primary forms
39091000	Urea resins; thiourea resins
39095050	Polyurethanes, other than elastomeric or cements, in primary forms
39139020	Polysaccharides and their derivatives, nesoi, in primary forms
39219050	Nonadhesive plates, sheets, film, foil and strip, nonflexible, nesoi, of noncell
39239000	Articles nesoi, for the conveyance or packing of goods, of plastics
40111010	New pneumatic radial tires, of rubber, of a kind used on motor cars (including s
42010060	Saddlery and harnesses for animals nesi, (incl. traces, leads, knee pads, muzzle
43031000	Articles of apparel and clothing accessories, of furskins
43039000	Articles of furskin, nesi
44101100	Waferboard, including oriented strand board, of wood
44101900	Particle board and similar board of wood, other than waferboard
44111100	Fiberboard of a density exceeding 0.8 g/cm3, not mechanically worked or surface
48025210	Writing paper, weighing 40 g/m2 to 150 g/m2, cont. n/o 10% by weight total fibe
69109000	Ceramic (o/than porcelain or china) sinks, washbasins, baths, bidets, water clos
70071100	Toughened (tempered) safety glass, of size and shape suitable for incorporation
71141160	Articles of silver nesoi, for household, table or kitchen use, toilet and sanita
72022150	Ferrosilicon containing by weight more than 55% but not more than 80% of silic
72023000	Ferrosilicon manganese
73089095	Iron or steel, structures (excluding prefab structures of 9406) and parts of str
73159000	Iron or steel, parts of chain (other than articulated link chain)
74091150	Refined copper, plates, sheets and strip, in coils, with a thickness over 0.15mm
74092100	Copper-zinc base alloys (brass), plates, sheets and strip, in coils
74199950	Copper, articles nesoi, not coated or plated with precious metal
79011100	Zinc (o/than alloy), unwrought, containing o/99.99% by weight of zinc
79011250	Zinc (o/than alloy), unwrought, o/than casting-grade zinc, containing at least 9
82072000	Interchangeable dies for drawing or extruding metal, and base metal parts thereo
84099150	Parts nesi, used solely or principally with spark-ignition internal-combustion p
84099199	Parts nesi, used solely or principally with spark-ignition internal-combustion p
84099991	Parts nesi, used solely or principally with the engines of heading 8408, for veh
84139190	Parts of pumps, nesi
84223090	Machinery for filling,closing,sealing, capsuling or labeling bottles, cans, boxe
84314910	Parts suitable for use solely or principally with the machinery of heading 8426,
84714937	ADP printer units, nesoi, entered with the rest of a system
84716057	Assembled ADP printer units, nesoi, incorporating at least certain mechanisms, n
84775100	Machinery for molding or retreading pneumatic tires or for molding or otherwise
84792000	Machinery for the extraction or preparation of animal or fixed vegetable fats or
84803000	Molding patterns
84813020	Check valves of iron or steel for pipes, boiler shells, tanks, vats or the like

Notes: Continuation of Table A.1.

84818030	Taps, cocks, valves & similar appliances for pipes, boiler shells, tanks, vats
84818090	Taps, cocks, valves & similar appliances for pipes, boiler shells, tanks, vats
84819030	Parts of hand operated and check appliances for pipes, boiler shells, tanks, vat
85030065	Stators and rotors for electric motors & generators of heading 8501, nesi
85243100	Pre-recorded discs for laser reading systems, reproducing phenomena other than s
85243200	Pre-recorded discs for laser reading systems, reproducing sound only
85245210	Pre-recorded magnetic video tape recordings of a width exceeding 4 mm but not ex
85246000	Pre-recorded sound or other similar recorded phenomena, recorded on cards incorp
85249100	Pre-recorded media, nesoi, with recordings of phenomena other than sound or imag
85249940	Pre-recorded media of sound or other similar recorded phenomena, nesoi
85369000	Electrical apparatus nesi, for switching or making connections to or in electric
85389080	Other parts nesi, suitable for use solely or principally with the apparatus of h
87086080	Pts. & access. of mtr. vehic. of 8701, nesoi, of 8702, and of 8704-8705, non-dr
87087060	Pts. & access. of mtr. vehicc of 8701, nesoi, and of 8702-8705, pts. & access.
87089980	Pts. & access., nesoi, of motor vehicles of 8701, nesoi, and 8702-8705
87169050	Parts of trailers and semi-trailers and vehicles, not mechanically propelled, ne
90039000	Parts of frames and mountings for spectacles, goggles or the like
90189010	Mirrors and reflectors used in medical, surgical, dental or veterinary sciences,
91131000	Watch straps, watch bands and watch bracelets, of precious metal or of metal cla
91132060	Parts of watch bracelet of base metal, whether or not gold- or silver-plated, va
94032000	Furniture (o/than seats) of metal nesoi, o/than of a kind used in offices
94035090	Furniture (o/than seats) of wood (o/than bentwood), of a kind used in the bedroo
94036080	Furniture (o/than seats & o/than of 9402) of wooden (o/than bentwood) nesoi

Notes: Continuation of Table A.1.

A.2 Timeline of news on suspension

17 December 1995: First article mentioning the conflict on patents and the possibility of sanctions The Argentinian government declares that the law was compatible with the GATT but the US demands stronger recognition of property rights for pharmaceuticals. Ambassador Granillo Ocampo explains that the patent law was the only conflict Argentina had with the US and dismisses the possibility of trade sanctions.

Furthermore, because the new patent law was voted by the Argentinian Congress and approved with unanimity, the government had its hands effectively tied. That helps to explain why the government, which at the time was otherwise aligned with the US, did not respond to the US pressures with policy changes.

8 January 1997: First article mentioning the possibility of GSP suspensions related to the conflict on patents Enrique Mansilla, the chief of the chamber of exporters, says in an interview that he expected strong pressures from the US in the near future. The article mentions that the potential punishment was the removal from GSP. This possibility was mentioned, according to the article, in the *Journal of Commerce*, which stated that President Clinton would adopt that decision in the "next week," although there was no indication on how the suspension would be implemented.

The article also mentions that another mechanism considered by the US was the introduction of a clause on property rights in the ongoing discussions about the creation of a Free Trade Area of the Americas.

15 January 1997: First indication that the suspension was going to be the removal of 50% of the products receiving preferences under GSP The article came out after the formal communication of the decision of the US Administration to partially suspend Argentina from GSP. It mentions that the cause of the suspension is the patent law on pharmaceuticals. The expectation was that the loss for Argentina would be about US$ 20 million dollars.

The article also mentions that the pressures on Argentina were lobbied for by a chamber of US pharmaceutical multinational firms and that, according to Argentinian officers, the unilateral sanction demonstrated that the Argentinian law was compatible with the GATT. Moreover, the fact that the sanction included only half of GSP-eligible products was taken as a surprise and was difficult to understand by the Argentinian authorities.

The timeline expected on January 15 was that the US would select the products to be suspended in a month. On February 14, the products would be announced. And on April 1st the sanction would take place.

Subsequent weeks: Substantial political activity trying to convince the Clinton Administration not to implement the sanction Those attempts, nevertheless, did not bear fruit, and the suspension was put in place on 15 April 1997, although with fewer products suspended than anticipated.

A.3 Results on product interdependence

We prove here some general propositions from our model. They imply, as special cases, Results 1 to 3 from the main text.

A.3.1 American market

Results 1 and 2 are exclusively about the American market. Thus, to prevent an unnecessarily extensive taxonomy, in this subsection we consider that firms are not exporting to other markets. Accordingly, we do not use indexes for markets.

We first show that the profit from selling good 2 minus the profit from not selling good 2—the key criterion to define whether to sell it—changes with τ_1 if and only if variable costs are not independent and/or there are economies of scale through fixed costs. We then show a similar result at the intensive margin, when both products are sold.

The following lemma will be useful for the proof of the first proposition. In what follows, superscript 0 on a variable related to product i indicates that it is evaluated when $q_j = 0$, $i \neq j$.

Lemma 1 *Under diseconomies of scope, when good 1 is exported, its optimal export quantity falls if good 2 is exported:* $q_1 < q_1^0$.

Proof. The first-order conditions when the firm exports only q_1 and when it exports both goods are, respectively,

$$\frac{d\pi_1}{dq_1} = MR_1(q_1^0) - MC_1(q_1^0, q_2 = 0) - \tau_1 = 0$$

and

$$\frac{d\pi_1}{dq_1} = MR_1(q_1) - MC_1(q_1, q_2 > 0) - \tau_1 = 0,$$

where MR_j and MC_j represent marginal revenue and marginal cost of good j, and where all variables are evaluated at the level that maximizes profits in each case. Due to the diseconomies of scope, $MC_1(q_2 = 0) < MC_1(q_2 > 0)$ for a given level of q_1. Thus, given the concavity of function π_1 in q_1, the only way both conditions can be satisfied is if the optimal choices q_1^0 and q_1 satisfy $q_1 < q_1^0$. ■

Proposition 1 *When τ_1 rises, an exporter drops or adds good 2 in the American market only if there is product interdependence.*

Proof. There are three possible cases. We consider each in turn.

Case 1: good 1 is exported neither before nor after the shock

This case is trivial. Since τ_1 can affect the gains from exporting good 2 only through changes in q_1, the impact is nil, regardless of possible interdependences.

Case 2: good 1 is exported both before and after the shock

The change in profits from exporting good 2 in this case may depend on τ_1. It can be written as (dropping firm parameters ϕ, A_1 and A_2 for brevity):

$$\begin{aligned} \pi_B - \pi_1 &= [p_1 q_1 + p_2 q_2 - C(q_1, q_2) - \tau_1 q_1 - \tau_2 q_2 - F_1 - F_2] - \left[p_1^0 q_1^0 - C(q_1^0, 0) - \tau_1 q_1^0 - F_1\right] \\ &= \left(p_1 q_1 - p_1^0 q_1^0\right) + p_2 q_2 - \left[C(q_1, q_2) - C(q_1^0, 0)\right] - \tau_1 \left(q_1 - q_1^0\right) - \tau_2 q_2 - F_2. \end{aligned} \tag{15}$$

Note that F and F_{us} do not appear in equation (15), because they are always incurred if good 1 is exported.

Under independence of variable costs, $C(q_1, q_2) = C(q_1, 0) + C(0, q_2)$. As a result, $q_1 = q_1^0$ and $p_1 = p_1^0$. Equation (15) then collapses to

$$p_2 q_2 - C(0, q_2) - \tau_2 q_2 - F_2,$$

which is independent of τ_1.

With diseconomies of scope, $C(q_1, q_2) > C(q_1, 0) + C(0, q_2)$. As a result, $q_1 < q_1^0$ (Lemma 1). After the tariff hike, the change in profits from exporting good 2 has the same form as in equation (15), but is now evaluated at a higher τ_1. Thus, we can assess the impact of the shock on the desirability of exporting good 2 by considering a small increase in τ_1. Differentiating $\pi_B - \pi_1$ as given by equation (15) with respect to τ_1, while using the envelope theorem, we find

$$\frac{\partial(\pi_B - \pi_1)}{\partial\tau_1} = -q_1 + q_1^0 > 0.$$

Hence, an increase in τ_1 makes it more appealing to export good 2.

Case 3: good 1 is exported before but not after the shock

The gain from exporting good 2 before the tariff hike remains given by $\pi_B - \pi_0$, as shown in equation (15). But now, after the shock, $q_1 = 0$, so the gain from selling good 2 becomes

$$p_2^0 q_2^0 - C(0, q_2^0) - \tau_2 q_2^0 - F_2 - F_{us} - F. \tag{16}$$

Hence, the difference between (15) and (16) can be written as

$$\begin{aligned} &\left[p_1^0 q_1^0 - C(q_1^0, 0) - \tau_1 q_1^0\right] + \left[p_2^0 q_2^0 - C(0, q_2^0) - \tau_2 q_2^0\right] \\ &- \left[p_1 q_1 + p_2 q_2 - C(q_1, q_2) - \tau_1 q_1 - \tau_2 q_2\right] - F_{us} - F, \end{aligned} \tag{17}$$

or equivalently,

$$\pi_1 + \pi_2 - \pi_B. \tag{18}$$

Equation (18) is the "diff-in-diff" profits from exporting good 2 relative to not exporting it after the shock (in the case where good 1 is no longer exported), compared with the same difference before the shock (when good 1 is exported).

Let us first assess the sign of this double-difference. Clearly, under independence of variable costs and without export fixed costs, $\pi_1 + \pi_2 - \pi_B = 0$ and the gains from exporting good 2 is unaffected by τ_1.

Let $F_T \equiv F + F_{us}$. If we allow $F_T > 0$ but keep the independence of variable costs, equation (18) becomes $\pi_1 + \pi_2 - \pi_B = -F_T < 0$. Because of the fixed cost to export, there are economies of scale, which lower the gain from exporting good 2 after the shock. Now, introducing diseconomies of scope, $\pi_1 + \pi_2 - \pi_B > -F_T$ and the difference in (18) may become positive despite the fixed cost.

Therefore, whether exporting good 2 in the US becomes more attractive after the shock depends on the relative importance of diseconomies of scope vs. economies of scale. For a given size of the diseconomies of scope, there is a threshold value F^{sc} that makes $\pi_1 + \pi_2 + \pi_B = -F^{sc}$. For any $F_T > F^{sc}$, economies of scale prevail and it may not be worthwhile to export good 2 after the shock even if it were exported before the shock. Conversely, if $F_T < F^{sc}$, diseconomies of scope prevail and it may become worthwhile to export good 2 after the shock even if it were not exported before the shock. ∎

Proposition 1 yields, as a by-product, **Result 2** from the main text. It follows from Case 3 of the proposition's proof. It shows that the shock can drive out of the market firms that exported both types of goods prior to the shock only if firm-level scale economies are present and are sufficiently strong.

Observe that **Case 2** rationalizes the findings of Table 7 and of Table 9, Panel B, on substitutability: with the shock, the likelihood that a firm will add a non-suspended good to its export basket increases. This effect is illustrated by the dark gray area labeled "D_1 to D_B" in panel (a) of Figure A1.

In turn, **Case 3**, when $F_T > F^{sc}$, rationalizes the findings of Table 8 on the extensive margin. This effect is illustrated by the light gray areas "D_1 to D_0" in both panels of Figure A1, as well as by the light gray area "D_B to D_0" in Figure A1, panel (b). Finally, **Case 3**, when $F_T < F^{sc}$, rationalizes the findings of Table 7 and of Table 9, Panel B, on substitutability. This effect is illustrated by the area "D_1 to D_2" in Figure A1, panel (a).

Proposition 2 *If a firm exports goods 1 and 2 to the American market both before and after the shock, the shock makes it worthwhile to increase exports of good 2 if and only if there are diseconomies of scope.*

Proof. When the firm exports both goods, the first-order condition with respect to the quantity of good 2 is

$$\frac{d\pi_B}{dq_2} = MR_2 - MC_2 - \tau_2 = 0.$$

It is affected by the tariff on good 1 as follows:

$$\frac{d^2\pi_B}{dq_2 d\tau_1} = -\frac{dMC_2}{dq_1}\frac{\partial q_1}{\partial \tau_1}.$$

Under product independence, this expression is zero, since MC_2 is unaffected by q_1. Under diseconomies of scope, the expression is negative because $\frac{\partial q_1}{\partial \tau_1} < 0$ and $\frac{dMC_2}{dq_1} > 0$. ■

Result 1 from the main text is a corollary of propositions 1 and 2. Case 3, in the proof of Proposition 1, shows that the shock can induce firms to start exporting non-suspended goods if firm-level diseconomies of scope are sufficiently strong. In turn, Proposition 2 shows that the shock induces an increase in the exports of non-suspended goods only under diseconomies of scope. Observe that this rationalizes the findings of Table 10 on the intensive margin.

A.3.2 ROW markets

We now turn to the conditions under which the tariff increase in the US can induce firms to drop products or exit from third markets. Observe that, when tariff τ_1 rises in the US, diseconomies of scope alone would make it *less likely* that exporters will exit or drop good 2 from ROW, since the shock makes exporting good 2 more attractive. Thus, to simplify exposition, henceforth we abstract from diseconomies of scope. This implies that the variable cost function satisfies $C(\phi, q_1, q_2) = C(\phi, q_1, 0) + C(\phi, 0, q_2)$ for any ϕ and for all levels of q_1 and of q_2.

The next proposition essentially replicates **Result 3** from the main text.

Proposition 3 *A firms exits or drops products from ROW because of the policy shock in the US only if there are firm- or product-level scale economies. Furthermore, this can happen only for firms that also exit or drop products in the US because of the shock.*

Proof. Because variable cost exhibits constant returns to scale and here we are assuming diseconomies of scope away, it becomes separable across markets (dropping firm parameters ϕ, A_1 and A_2 for brevity): $C(q_1^{us} + q_1^{row}, q_2^{us} + q_2^{row}) = C(q_1^{us}, q_2^{us}) + C(q_1^{row}, q_2^{row})$. Hence, when we study export decisions to ROW for given extensive margin decisions in the US, we can ignore changes in the variable costs of exporting to the US.

There are 16 potential cases based on the extensive margin decisions in the US about goods 1 and 2, before and after the shock. However, we do not need to consider situations in which a firm does not export good 1 to the US prior to the shock, in which case the tariff shock has no effect. Furthermore, we know from the proof of Proposition 1 that, in the absence of diseconomies of scope, firms will not react to the increase in τ_1^{us} by adding good 2 in their export baskets to the US (although they may drop it due to scale economies). Therefore, we do not need to consider situations in which a firm exports good 2 to the US only after the shock. Finally, it is also unnecessary to consider the case in which the firm exports good 1 to the US before and after the shock, but good 2 only before. The reason is that the shock will not induce firms to drop good 2 from the US if it keeps exporting good 1 there (Case 2 of Proposition 1).

This leaves us with 5 relevant cases to consider depending on the extensive margin behavior of the firm in the US market. We consider each in turn.

Case 1: goods 1 and 2 are exported to the US both before and after the shock

Consider first the profit from exporting only good 1 in ROW. Since the firm pays F and F_1 regardless of its involvement in ROW, the profit from exporting good 1 to ROW is simply

$$\pi_1^{row} = (p_1^{row} - \tau_1^{row})q_1^{row} - C(q_1^{row}, 0) - F_{row}. \tag{19}$$

Because of the separability of the variable cost, changes in the tariff in the US, τ_1^{us}, have no impact on π_1^{row}.

Consider now the profit from exporting goods 1 and 2 in ROW. Since the firm is paying F, F_1 and F_2 regardless of its involvement in ROW, the profit from exporting good 1 to ROW is simply

$$\pi_{12}^{row} = (p_1^{row} - \tau_1^{row})q_1^{row} + (p_2^{row} - \tau_2^{row})q_2^{row} - C(q_1^{row}, q_2^{row}) - F_{row}. \tag{20}$$

Once again, because of the separability of the variable cost, changes in the tariff in the US, τ_1^{us}, have no impact on π_{12}^{row}.

It is trivial to see that the profit from exporting only good 2 in ROW is also unaffected by τ_1^{us}.

Case 2: good 1 is exported to the US both before and after the shock; good 2 is not exported to the US

Consider first the profit from exporting only good 1 in ROW. It is once again given by equation (19). Therefore, the same conclusion from Case 1 applies here.

Consider now the profit from exporting goods 1 and 2 in ROW. Now this requires incurring F_2, since good 2 is not exported to the US. Therefore,

$$\pi_{12}^{row} = (p_1^{row} - \tau_1^{row})q_2^{row} + (p_2^{row} - \tau_2^{row})q_2^{row} - C(q_1^{row}, q_2^{row}) - F_{row} - F_2. \tag{21}$$

However, for the same reason as in Case 1, changes in the tariff in the US, τ_1^{us}, have no impact on π_{12}^{row}.

It is trivial to see that the profit from exporting only good 2 in ROW is also unaffected by τ_1^{us}.

Case 3: good 1 is exported to the US only before the shock; good 2 is exported to the US before and after the shock

Consider first the profit from exporting only good 1 in ROW:

$$\pi_1^{row} = (p_1^{row} - \tau_1^{row})q_1^{row} - C(q_1^{row}, 0) - F_{row} - I\{q_1^{us} = 0\}F_1, \tag{22}$$

where $I\{.\}$ is an indicator function. The difference with respect to the previous cases is that the shock causes a change in the extensive margin in the US. Thus, the change in profits from exporting good 1 to ROW due to the increase in the tariff in the US, τ_1^{us}, is $\Delta\pi_1^{row} = -F_1$.

Consider now the profit from exporting goods 1 and 2 in ROW:

$$\pi_{12}^{row} = (p_1^{row} - \tau_1^{row})q_2^{row} + (p_2^{row} - \tau_2^{row})q_2^{row} - C(q_1^{row}, q_2^{row}) - F_{row} - I\{q_1^{us} = 0\}F_1. \tag{23}$$

Once again, the difference with respect to the previous cases is that now the shock causes a change in the extensive margin in the US. Thus, the change in profits from exporting goods 1 and 2 to ROW due to the increase in the tariff in the US, τ_1^{us}, is $\Delta\pi_{12}^{row} = -F_1$.

Clearly, the profit from exporting only good 2 in ROW is once again unaffected by τ_1^{us}.

Hence, we have that $\Delta\pi_{12}^{row} = \Delta\pi_1^{row} = -F_1$ and $\Delta\pi_2^{row} = 0$. The following conclusions then follow. If initially the firm did not export to ROW, the shock will not induce it to do so. If it exported only good 2 to ROW before the shock, that will still be its best choice after the shock. If it exported only good 1 to ROW before the shock, $\pi_1^{row} > \pi_{12}^{row}$ before and after the shock, and exporting good 2 is not worthwhile; then, after the shock it will keep exporting good 1 to ROW if prior to the shock $\pi_1^{row} \geq F_1$, and otherwise exit that market. Finally, if the firm exported both goods 1 and 2 to ROW before the shock, after the shock it may keep exporting both goods to ROW (if $\pi_{12}^{row} > 0$ and $\pi_{12}^{row} > \pi_2^{row}$ also after the shock), drop good 1 from ROW (if $\pi_2^{row} > 0 > \pi_{12}^{row}$ after the shock), or exit that market (if $\pi_{12}^{row} < 0$ and $\pi_2^{row} < 0$ after the shock). These last two possibilities arise only if $F_1 > 0$.

Case 4: good 1 is exported to the US only before the shock; good 2 is not exported to the US

Consider first the profit from exporting only good 1 in ROW:

$$\pi_1^{row} = (p_1^{row} - \tau_1^{row})q_1^{row} - C(q_1^{row}, 0) - F_{row} - I\{q_1^{us} = 0\}(F_1 + F). \tag{24}$$

The difference with respect to Case 3 is that the shock causes the complete exit of the firm from the US market. Thus, the change in profits from exporting good 1 to ROW due to the increase in the tariff in the US, τ_1^{us}, is $\Delta\pi_1^{row} = -(F_1 + F)$.

Consider now the profit from exporting goods 1 and 2 in ROW:

$$\pi_{12}^{row} = (p_1^{row} - \tau_1^{row})q_2^{row} + (p_2^{row} - \tau_2^{row})q_2^{row} - C(q_1^{row}, q_2^{row}) - F_{row} - I\{q_1^{us} = 0\}(F_1 + F). \tag{25}$$

Once again, the difference with respect to Case 3 is that now the shock causes the complete exit of the firm from the US market. Thus, the change in profits from exporting goods 1 and 2 to ROW due to the increase in the tariff in the US, τ_1^{row}, is $\Delta\pi_{12}^{row} = -(F_1 + F)$.

Finally, consider the profit from exporting only good 2 to ROW:

$$\pi_2^{row} = (p_2^{row} - \tau_2^{row})q_2^{row} - C(0, q_2^{row}) - F_{row} - I\{q_1^{us} = 0\}F. \tag{26}$$

The difference with respect to the previous cases is that the shock causes the complete exit of the firm from the US market. Thus, the change in profits from exporting good 2 to ROW due to the increase in the tariff in the US, τ_1^{us}, is $\Delta\pi_2^{row} = -F$.

Hence, we have that $\Delta\pi_{12}^{row} = \Delta\pi_1^{row} < \Delta\pi_2^{row} < 0$. The following conclusions then follow. If initially the firm did not export to ROW, the shock will not induce it to do so. If it exported only good 1 to ROW before the shock, $\pi_1^{row} > \pi_{12}^{row}$ before and after the shock, and exporting good 2 is not worthwhile; then, after the shock it will keep exporting good 1 to ROW if prior to the shock $\pi_1^{row} \geq F_1 + F_2$, and otherwise exit that market. If it exported only good 2 to ROW before the shock, $\pi_2^{row} > \pi_{12}^{row}$ before and after the shock, and exporting good 1 is not worthwhile; then, after the shock it will keep exporting good 2 to ROW if prior to the shock $\pi_2^{row} \geq F$, and otherwise exit that market. Finally, if the firm exported both goods 1 and 2 to ROW before the shock, after the shock it may keep exporting both goods to ROW (if $\pi_{12}^{row} > 0$ and $\pi_{12}^{row} > \pi_2^{row}$ also after the shock), drop good 1 from ROW (if $\pi_2^{row} > 0 > \pi_{12}^{row}$ after the shock), or exit that market (if $\pi_{12}^{row} < 0$ and $\pi_2^{row} < 0$ after the shock). These last two possibilities arise only if $F > 0$.

Case 5: goods 1 and 2 are exported to the US only before the shock

Following the same steps as before, we have that the profit from exporting only good 1 in ROW is exactly as in equation (24), the profit from exporting both goods 1 and 2 in ROW is

$$\pi_{12}^{row} = (p_1^{row} - \tau_1^{row})q_2^{row} + (p_2^{row} - \tau_2^{row})q_2^{row} - C(q_1^{row}, q_2^{row}) - F_{row} - I\{q_1^{us} = 0\}(F_1 + F_2 + F), \tag{27}$$

and the profit from exporting only good 2 in ROW is

$$\pi_2^{row} = (p_2^{row} - \tau_2^{row})q_2^{row} - C(0, q_2^{row}) - F_{row} - I\{q_1^{us} = 0\}(F + F_2). \tag{28}$$

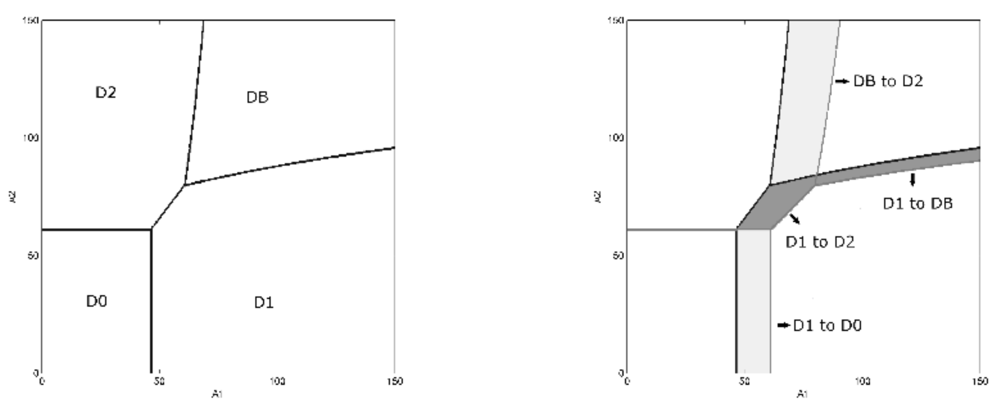
Thus, $\Delta\pi_1^{row} = -(F_1 + F)$, $\Delta\pi_{12}^{row} = -(F_1 + F_2 + F)$, and $\Delta\pi_2^{row} = -(F_2 + F)$. Using the same rationale as before, it follows that the tariff increase in the US may cause the firm to drop good 1 from ROW or to exit from ROW. These scenarios can arise if at least some of the fixed costs are strictly positive. ■

A.4 Additional figures and tables

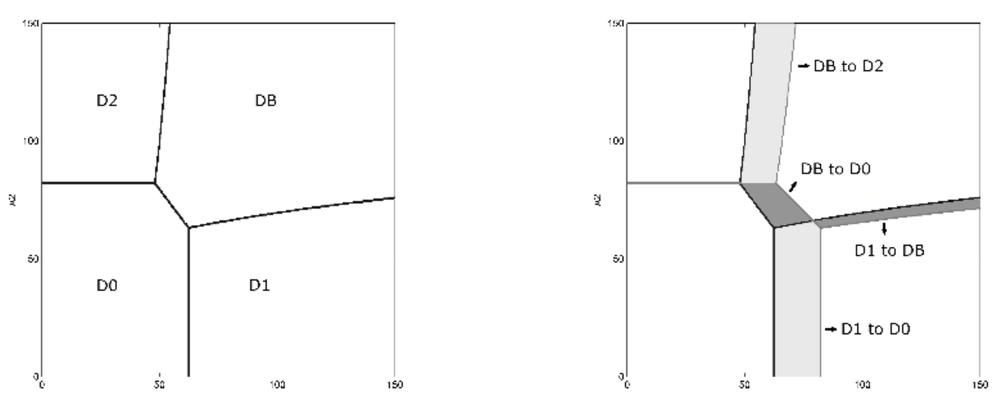
Interdependencies across products in the US market. Figure A1 shows export decision zones of different baskets of goods to the US market analogous to Figure 1. In both cases there are scale economies given by $F_{us} > 0$ and diseconomies of scope. The shapes of the export zones depend on which force is stronger, since they work in opposite directions. In panel (a), diseconomies of scope are dominant. In panel (b), economies of scale are dominant. Some firms will be best represented by panel (a), while others will fit best the changes illustrated in panel (b), according to their idiosyncratic parameter values.

Fig. A1: Exports to the US. Joint effect of fixed cost and diseconomies of scope

(a) High diseconomies of scope



(b) High fixed costs



Notes: The figure illustrates export decision zones analogous to Figure 1 with the same MFN tariffs and demand and cost functions. In Panel (a) $\beta = 3$, $F_{us} = 2$, $F = 0$. In Panel (b) $\beta = 3$, $F_{us} = 7$, $F = 0$.

Table A1: Product hierarchy. Firm-product level regressions

	Suspension dummy		Tariff increase	
	All products (1)	GSP products (2)	All products (3)	GSP products (4)
Panel A: Probability of being core				
$SProd$	-0.0003***	-0.0002***	-0.0024***	-0.0019***
	(0.0001)	(0.0001)	(0.0004)	(0.0004)
Obs.	92505105	15345099	92505105	15345099
Firm-products	13215015	2192157	13215015	2192157
Panel B: Probability of being top 2				
$SProd$	-0.0006***	-0.0004***	-0.0061***	-0.0050***
	(0.0001)	(0.0001)	(0.0007)	(0.0008)
Obs.	92505105	15345099	92505105	15345099
Firm-products	13215015	2192157	13215015	2192157
Panel C: Probability of being top 3				
$SProd$	-0.0008***	-0.0006***	-0.0098***	-0.0082***
	(0.0001)	(0.0002)	(0.0011)	(0.0012)
Obs.	92505105	15345099	92505105	15345099
Firm-products	13215015	2192157	13215015	2192157

Notes: Regressions at the firm-product-year level. Data from Argentine customs. Dependent variable: indicator variable for core product (Panel A); indicator variable for top 2 product (Panel B); indicator variable for top 3 product (Panel C). Products, sample and treatment variables defined as in Table 6. Panel A conditions on the firm exporting more than one product, Panel B conditions on the firm exporting at least three products, and Panel C conditions on the firm exporting at least 4 products, all on average during 1994–1996. Standard errors are clustered at the firm-product level. Significance at the 10, 5 and 1 percent level denoted with *, **, ***.

Table A2: Pairwise correlation coefficients: Unit values of dropped and added products

	Dropped			
Added	Single-uv	Max-uv	Min-uv	Median-uv
Single-uv	-0.06			
Max-uv		-0.05		
Min-uv			-0.03	
Median-uv				-0.04

Notes: The sample includes firms with at least one suspended product in 1996 with positive exports in 1998 with a different export basket. "Single-uv" is the unit value of dropped and added products when reshuffling involved only one product. If reshuffling involved dropping or adding more than one product, we select the maximum ("Max-uv"), minimum ("Min-uv") and the median unit value ("Median-uv") of dropped and added products.