Sequential Exporting Across Products: Evidence from Peru

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Abstract

This paper presents a theoretical model illustrating a sequential exporting strategy by firms across products in one destination, incorporating a scenario of trade liberalisation, and considering the role of production costs. Three predictions emerge from this framework, which are tested using a rich dataset of Peruvian firms that exported to the United States between 2006 and 2013, analysing whether successful new Peruvian exporters to USA are more likely to intensify their participation in that market than more expert firms. In parallel, I analyse whether the tariff elimination from the USA-Peru Free Trade Agreement exacerbates this phenomenon; and whether these dynamics are more evident for core competence products. Firms with one–year experience exporting a given product to USA grow more at the intensive and extensive margin than more experienced firms. However, they are also more prone to stop exporting a product to that market. Trade liberalisation is associated with a reduction of the exit probability for new exporters. It is also linked to an increase in the entry likelihood with a new product to USA for experienced exporters. New firms, especially the smallest ones, tend to grow more at the intensive margin with a non-core competence product; but progress more at the extensive margin and are less likely to exit with a core product.

Keywords: Export dynamics, experimentation, trade liberalisation, core competence products, USA-Peru Free Trade Agreement

JEL Classification: D21, F10, F15

1 Introduction

A growing literature has explored the dynamics of exports at the firm level, usually highlighting the continuous entry and exit flow of firms into the export activity, despite having borne entry costs. Eaton et al. (2008), for example, show in the Colombian case that firms that start and stop exporting tend to account for limited contributions to overall export revenues. Freund and Pierola (2010), in the Peruvian context, report that this exit flow is especially likely after the first year exporting, and particularly likely for small firms. Similarly, analysing US imports at the country level, Besedeš and Prusa (2006a) show that trade relationships involving either small countries, small exporters or low initial values.

Other studies focus on the role of productivity and export experience as determinants of success in the export market, pointing to the fact that the most productive firms decide to start

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exporting, paying sunk entry costs, and increasing their knowledge about their productivity through learning and experimentation, compared to non-exporters. Roberts and Tybout (1997) find that this export experience is determinant in Colombian plants' decision to enter foreign market; but such experience depreciates once they stop exporting.

All these studies focus on export dynamics at the firm or country level; but none of them establishes differences in these dynamics across products. Only Besedeš and Prusa (2006b) makes a difference between differentiated and non-differentiated products in their export survival analysis. Moreover, in this literature the issue of trade liberalisation is just indirectly addressed by, for instance, including dummies accounting for a regional or bilateral trade agreement between countries, like Brenton et al. (2010) in their survival analysis for developing countries. Hence, the effect of trade liberalisation on firm export entry and exit decisions is still a strand for potential research.

Recent literature on firm export dynamics has made emphasis on the analysis of new exporters as opposed to more experienced firms in the foreign market. In a descriptive analysis for Colombian plants, Eaton et al. (2008) report that most new entrants into the export business leave after one year, and a small minority become incumbents. More recently, Albornoz et al. (2012), focus their analysis on firms with only one-year experience in the Argentinean industry, finding that this type of firm tends to drop out of the export business very quickly; however, new entrants achieving to remain in the market grow at both the intensive margin (export growth in one destination) and the extensive margin (entering new destinations). Thus, those new exporters experience a *sequential exporting* process.

This *sequential* behaviour researched by Albornoz et al. (2012) was in terms of market (destination) diversification. How do export dynamics work across products within one particular destination? Moreover, this *sequential* behaviour has not been tested yet in a context of trade liberalisation, which represents a gap to be bridged.

In that sense, this paper contributes to the literature by providing a theoretical model, empirically tested afterwards, which reorients the *sequential exporting* analysis, now focusing on the dynamics new exporters undergo in terms of product diversification within one destination, incorporating trade liberalisation into that analysis, in the shape of a tariff elimination by one country on the products exported by a trading partner. To address this issue, it is also necessary to establish differences in firms' export dynamics between products; for instance, between better performing (core competence) products and worse performing ones.

Given the data availability and the recent occurrence of trade reforms, the relation between Peru and the United States represents a good scenario to analyse. These countries signed a Free Trade Agreement in 2009. Hence, several research questions can be addressed on its impact on Peruvian exporters' performance, and the analysis of Peruvian export dynamics in the US market is an interesting starting point. As a result, this work is one of the first researches on the effect of the recent USA-Peru Free Trade Agreement on the performance of Peruvian firms in the US market.

This paper contributes to the literature in a number of ways. It investigates whether Peruvian firms with one-year experience in the US market more likely than more experienced firms to grow their exports to that country at the intensive (growth in one product) and extensive margin (entry with other products). It also researches whether these newcomers are more likely to give up exporting a product to the US than more experienced firms. The paper additionally explores the role of trade liberalisation, analysing whether the aforementioned process undertaken by Peru with the United States boost even more these dynamics. Finally, it investigates whether these dynamics are more evident for core competence products.

I exploit a very rich dataset of Peruvian firms that exported to USA between 2006 and 2013 to address these questions, estimating three different models on export growth, entry and exit. A particular challenge for this and future researches is that the enactment of USA-Peru FTA occurred simultaneously with the world economic crisis that negatively affected Peruvian exports. I disentangle the effects of the crisis from those of liberalisation by controlling for the change in tariffs levied by USA on each Peruvian product exported, as well as considering year fixed effects.

The results support the hypotheses from the model, showing that firms with only recent experience in the US market, conditional on survival, tend to experience a larger intensive margin export growth with the first products they sell to that market, as opposed to subsequent products and more consolidated firms. They are also more likely to experiment with a new product in that destination in the future (extensive margin). However, these new firms are more prone to drop out of the export of a product in USA than incumbents.

Trade liberalisation, expressed as the tariff elimination by USA on Peruvian products in 2009, helps the one-year experienced firms to remain exporting a product to that market. On the other hand, such tariff elimination facilitates the decision by more experienced firms to experiment in the US market by selling new products there.

The export growth on the intensive margin by new exporters is increased if the firm exports a non-core competence product; namely, a product in which the firm does not tend to perform well in terms of sales. In contrast, the extensive margin growth is boosted for core competence products and if the firm has previously exported a similar product. Moreover, a new exporter selling a core product to the USA is less likely to exit that business. These core competence effects on the new exporters' performance tend to be more relevant for the smallest firms.

The remainder of the paper is organised as follows. Section 2 explores more deeply the related literature. Section 3 details the theoretical model. Section 4 describes the data and provides a descriptive analysis of Peruvian firms' export performance in the US market. Section 5 presents the three empirical models with their respective results. Section 6 complements with some robustness checks. Section 7 concludes.

2 Related Literature

This paper relates to several strands of literature. First, to the growing literature on ***firm export dynamics***, mainly firm entry and exit, as well as the evolution of the intensive (within one market) and extensive margin (across markets). One of the first contributions is Roberts and Tybout (1997) who quantified the effect of prior exporting experience on manufacturing plants' decision to enter into foreign markets. They find that after a two-year absence, due to the export experience depreciation, re-entry costs are as similar as those of a new exporter. Moreover, larger and older plants are all more likely to export. Eaton et al. (2008) also for the Colombian case, observe that, while many firms start and stop exporting, export sales are dominated by a small number of very large and stable exporters.

Freund and Pierola (2010) also show a considerable entry and exit flows of Peruvian exporters each year. However, contrary to other studies, they argue that smaller firms can discover their entry costs by a very cheap trial, while the larger the firm, the larger the initial export sales. In contrast, developing new products requires a much larger entry cost. Also focusing on the Peruvian industry (agriculture), Malca and Rubio (2012) analyse the relation between continuity of Peruvian firms in export markets and their export performance, finding that for one additional year a firm exports, there is a considerable increase in the probability of survival.[1]

More concentrated on the survival (duration) of trade relations. Besedeš and Prusa (2006a) address the duration of US imports from up to 180 countries, finding a short median duration of US imports, of about 2 or 4 years. They also obtain a negative duration dependence; that is, if a country can survive exporting for the first few years, its failure probability gets lower, being likely to export a product for longer.

Other studies, like Besedeš and Prusa (2006b) use more conventional survival analysis methods like the Kaplan-Meier estimator and the Cox proportional hazard models. These authors examine the extent to which product differentiation affects duration of US import trade relationships, finding that differentiated products have over twice as long a median duration as other product types, starting with considerably smaller initial purchases. The larger these initial purchases, the longer the duration, and the larger the differences across product types. Volpe Martincus and Carballo (2008) use both approaches in the Peruvian case considering only new exporters, finding that both product and, especially, geographical diversification of exports raise the chances of remaining an exporter. Larger firms, in terms of the number of employees, are more likely to survive in foreign markets, according to the authors. [2]

Despite the valuable findings from these studies, there is a limited consideration of trade liberalisation into the analysis of export dynamics – Brenton et al. (2010), for instance, only introduces a dummy for countries signing a Regional Trade Agreement–, leaving room for further research.[3] Furthermore, no previous papers have estimated the trade dynamics surrounding the recent enactment of the USA-Peru Free Trade agreement and other treaties. In that sense, this research represents an opportunity to bridge that gap, addressing the dynamics of exports in Peru, in a context of trade liberalisation.

Within the firm export dynamics strand of the literature, my research is closely related to the recently explored issue of ***sequential exporting***. In fact, the theoretical model and empirical approach proposed in this paper are inspired in a previous research by Albornoz et al. (2012) for the Argentinean industry. These authors emphasise that many new exporters exit that business very shortly after entering, despite the existence of substantial entry costs; while others raise sales and expand to new destinations.

Their basic assumption is that a firm's export profitability is initially uncertain, and it will only be known once it enters the export market, paying a fixed entry cost. Such export profitability is perfectly correlated over time (persistent but ex-ante unknown demand patterns) and across destinations (similarities in either demand or supply conditions). The discovery of this profitability leads to a *sequential exporting* process, whereby firms use their initial export experience to infer information on their future success in a market and others.

[1] They classify firms by their mean annual exports, employing two categories: small (below US$ 50,000) and large (above or equal to US$ 50,000).

[2] Many other studies analyse export survival by employing the aforementioned approaches, such as Besedes and Blyde (2010) for Latin America and Carrère and Strauss-Kahn (2014) for non-OECD countries. Other studies discard the use of the Cox model and explore alternative methods like discrete-time models (Hess and Persson (2012)), or the Prentice and Gloeckler (1978) model (Brenton et al. (2010)).

[3] On the other hand, most of the recent works addressing trade liberalisation with firm-level data have been predominantly focused on its relation with firms' productivity. The common idea tested is that most productive firms will enter the export market and/or exporting makes firms more productive, and trade liberalisation plays the role of facilitating market access, especially for those more productive. Researches like Bustos (2011) on Argentina; Schor (2004) on Brazil; Pavcnik (2002) on Chile; Fernandes (2007) on Colombia; Amiti and Konings (2007) on Indonesia; Bernard and Jensen (1999) and Bernard and Jensen (2004) on the United States; De Loecker (2007) on Slovenia; Van Biesebroeck (2005) on Sub-Saharan African countries; and Lileeva and Trefler (2007) on Canada, go on that line.

By developing a model of profit maximisation, Albornoz et al. (2012) derive three predictions on the export behaviour of new exporters as opposed to more experienced firms in the foreign market. After testing these predictions, the authors find that, despite entry sunk costs, many firms that start exporting drop out of the export business very shortly, while the successful ones grow at both intensive and extensive margin. Since breaking into a new market entails unrecoverable costs, and export profitability has a global scope, these new exporters have an incentive to enter foreign destinations sequentially.

Despite the compelling findings from their work, their sequential exporting analysis is undertaken across markets, leaving as an unattended issue how these firm export dynamics operate across products within one particular destination. Furthermore, the issue of trade liberalisation is not considered in this analysis. Indeed, Albornoz et al., 2012, (p. 30) argue that there is a gap in the literature to link *sequential exporting* with trade liberalisation processes:

"Another area where understanding firms' sequential exporting strategies can be far-reaching is trade policy. (...) the impact of trade agreements, at both the regional and the multilateral levels, could be much richer than what existing studies indicate. (...) this is an area that surely calls for further research".

Given this circumstance, the Peruvian case –with recent reforms in trade policy, especially the approval of the Free Trade Agreement with the United States in 2009, which effects on Peruvian firms' performance haven't been sufficiently researched yet– represents an interesting scenario in which the aforementioned gaps can be bridged.

Since the firm export dynamics analysis I develop in this paper is across products in one destination, the existence of ***multi-product firms*** and the difference within firms between core and non-core competence products is an issue to be addressed. That is the other large strand of the literature my research relates to.

Focusing on four African countries, Cadot (2011) conclude that more diversified firms in terms of products, as well as in terms of markets, are more likely to succeed and survive in the export business beyond the first year.

But some other works give special emphasis to the issue of "core competence" products and its link with trade liberalisation, like Eckel and Neary (2010) who show that globalisation affects the scale and scope of multi-product firms through a competition and a demand effect. Their theory states that firms face a pressure to become "leaner and meaner", thereby raising their productivity and total output to serve foreign markets. Thus, firms are encouraged to focus on their "core competence" products, dismissing more marginal costly varieties. In that same line, Eckel et al. (2009), test the predictions of a theoretical model for the Mexican industry, arguing that there is a "cannibalisation effect", whereby an increase in the output of a "core competence" variety will reduce the sales of the others. The authors argue that this pattern takes place in response to trade liberalisation under the NAFTA treaty with Canada and USA, caused by an "intra-firm extensive margin" adjustment. Similar findings were obtained by Mayer et al. (2011) in the case of French exporters reacting to tougher competition.

Despite the links between found product specialisation and trade liberalisation, most of these works are limited to a single-year analysis at a firm level, rather than at a wider firm-product level. The rich dataset obtained for Peruvian firms, products exported and tariff rates over time provide a good chance to incorporate in this paper the difference between core and non-core competence products into an analysis on firm export dynamics across products, also accounting for the role of trade liberalisation.

3 Theoretical Framework

This section develops a theoretical model in order to explain the export dynamics of firms across products within one destination. First, I develop the core model, exploring firms' entry and exit decision into that destination, then defining three predictions in terms of intensive margin, extensive margin and exit decisions, considering the scenario of trade liberalisation and the tradeoff between high tariffs and core competences, modelled as low production costs.

3.1 The Model

This approach consists of a two-period analysis –$t = 1, 2$– considering two countries; a country of origin, o, and a country of destination, d.

A risk-neutral producer from country o evaluates whether to export or not to country d. His product portfolio consists of two products A and B. If the firm decides to enter d, it will have to pay a sunk entry cost F_d for any product it exports, assumed to the identical across products. These sunk entry costs are hypothesised to reflect distribution channels, marketing strategy and exporting procedures, which might be specific to each kind of product. I assume other entry costs that are common across products within a market, such as information on institutional and policy characteristics of the foreign country, to be minimal and/or easily accessible to firms.

In order to export products A and B to country d, firms must pay a product-specific unit trade cost (tariff levied by d) τ^A and τ^B, such that $\tau^A \leq \tau^B$.[4] The variable costs firms have to incur for each product comprise a unit export cost, c_x^A and c_x^B, and a firm-specific unit production cost, c_p^A and c_p^B, such that $c_p^A > c_p^B$, which means that, a firm is more efficient producing good B than good A. This implies that good B is the firm's core competence product; the good in which the firm is more productive. While the production costs are known to the firm, the unit export costs are unknown.

The demand side, on the other hand, is represented by the following function:

$$q^j(p^j) = d^j - p^j \tag{1}$$

where q^j denotes the quantity of product A or B exported; p^j is the price of that product; and d^j is an unknown demand component. In other words, uncertainty can be found in both the supply and demand sides. The calculation of firms' export profitability for product $j = \{A, B\}$, denoted as μ^j, will then consider the unknown demand component and the unknown unit export cost, as well as the known unit production cost:

$$\mu^j \equiv d^j - c_x^j - c_p^j \tag{2}$$

The unknown components of that export profitability of product j in destination d, $d^j - c_x^j$, can be summarised by the term μ^{Nj}, which is the uncertain variable of interest in the model. Hence, when it comes to determine the optimal quantity of product j exported to d in each time period, firms will have to maximise profits –revenues minus costs–, expressed by:

$$\pi^j = (\mu^{Nj} - c_p^j - \tau^j - q^j)q^j \tag{3}$$

[4] I make the assumption that home firm pays the tariff, since I do not have information on importers.

The central assumption of this model is that the unknown export profitabilities of products sold in destination d are perfectly correlated, implying that they are constant over time and common across products. [5] In other words, μ^{Nj} is constant at $t = 1, 2$, and $\mu^{NA} = \mu^{NB} = \mu^{N}$.

The model also assumes that the uncertain export profitability μ^N is a random variable with a cumulative distribution function $G(.)$, ranging within the interval $[\underline{\mu^N}, \bar{\mu^N}]$.

Consider an initial scenario where $\tau^A + c_p^A \leq \tau^B + c_p^B$, meaning that it is still cheaper for the firm to produce and export product A. Subsequently, I incorporate the event of trade liberalisation by destination d, expressed as $\tau^A = \tau^B = 0$. Thus, after that event, the firm finds that it is less costly to export product B, since $c_p^A > c_p^B$. In that sense, this model aims to illustrate the firm's export decisions over time, depending on the presence or absence of trade costs, and considering the firm's own efficiency across products. In other words, the potential existence of a tradeoff between core competences (expressed in low production costs) and trade costs (expressed in high tariffs).

3.2 Firm's Export Decision

I make an exercise of a firm evaluating profits from exporting to destination d, *ex ante* at $t = 0$. Like Albornoz et al. (2012), I assume that firms do not discount future profits.

Initially, I analyse the firm's behaviour at $t = 1, 2$, in a scenario without trade liberalisation. I illustrate what decision the firm makes in each period, and the conditions firms takes into account in their decision-making process. Henceforth, I denote as e_t^j the firm's decision to export product j to destination d at time t, taking value 1 if the firm actually exports, and 0 otherwise. The firm decides from the following set of options: i) *no entry* to destination d; ii) *simultaneous entry*, exporting both products A and B; or iii) *sequential entry*, exporting first the cheaper product A in $t = 1$, then selling both A and B in $t = 2$.

3.2.1 Firm's Export Decision at t=2

In case the firm decides ***not to enter*** to market d, it will not discover the uncertain export profitability. Hence, in effective terms, $\mu^N = 0$.

In the ***simultaneous entry*** option, the firm will have already realised the export profitability μ^N, and will choose $\hat{q}_2^j$, its optimal export value for product $j = A, B$ in $t = 2$ by maximising the profit function in (3), provided that the realised μ^N is greater than product j's unit costs:

$$\hat{q}_2^j = 1_{[\mu^N > \tau^j + c_p^j]}(\frac{\mu^N - c_p^j - \tau^j}{2}) \tag{4}$$

Substituting this optimal output into (3), the maximised profit from j in $t = 2$ is:

$$\hat{\pi}_2^j = (\frac{\mu^N - c_p^j - \tau^j}{2})^2 \tag{5}$$

[5] Correlation over time can be related to *ex ante* unknown demand patterns in the target market or unknown idiosyncratic export costs, which are stable over time.Albornoz et al. (2012) mention, as examples of these export costs, shipping and port activities, distribution of goods in foreign markets, export finance and insurance, among others. Similarly, correlation across products may arise from similarities in either supply or demand conditions across products exported to a particular destination. Regarding this last point, most of the firms considered in the sample are focused in one industry, exporting goods with similar supply and demand patterns. Hence, I consider the assumption of correlation across products as appropriate.

If, in contrast, the realised export profitability does not exceed the known costs ($\mu^N \leq \tau^j + c^{pj}$), q_2^j will be zero.

Since I am interested in obtaining the expected value in $t = 0$ of those maximised profits in $t = 2$, and given the assumed distribution of export profitabilities, I construct the following expression, representing the value of continuing to export product j in $t = 2$ after $\mu^N > \tau^j + c_p^j$ is discovered:

$$V(\tau^j; c_p^j) = \int_{\tau^j + c_p^j}^{\bar{\mu^N}} (\frac{\mu^N - c_p^j - \tau^j}{2})^2 \mathrm{d}G(\mu^N); j = A, B \tag{6}$$

If the firm opts for ***sequential entry***, it will have inferred μ^N after exporting product A in $t = 1$. Hence, the export value of that product in $t = 2$, q_2^j is given similarly to (4), leading to an expected value of profits in $t = 2$, denoted as $V(\tau^A; c_p^A)$, like in (6).

As for product B, the firm will export it in $t = 2$ if the maximised profits are larger than the destination's sunk cost F_d:

$$(\frac{\mu^N - c_p^B - \tau^B}{2})^2 \geq F_d \tag{7}$$

Rearranging (7), the firm will export B in $t = 2$ $-e_2^B(\tau^B; c_p^B) = 1-$ if $\mu^N \geq 2F_d^{1/2} + \tau^B + c_p^B$. From that inequality, I can obtain a value $F_{d2}^B(\tau^B; c^{pB})$ for which (7) becomes an equality. Thus, I can conclude that $e_2^B(\tau^B; c_p^B) = 1$ if $F_d \leq F_{d2}^B(\tau^B; c_p^B)$. It can be inferred that F_{d2}^B is strictly decreasing in the known costs τ^B and c_p^B.

Since $e_2^B = 1$, this implies that $\mu^N > \tau^B + c_p^B$. Hence, the firm will decide its export value of product B to d in $t = 2$ in the same way as it did for product A. Hence, $\hat{q}_2^B = (\frac{\mu^N - c_p^B - \tau^B}{2})$.

With the output and profits obtained, I am now able to define the expected value in $t = 0$ of the firm's decision to export B to destination d in $t = 2$:

$$\begin{aligned} W(\tau^B; c_p^B; F_d) &\equiv \int_{2F_d^{1/2} + \tau^B + c_p^B}^{\bar{\mu^N}} [(\frac{\mu^N - c_p^B - \tau^B}{2})^2 - F_d] \mathrm{d}G(\mu^N) \\ &= \{V(\tau^B; c_p^B) - \int_{\tau^B + c_p^B}^{2F_d^{1/2} + \tau^B + c_p^B} (\frac{\mu^N - c_p^B - \tau^B}{2})^2 \mathrm{d}G(\mu^N)\} \\ &- F_d[1 - G(2F^{1/2} + \tau^B + c_p^B)] \end{aligned} \tag{8}$$

The term in the left hand side of (8), $W(\tau^B; c_p^B; F_d)$, represents the expected value of exporting product B to d after realising μ^N by previously exporting product A. The term in curly brackets accounts for the *ex ante* expected gross profit from exporting B in $t = 2$; whereas the last line of the equation stands for the fixed entry cost incurred to export B, multiplied by the probability that exporting such product is worthwhile.

3.2.2 Firm's Export Decision at t=1

Like in the second period, if the firm opts for ***not to entering*** destination d in $t = 1$, it will not be able to realise the uncertain export profitability; namely, $\mu^N = 0$.

If the firm undertakes a ***simultaneous entry*** strategy, it chooses the optimal export values q_1^A and q_1^B to maximise its total gross profits for the two time periods, expressed by:

$$\begin{aligned}\psi(q_1^A, q_1^B; \tau^A, \tau^B; c_p^A, c_p^B) \equiv & \int_{\underline{\mu^N}}^{\bar{\mu^N}} (\mu^N - \tau^A - c_p^A - q_1^A) q_1^A \mathrm{d}G(\mu^N) \\ & + \int_{\underline{\mu^N}}^{\bar{\mu^N}} (\mu^N - \tau^B - c_p^B - q_1^B) q_1^B \mathrm{d}G(\mu^N) \\ & + max\{1_{\{q_1^A>0\}}, 1_{\{q_1^B>0\}}\}[V(\tau^A; c_p^A) + V(\tau^B; c_p^B)]\end{aligned} \tag{9}$$

The first two terms on the right hand side of the equation correspond to the expected gross profits of the firm in $t = 1$; while the third term represents the expected gross profits in $t = 2$, given that the firm exported either product A or B in the previous period. This latter term accounts for the idea that exporting one product to a destination reveals information about the firm's profitability in both products.

By maximising (9), the firm obtains the optimal export values for each product in $t = 1$, now taking into account the expected value of the uncertain export profitability, $E\mu^N$. Thus, the optimal exports are:

$$\hat{q}_1^A(\tau^A; c_p^A) = 1_{\{E\mu^N>\tau^A+c_p^A\}}(\frac{E\mu^N - \tau^A - c_p^A}{2}) + 1_{\{E\mu^N\leq\tau^A+c_p^A\}}\varepsilon \tag{10}$$

$$\hat{q}_1^B(\tau^B; c_p^B) = 1_{\{E\mu^N>\tau^B+c_p^B\}}(\frac{E\mu^N - \tau^B - c_p^B}{2}) \tag{11}$$

(10) shows that it is possible for the firm to decide to export A in $t = 1$ even if $E\mu^N < \tau^A+c_p^A$, selling an arbitrarily small value ε, representing a case of experimentation in d with product A. The benefit of this decision is the discovery of the unknown μ^N. If such discovered profitability is greater than the known costs, the firm will remain exporting that good in the subsequent periods. In this model, the firm can adopt that strategy for product A exclusively, since $\tau^A+c^{pA} \leq \tau^B+c_p^B$ and $\mu^{NA} = \mu^{NB}$. The decision for product B is more restrictive, as the firm will export that product to d in $t = 1$ if the expected export profitability exceeds the unit trade and production costs of B.

In the extreme case of exporting ε of A in $t = 1$, I obtain a positive value for the limit of the expected gross profits from the *simultanoeus entry* strategy:

$$\lim_{\varepsilon\to 0} \psi(\varepsilon, 0; \tau^A, \tau^B; c_p^A, c_p^B) \equiv V(\tau^A; c_p^A) + V(\tau^B; c_p^B) > 0, \tag{12}$$

which is clearly greater than the option of not exporting at all in $t = 1$, since the firm would not be able to benefit from realising the export profitability, represented by the future profits from exports in $t = 2$.

If, conversely, the firm expects the unknown export profitability to be greater than the known costs of products A and B, respectively, this will be its expected gross profits from entering destination d with each product j:

$$\psi^j(\tau^j; c_p^j) \equiv 1_{\{E\mu^N>\tau^j+c_p^j\}}(\frac{E\mu^N - \tau^j - c_p^j}{2})^2 + V(\tau^j; c_p^j) > 0, \tag{13}$$

Thus, considering (12) and)13), and the optimal export values from (10) and (11), I can attain the firm's expected gross profits from the *simultanoeus entry* strategy, at optimal output levels:

$$\begin{aligned}\psi^{Sm}(\tau^A,\tau^B;c_p^A,c_p^B) &\equiv \lim_{\varepsilon\to 0^+}\psi^{Sm}(\hat{q}_1^A(\tau^A;c_p^A),\hat{q}_1^B(\tau^B;c_p^B);\tau^A,\tau^B;c_p^A,c_p^B)\\ &= \psi^A(\tau^A;c_p^A)+\psi^B(\tau^B;c_p^B)]\end{aligned} \tag{14}$$

If the firm, on the contrary, opts for a ***sequential entry*** strategy, at $t = 1$ the firm will enter destination d with product A for being less costly. Hence, it will choose q_1^A to maximise its gross profits:

$$\begin{aligned}\psi^{Sq}(q_1^A;\tau^A,\tau^B;c_p^A,c_p^B) \equiv &\int_{\underline{\mu^N}}^{\bar{\mu^N}}(\mu^N-\tau^A-c_p^A-q_1^A)q_1^A\mathrm{d}G(\mu^N)\\ &+1_{\{q_1^A>0\}}[V(\tau^A;c_p^A)+W(\tau^B;c_p^B;F_d)]\end{aligned} \tag{15}$$

The expression above emphasises that the firm learns its export profitability in destination d only if it decides to export A ($q_1^A > 0$). Then, by choosing its optimal level of output for product A, $\hat{q}_1^A(\tau^A;c^{pA})$, (15) converges to the following expression for the expected gross profits from the firm's *sequential entry* strategy:

$$\begin{aligned}\psi^{Sq}(q_1^A;\tau^A,\tau^B;c_p^A,c_p^B) &\equiv \lim_{\varepsilon\to 0^+}\psi^{Sq}(\hat{q}_1^A(\tau^A;c_p^A);\tau^A,\tau^B;c_p^A,c_p^B)\\ &= \psi^A(\tau^A;c_p^A)+W(\tau^B;c_p^B;F_d)\end{aligned} \tag{16}$$

which reflects the firm's possibility to enter destination d with product A first, even if its initial expectations are pessimistic: $E\mu^N < \tau^A + c_p^A$. This occurs because, by exporting the arbitrarily small value ε in $t = 1$, the firm does not only get informed of its success in product A, making it export more of such product in $t = 2$; but it also gets informed of its potential success in product B, making it jump into that business in $t = 2$, since profitabilities in both products are perfectly correlated.

3.3 Firm's Entry Decision

When defining the export strategy followed by firm i in destination d, I focused on the expected gross profits, ψ^{Sm} and ψ^{Sq}, from *simultaneous* and *sequential exporting*, respectively. However, in order to determine which of these entry strategies to undertake, the firm will have to consider the net profits from each of those options. Such net profits are in function of these expected values and the product-specific sunk entry costs F_d. From the derivation of net profits, I can obtain some cutoff values of F_d which determine whether it is optimal to adopt a sequential or simultaneous entry strategy, or no entry at all to destination d.

From (14), I can obtain the firm's net profit from the *simultaneous entry* strategy, expressed as π^{Sm}:

$$\pi^{Sm} = \psi^A(\tau^A;c_p^A)+\psi^B(\tau^B;c_p^B)-2F_d \tag{17}$$

which shows that, from the gross profit, the firm has to discount the sunk entry cost for each product, assumed to be identical across them.

Similarly, from (16), I attain the firm's net profit from the *sequential entry* strategy, expressed as π^{Sq}:

$$\pi^{Sq} = \psi^A(\tau^A; c_p^A) + W(\tau^B; c_p^B; F_d) - F_d \tag{18}$$

It can be concluded that *simultaneous entry* into destination d with products A and B will be optimal if $\pi^{Sm} > \pi^{Sq}$ and $\pi^{Sm} \geq 0$. Conversely, *sequential entry*, by exporting product A in $t = 1$ and both products in $t = 2$ will be optimal if $\pi^{Sq} > \pi^{Sm}$ and $\pi^{Sq} \geq 0$. If neither of these conditions is met, the firm does not enter destination d with any product.

Therefore, from (17) and (18), I can argue that *simultaneous entry* is optimal if $F_d < \psi^B(\tau^B; c_p^B) - W(\tau^B; c_p^B; F_d)$ and $F_d \leq \frac{[\psi^A(\tau^A; c_p^A) + \psi^B(\tau^B; c_p^B)]}{2}$. Comparing these two expressions, it can be stated that the right hand side of the second condition is necessarily greater than the right hand side of the first one, since $W(\tau^B; c_p^B; F_d) > 0$ and $\psi^B(\tau^B; c_p^B)$ is strictly decreasing in τ^B and c_p^B, also considering that $\tau^A + c_p^A \leq \tau^B + c_p^B$. Meeting these criteria encourages to prefer *simultaneous* to *sequential entry*. Moreover, if the sunk entry cost F_d is small enough, the firm will even prefer *simultaneous entry* to no entry to destination d at all.

Thus, firm i's entry strategy into destination d at $t = 1$ can be summarised as follows:

a) *simultaneous entry* is optimal if: $F_d < \psi^B(\tau^B; c_p^B) - W(\tau^B; c_p^B; F_d)$,

b) *sequential entry* is optimal if: $\psi^B(\tau^B; c_p^B) - W(\tau^B; c_p^B; F_d) \leq F_d \leq \psi^A(\tau^A; c_p^A) + W(\tau^B; c_p^B; F_d)$,

which implies that the firm will export product A to destination d in $t = 1$ if either condition a) or b) is satisfied. On the other hand, it will export B in $t = 1$ only if condition a) is met. These implications can be expressed as:

1. $e_1^A(\tau^A, \tau^B; c_p^A, c_p^B) = 1 \leftrightarrow F_d \leq \psi^A(\tau^A; c_p^A) + W(\tau^B; c_p^B; F_d)$
2. $e_1^B(\tau^B; c_p^B) = 1 \leftrightarrow F_d < \psi^B(\tau^B; c_p^B) - W(\tau^B; c_p^B; F_d)$

In other words, *simultaneous entry* into d takes place if the sunk entry cost per product F_d is sufficiently small. The higher this cost is, the better it is to postpone the export of the more costly product B.

Hence, similar to Albornoz et al. (2012) entry export strategy across markets, I find that there are thresholds of the sunk entry cost whereby firms determine their entry export strategy across products within one market. There is a threshold value F_d^{Sm} at which the firm is indifferent between *simultaneous* and *sequential entry*; and another threshold F_d^{Sq}, at which it is indifferent between *sequential entry* and *no entry* into destination d at all.

These results can be summarised in the following proposition:

Proposition 1: *There are threshold values for F_d, such that $F_d^{Sq} > F_d^{Sm} \geq 0$. At $t = 1$, the firm exports both products to d if $F_d < F_d^{Sm}$; only product A if $F_d^{Sm} \leq F_d \leq F_d^{Sq}$; and no product if $F_d > F_d^{Sq}$. The smaller F_d^{Sm} threshold is positive only if $E\mu^N > \tau^B + c_p^B$. Finally, when $F_d^{Sm} \leq F_d \leq F_d^{Sq}$, the firm will export product B in $t = 2$ if it previously realises in $t = 1$ that $\mu^N \geq 2F_d^{1/2} + \tau^B + c_p^B$.*

3.4 Predictions from the Model

The model described generates several implications regarding the dynamics of exporters' behaviour in a particular market. Specifically, there is a difference between firms that are new to a particular destination, and more consolidated exporters in that market, in terms of the export growth of a good –*intensive margin*–, the decision to export a new product –*extensive margin*–, and the decision to stop exporting a product to that destination –*exit*–. Here I detail the three main predictions derived from the theoretical model. Each prediction is presented under the scenarios with and without trade liberalisation, expressed as an unanticipated elimination of tariffs τ^j, in $t = 2$, by country d on products from country o, in order to see how the export dynamics change from one case to the other.[6]

Prediction 1* – *Intensive Margin: *Conditional on survival, firms tend to experience a faster export growth in destination d in* $t = 2$*, once after they began exporting their first products there in* $t = 1$*. Trade liberalisation exacerbates this growth, which will be larger the higher the initial tariff and the production costs are.*

This implies that exporters raise the sales of their products to a country to a larger extent when they are new to that market; namely, when they learn their export profitabilities in that destination.[7] Once the uncertainty is resolved, there is no reason for further export growth in the future for those products.[8] Also, since exporting those first products convey all information about a destination, we should not expect export growth for subsequent products exported. Such null export growth is also expected for more experienced firms that discovered their export profitabilities further in the past.

When *trade liberalisation* occurs, expressed as a tariff elimination by destination d in $t = 2$, such export growth is boosted, especially for those products with higher initial tariffs and/or production costs.[9] Moreover, after the event of liberalisation, the export growth for first products will be greater for those goods with larger known production costs; namely, those at which firms are not so efficient –non-core competence products–. This occurs because firms, which tend to experiment with a small shipment of a non-core product, realise that export profitabilities are greater than these high costs, and trade liberalisation can be reflected as a downward movement along the US linear demand curve, leading to larger sales and revenues one period later. Hence, they are motivated to explore their potential with these products. Additionally, even though expert firms also grow at the intensive margin when tariffs are eliminated, the effect of trade liberalisation is greater for the less experienced firms in d.

Prediction 2* – *Extensive Margin: *Conditional on survival, firms that started exporting to destination d in* $t = 1$ *are more likely to export a new product to that market in* $t = 2$ *than more experienced firms. That experimentation likelihood is larger for less costly products. Trade liberalisation increases even more that likelihood for all firms, especially the experts.*

Once a firm starts exporting to a destination, and having discovered its profitability, conditional on survival, it is very likely to explore more that market by exporting new products in the next period. Conversely, more expert firms in d have already learnt enough about that market, and are less likely to make that decision, which has probably been done in the past.[10]

When *trade liberalisation* occurs, there is an increase in the probability of new exporters

[6] Appendix A provides a full proof for each of these predictions.

[7] See Equations (A.2) and (A.3)

[8] See Equation (A.6)

[9] See Equations (A.9) and (A.10)

[10] See Equation (A.13)

experimenting with new products in d in the future, regardless of how costly it is to produce a particular good. However, that increase in the entry probability is larger for expert firms, which without liberalisation had zero entry likelihood.[11] Besides, exporters are more likely to experiment in the next period with a less costly product, belonging to its core competences, especially after the event of liberalisation.

Prediction 3 – Exit: *Firms that exported their first products to destination d in $t = 1$ are more likely to stop exporting those goods in $t = 2$ than more expert firms in that market. Such likelihood is larger for more costly products; and trade liberalisation diminishes that probability.*

Since more expert firms are more aware of the export profitability in destination d than newcomers, the latter are more likely to discover that it is not worth exporting a particular product to that market, leading to stop exporting that product to d, right after entering that market.[12]

Once *trade liberalisation* takes place, that higher exit likelihood for new exporters decreases, regardless of the product they export. However, the exit probability is generally greater for more costly products, not belonging to firms' core competences, especially after the event of liberalisation.[13]

3.5 Assuming Imperfect Correlation in Export Profitability Across Products

So far, I have assumed perfect correlation of export profitabilities over time and across products. Yet, going back to the original definition of μ^{Nj} ($\mu^{Nj} = d^j - c_x^j$), it may be reasonable to argue that the unknown export costs c_x^j are constant across products; but less so that they have the same uncertain demand component d^j.

Here I explore how my initial predictions vary by assuming positive but imperfect correlation in export profitabilities across products. This essentially means that exporting product A, the least costly one, to market d provides incomplete information about the profitability of exporting product B to that destination. Thus, in order to make a decision on exporting product B in $t = 2$, we have to consider the realisation of of μ^{NA} in $t = 1$, and how both profitabilities are correlated.

Here, I assume that export profitabilites of both products follow identical distributions, $G(\mu^{NA})$ and $G(\mu^{NB})$. Also, I need to consider the expected value of μ^{NB} given the realisation of μ^{NA}, expressed as $E(\mu^{NB} \mid \mu^{NA})$.

The new assumption of imperfect correlation does not have any effect on the *simultaneous exporting* decisions, nor on the decision to export product A in $t = 1$ as part of the *sequential exporting* strategy, because firms do not need to consider any previos information from product A. But it does affect the output choice of product B in $t = 2$ in the *sequential exporting* decision. Following Albornoz et al. (2012), who consider the convexity of the maximisation function and Jensen's inequality, I obtain that the expected value of profits increase when the output decision is made considering μ^{NA}. By maximising those profits to solve for the optimal output level, denoted as $\bar{q}_2^B$ to distinguish it from the perfect correlation case, I achieve the following:

$$\bar{q}_2^B = \frac{E(\mu^{NB} \mid \mu^{NA}) - c_p^B - \tau^B}{2} \tag{19}$$

[11] See Appendix A.2.2

[12] See Equation (A.14)

[13] See Appendix A.3.2

Subsequently, I estimated the expected value of the *sequential exporting* decision considering imperfect correlation. As a first step, I needed to define the expected value of μ^{NB} given μ^{NA} employed in Equation 19. For simplicity, again following Albornoz et al. (2012), I assume that these profitabilities follow a bivariate normal distribution, with parameters $(E\mu^{NA}, E\mu^{NB}, \sigma^A, \sigma^B, \rho)$. Thus, I obtain the following:

$$E(\mu^{NB} \mid \mu^{NA}) = E\mu^{NB} + (\mu^{NA} - E\mu^{NA})\rho\frac{\sigma^A}{\sigma^B} \tag{20}$$

This outcome shows that the output choice of B in $t = 2$ considers not only the export profitability from product A, both in expected and actual terms, but also the statistical dependence between μ^{NA} and μ^{NB}, represented by $\rho\frac{\sigma^A}{\sigma^B}$, henceforth denoted as ω.

Following the original model, now in a context of imperfect correlation between export profitabilities, a firm decides to export B in $t = 2$ in a *sequential exporting* strategy if $E(\mu^{NB} \mid \mu^{NA}) \geq 2F_d^{1/2} + \tau^B + c_p^B$, since the total profits from exporting B must be greater or equal to the fixed entry costs. From that criterion, and using (20), I can get a maximum value for those fixed entry costs, below which it is convenient to export B in $t = 2$. Moreover, also from (20), I am able to find a cutoff realisation of μ^{NA} above which a sequential exporter will sell B in such period. That cutoff is in function of the known costs, the expected value of μ^{NB} and, more relevant, the statistical dependence between both profitabilities, ω:[14]

$$\mu^{*NA}(\omega) \equiv (\frac{1}{\omega})(2F_d^{1/2} + \tau^B + c_p^B) - (\frac{1-\omega}{\omega})E\mu^{NB} \tag{21}$$

μ^{*NA} is employed to obtain, expressed in $t = 0$ expected terms, the value of the profits from exporting product B in $t = 2$, which is:

$$\bar{W}(\tau^B; c_p^B; F_d) \equiv \int_{\mu^{*NA}(\omega)}^{\bar{\mu^N}} [(\frac{E(\mu^{NB} \mid \mu^{NA}) - \tau^B - c_p^B}{2})^2 - F_d] \mathrm{d}G(\mu^{NA}) \tag{22}$$

What is relevant is how this cutoff μ^{*NA} varies with changes in ω; namely, how the cutoff varies with the statistical dependence between μ^{NA} and μ^{NB}. Taking the derivative of the cutoff with respect to ω, I obtain:

$$\frac{d\mu^{*NA}}{d\omega} = \frac{E\mu^{NB} - (2F_d^{1/2} + \tau^B + c_p^B)}{\omega^2} \tag{23}$$

The effect of ω on the cutoff depends on the numerator, and can be summarised in the following proposition:

Proposition 2:*If $E\mu^{NB} > 2F_d^{1/2} + \tau^B + c_p^B$, the effect of ω on μ^{*NA} will be positive, meaning that the value for the profits from exporting B in $t = 2$ will be lower ($\bar{W}$ falls), because in that case it is better to export simultaneously in $t = 1$. The converse occurs if $E\mu^{NB} < 2F_d^{1/2} + \tau^B + c_p^B$, since now μ^{*NA} falls with ω, implying a higher value for the profits from exporting B in $t = 2$ ($\bar{W}$ rises). In that case, the closer to perfect correlation, the more worthwhile it is to apply a sequential exporting strategy.*

[14]In order to get to this final relation, I had to consider the case in which μ^{NA} and μ^{NB} follow a bivariate normal distribution with parameters $(E\mu^N, E\mu^N, \sigma, \sigma, \rho)$, meaning that $E\mu^{NA} = E\mu^{NB}$.

3.5.1 Implications for Prediction 2 (Extensive Margin)

While the assumption of imperfect correlation in export profitability across products has no effects for the predictions on the *intensive margin* (export growth) and the *exit*. It does, however, have an implication for the prediction on the *extensive margin* (entry). Now the probability of exporting a new product to destination d in $t = 2$, having previously exported a cheaper product in $t = 1$, is not only a function of the known costs, but also a function of the expected export profitability for that new product and the statistical dependence ω.[15] In other words, now this entry probability is a function of the minimum cutoff ${\mu^*}^{NA}$ obtained in (21). This is expressed as follows:

$$Pr(e_2^j = 1 \mid e_1^A = 1 \& e_1^j = 0) = 1 - G[(\frac{1}{\omega})(2F_d^{1/2} + \tau^j + c_p^j) - (\frac{1-\omega}{\omega})E\mu^{Nj}] > 0 \qquad (24)$$

It can be observed that such entry probability is still positive; hence, still higher than the probability of exporting a new product in a subsequent period $t > 2$, which is *zero*, according to Prediction 2. Nevertheless, this positive likelihood now varies according to the dependence between export profitabilities and the expected μ^{Nj}. This outcome holds both with and without *trade liberalisation*.

In summary, the entry probability with a new product in $t = 2$ rises by reductions in the known costs: the fixed entry cost F_d, the unit trade cost or tariff τ^j, and the unit production cost c_p^j. It will also rise the higher the expected export profitability from product j is. As for the statistical dependence ω, that for simplicity can be treated as the correlation ρ, its effect on the entry probability depends on the expectation of μ^{Nj} with respect to the known costs. Thus, if $E\mu^{Nj} < 2F_d^{1/2} + \tau^j + c_p^j$, a rise in ω decreases the cutoff ${\mu^*}^{NA}$, increasing the value for experimentation, and consequently raising the entry probability with product j. The opposite, a reduction of such entry probability, occurs if $E\mu^{Nj} > 2F_d^{1/2} + \tau^j + c_p^j$, since it is more convenient in that case export the two products simultaneously.

4 Data and Descriptive Analysis

To test the predictions discussed in Section 3, I exploit a rich dataset of exports by Peruvian firms to the United States at the transaction level. To understand why the Peru-USA case is an appropriate scenario, it is necessary to have an insight about the context of this trade relation.

Since the early 1990s, Peru has undertaken a series of liberal economic reforms, including a determined increase of trade openness, unilaterally reducing tariff levels and dispersion. In parallel, the United States, historically Peru's most important trading partner, implemented since 1991 unilateral trade preferences to several Peruvian exports through the Andean Trade Preference Act (ATPA) and the Andean Trade Promotion and Drug Eradication Act (ATPDEA), periodically renewed.

Pursuing to stop depending on these renewals, Peru began the negotiations of a Free Trade Agreement with the United States, approved in 2006 and coming into force on the 1st of February, 2009, consolidating the free entry to USA for 98% of tariff lines. Before and after the enactment, a controversy arose about the potential effects of this agreement on Peruvian exports, especially from manufacturing industries and smaller firms. The common argument was

[15] See Appendix A for the proof of Prediction 2 on the extensive margin.

that these firms would be harmed by the FTA for their increasing exposure to competition with US products, driving down their prices.

So far, most reports on the impact of the USA-Peru Free Trade Agreement have highlighted the overall rise in exports to USA, on average 5.81% between 2008 and 2012.[16] However, a great part of that increase is accounted for by a small number of products, mostly traditional exports like minerals, oil and fuel and, to a minor extent, agriculture and textile products.[17] Moreover, other reports reveal that from 2009 to 2011, 1,973 new firms began exporting to USA, being 1,782 micro and small enterprises; but only 180 of them remained exporting throughout all those years.[18] Yet, there is so much left to be unveiled about how this trade liberalisation process has affected Peruvian exporters' decisions.

4.1 The Data

The export data utilised in this paper was provided by the Peruvian Society of Foreign Trade (COMEXPERÚ in Spanish), which manages data on daily export and import transactions from diverse sectors. This information is collected from the Peruvian Tax and Tariff Agency (Superintendencia Nacional de Administración Tributaria - SUNAT in Spanish).

The time period of the eight original datasets ranges from 1998 to 2013, each compiling information on daily export transactions per firm, from eight sectors: Agriculture, Basic Metal Industries, Chemical, Jewellery, Metallic-Mechanics, Non-Metallic Mining, Textile and Apparel, and Timber and Paper.

Each transaction contains very detailed information, such as the transaction date, name and tax code of the firm, port of departure, description and 10-digit tariff line of the product, destination and port of arrival, export value in US dollars, weight and unit of measure. As I am interested in manufacturing industries, this paper does not work with exports from sectors like mining, fishery and oil and derivatives, which traditionally account for more than 50% of total Peruvian exports.[19]

From the Peruvian Tax and Tariff Agency, I also collected firm-level information, such as the year each firm came into existence and, where relevant, the year they exited the business, as well as the region their main headquarters is located.

In order to account for trade liberalisation, I collected data on tariff rates levied by the United States at the HS 8-digit level, from the World Integrated Trade Solutions (WITS) database of the World Bank. These tariff rates derive from the Most Favoured Nation (MFN) scheme, until 2008. From 2009 onwards, I consider the rates valid under the Free Trade Agreement (FTA) between Peru and the United States. Additionally, since many products were unilaterally liberalised by the US before the enactment of the FTA under the ATPDEA scheme, I also

[16] Source: Commission for Promotion of Exports and Tourism of Peru - PROMPERÚ.

[17] "Traditional exports" mainly embraces commodities and raw material from the mining, fishery, agriculture and fuel sectors; in contrast, "non-traditional exports" considers more value-added products from the mentioned sectors, as well as the textile, chemical, metallic, timber, jewellery and other sectors. That categorisation became popular in Peru since the late 1970s.

[18] Source: Ministry of Foreign Trade and Tourism of Peru. That study considered as large firms those that exported over US$ 10 million per year; medium firms were those exporting between US$ 1 million and US$ 10 million; small firms exported between US$ 100,000 and US$ 1 million; and finally micro enterprises exported less than US$ 100,000 per year.

[19] I focus on manufacturing industries because a large share of them are small, unlike more traditional extractive industries dominated by medium and large firms. Moreover, there was a previous controversies on a potential damage by an FTA with the US to Peruvian manufacturers, especially the smallest firms.

obtained the list of 8-digit tariff lines eligible under that regime, with their respective tariff until 2008.

Appending the datasets for the eight sectors, I achieved a broad dataset of Peruvian exports to USA, consisting of 8,976 Peruvian firms. For each firm I constructed export transactions per 8-digit tariff line/year. In total, the dataset comprises 3,654 manufacturing 8-digit tariff lines.

4.2 Descriptive Analysis

4.2.1 Export Statistics

From this original dataset of Peruvian firms that exported at least once to the United States, I plotted the evolution of their exports to that destination from 1998 to 2013 in US Dollars (Figure 1) and their annual growth rates (Figure 2). Exports follow a continuous growth that gets more pronounced from 2004, but then sharply fall in 2009, exactly the same year the Free Trade Agreement between Peru and the United States came into force. Afterwards, there was a sustained recovery of exports until 2011, and then slightly decreased again from 2012. A similar tendency can be found for the overall exports of this sample.

Figure 1

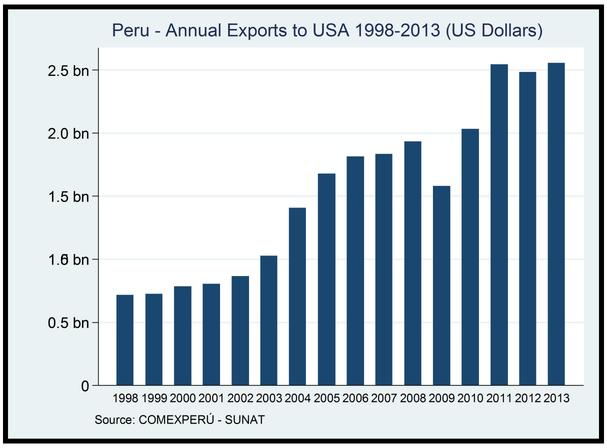
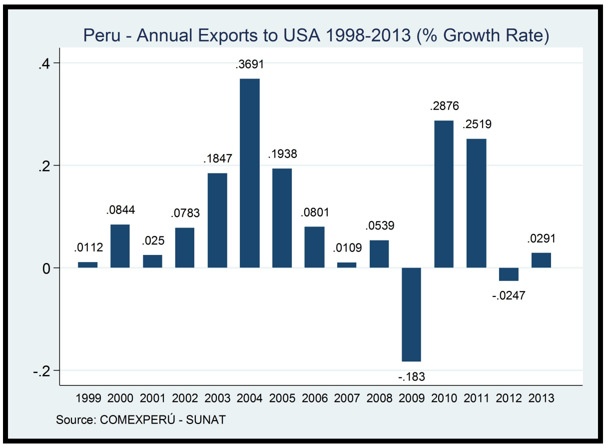


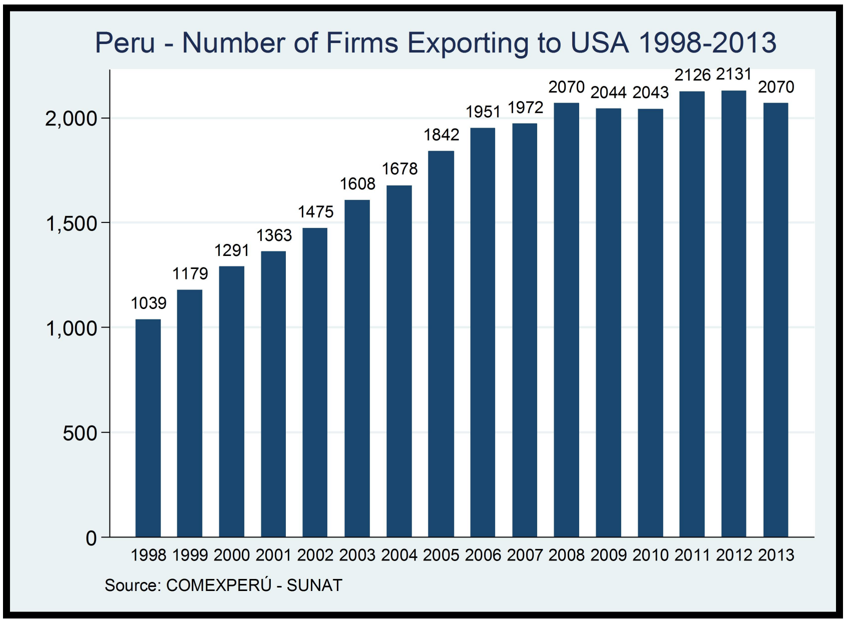
Figure 2



The pronounced decrease of exports in 2009, when the enactment of the USA-Peru FTA took place, represents a challenge for the analysis in this paper and further studies, as it is necessary to disentangle the effects of trade liberalisation from those from an economic crisis.

Figure 3 displays the evolution of the number of Peruvian firms exporting to USA during the period analysed. Unlike the export volumes, the number of exporters follows a steady pace until 2008 and then roughly constant, despite any external shock produced by the crisis during those years. The main effect of the crisis was, therefore, expressed in export volumes.

Figure 3



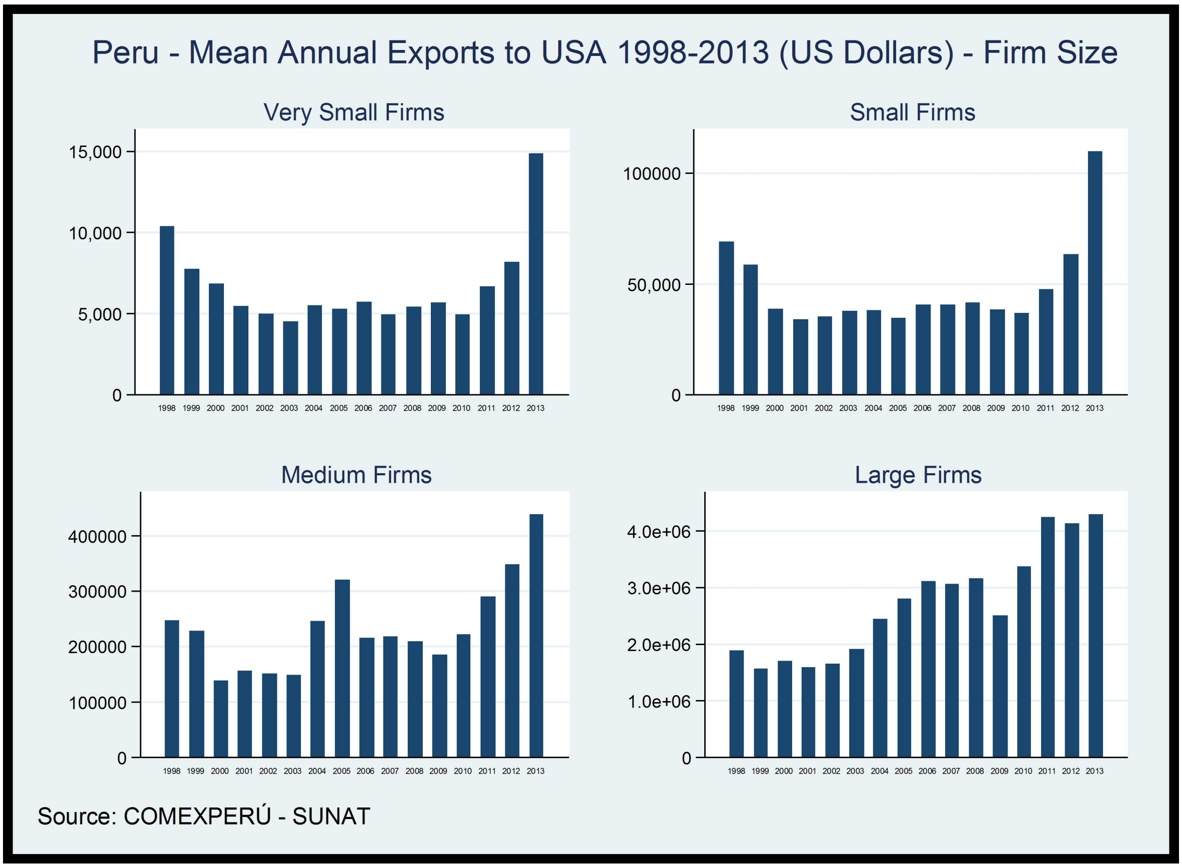
Aiming to categorise these firms per size as an approximation, I calculated the mean of firms' annual exports throughout the 1998-2013 period, which led to the following four groups:

- a Large Firms, with mean annual exports higher than US$ 1,000,000.
- b Medium Firms, with mean annual exports ranging from US$ 100,000 to US$ 1,000,000.
- c Small Firms, with mean annual exports ranging from US$ 10,000 to US$ 100,000.
- d Very Small Firms, with mean annual exports up to US$ 10,000.

According to this categorisation, 54.16% of firms are very small and only 6.97% are large. I employ this criterion in further empirical estimations; but in this section I compare the evolution over time of the mean annual exports to USA of firms across size categories.

The statistics provided by Figure 4 are striking. All types of firms except the large ones experience a continuous positive evolution in exports during the last four years of the sample, exactly when the USA-Peru FTA was in course, with a pronounced jump in 2013. By contrast, the figures for larger firms follow the overall trend presented earlier. Figure 4 might give a first sign that bilateral trade liberalisation between both countries facilitated the export growth and entry of new Peruvian firms into that market, especially the smallest ones.

Figure 4



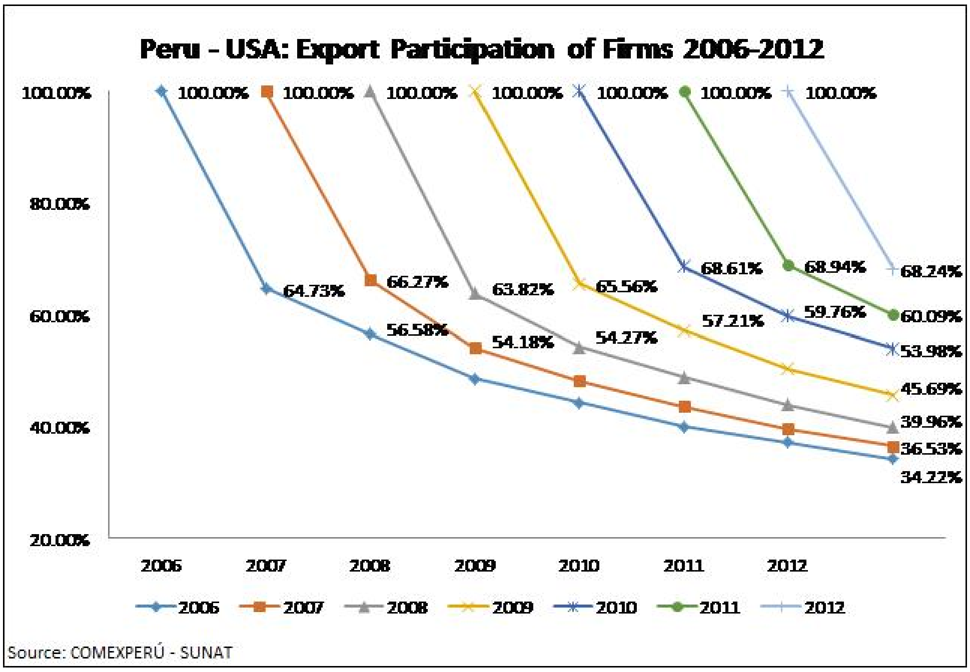
4.2.2 Firm Entry and Exit

For the subsequent econometric analysis, I reduced the sample to the 2006-2013 time period. After the negotiations to achieve the FTA between Peru and USA finalised in late 2005, some uncertainty remained about the ratification of this treaty by both countries, as well as its implementation from 2009 when the agreement came into force.

This sample reduction led to 4,579 Peruvian exporters, 2,371 8-digit tariff lines and 31,311 firm-product pairs. Since some tariff lines did not have available information on actual tariff levels before the enactment of the Free Trade Agreement, they had to be removed from the dataset, also leading to the removal of some firms from the analysis.

With this reduced sample, I made an analysis of the continuity of Peruvian firms in the US export market. Figure 5 indicates that from the 1,914 firms that exported to USA in 2006, 64.73% (1,239 firms) exported in 2007. Overall, this chart shows that just over 60% of firms that exported to USA in a particular year do it the year after, which means that over 30% of firms leave the US market after one year. Hence, attrition levels are quite high.

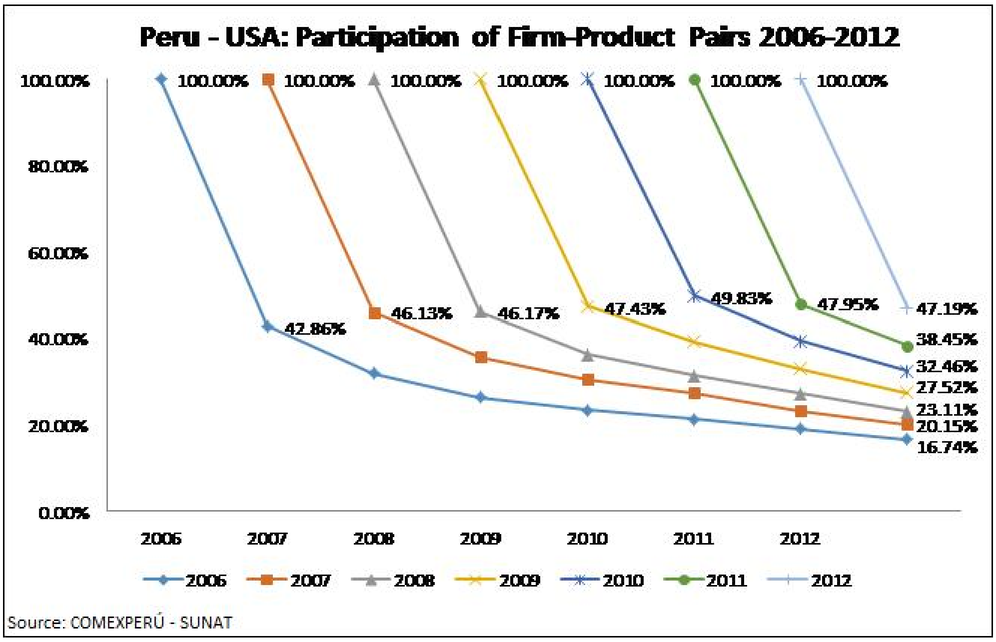
Figure 5



But a parallel exercise shows that, for example, from the 1,927 firms that exported to USA in 2007, 64.30% (1,239 firms) did it in 2006. In general, between 63% and 76% of firms that exported to USA in a particular year did it the year before. That means that between 24% and 37% of firms each year entered or re-entered into the US export market. Therefore, these numbers provide an idea of how dynamic this market is in terms of entry and exit.

A similar analysis considered this time the firm-product pairs. 62.49% of them are present in the sample only for one year, whereas 15.94% do it for two years. Thus, Figure 6 says that over 50% of firm-product pairs present in the US export market in a year leave it the year after. But a parallel exercise done showed that between 42% and 52% of pairs exporting in a year did it the year before, meaning that from 48% to 58% of pairs that exported in that year were new or re-entrants. Hence, entry and exit dynamics are more evident at the firm-product-pair level.

Figure 6



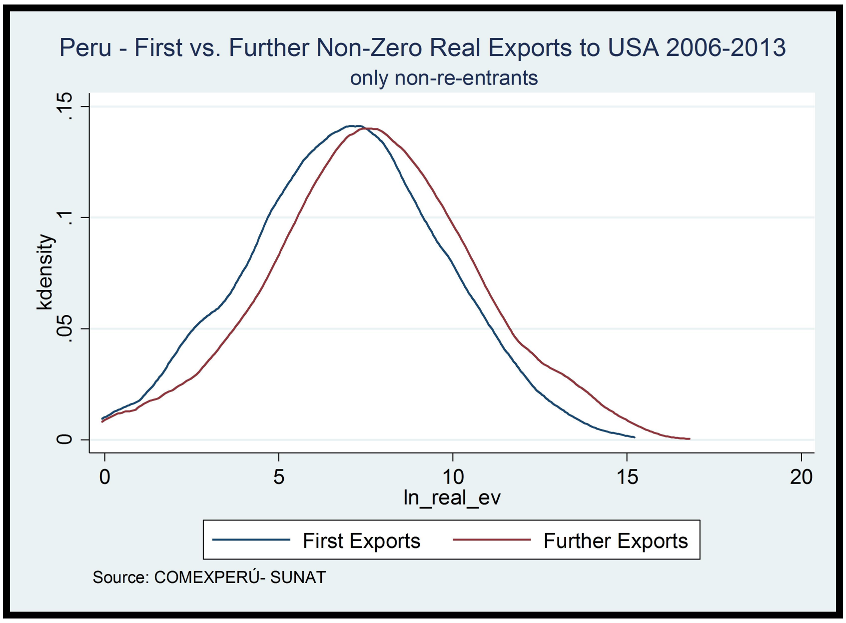
4.2.3 First vs. Subsequent Exports

Since the focus of this paper is to analyse the dynamics of genuinely new exporters, in my empirical approach I restrict even more my sample, considering only those firms that began exporting to the US market since 2006. In other words, I disregard the firms with prior experience in that destination and those that re-entered that market from 2006 onwards. As a result, in my estimations I work with a final “non-re-entrants” sample of 2,720 firms, 1,579 8-digit tariff lines and 12,074 firm-product pairs.

With this final dataset, I constructed some Kernel density graphs, addressing the difference in export values between the first exports made by Peruvian firms and their subsequent shipments into USA.

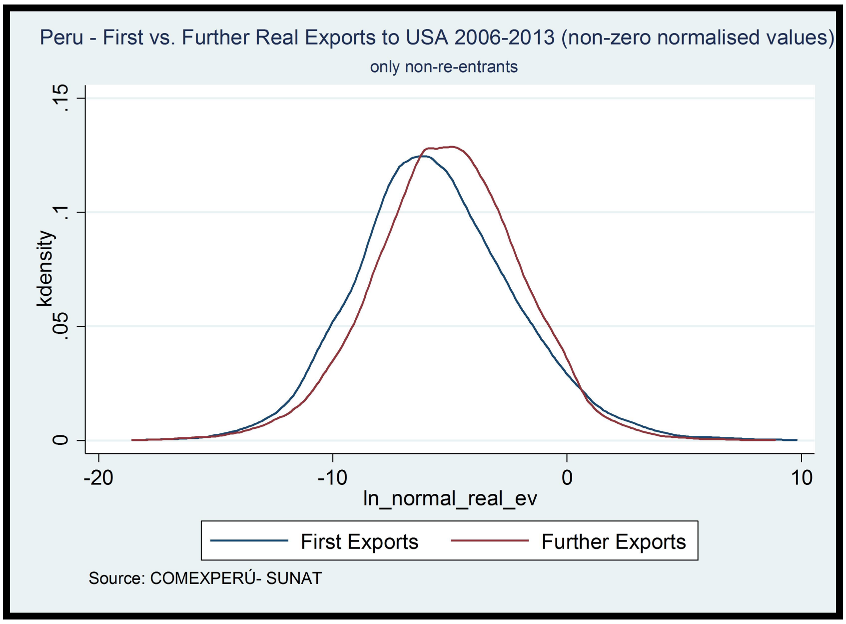
Figure 7 compares the densities between the values of the first non-zero real exports to USA per firm-product pair and the subsequent ones. Clearly, the subsequent export values tend to be greater than the initial shipments, as the theoretical model implies. The latter achieve a mean of US$ 28,283.14; whereas the former are on average US$ 95,766.40.

Figure 7



In order to confirm that tendency, I normalised the export values per firm-product pair by employing the total sum of real exports of product j to USA in 2013, the final year of the dataset. The outcome is shown in Figure 8, with the non-zero normalised values, confirming that subsequent real exports to USA tend to be larger than the first ones.[20]

Figure 8

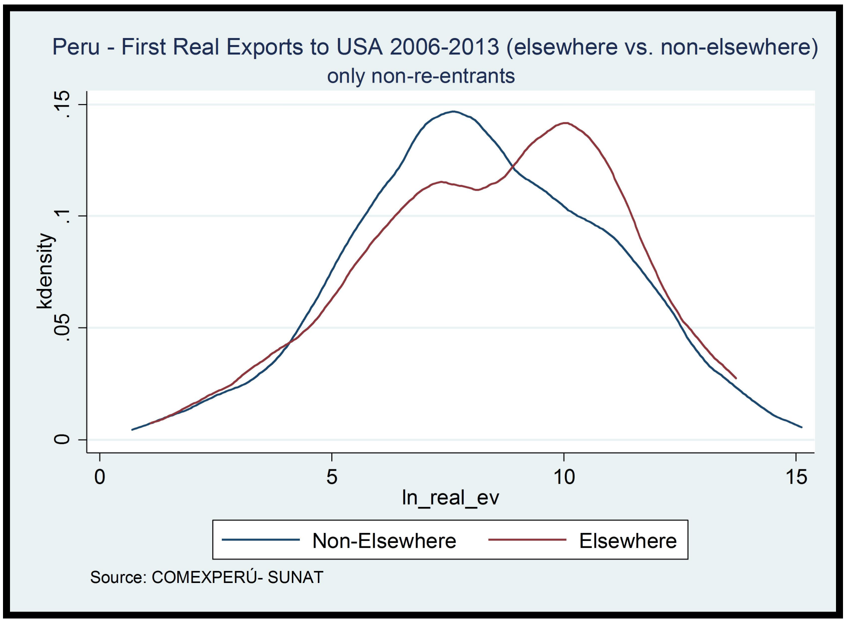


I argue in my empirical approach that there might be differences in the export performance of Peruvian firms in the US market, depending on whether they have previously exported

[20]The mean of normalised first real exports is 9.39; while that for further shipments is 2.57. However, the initial exports have a much larger standard deviation of 287.03 than that for further values (85.63).

product j to another destination. Figure 9 displays an exercise for the first real exports by firms of product j, distinguishing whether such product was exported elsewhere in $t-1$ or not. The distributions are clearly different, and even though the first exports for the "non-elsewhere" firms have a larger mean (US$ 70,480.45 against US$ 58,055.72), the first exports of the "elsewhere" firms have a larger 50% percentile, and a lower dispersion.

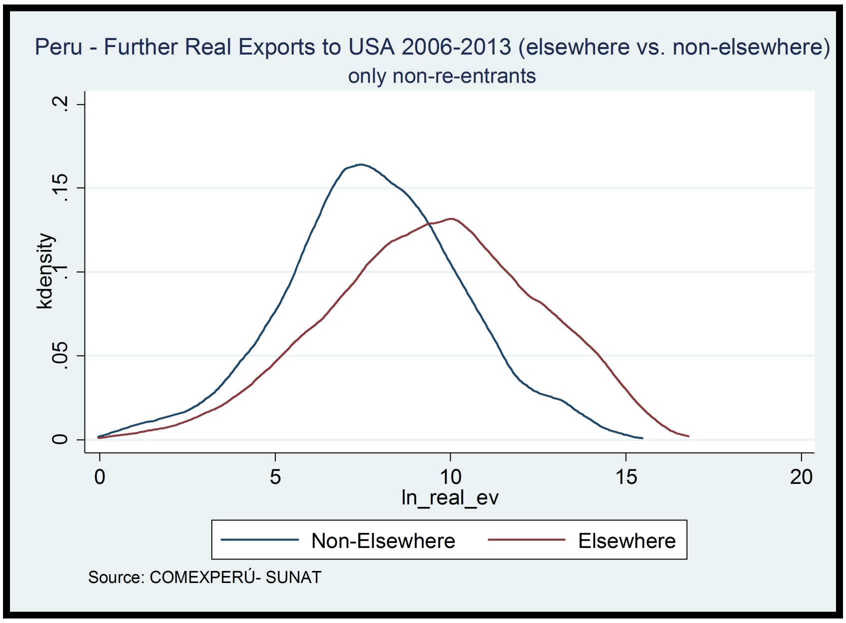
Figure 9



When it comes to analysing the further exports, however, the figures change, as Figure 10 suggests. If firm i exported product j elsewhere in $t-1$, it tends to send larger shipments to USA in t than those firms not exporting to anywhere else. Both means and medians are much larger for the "elsewhere" firms, and their degree of dispersion is greater as well. This outcome might entail that the experience in other destinations is relevant to encourage firms to explore more and more the US market.[21]

[21] "Non-elsewhere" firms have a mean export value to USA of US$ 46,104.38; "elsewhere" firms, US$ 289,839.70. As for the 50% percentile, the values are US$ 2,366.73 against US$ 14,324.90.

Figure 10



4.2.4 New vs. Expert Firms

As a first attempt to test the first prediction of the theoretical model, Figure 11 compares the export growth of real exports of product j to USA between new firms –those that began exporting to USA in $t-1$– and the incumbent or expert firms in that market. This is a first assessment of the differences between new and expert firms at the *intensive margin*, which shows that the export growth rate for less experienced Peruvian firms in USA tends to be larger than for the incumbents. Furthermore, the distribution for the new firms is more skewed to the left, meaning that their export growth have a positive tendency.

Figure 11

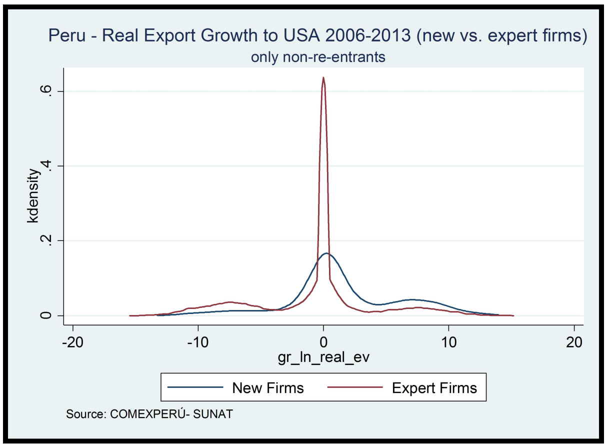
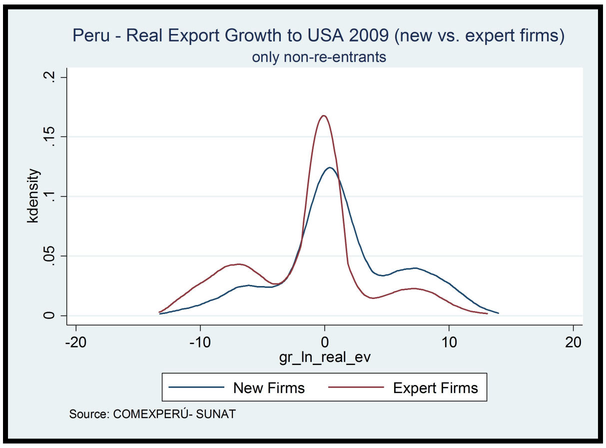


Figure 12



But the theory also argues that this difference in export growth between new and expert firms is boosted by trade liberalisation. As a preliminary evidence of that, Figure 12 presents the densities of real export growth rates exclusively for 2009, the year most of the tariff eliminations by USA on Peruvian products took place. Clearly, the difference in favour of new firms is much more evident, with a greater frequency of positive export growth rates than for incumbent firms.

5 Empirical Approach

Here I present the three econometric models designed for my study on sequential exporting across products, with their respective main results. Each identification seeks to test the three predictions derived from the theory described earlier, on the export dynamics of less experienced firms at the *intensive margin* (Model 1), *extensive margin* (Model 2) and *exit* from an export business (Model 3). The models are tested for the case of Peruvian firms exporting to the United States.

The observations for the three models are defined as a Peruvian firm i exporting a product j to the United States at year t. The analysis considers the 2006-2013 time period. The main results are based upon samples restricted to firms that began exporting to USA from 2006 onwards, also called *non-re-entrants*, in order to facilitate the comparison between one-year experienced firms and firms with longer presence in the US market.

5.1 Model 1: Intensive Margin (Export Growth)

The purpose of this first estimation is to test Prediction 1 on *intensive margin* derived from the theory, which states that, conditional in survival, new firms exporting their first products to a destination experience a greater intensive margin export growth than more expert firms.

The basic specification is presented in (25), estimated by a Fixed Effects Model at the firm level, with robust standard errors. The dependent variable $gr\_ln\_real\_ev_{ijt}$ is the log of the annual growth of firm i's real exports of product j in year t. It is regressed on a binary variable $new\_USA_{i,t-1}$ taking value 1 if that firm exported to the US market for the first time in year $t-1$. This dummy was defined to control for the condition of firms having an overall one-year experience in the US market, as well as the condition of product j being the first product exported to that destination.

$$
\begin{aligned}
gr\_ln\_real\_ev_{ijt} = {} & \alpha_0 + \alpha_1 new\_USA_{i,t-1} + \alpha_2 fta_{jt} + \\
& \alpha_3 newUSA * lag2else_{ijt} + \alpha_4 fta * new\_USA_{ijt} + \\
& \alpha_5 lag1\_core50_{ijt} + \alpha_6 newUSA * lag1core50_{ijt} + \mu_{ijt}
\end{aligned} \tag{25}
$$

This effect on export growth might be enhanced by the existence of the Free Trade Agreement between Peru and the US since 2009. To account for that, I include a variable accounting for this trade liberalisation process, named fta_{jt}, which represents the change in logs of unity plus the tariff levied by the United States to product j (8-digit tariff line), from $t-1$ to t. This variable is included on its own and interacted with the dummy controlling for one-year experienced exporters in the US market, denoted as $fta * new\_USA_{ijt}$. The outcome I expect from these variables is a negative sign, since my initial hypothesis is that a reduction in tariff rates in the US market facilitates the export performance of Peruvian firms in product j, especially the newcomers.

It is important to stress that this fta_{jt} variable is also useful disentangling the effects of trade liberalisation from the effects of the economic crisis that lowered Peruvian exports in 2009, the same year the USA-Peru FTA came into force.

Although the main focus is the bilateral trade relation between Peruvian firms and the United States, it is also necessary to consider the rest of markets firm i trades with and how it might influence its performance at the market of interest. For that reason, I include the variable

$newUSA * lag2else_{ijt}$, the interaction between $new\_USA_{i,t-1}$ and the dummy $lag2else$, which takes value 1 if firm i exported product j to any other destination in $t-2$, and zero otherwise. The idea behind this interaction is to illustrate the case of a Peruvian firm that previously exported j elsewhere in $t-2$, then exporting it sequentially to the US market in $t-1$, in order to test whether having exported elsewhere in the past has an extra effect on new exporters in the United States.

The model addresses the differences across products ("core competence" vs. the rest) by the inclusion of the last two variables. $lag1\_core50_{ijt}$ takes value 1 if product j accounted for a minimum of 50% of firm i's total exports to the world in $t-1$.[22] In other words, this variable controls for products belonging to firm i's core competences in the previous year. $lag1\_core50_{ijt}$ is included on its own and interacted with $new\_USA_{i,t-1}$. Since my theoretical approach predicts that the firm, particularly a one-year experienced one, will have a greater export growth over time with a non-core, I expect a negative sign for both variables. Thus, growth at the intensive margin is higher if a firm exports a non-core product, compared to a core one.

The model is enriched with the inclusion of fixed effects at different levels. Year fixed effects control for particular demand shocks occurring in a specific year, like 2008 and 2009 when the recent economic crisis in the US and Europe took place. The reference year is 2006, the beginning of the sample. Besides, I take into account the issue that many products exported to the United States were previously liberalised by the ATPDEA unilateral liberalisation or enjoyed a 0% tariff from the Most-Favoured-Nation scheme, even before the enactment of the FTA. Regarding sector fixed effects, dummies accounting for the industry each product belongs to are added as well. Recall I work with eight different sectors, and the reference for this analysis is agriculture.

It is also feasible that export growth of product j by firm i in the US market is influenced by firm i's export performance in the previous year. That is why I incorporate in further estimations the log of firm i's overall real exports to the US in year $t-1$, $lag\_ln\_real\_ev\_USA\_tot_i$, which sign I expect it to be negative because it is arguable that larger exports to USA imply that the firm is close to its equilibrium level of exports.

It is necessary to mention that for this first model, working on growth rates, the sample is restricted to firms that exported a product to the US for at least two consecutive years and standard errors are clustered at the firm level.

5.1.1 Main Results

Table 1 reports the main results from Model 1 on the *intensive margin*. The basic specification from (25) is presented in Column (1), while Columns (2)-(4) test the robustness of this main estimation by adding further interactions with the tariff change variable. Additionally, Columns (3)-(4) exclude the $newUSA * lag2else_{ijt}$ variable to compare the significance of the main variables of interest.

These first estimations confirm the positive and significant association between the condition of being a one-year experienced Peruvian firm in the US market, exporting its first products to that market, and the intensive margin export growth. However, that positive relation is eliminated if such new firm has also been exporting the same product j to any other destination, according to the negative and significant coefficients of $newUSA * lag2else_{ijt}$.[23]

[22] This criterion is an approximation to what the theory considers as less costly products, given that I do not

Table 1: Model 1 - Intensive Margin

Dependent Variable	gr_ln_real_ev							
Estimation	FE Robust							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	2.254***	2.282***	2.091***	2.090***	1.220***	1.222***	1.130***	1.130***
	(0.260)	(0.260)	(0.259)	(0.258)	(0.233)	(0.231)	(0.227)	(0.227)
newUSA*lag2else	-2.415***	-2.402***			-0.932***	-0.931**		
	(0.435)	(0.436)			(0.360)	(0.361)		
lag1_core50	-4.061***	-4.068***	-3.997***	-4.009***	-2.195***	-2.196***	-2.165***	-2.165***
	(0.201)	(0.201)	(0.201)	(0.204)	(0.155)	(0.155)	(0.154)	(0.158)
newUSA*lag1core50	0.417	0.309	-0.0533	-0.0424	0.203	0.194	0.0587	0.0588
	(0.340)	(0.346)	(0.359)	(0.359)	(0.295)	(0.299)	(0.296)	(0.298)
fta	-4.758*	-4.773*	-4.734*	-4.501	-3.099	-3.099	-3.027	-3.026
	(2.698)	(2.698)	(2.707)	(2.865)	(2.406)	(2.407)	(2.410)	(2.506)
fta*new_USA	7.304	9.053*	10.02*	9.783*	3.248	3.391	3.653	3.652
	(4.792)	(5.408)	(5.431)	(5.497)	(4.046)	(4.619)	(4.577)	(4.619)
fta*lag1core50				-1.941				-0.00585
				(5.215)				(4.088)
ftanewUSA*lag1core50		-8.938	-10.03	-8.083		-0.727	-1.096	-1.091
		(6.336)	(6.280)	(7.980)		(5.848)	(5.784)	(7.025)
lag_ln_real_ev_USA_tot					-0.554***	-0.554***	-0.555***	-0.555***
					(0.0209)	(0.0210)	(0.0210)	(0.0210)
Year FE					Yes	Yes	Yes	Yes
Sector FE					Yes	Yes	Yes	Yes
ATPDEA and MFN dummies					Yes	Yes	Yes	Yes
N	17077	17077	17077	17077	17077	17077	17077	17077
r2_o	0.0331	0.0331	0.0329	0.0329	0.164	0.164	0.164	0.164
N_clust	1000	1000	1000	1000	1000	1000	1000	1000

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

When it comes to the condition of "core competences" by product j, represented by the $lag1\_core50_{ijt}$ dummy and its interaction with $new\_USA_{i,t-1}$, the negative and significant estimates of the former convey that the export growth to the US of products the firm usually performs better at in terms of sales is lower compared to the "non-core competence" products, just like the theoretical model predicts. This effect holds for both new and incumbent Peruvian firms in the US market and, given the insignificance of the $newUSA * lag1core50_{ijt}$ interaction, there does not seem to be an outstanding difference in that effect between both types of firms.

Regarding the variables controlling for trade liberalisation, the tariff growth rate fta_{jt} and its interaction with the "new exporter to USA" dummy, the estimates attained are not significant; but exhibit a positive sign that differs from the theory's implications, which might entail that trade liberalisation is not so determinant for the intensive margin. This result might imply that the export growth is explained by other factors apart from the $\frac{\tau}{2}$ obtained from the theoretical model. Among those, I can think of the ability of some firms, particularly the incumbents, to anticipate the liberalisation process in their export making decisions, making them adjust their overall cost structure and make the most of the tariff elimination by raising their export levels.

Columns (5)-(8) show the results when additionally controlling for the firm's past performance in the US market, time and sector fixed effects and the ATPDEA and MFN dummies, all included at once because thus the main variables of interest obtain less overestimated and more reliable estimates. Indeed, the condition of "new exporter" maintains the positive effect

count on firms' actual cost data.

[23]Recall from Figures 9 and 10 that firms that exported product j elsewhere in $t-1$ tend to export larger volumes to USA. Hence, it is expectable that growth rates between these volumes are not as large as rates for firms which experiment with product j only in USA.

on the export growth, but to a lower extent. The same can be argued for the estimates for the role of having exported product j elsewhere and the past "core competence" condition of such product. The negative coefficients for $lag\_ln\_real\_ev\_USA\_tot_i$ imply that the better the firm did in $t-1$ in terms of export sales to USA, the lower the export growth for product j to that market, which makes sense, as it provides the idea that a firm might be close to their equilibrium value of exports to USA in $t-1$. Hence, the export growth in t does not need to be so large.

5.2 Model 2: Extensive Margin (Entry)

Through this second estimation on the extensive margin, I test Prediction 2 from the theory, which states that, conditional on survival, new firms in the US market are more likely to export new products to that destination than more experienced firms.

Applying a Linear Probability Model, the dependent variable for this regression, expressed in (26), is denoted as $Entry_{ijt}$. That is a binary variable taking value 1 if firm i exported product j to the United States in year t for the first time, and 0 otherwise. That dummy is regressed on the known binary variable, $new\_USA_{i,t-1}$, taking value 1 if the firm entered the US market for the first time in year $t-1$. Such variable again controls for new Peruvian exporters to the US, and it is expected to obtain a positive coefficient, since new exporters have more unexploited opportunities to follow up.

$$\begin{aligned} Pr[Entry_{ijt} = 1] = \beta_0 + \beta_1 new\_USA_{i,t-1} + \beta_2 fta_{jt} + \beta_3 fta * new\_USA_{ijt} + \\ \beta_4 similar\_prod_{ij,t-1} + \beta_5 newUSA * lag1else_{ijt} + \\ \beta_6 core50_{ijt} + \beta_7 newUSA * core50_{ijt} + \mu_{ijt} \end{aligned} \tag{26}$$

The effect of trade liberalisation is controlled for by the fta_{jt} variable described earlier, adding it on its own and interacting it with the dummy of new exporter in the US market. Given the implications from the theory, I expect a negative coefficient for the tariff change variable, making the entry probability with a new product higher for all firms. However, for $fta * new\_USA_{ijt}$, I would expect a positive sign, since Prediction 2 states that such entry probability growth is larger for the incumbent firms, for which it would be easier to export a liberalised product than for newcomers.

My extensive margin prediction is affected by the positive but imperfect correlation of the unknown export profitability μ^N across products. Such correlation can be interpreted as similarities across products, in terms of demand and supply patterns. In that sense, I incorporate the $similar\_prod_{ij,t-1}$ dummy, which takes value 1 if firm i exported to USA in $t-1$ at least one product belonging to the same 4-digit HS tariff group as the product j the firm exports in t. I expect a positive sign for that variable, as a firm that had a previous experience in $t-1$ exporting to USA a product from a particular tariff group would be more likely to experiment with a new product from that group. In further estimations, this dummy is interacted with the variables accounting for new exporters and trade liberalisation. The expected signs for these interactions are uncertain since the theory predicts that the effect of positive correlation depends on the firm's expected export profitabilities with respect to the known costs.

I also need to control for "core competence" products, by including the $core50_{ijt}$ dummy and its interaction with the new exporters dummy, $newUSA * core50_{ijt}$. Unlike Model 1, this time I use the level of $core50$, which takes value 1 if product j accounts for 50% or more of firm i's total exports in year t. For that dummy and its interaction, I expect, according to the prediction, a positive coefficient, as firms tend to experiment with a new product for which known production costs are lower; feature that is approximated by higher overall export sales.

As an additional covariate to control for the firm's experience in other destinations, I incorporate the interaction $newUSA * lag1else_{ijt}$, similar to that from Model 1; but now $new\_USA_{i,t-1}$ is interacted with the $lag1else$ dummy, taking value 1 if firm i exported product j to another market in $t-1$. My hypothesised sign is positive for this variable, as I can argue that a firm that exported a product to a previous destination, once in the US market will experiment there with that same product.

The entry into the US market with a new product might be also influenced by the performance of other firms in the Peruvian industry in the previous year. For that reason, inspired in Albornoz et al. (2012), in further estimations I include $ln\_lag\_n\_sec\_exp\_USA_t$, the number of exporters to the United States in year $t-1$ from the sector the product belongs to, as well as the growth of the log of exports from that sector to the US in year t, $gr\_ln\_real\_sector\_USA\_exports_t$. Like in Model 1, the log of exports by firm i to the US in year t-1 is added in some specifications. Year, sector and product fixed effects are also included.

Once again, standard errors are clustered at the firm level, and the sample includes firms exporting to the US for at least two years. However, since I am interested in the entry into a particular product, the firm-product pair is dropped from the sample from year t+1 onwards.

5.2.1 Main Results

Table 2 reports the main results from Model 2 on the extensive margin. The basic regression is shown in Column (1), while Columns (2)-(4) check the robustness of this first estimation controlling for further interactions involving fta_{jt} and $similar\_prod_{ij,t-1}$. Columns (5)-(8) replicate the exercise, adding controllers on the size of product j's sector.

A Peruvian firm with only one year of experience in the US market is more likely to export a new product j to that country in t than a more consolidated exporter, according the positive and significant estimates for $new\_USA_{i,t-1}$ across all the specifications. These numbers match the second prediction of the theoretical framework. Such positive effect is clearly boosted if that new exporter has exported product j elsewhere in $t-1$.

Table 2: Model 2 - Extensive Margin (Entry)

Dependent Variable	Entry_ijt							
Estimation	LPM							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	0.174***	0.174***	0.196***	0.196***	0.171***	0.171***	0.193***	0.193***
	(0.0353)	(0.0354)	(0.0371)	(0.0371)	(0.0353)	(0.0354)	(0.0372)	(0.0372)
newUSA*lag1else	0.0861**	0.0870**	0.107***	0.107***	0.0866**	0.0875**	0.108***	0.108***
	(0.0376)	(0.0375)	(0.0367)	(0.0367)	(0.0375)	(0.0375)	(0.0366)	(0.0366)
core50	0.541***	0.542***	0.553***	0.552***	0.539***	0.539***	0.551***	0.550***
	(0.0195)	(0.0200)	(0.0191)	(0.0186)	(0.0195)	(0.0201)	(0.0192)	(0.0186)
newUSA*core50	-0.112**	-0.100**	-0.00700	-0.00605	-0.111**	-0.0993**	-0.00619	-0.00538
	(0.0445)	(0.0461)	(0.0459)	(0.0456)	(0.0444)	(0.0460)	(0.0458)	(0.0456)
fta	-0.682***	-0.686***	-0.810***	-0.800***	-0.572***	-0.575***	-0.698***	-0.690***
	(0.211)	(0.217)	(0.235)	(0.228)	(0.211)	(0.217)	(0.235)	(0.228)
fta*new_USA	1.341***	1.309***	1.215**	1.204**	1.312***	1.278***	1.190**	1.181**
	(0.441)	(0.447)	(0.496)	(0.492)	(0.439)	(0.445)	(0.494)	(0.490)
fta*core50		0.0831	0.183			0.0544	0.154	
		(0.466)	(0.472)			(0.467)	(0.473)	
ftanewUSA*core50		1.733	1.984	2.167		1.755	2.006	2.160
		(1.673)	(1.431)	(1.341)		(1.662)	(1.424)	(1.333)
similar_prod	0.217***	0.217***	0.336***	0.336***	0.214***	0.214***	0.332***	0.332***
	(0.0202)	(0.0202)	(0.0275)	(0.0275)	(0.0204)	(0.0204)	(0.0277)	(0.0277)
newUSA*similar			-0.241***	-0.241***			-0.240***	-0.240***
			(0.0399)	(0.0399)			(0.0398)	(0.0398)
core50*similar			-0.303***	-0.302***			-0.302***	-0.302***
			(0.0579)	(0.0579)			(0.0580)	(0.0580)
fta*similar			1.579***	1.572***			1.564***	1.557***
			(0.457)	(0.456)			(0.460)	(0.458)
ftanewUSA*similar			-1.098*	-1.091			-1.109*	-1.102*
			(0.667)	(0.665)			(0.667)	(0.666)
ln_lag_n_sec_exp_USA					0.0445***	0.0445***	0.0429***	0.0430***
					(0.00717)	(0.00716)	(0.00719)	(0.00719)
gr_ln_real_sector_USA_exports					-0.0340**	-0.0340**	-0.0341**	-0.0341**
					(0.0153)	(0.0153)	(0.0153)	(0.0154)
N	28488	28488	28488	28488	28488	28488	28488	28488
r2_o	0.100	0.101	0.107	0.107	0.102	0.102	0.109	0.109
N_clust	1158	1158	1158	1158	1158	1158	1158	1158

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

The hypothesis on the relation between the "core competence" condition of a product and the extensive margin growth is supported by the estimations, since I obtain positive and significant coefficients for the $core50_{ijt}$ dummy. This means that firm i is more likely to export to USA a new product that accounts for a minimum of 50% of its total exports, as a proxy for production efficiency. That effect is also positive for new Peruvian exporters to USA; however, given the negative sign and lower absolute values for the $newUSA * core50_{ijt}$ interaction, such effect for new firms is not as large as for more consolidated exporters.

The variables controlling for trade liberalisation provide results that are consistent with the implications from the theory. A tariff elimination by USA on Peruvian products is linked with an increase in the entry probability by a firm into that market with product j, according to the negative and significant coefficients for fta_{jt} across all specifications. However, that rise in the entry probability is offset for newcomers, compared to the most established firms in the US market. That is represented by the positive and significant values for $fta * new\_USA_{ijt}$, which is larger in absolute value, meaning that new Peruvian exporters are in disadvantage with respect to the incumbents in the US market at the extensive margin, presumably due to a larger degree of competition from liberalisation. The latter gives certain support to Prediction 2, which states that the increase in the entry probability with trade liberalisation is larger for expert firms. Regarding the $fta * core50$ and $ftanewUSA * core50$ interactions, there seems not to be differences in the liberalisation effect between core and non-core products.

The positive and imperfect correlation across products, understood as similarities across goods, is accounted for by the $similar\_prod_{ij,t-1}$ dummy, which is positive and significant in all the regressions, supporting my initial expectations. Hence, firms tend to undertake a *sequential exporting* strategy with products that belong to a common 4-digit tariff group. The interactions of that dummy provide interesting results. The interaction with $new\_USA_{i,t-1}$ gives negative and significant numbers with lower absolute value, meaning that the effect of having previously exported a similar product to USA is greater for an incumbent firm. These negative signs can also be related to the prediction arising from the case in which $E\mu^{Nj} > 2F_d^{1/2} + \tau^j + c^{pj}$, meaning that new firms tended to export correlated products simultaneously, rather than sequentially.[24] Likewise, the negative and significant values for the interaction between similar products and the $core50_{ijt}$ dummy entail that the "similar" effect might be larger for "non-core competence" products. However, the results for these variables will be afterwards compared with further regressions.

More consolidated firms in the US market are encouraged to diversify their export portfolio with other type of products when liberalisation occurs. That is expressed by the positive and significant coefficients for the $fta * similar$ interaction. In contrast, the $ftanewUSA * similar$ interaction, through its negative –although less significant– coefficients, indicate that the disadvantage for new firms at the extensive margin in the event of liberalisation is somehow compensated if those firms experiment with a similar product to the one previously exported.

No major changes in the coefficients of interest take place when adding the variables on the size of product j's sector, accounting for competition level. These variables imply that the entry probability with product j is positively associated with the degree of competition in terms of number of exporters to USA from that sector (positive values for $ln\_lag\_n\_sec\_exp\_USA$); while a negative association is attained in terms of the growth of the sectoral export volume (negative coefficients for $gr\_ln\_real\_sector\_USA\_exports$).

Appendix B reports the results from Model 2 when controlling for firm i's past performance in the US market, time and sector fixed effects and product-specific dummies. The most evident change is the loss of significance for the variables of interest –new exporter and trade liberalisation covariates– when $lag\_ln\_real\_ev\_USA\_tot_i$ is included. This variable, controlling for the export to USA in $t-1$ always provides positive coefficients, meaning that the more a firm exports to USA, the more likely it is to experiment in the future with new products. This outcome implies that the past performance plays a determinant role in Peruvian firms' export decisions in both the intensive and extensive margin.

There is another relevant and striking change when these additional controllers are included. The $newUSA * similar$ interaction, which was negative and significant in the main results, now turns positive and significant in most regressions. That difference between results can be interpreted as follows: a large exports value to USA by a firm can be arguably associated to the number of products it exports to that market. From my dataset, I can identify that larger exporters with more years in the US market, have already sold many products from the same tariff group in the past. In contrast, less experienced firms, tending to start with less products and lower values, might be more likely to continue experimentation with a product from the same 4-digit tariff group as those exported to USA last year.

[24] Recall that in such case, the larger the correlation across products, the greater the cutoff of μ^{NA} above which a firm exports sequentially, meaning that the value of experimentation is lower. Hence, it will be preferred to export simultaneously.

5.3 Model 3: Exit from a Market

The last model I present was designed to test Prediction 3, which states that new firms in the US market are more likely than more consolidated exporters to stop exporting a particular product to that country; and that such probability is reduced by trade liberalisation, and is also lower for core competence products.

Another Linear Probability Model is estimated, which basic specification is expressed in (27). The dependent variable, denoted as $Exit_{ijt}$, is a binary variable that takes value 1 if firm i stops exporting product j to the United States in year t, and 0 otherwise.

$$\begin{aligned} Pr[Exit_{ijt} = 1] = \gamma_0 + \gamma_1 new\_USA_{i,t-1} + \gamma_2 fta_{jt} + \\ \gamma_3 fta * new\_USA_{ijt} + \gamma_4 newUSA * lag1else_{ijt} + \\ \gamma_5 core50_{ijt} + \gamma_6 newUSA * core50_{ijt} + \mu_{ijt} \end{aligned} \tag{27}$$

That dummy is regressed on the $new\_USA_{i,t-1}$ binary variable defined in Model 1, controlling for the entry of firm i into the US market in year $t-1$ with product j. The variable accounting for the US trade liberalisation in 2009 is included on its own, and interacted with $new\_USA_{i,t-1}$. I expect a positive coefficient for the dummy on new exporters to USA. For the liberalisation variables, I also expect positive signs, because the theoretical framework predicts that a tariff reduction diminishes the exit likelihood by firms, especially the less experienced ones, from the business of exporting product j to destination d.

Like in the previous models, I control for the firm's performance in other destinations by incorporating the aforementioned $newUSA * lag1else_{ijt}$, for which I expect a negative sign, meaning that a new exporter to USA is less likely to stop exporting product j to that market if it previously exported that good elsewhere.

Regarding the role of production costs, I again try to approximate their effect by using the $core50_{ijt}$ dummy on its own and interacted with $new\_USA_{i,t-1}$. Following the theory, I expect both variables to provide negative coefficients, meaning that a core competence product makes the firm's exit probability lower, especially for new firms in the US market. For reasons I will explain when presenting the results, I experiment by using these variables in levels ($core50_{ijt}$) and in lags ($lag1\_core50_{ijt}$), like in the *intensive margin* model.

Aiming to control for firm i's past performance in the US market, I include in some specifications the variable $lag\_ln\_real\_ev_{ijt}$, which represents the log of the real export value of product j by firm i to the United States in $t-1$. Fixed effects utilised in the previous models are included, such as year, product and sector fixed effects.

For this third estimation, all exporters to the US from 2006 to 2013 are considered, with no restriction on the number of years they have exported within the sample. As I am interested in the transition from exporting to not exporting, observations with zero exports per firm-product pair before the first non-zero export are dropped, as well as the observations per firm-product pair after the year the $Exit_{ijt}$ dummy becomes 1. Once again, the robust standard errors are clustered at the firm level.

5.3.1 Main Results

Table 3 displays the main results from this model. The basic specification from (27) is presented in Column (1), while the next two columns incorporate some interactions with the tariff change variable. Columns (4)-(6) mirror those estimations, but additionally control for the lag of firm i's export of product j to USA, year, sector, ATPDEA and MFN dummies.

These specifications indicate that a Peruvian firm with only one year of experience in the US market, exporting their first products in $t-1$, is more likely to stop exporting product j to that country in year t, compared to the incumbent exporters. This is shown by the positive and highly significant coefficients for $new\_USA_{i,t-1}$. That exit probability tends to diminish if that new firm previously exported product j to another market in $t-1$, given the negative values for the $newUSA * lag1else_{ijt}$ interaction, which are significant in Columns (4)-(6).

Table 3: Model 3 - Exit - controlling for core products in year t

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.172***	0.173***	0.173***	0.186***	0.187***	0.187***
	(0.0245)	(0.0246)	(0.0246)	(0.0173)	(0.0173)	(0.0173)
newUSA*lag1else	0.00185	0.00212	0.00215	-0.0699***	-0.0698***	-0.0698***
	(0.0314)	(0.0313)	(0.0314)	(0.0212)	(0.0211)	(0.0211)
core50	-0.510***	-0.511***	-0.515***	-0.343***	-0.343***	-0.343***
	(0.0120)	(0.0120)	(0.0120)	(0.0115)	(0.0115)	(0.0117)
newUSA*core50	-0.0482*	-0.0604**	-0.0573**	-0.160***	-0.165***	-0.166***
	(0.0285)	(0.0288)	(0.0288)	(0.0224)	(0.0228)	(0.0228)
fta	0.228	0.227	0.301	-0.222	-0.222	-0.228
	(0.263)	(0.263)	(0.289)	(0.173)	(0.173)	(0.184)
fta*new_USA	0.589	0.711	0.634	0.704***	0.757***	0.763***
	(0.430)	(0.455)	(0.469)	(0.269)	(0.282)	(0.290)
fta*core50			-0.613*			0.0491
			(0.357)			(0.284)
ftanewUSA*core50		-1.219**	-0.607		-0.495	-0.544
		(0.525)	(0.629)		(0.448)	(0.526)
lag_ln_real_ev				0.0491***	0.0491***	0.0491***
				(0.00163)	(0.00163)	(0.00163)
Year FE				Yes	Yes	Yes
Sector FE				Yes	Yes	Yes
ATPDEA and MFN dummies				Yes	Yes	Yes
N	31882	31882	31882	27434	27434	27434
r2_o	0.0986	0.0986	0.131	0.246	0.246	0.246
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

The negative and significant estimates for the variables controlling for core products inform that the firm is more likely to remain exporting a product if it was one of the firm's core competences in year t. There is an additional preventing effect from exit by $core50_{ijt}$ for new firms, identified from the negative and significant values for the $newUSA * core50$ interaction.

Regarding the liberalisation variables, the tariff change on its own does not seem to represent any effect on the exit likelihood. However, it does represent an effect for newcomers, because the positive and significant coefficients for $fta * new\_USA_{ijt}$ in Columns (4)-(6) report that the tariff elimination by USA in 2009 reduced the new firms' probability of stopping the export of product j to that market. The interactions of trade liberalisation with the $core50_{ijt}$ dummy do not provide quite significant effects.

When controlling for firm i's past performance and the other fixed effects, few changes to the variables of interest occur. The positive and significant values for the firm's export value of product j in $t-1$ might be an indicator that the more of j the firm exported in the past, the more ready is to export other products.

Appendix B contains six additional regressions for Model 3. The first three columns show results controlling for MFN and ATPDEA dummies, along with time and sector fixed effects; while the other three only add the lag of the export value of product j. No major differences from the main regressions are perceived, except that the robustness of the main conclusions for the variables of interest is strengthened by the inclusion of $lag\_ln\_real\_ev_{ijt}$.

Since the "core competence" condition of a product may vary over time, I considered it informative to make an experiment, shown in Appendix B, which replace the level of the "core50" condition with its first lag,$lag1\_core50_{ijt}$, including the $newUSA * lag1core50_{ijt}$ interaction. The patterns followed by the main variables of interest remain unchanged. Moreover, $fta * new\_USA_{ijt}$ and $newUSA*lag1else_{ijt}$ exhibit a greater significance across regressions. However, the fall in the exit likelihood for products that account for 50% or more of the firm's total exports is not so evident when controlling for "core competence" products in $t-1$. Without including the lag of the firm's export value of product j, the $lag1\_core50_{ijt}$ variable and its interaction with $new\_USA_{i,t-1}$ obtain positive and significant values. But when controlling for firm i's past performance, although $lag1\_core50_{ijt}$ reports negative estimates like in Table 3; the $newUSA * lag1core50$ interaction again gives positive coefficients.[25]

6 Robustness Checks

In this section, I summarise the main results from the robustness checks I run for the three models developed, mainly focusing on the alternatives to control for core competence products, and how this "core competence" effect on the export growth and exit differs across firm sizes.

6.1 Interactions between Core Products and Firm Size

One first attempt is to interact the original $core50$ dummy with binary variables accounting for firm size, measured by the mean total annual exports of firms between 1998 and 2013, in order to determine whether there are differences in the effect of "core competence" products across firm size. In the previous descriptive analysis, I distinguished four size categories: *large firms*, with mean annual exports over US$ 1,000,000; *medium firms*, with mean annual exports between US$ 100,000 and US$ 1,000,000; *small firms*, with mean annual exports between US$ 10,000 and US$ 100,000; and *very small firms* –my reference category in this exercise–, with mean annual exports below US$ 10,000. These firm size dummies are also interacted with the previously constructed interaction between $core50$ and the new_USA variable.

For Model 1 on the *intensive margin*, as can be recalled, I used the first lag of that $core50$ dummy to assess if the "core competence" condition of product j in $t-1$ had an effect on the export growth in time t. Table 4 presents the results of this robustness check, which does not lead to major changes for the main variables of interest. In fact, $new\_USA_{i,t-1}$ conserves its positive and significant values; while the tariff change from 2008 to 2009 still shows negative but rarely significant coefficients.

Regarding the results for $lag1\_core50$ and its interaction with $new\_USA_{i,t-1}$, the negative and significant values for the former and the significantly positive numbers for the latter confirm what the main estimations showed, matching the prediction from the theoretical analysis: export

[25]The sign change for $lag1\_core50_{ijt}$ when including the lag of exports of product j to USA makes sense, as the "core competence" condition of product j in $t-1$ might partly be explained by the amount of that good exported to USA in that year.

growth rates are bigger for "non-core competence" products. That effect holds for both new and expert firms; but tends to be larger for the latter.

The incorporation of the firm size provides an interesting outcome: this positive effect for non-core products tend to fade out the larger the firm is in terms of export sales. That is derived from the positive and significant numbers for the interactions with firm size, implying that the effect of non-core products, as an approximation of more costly products, on the intensive margin is more relevant for the smallest firms.

Table 4: Model 1 - Intensive Margin - including interactions between lag1_core50 and firm size

Dependent Variable	gr_ln_real_ev							
Estimation	FE Robust							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	2.261***	2.285***	2.090***	2.088***	1.203***	1.199***	1.113***	1.112***
	(0.261)	(0.261)	(0.259)	(0.259)	(0.232)	(0.230)	(0.226)	(0.226)
fta	-4.828*	-4.839*	-4.809*	-4.478	-3.086	-3.086	-3.011	-2.888
	(2.683)	(2.682)	(2.693)	(2.855)	(2.400)	(2.400)	(2.403)	(2.504)
fta*new_USA	7.519	9.031*	10.03*	9.691*	3.678	3.439	3.672	3.549
	(4.776)	(5.411)	(5.432)	(5.502)	(4.047)	(4.611)	(4.572)	(4.614)
newUSA*lag2else	-2.458***	-2.446***			-0.844**	-0.845**		
	(0.436)	(0.437)			(0.366)	(0.367)		
lag1_core50	-6.171***	-6.172***	-6.155***	-6.167***	-3.769***	-3.768***	-3.759***	-3.763***
	(0.333)	(0.334)	(0.335)	(0.337)	(0.257)	(0.257)	(0.257)	(0.258)
lag1core50*small	1.879***	1.874***	1.939***	1.926***	1.282***	1.283***	1.305***	1.300***
	(0.472)	(0.472)	(0.474)	(0.477)	(0.340)	(0.340)	(0.340)	(0.343)
lag1core50*medium	3.307***	3.299***	3.331***	3.333***	2.816***	2.817***	2.828***	2.828***
	(0.509)	(0.509)	(0.510)	(0.510)	(0.360)	(0.360)	(0.360)	(0.360)
lag1core50*large	4.721***	4.720***	4.807***	4.809***	2.867***	2.867***	2.894***	2.895***
	(0.542)	(0.542)	(0.546)	(0.546)	(0.400)	(0.400)	(0.401)	(0.401)
newUSA*lag1core50	1.139**	1.070**	1.006**	1.019**	1.191***	1.202***	1.188***	1.193***
	(0.473)	(0.476)	(0.487)	(0.488)	(0.417)	(0.418)	(0.420)	(0.421)
newUSA*lag1core50*small	-0.131	-0.194	-0.483	-0.471	-0.112	-0.102	-0.206	-0.202
	(0.563)	(0.565)	(0.585)	(0.586)	(0.508)	(0.509)	(0.515)	(0.516)
newUSA*lag1core50*medium	-1.425**	-1.450**	-1.953***	-1.956***	-2.113***	-2.109***	-2.288***	-2.289***
	(0.679)	(0.679)	(0.693)	(0.693)	(0.622)	(0.621)	(0.616)	(0.616)
newUSA*lag1core50*large	-0.664	-0.642	-1.341	-1.346	-2.511***	-2.515***	-2.767***	-2.768***
	(0.964)	(0.965)	(0.941)	(0.941)	(0.849)	(0.848)	(0.835)	(0.835)
fta*lag1core50				-2.773				-1.003
				(5.106)				(4.059)
ftanewUSA*lag1core50		-7.840	-8.947	-6.167		1.234	0.902	1.907
		(6.410)	(6.383)	(7.980)		(5.909)	(5.862)	(7.077)
lag_ln_real_ev_USA_tot					-0.551***	-0.551***	-0.552***	-0.552***
					(0.0209)	(0.0209)	(0.0209)	(0.0209)
Firm Size dummies					Yes	Yes	Yes	Yes
Year FE					Yes	Yes	Yes	Yes
Sector FE					Yes	Yes	Yes	Yes
ATPDEA and MFN dummies					Yes	Yes	Yes	Yes
N	17077	17077	17077	17077	17077	17077	17077	17077
r2_o	0.0421	0.0420	0.0417	0.0417	0.172	0.172	0.172	0.172
N_clust	1000	1000	1000	1000	1000	1000	1000	1000

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Equally interesting results are obtained for Model 2 on the *extensive margin*, presented in Table 5. The main variables of interest, controlling for new exporters and trade liberalisation, do not experience obvious modifications in sign and significance. The same can be argued for similarities across products, the size of the sector and condition of exporting elsewhere. Appendix C shows, however, that significance is lost when controlling for year and sector fixed effects, ATPDEA and MFN dummies and firm i's past performance in the US market.

The *core*50 dummy obtains the positive and significant values predicted by the theoretical model. All specifications show that both new firms and incumbents tend to experiment in the

US market with a core product, but such effect tends to be slightly larger for the expert ones. When controlling for the firm size, the role of "core competence" products turns more irrelevant the larger the firm is. As a result, the effect of a top 50% product, as an approximation of less costly products, on the extensive margin is greater for the smallest firms.

Table 5: Model 2 - Extensive Margin (Entry) - including interactions between core50 and firm size

Dependent Variable	Entry_ijt							
Estimation	LPM							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	0.171***	0.171***	0.194***	0.194***	0.168***	0.168***	0.191***	0.191***
	(0.0353)	(0.0354)	(0.0372)	(0.0372)	(0.0353)	(0.0354)	(0.0372)	(0.0372)
fta	-0.676***	-0.688***	-0.814***	-0.796***	-0.564***	-0.575***	-0.701***	-0.684***
	(0.211)	(0.217)	(0.234)	(0.227)	(0.210)	(0.216)	(0.234)	(0.227)
fta*new_USA	1.329***	1.327***	1.221**	1.203**	1.299***	1.296***	1.197**	1.180**
	(0.438)	(0.445)	(0.496)	(0.491)	(0.436)	(0.443)	(0.493)	(0.489)
similar_prod	0.221***	0.221***	0.336***	0.336***	0.218***	0.218***	0.333***	0.333***
	(0.0200)	(0.0200)	(0.0275)	(0.0275)	(0.0201)	(0.0202)	(0.0277)	(0.0277)
ln_lag_n_sec_exp_USA					0.0472***	0.0472***	0.0456***	0.0456***
					(0.00744)	(0.00744)	(0.00743)	(0.00743)
gr_ln_real_sector_USA_exports					-0.0337**	-0.0337**	-0.0336**	-0.0337**
					(0.0153)	(0.0153)	(0.0153)	(0.0153)
newUSA*lag1else	0.104***	0.104***	0.120***	0.120***	0.104***	0.105***	0.120***	0.120***
	(0.0382)	(0.0382)	(0.0373)	(0.0373)	(0.0381)	(0.0381)	(0.0372)	(0.0372)
core50	0.723***	0.725***	0.728***	0.726***	0.723***	0.724***	0.728***	0.726***
	(0.0221)	(0.0225)	(0.0225)	(0.0222)	(0.0220)	(0.0224)	(0.0224)	(0.0221)
core50*small	-0.211***	-0.211***	-0.206***	-0.206***	-0.214***	-0.214***	-0.209***	-0.209***
	(0.0415)	(0.0415)	(0.0406)	(0.0406)	(0.0415)	(0.0415)	(0.0405)	(0.0405)
core50*medium	-0.356***	-0.356***	-0.347***	-0.348***	-0.361***	-0.360***	-0.352***	-0.352***
	(0.0405)	(0.0406)	(0.0398)	(0.0398)	(0.0404)	(0.0405)	(0.0397)	(0.0397)
core50*large	-0.590***	-0.591***	-0.577***	-0.576***	-0.593***	-0.594***	-0.581***	-0.579***
	(0.0645)	(0.0646)	(0.0625)	(0.0624)	(0.0646)	(0.0646)	(0.0625)	(0.0624)
newUSA*core50	-0.119**	-0.118**	-0.0772	-0.0752	-0.118**	-0.118**	-0.0770	-0.0752
	(0.0475)	(0.0485)	(0.0510)	(0.0507)	(0.0475)	(0.0485)	(0.0510)	(0.0506)
newUSA*core50*small	0.00702	0.0120	0.0969	0.0964	0.00789	0.0127	0.0972	0.0968
	(0.0832)	(0.0827)	(0.0717)	(0.0716)	(0.0833)	(0.0827)	(0.0718)	(0.0718)
newUSA*core50*medium	-0.137	-0.126	-0.0771	-0.0772	-0.135	-0.124	-0.0754	-0.0755
	(0.0962)	(0.0992)	(0.0960)	(0.0960)	(0.0960)	(0.0989)	(0.0957)	(0.0957)
newUSA*core50*large	0.0758	0.0757	0.153	0.151	0.0728	0.0725	0.149	0.148
	(0.118)	(0.118)	(0.119)	(0.119)	(0.116)	(0.117)	(0.118)	(0.118)
core50*similar		0.240	0.328			0.211	0.298	
		(0.447)	(0.455)			(0.447)	(0.455)	
fta*core50		0.509	0.862	1.188		0.527	0.880	1.176
		(1.781)	(1.458)	(1.380)		(1.770)	(1.451)	(1.374)
ftanewUSA*core50			-0.227***	-0.227***			-0.226***	-0.226***
			(0.0481)	(0.0481)			(0.0481)	(0.0481)
newUSA*similar			-0.243***	-0.243***			-0.242***	-0.242***
			(0.0398)	(0.0398)			(0.0397)	(0.0397)
fta*similar			1.598***	1.584***			1.581***	1.568***
			(0.457)	(0.455)			(0.459)	(0.457)
ftanewUSA*similar			-1.086	-1.072			-1.096	-1.084
			(0.669)	(0.668)			(0.669)	(0.668)
Firm Size dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	28488	28488	28488	28488	28488	28488	28488	28488
r2_o	0.106	0.106	0.111	0.111	0.107	0.107	0.112	0.113
N_clust	1158	1158	1158	1158	1158	1158	1158	1158

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Under the same logic, I re-estimated Model 3 on *exit*, which results are illustrated in Table 6. The patterns identified for the main variables of interest are almost identical to those in the first results. Hence, less experienced firms are more likely to stop exporting a product to USA, but trade liberalisation prevents them from making that decision.

When looking at the results for products being a "core competence" in period t, it is clear that such condition encourages the firm to keep on exporting that product to USA, given the negative and significant sign for $core50$. This encouraging effect is shown to be even larger for the least experienced firms, derived from the negative and significant coefficients for the interaction with $new\_USA_{i,t-1}$ in columns (4)-(6). Nonetheless, when controlling for the firm size, the exit-preventing effect for both new and expert firms gets offset the larger the firm is, proving that such effect is more relevant for the smallest ones. Further similar results are presented in Appendix C.

Table 6: Model 3 - Exit (core competence in t) - including interactions between core50 and firm size

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.159***	0.161***	0.160***	0.191***	0.192***	0.192***
	(0.0248)	(0.0249)	(0.0249)	(0.0175)	(0.0175)	(0.0175)
fta	0.243	0.242	0.304	-0.221	-0.221	-0.228
	(0.263)	(0.263)	(0.289)	(0.172)	(0.172)	(0.183)
fta*new_USA	0.538	0.637	0.574	0.697***	0.755***	0.762***
	(0.430)	(0.453)	(0.468)	(0.269)	(0.281)	(0.289)
newUSA*lag1else	0.0101	0.0103	0.0103	-0.0840***	-0.0839***	-0.0839***
	(0.0324)	(0.0324)	(0.0324)	(0.0215)	(0.0215)	(0.0215)
core50	-0.657***	-0.657***	-0.660***	-0.311***	-0.310***	-0.310***
	(0.0159)	(0.0159)	(0.0160)	(0.0145)	(0.0145)	(0.0147)
core50*small	0.228***	0.227***	0.225***	-0.0362*	-0.0370*	-0.0368*
	(0.0217)	(0.0217)	(0.0215)	(0.0207)	(0.0207)	(0.0207)
core50*medium	0.290***	0.288***	0.288***	-0.0543*	-0.0551*	-0.0550*
	(0.0256)	(0.0256)	(0.0255)	(0.0286)	(0.0285)	(0.0286)
core50*large	0.383***	0.382***	0.382***	-0.119**	-0.120**	-0.120**
	(0.0340)	(0.0341)	(0.0341)	(0.0530)	(0.0530)	(0.0530)
newUSA*core50	0.0316	0.0229	0.0252	-0.236***	-0.241***	-0.241***
	(0.0355)	(0.0354)	(0.0354)	(0.0289)	(0.0289)	(0.0290)
newUSA*core50*small	-0.102***	-0.106***	-0.105***	0.0490	0.0467	0.0465
	(0.0370)	(0.0370)	(0.0369)	(0.0370)	(0.0371)	(0.0371)
newUSA*core50*medium	-0.147***	-0.148***	-0.148***	0.142***	0.142***	0.142***
	(0.0420)	(0.0417)	(0.0417)	(0.0411)	(0.0411)	(0.0411)
newUSA*core50*large	-0.156***	-0.156***	-0.156***	0.342***	0.342***	0.342***
	(0.0563)	(0.0562)	(0.0562)	(0.0579)	(0.0581)	(0.0581)
fta*core50			-0.511			0.0548
			(0.349)			(0.281)
ftanewUSA*core50		-0.992*	-0.483		-0.554	-0.609
		(0.536)	(0.632)		(0.454)	(0.530)
lag_ln_real_ev				0.0498***	0.0495***	0.0498***
				(0.00162)	(0.00168)	(0.00162)
Firm Size dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year FE				Yes	Yes	Yes
Sector FE				Yes	Yes	Yes
ATPDEA and MFN dummies				Yes	Yes	Yes
N	31882	31882	31882	27434	27434	27434
r2_o	0.0418	0.0419	0.0418	0.188	0.188	0.188
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

I additionally developed an exercise employing the first lag of $core50$, displayed in Appendix C, in which the outcome for the main variables of interest do not change notoriously. Like in the main results, however, the effect of exporting a product that was a "core competence" in $t-1$ is interpreted in a different way, since that condition is associated with a higher exit probability, for both new firms and incumbents in the US market. But if I control for the firm size, that increase in the exit likelihood gets lower and even turns into a negative effect on exit the larger the firm is. Therefore, I can argue that, since the smallest firms are likely to have a brief experience exporting j, the fact that such good is currently a core product, encourages them more to remain exporting it to USA. For larger firms, which presumably have more experience producing a core product, that past experience seems to be more influential for them to make the decision to stay in the export business to USA with that product.

6.2 Alternative Criteria for Core Products

Throughout the research, I have been considering a product as a core competence for a firm if its annual export sales accounted for a minimum of 50% of firm i's total exports to the world. Such assumption may be judged as very restrictive, leading to a limited amount of goods treated as core. Hence, as a next experiment, I expand the definition of "core competence" to a wider range of products, by creating the $core25$ and $core10$ dummies. Thus, I treat product j as core if it accounts for a minimum of 25% and 10% of firm i's total annual sales to the rest of the world, respectively. These dummies are included into the models on their own and interacted with $new\_USA_{i,t-1}$ and the liberalisation variables. Recall that in Models 2 and 3 I control for the level of the core dummies; while for Model 1 I consider the first lag.

The main results for the experiment with the $core25$ and $core10$ dummy can be found at Appendix D and Appendix E, respectively. Overall, the findings I obtained from the main exercise with the $core50$ variables hold for these alternative definitions of core competence products; both in terms of sign and significance. In terms of the value of the estimates, no major changes are perceived either; perhaps a slight reduction in the absolute value of some estimates when changing the core competence definition from 50% to 25%; and a subsequent tiny rise of values when moving from 25% to 10%.

6.3 Annual Transactions Greater than US$ 1,000

Diverse studies working with firm-level exports data make use of a lower bound for annual exports, in order to prevent any distortions or biases probably caused by very small export transactions, such as sample deliveries. For this research, given the massive presence of annual exports per firm/product pair lower than US$ 1,000, I employ this value as a lower bound, so as to compare the subsequent results with the original regressions. By using that threshold, Model 1's dataset drops by 33.6%; 43.7% for Model 2 on entry; and 46.5% for Model 3 on exit.

As in previous robustness checks, the main conclusions on the effects of being a new exporter, trade liberalisation, and core competence products are not affected by restricting the annual exports to a minimum of US$ 1,000, both in terms of signs and significance of the estimates.

Regarding the values of coefficients, some patterns can be mentioned. In Model 1, the effect of being a one-year experienced firm in the US market on export growth tends to be greater, as well as the effect of exporting a product that was not a core competence in $t-1$. In Model 2 on entry, $new\_USA_{i,t-1}$ gets lower values; the difference in the effect of trade liberalisation between new and expert firms (comparing values of fta_{jt} and $fta * new\_USA_{ijt}$) turns larger in favour of the incumbents; and the effect of product j being a core one gets slightly larger. Finally, for Model 3, the positive relation between being a newcomer and the exit likelihood gets smaller. Also, the exit-preventing role of trade liberalisation for less expert firms loses strength; while the effect of core competence products on exit prevention gets larger, especially for more consolidated firms. The details of these results can be found in Appendix F.

7 Conclusions

This paper examines the differences in export dynamics across products within one destination, between less experienced exporters and more consolidated firms in a market. First, it develops a theoretical approach pursuing to illustrate the firms' export strategy in a particular destination, with uncertain export profitabilities, assumed to be correlated across products and over time. Depending on their known costs and expected profits, a firm may decide to export products sequentially over time, simultaneously, or not to enter at all to that destination.

From that framework, three predictions can be inferred regarding the export dynamics of new exporters (one-year experience in a destination) in terms of their growth in the *intensive margin*, *extensive margin* and their *exit* probability from an export business, considering the role of trade liberalisation and the difference between "non-core" and "core competence" products.

These predictions are empirically tested with a very rich dataset of Peruvian exports to the US market, at the firm-product level, from 2006 to 2013. Both theoretical and empirical approaches consider the issue of trade liberalisation and the difference in dynamics across products, depending on the "core competence" condition of a product for a firm. This research is one of the first attempts to measure the effects of the Free Trade Agreement signed by Peru and the United States on the performance of Peruvian exporters.

Overall, the results from my empirical tests give support to the predictions derived from the model. There is a positive association, conditional on survival, between the "new exporter" condition of a firm in the US market, compared to more consolidated ones, and the export growth for the first products it sells to that destination (intensive margin). A boost is also established at the extensive margin, since newcomers to USA are more likely to export a new product to that market in the future than the incumbent firms. Nevertheless, those newcomers are more likely to stop exporting a product there than the experts.

From my outcomes, trade liberalisation, expressed as the tariff elimination by USA on Peruvian products via the Free Trade Agreement in 2009, does not seem to mean an additional incentive to firms, especially the new entrants, to grow at the intensive margin. It does represent a boost for more experienced firms to export new products to USA (extensive margin) compared to newcomers, just like the theoretical model entails. But the results also confirm that trade liberalisation prevents the least expert Peruvian firms from exiting the export business of a particular product to the US.

There are differences in the effect of being a new exporter across products. For the intensive margin, the export growth of a new firm selling to the US is larger for non-core competence products –not so well-performing goods–, matching the theory's implications. Also backing the theoretical predictions, a Peruvian newcomer to USA is more likely to begin exporting a relatively good product in terms of sales –a core-competence product–, and even more likely if that product is similar to others previously exported. Besides, if the product is a core-competence one, that new firm is less likely to stop exporting it. Moreover, according to my robustness checks, all these mentioned effects are particularly larger for the smallest firms, measured in terms of mean annual exports. Nonetheless, it is necessary to point out that the core-competence effects on the extensive margin tend to be more important for incumbents than for new exporters.

The analysis implemented is limited by the lack of data, such as firm-specific characteristics to account for heterogeneity or product-specific information on production costs.

There are surely other factors that affect firms' decision to enter or exit the export business in the US market, from both the supply and demand side. One of those is the economic crisis occurred in 2009, the same year the USA-Peru FTA came into force. I disentangle the effects of liberalisation from the crisis by considering the tariff reduction per product. The lack of significance of trade liberalisation in the extensive margin model might be due to other factors not considered in firms' decision-making process, such as the anticipation of the 2009 USA-Peru FTA. This issue can be accounted for in further stages, as well as the fact that some industries are more credit constrained than others, affecting their performance in the export market.

Additional experiments to complement the findings of this research can be done, like the reformulation of the new exporter criterion. It would be interesting to consider two, three-year or even six-month experienced exporters as new to see how the initial results change.

Future research on the effect of trade liberalisation by USA on Peruvian export dynamics may include the geographical spread of trade at the firm level, inspired by a recent working paper by Borchert (2009a). That is, does the trade liberalisation that occurred between Peru and the United States boost Peruvian exporters' decision to enter third markets and increase their sales to those markets? The effects of this FTA and the previous unilateral liberalisation by USA under the ATPDEA regime on the duration (survival) of Peruvian firms' trade relations with that country may also be an interesting issue of further research.

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Appendix A Proof of the Model Predictions

A.1 Prediction 1: Intensive Margin

A.1.1 Without Trade Liberalisation

In a scenario without trade liberalisation, firms choose their optimal export values of their first product A to destination d in t=1,2 as follows:

1. At t=1, $q_1^A = 1_{\{E\mu^N > \tau^A + c_p^A\}}(\frac{E\mu^N - \tau^A - c_p^A}{2}) + 1_{\{E\mu^N \leq \tau^A + c_p^A\}}\varepsilon$
2. At t=2, if $\mu^N > \tau^A + c_p^A, q_2^A = \frac{\mu^N - \tau^A - c_p^A}{2}$

For $t = 2$, I can make an ex ante calculation of the expected value of q_2^A, conditional on survival; namely, if the discovered export profitability is greater than the known costs ($\mu^N > \tau^A + c_p^A$):

$$\begin{aligned} \text{Ex ante } E(q_2^A \mid \mu^N > \tau^A + c_p^A) &= \int_{\tau^A + c_p^A}^{\bar{\mu^N}} \frac{\mu^N - \tau^A - c_p^A}{2} \mathrm{d}G(\mu^N \mid \mu^N > \tau^A + c_p^A) \\ &= \frac{\int_{\tau^A + c_p^A}^{\bar{\mu^N}} \frac{\mu^N - \tau^A - c_p^A}{2} \mathrm{d}G(\mu^N)}{1 - G(\tau^A + c_p^A)} \\ &= \frac{E(\mu^N \mid \mu^N > \tau^A + c_p^A) - \tau^A - c_p^A}{2} > 0 \end{aligned} \tag{A.1}$$

Using this ex ante value for q_2^A, I am now able to calculate the firm's export growth of product A to d, denoted as δ^A, depending on its initial expectations:

$$\text{If } E\mu^N \leq \tau^A + c_p^A,\ \delta^A \equiv \frac{E(\mu^N \mid \mu^N > \tau^A + c_p^A) - \tau^A - c_p^A}{2} - \varepsilon > 0 \tag{A.2}$$

$$\begin{aligned} \text{If } E\mu^N > \tau^A + c_p^A,\ \delta^A &= \frac{E(\mu^N \mid \mu^N > \tau^A + c_p^A) - \tau^A - c_p^A}{2} - \frac{E\mu^N - \tau^A - c_p^A}{2} \\ &= \frac{1}{2}[E(\mu^N \mid \mu^N > \tau^A + c_p^A) - E\mu^N] > 0 \end{aligned} \tag{A.3}$$

Hence, regardless of the initial expectations by the firm on the export profitability, it will experience a positive export growth at the intensive margin in $t = 2$, conditional on having survived in $t = 1$. In order to clarify the outcome in (A.3), I can prove that the last term in squared brackets is positive. $E(\mu^N \mid \mu^N > \tau^A + c_p^A)$ can be expressed as:

$$
\begin{aligned}
E(\mu^N \mid \mu^N > \tau^A + c_p^A) &= \int_{\tau^A + c_p^A}^{\bar{\mu^N}} \mu^N \mathrm{d}G(\mu^N \mid \mu^N > \tau^A + c_p^A) \\
&= \int_{\tau^A + c_p^A}^{\bar{\mu^N}} \frac{\mu^N}{1 - G(\tau^A + c_p^A)} \mathrm{d}G(\mu^N) \\
&= \frac{1}{1 - G(\tau^A + c_p^A)} \{\bar{\mu^N} - \int_{\tau^A + c_p^A}^{\bar{\mu^N}} G(\mu^N)\mathrm{d}\mu^N\}
\end{aligned} \tag{A.4}
$$

The last term in curly brackets was obtained through integration by parts. Considering that $E\mu^N = \bar{\mu^N} - \int_{\underline{\mu^N}}^{\tau^A + c_p^A} G(\mu^N)\mathrm{d}\mu^N - \int_{\tau^A + c_p^A}^{\bar{\mu^N}} G(\mu^N)\mathrm{d}\mu^N$, I can rewrite (A.4) as:

$$
E(\mu^N \mid \mu^N > \tau^A + c_p^A) = \frac{1}{1 - G(\tau^A + c_p^A)} \{E\mu^N + \int_{\underline{\mu^N}}^{\tau^A + c_p^A} G(\mu^N)\mathrm{d}\mu^N\} \tag{A.5}
$$

This result, along with the fact that $G(\tau^A + c_p^A) > 0$ if $\tau^A + c^{pA} \in (\underline{\mu^N}, \bar{\mu^N})$ –making $\frac{1}{1-G(\tau^A + c_p^A)} > 1$–, proves that $E(\mu^N \mid \mu^N > \tau^A + c_p^A) > E(\mu^N)$ and, hence, the export growth δ^A for new exporters in destination d, conditional on survival, is positive.

For the next periods, no export growth is expected for product A, $\delta^A = 0$, since the further export values also depend on the already realised export profitability, which exceeds the known trade and production costs. In other words, for all $t > 1$, $E(q_t^A \mid \mu^N > \tau^A + c_p^A) = \frac{E(\mu^N \mid \mu^N > \tau^A + c_p^A) - \tau^A - c_p^A}{2}$.

As for the rest of products $j \neq A$, recall that the firm starts exporting that product to d in period t only if $\mu^N > 2F_d^{1/2} + \tau^j + c_p^j$. Since the uncertain export profitabilities are correlated over time and output decisions are based on them once realised, I do not expect any positive export growth for product j from t to $t+1$. Therefore, I expect the export values for product j to d to be the same over time:

$$
E(q_{t+1}^j) = E(q_t^j) = \frac{E(\mu^N \mid \mu^N > 2F_d^{1/2} + \tau^j + c_p^j) - \tau^j - c_p^j}{2}, \forall t > 1, \tag{A.6}
$$

which means that I also expect δ^j to be zero for products other than A. Hence, overall I expect a higher export growth for firm's first product sold in d, product A, between $t = 1$ and $t = 2$.

A.1.2 With Trade Liberalisation at t=2

Without trade liberalisation, it is cheaper to export product A to d ($\tau^A + c_p^A \leq \tau^B + c_p^B$). But if we assume that trade liberalisation, expressed as a tariff elimination, occurs in $t = 2$, it will be less costly to export product B since then, as $c_p^A > c_p^B$. This will have an effect on the firm's output decision from $t = 2$ onwards.

If the firm opts for a *sequential entry* strategy, it will experiment with product A in $t = 1$, because at that period it is still more efficient producing A. Hence, the calculation of q_1^A will be identical to the case of no liberalisation, with the small value ε for pessimistic expectations. However, at $t = 2$, when τ^A is eliminated, the firm will only consider the existing production cost c_p^A in its export decisions. Hence, at $t = 2$, if $\mu^N > c_p^A, q_2^A = \frac{\mu^N - c_p^A}{2}$.

When taking the ex ante expected value of q_2^A, now the "conditional on survival" constraint is limited to $\mu^N > c_p^A$, leading to:

$$\begin{aligned}
\text{Ex ante } E(q_2^A \mid \mu^N > c_p^A) &= \int_{c_p^A}^{\bar{\mu^N}} \frac{\mu^N - c_p^A}{2} \mathrm{d}G(\mu^N \mid \mu^N > c_p^A) \\
&= \frac{\int_{c_p^A}^{\bar{\mu^N}} \frac{\mu^N - c_p^A}{2} \mathrm{d}G(\mu^N)}{1 - G(c_p^A} \\
&= \frac{E(\mu^N \mid \mu^N > c_p^A) - c_p^A}{2} > 0
\end{aligned} \tag{A.7}$$

After this calculation above, I can again obtain the export growth δ^A, depending on the firm's initial expectations:

$$\text{If } E\mu^N \leq \tau^A + c_p^A,\ \delta^A \equiv \frac{E(\mu^N \mid \mu^N > c_p^A) - c_p^A}{2} - \varepsilon > 0 \tag{A.8}$$

$$\begin{aligned}
\text{If } E\mu^N > \tau^A + c_p^A,\ \delta^A &= \frac{E(\mu^N \mid \mu^N > c_p^A) - c_p^A}{2} - \frac{E\mu^N - \tau^A - c_p^A}{2} \\
&= \frac{1}{2}[E(\mu^N \mid \mu^N > c_p^A) + \tau^A - E\mu^N] > 0
\end{aligned} \tag{A.9}$$

Working on the last term in squared brackets in (A.9), as I did in the case of no liberalisation, I can conclude that δ^A when $E\mu^N > \tau^A + c_p^A$ is positive and greater than the export growth rate without the tariff elimination. This can be seen if I operate that term in squared brackets and obtain the following expression:

$$\text{If } E\mu^N > \tau^A + c_p^A,\ \delta^A = \frac{1}{2}[\frac{1}{1 - G(c_p^A)}\{E\mu^N + \int_{\underline{\mu^N}}^{c_p^A} G(\mu^N)\mathrm{d}\mu^N\} + \tau^A - E\mu^N], \tag{A.10}$$

which will be greater the larger the initial tariff and production costs are. This outcome means that the firm just entering destination d in $t = 1$, in spite of tending to experiment with cheaper products, will experience a greater export growth at $t = 2$ with products that are more costly to produce (non-core competence products) and/or initially more expensive to export.

If the firm decides to apply a *simultaneous entry* strategy in a context of trade liberalisation, it will also export product B in $t = 1$ because it expects that $E\mu^N \leq \tau^B + c_p^B$. Hence, in that case, the definition of its optimal export values in both periods and the correspondent export growth will be identical to what was done for product A at the *sequential entry* strategy. Thus, the outcomes from (A.7) and (A.10) can be generalised to every product j with which the firm enters destination d simultaneously.

As for an expert firm, which was exporting to d before $t = 1$, there is also an effect on its intensive margin from trade liberalisation. Since it has already discovered its export profitability in that market, its export growth for product j from $t = 1$ to $t = 2$ will be expressed as:

$$\delta^j \text{ for an expert firm } = \frac{\mu^N - c_p^j}{2} - \frac{\mu^N - \tau^j - c_p^j}{2} = \frac{\tau^j}{2} \tag{A.11}$$

This means that, while new firms in market d obtain their intensive margin growth based on their initial expectations and the trade and production costs, for expert firms that export growth will only be determined by the eliminated tariff, which makes sense since both μ^N and c_p^j are already known to them. Comparing (A.10) and (A.11), I can argue that the export growth for new firms is greater than for the incumbent; namely, trade liberalisation has a greater positive effect at the intensive margin for the newcomers.

Once the tariff elimination took place, for all $t > 2$, new firms will define their export values basing only on their expected μ^N and the production costs. Since in that scenario, $c_p^B < c_p^A$, they will begin experimenting with the less costly product B instead. Again, the export growth for new exporters one period later will be greater than the zero growth for the incumbents; and no positive export growth is expected for other products these newcomers might export in the future. Even though new firms tend to start experimenting with the cheapest products, their initial export growth will be greater the more costly those products are, since after trade liberalisation, the export growth δ^j in the optimistic scenario is expressed as follows:

$$\begin{aligned} \text{If } E\mu^N > c_p^j,\ \delta^j &= \frac{1}{2}[E(\mu^N \mid \mu^N > c_p^j) - E\mu^N] \\ &= \frac{1}{2}[\frac{1}{1-G(c_p^j)}\{E\mu^N + \int_{\underline{\mu^N}}^{c_p^j} G(\mu^N)\mathrm{d}\mu^N\} - E\mu^N] \end{aligned} \tag{A.12}$$

A.2 Prediction 2: Extensive Margin

A.2.1 Without Trade Liberalisation

Let me denote as $Pr(e_2^j = 1 \mid e_1^A = 1 \& e_1^j = 0)$ the probability that a firm which has just started to export to destination d in $t = 1$ with the cheapest product A will export product j in the next period. Likewise, let me denote as $Pr(e_t^j = 1 \mid \pi_{i=1}^{t-1} e_{t-i}^A = 1 \& e_{t-1}^j = 0)$ the probability that a firm which has been exporting the cheap product A to destination d for longer will start to export product j to d in $t \geq 2$.

Since the new surviving firm has just discovered the export profitability μ^N by exporting A to market d, it will export any product j in the next period if $\mu^N \geq 2F_d^{1/2} + \tau^j + c_p^j$; namely, if its maximised profits from exporting j are greater than j's sunk entry costs. And, if μ^N follows a cumulative distribution function $G(.)$, I can argue that $Pr(e_2^j = 1 \mid e_1^A = 1 \& e_1^j = 0) = 1 - G(2F_d^{1/2} + \tau^j + c_p^j)$.

Conversely, incumbent firms in destination d have already discovered that μ^N longer ago, and have made their entry decision by comparing maximised profits with entry costs much earlier. Hence, under this framework there is no reason to expect any positive likelihood for these firms to start exporting a new product j in $t = 2$ or in the future. This implies that $Pr(e_t^j = 1 \mid \pi_{i=1}^{t-1} e_{t-i}^A = 1 \& e_{t-1}^j = 0) = 0$.

In summary, the proof of Prediction 2 on the extensive margin without trade liberalisation can be stated as follows:

$$Pr(e_2^j = 1 \mid e_1^A = 1 \& e_1^j = 0) = 1 - G(2F_d^{1/2} + \tau^j + c_p^j) > 0 = Pr(e_t^j = 1 \mid \pi_{i=1}^{t-1} e_{t-i}^A = 1 \& e_{t-1}^j = 0) \tag{A.13}$$

A.2.2 With Trade Liberalisation in t=2

When tariffs are eliminated in $t = 2$ by d for country o's products, both new and expert firms will have to re-evaluate their profit analysis, since now it is less costly to export to that market. In that sense, new firms will decide to export a new product j to d in $t = 2$ if $\mu^N \geq 2F_d^{1/2} + c_p^j$. In other words, the calculation of their maximised profits will no longer consider the tariff, which is now zero. Thus, the probability that the firm will export product j to d after having exported A previously will be expressed as $Pr(e_2^j = 1 \mid e_1^A = 1 \& e_1^j = 0) = 1 - G(2F_d^{1/2} + c_p^j)$. This likelihood is clearly greater than in the case of no liberalisation. Note that this entry probability is decreasing in the production cost c_p^j. Hence, it will be larger in the case of core competence products.

As for incumbent firms, given that their cost structure also changes with trade liberalisation, they will also have to re-evaluate their entry decisions at destination d in $t = 2$. They will have to compare their maximised profits from exporting j with the sunk entry cost for that product, in order to decided whether to export it or not. Hence, like newcomers, the expert firms will export a new product j to d in $t = 2$ if $\mu^N \geq 2F_d^{1/2} + c_p^j$; and that entry probability can also be expressed as $Pr(e_2^j = 1 \mid e_1^A = 1 \& e_1^j = 0) = 1 - G(2F_d^{1/2} + c_p^j)$.

However, a crucial difference takes place between new and expert firms when comparing the scenarios with and without trade liberalisation; specifically, in the growth of their entry probabilities. While for newcomers, that probability growth is $G(2F_d^{1/2} + \tau^j + c_p^j) - G(2F_d^{1/2} + c_p^j)$; for incumbents, it will be $1 - G(2F_d^{1/2} + c_p^j)$, since without liberalisation the entry probability was zero. Thus, experts have a greater entry probability growth than new firms in a context of trade liberalisation.

For further time periods, with tariffs eliminated, since now $c_p^B < c_p^A$, new firms will tend to enter d with product B. Experts, on the other hand, will have already learnt the new scenario post-liberalisation. Hence, the entry probability with a new product j for a newcomer, expressed as $1 - G(2F_d^{1/2} + c_p^j)$, will be again greater than the zero probability for incumbents.

A.3 Prediction 3: Exit

A.3.1 Proof: Without Trade Liberalisation

Let me denote as $Pr(e_2^A = 0 \mid e_1^A = 1)$ the probability that a firm stops exporting its first product A to d right after starting exporting it. Let me also denote as $Pr(e_{t+1}^j = 0 \mid e_t^j = 1 \& e_{t-1}^j = 1)$ the probability that a firm stops exporting any product j to d, after exporting it for more than one period.

It is known from the basic model that a firm will exit the export business of product A in market d if the realised export profitability does not cover the trade and production costs –$\mu^N < \tau^A + c_p^A$–. Given that μ^N follows a cumulative distribution function $G(.)$, and that new firms are much more likely to discover that such business might not be profitable, I can express that exit probability for a new firm as $Pr(e_2^A = 0 \mid e_1^A = 1) = G(\tau^A + c_p^A)$.

As for more expert firms, as they have already realised μ^N by experimenting with product A longer ago, they know how large or small such profitability is with respect to the costs of A and many other products. Hence, under this framework, there is no reason to expect an exit by the incumbents from the export business of a particular product to d. Thus, their exit probability can be expressed as $Pr(e_{t+1}^j = 0 \mid e_t^j = 1 \& e_{t-1}^j = 1) = 0$.

In summary, the proof of Prediction 3 without trade liberalisation can be stated as follows:

$$Pr(e_2^A = 0 \mid e_1^A = 1) = G(\tau^A + c_p^A) > 0 = Pr(e_{t+1}^j = 0 \mid e_t^j = 1 \& e_{t-1}^j = 1) \tag{A.14}$$

A.3.2 Proof: With Trade Liberalisation in t=2

When trade liberalisation occurs in $t = 2$, τ^A becomes zero, which means that the new firm will compare the realised μ^N with the production cost c^{pA} to decide whether to continue exporting A to d or to walk away. Therefore, the exit probability for the newcomer that entered into d with product A will be reduced to $Pr(e_2^A = 0 \mid e_1^A = 1) = G(c_p^A)$. Hence, trade liberalisation makes new firms more likely to stay exporting to destination d.

For expert firms, such exit probability remains in zero, since again the production costs for A and other products were already compared with the previously realised μ^N.

After the event of trade liberalisation, newcomers will tend to enter market d with product B, which is now cheaper than A. Hence, in further time periods, the exit probability for new exporters will be even more reduced to $G(c_p^B)$; but still greater than the zero probability for incumbents. Thus, the exit probability for newcomers will be lower as long as they enter market d with products in which they are more efficient; namely, core competence products.

Appendix B Models 2 and 3 - Additional Estimations

Table B.1: Model 2 - Extensive Margin (Entry) - including fixed effects and firm i's past performance

Dependent Variable	Entry_ijt											
Estimation	LPM											
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
new_USA	0.0334	0.0329	0.0214	0.0214	0.0337	0.0332	0.0215	0.0216	0.114***	0.114***	0.107***	0.107***
	(0.0316)	(0.0316)	(0.0313)	(0.0313)	(0.0318)	(0.0318)	(0.0315)	(0.0315)	(0.0203)	(0.0203)	(0.0203)	(0.0203)
fta	-0.261	-0.243	-0.279	-0.293	-0.250	-0.233	-0.268	-0.282	-0.430**	-0.401*	-0.437*	-0.463**
	(0.210)	(0.212)	(0.229)	(0.226)	(0.211)	(0.213)	(0.230)	(0.227)	(0.214)	(0.217)	(0.232)	(0.229)
fta*new_USA	0.232	0.198	0.0845	0.0987	0.228	0.195	0.0816	0.0955	0.354	0.307	0.160	0.187
	(0.342)	(0.346)	(0.385)	(0.382)	(0.341)	(0.345)	(0.384)	(0.381)	(0.347)	(0.351)	(0.390)	(0.387)
similar_prod	0.0123	0.0122	0.00850	0.00857	0.0119	0.0118	0.00768	0.00775	0.0525***	0.0524***	0.0577**	0.0578**
	(0.0138)	(0.0139)	(0.0182)	(0.0182)	(0.0138)	(0.0139)	(0.0182)	(0.0182)	(0.0182)	(0.0182)	(0.0261)	(0.0261)
ln_lag_n_sec_exp_USA					0.104	0.104	0.108	0.108				
					(0.0746)	(0.0746)	(0.0745)	(0.0745)				
gr_ln_real_sector_USA_exports					0.0115	0.0114	0.0111	0.0112				
					(0.0138)	(0.0138)	(0.0138)	(0.0138)				
newUSA*lag1else	0.0891***	0.0896***	0.0867**	0.0867**	0.0887***	0.0892***	0.0862**	0.0861**	0.0695**	0.0700**	0.0692**	0.0692**
	(0.0338)	(0.0338)	(0.0338)	(0.0338)	(0.0338)	(0.0338)	(0.0339)	(0.0339)	(0.0337)	(0.0337)	(0.0337)	(0.0337)
core50	0.441***	0.439***	0.456***	0.458***	0.441***	0.439***	0.456***	0.457***	0.426***	0.422***	0.436***	0.439***
	(0.0206)	(0.0212)	(0.0202)	(0.0197)	(0.0206)	(0.0211)	(0.0201)	(0.0196)	(0.0181)	(0.0187)	(0.0175)	(0.0170)
newUSA*core50	-0.0711**	-0.0634*	-0.0143	-0.0157	-0.0707**	-0.0631*	-0.0141	-0.0155	-0.0621*	-0.0530	-0.00205	-0.00449
	(0.0329)	(0.0333)	(0.0368)	(0.0365)	(0.0329)	(0.0333)	(0.0368)	(0.0365)	(0.0326)	(0.0333)	(0.0370)	(0.0368)
fta*core50		-0.342	-0.262			-0.338	-0.258			-0.533	-0.464	
		(0.478)	(0.482)			(0.477)	(0.481)			(0.449)	(0.452)	
ftanewUSA*core50		1.188	1.238	0.975		1.175	1.223	0.965		1.465	1.519	1.055
		(1.498)	(1.369)	(1.284)		(1.496)	(1.367)	(1.282)		(1.510)	(1.363)	(1.283)
core50*similar			-0.253***	-0.253***			-0.253***	-0.253***			-0.240***	-0.241***
			(0.0634)	(0.0635)			(0.0635)	(0.0636)			(0.0592)	(0.0594)
newUSA*similar			0.0607**	0.0608**			0.0618**	0.0618**			0.0413	0.0413
			(0.0285)	(0.0285)			(0.0285)	(0.0285)			(0.0323)	(0.0323)
fta*similar			0.257	0.268			0.259	0.270			0.296	0.316
			(0.437)	(0.436)			(0.436)	(0.436)			(0.433)	(0.432)
ftanewUSA*similar			0.405	0.395			0.405	0.395			0.472	0.452
			(0.611)	(0.610)			(0.611)	(0.610)			(0.619)	(0.618)
lag_ln_real_ev_USA_tot	0.00700*	0.00700*	0.00750*	0.00750*	0.00690	0.00690	0.00741*	0.00740*				
	(0.00424)	(0.00424)	(0.00422)	(0.00422)	(0.00424)	(0.00424)	(0.00421)	(0.00421)				
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ATPDEA and MFN dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	24530	24530	24530	24530	24530	24530	24530	24530	28488	28488	28488	28488
r2_o	0.197	0.197	0.199	0.199	0.197	0.197	0.199	0.199	0.220	0.220	0.221	0.221
N_clust	1158	1158	1158	1158	1158	1158	1158	1158	1158	1158	1158	1158

Robust standard errors adjusted for clusters in firms.

*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;

***Denotes statistical significance at the 1% level.

Table B.2: Model 3 - Exit (core competence in t) - additional regressions

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.114***	0.115***	0.114***	0.113***	0.114***	0.114***
	(0.0245)	(0.0246)	(0.0246)	(0.0179)	(0.0179)	(0.0179)
fta	0.0778	0.0778	0.133	0.0295	0.0289	0.0455
	(0.270)	(0.270)	(0.290)	(0.165)	(0.165)	(0.181)
fta*new_USA	-0.0950	0.00361	-0.0519	0.540*	0.591**	0.574*
	(0.426)	(0.451)	(0.464)	(0.276)	(0.289)	(0.298)
newUSA*lag1else	0.0228	0.0230	0.0230	-0.0881***	-0.0880***	-0.0880***
	(0.0307)	(0.0307)	(0.0307)	(0.0223)	(0.0223)	(0.0223)
core50	-0.483***	-0.483***	-0.486***	-0.392***	-0.392***	-0.393***
	(0.0115)	(0.0115)	(0.0115)	(0.0121)	(0.0121)	(0.0123)
newUSA*core50	-0.0507*	-0.0606**	-0.0583**	-0.153***	-0.157***	-0.157***
	(0.0273)	(0.0276)	(0.0275)	(0.0237)	(0.0242)	(0.0243)
fta*core50			-0.447			-0.139
			(0.349)			(0.299)
ftanewUSA*core50		-0.985*	-0.539		-0.483	-0.345
		(0.519)	(0.618)		(0.442)	(0.530)
lag_ln_real_ev				0.0591***	0.0591***	0.0591***
				(0.00168)	(0.00168)	(0.00168)
Year FE	Yes	Yes	Yes			
Sector FE	Yes	Yes	Yes			
ATPDEA and MFN dummies	Yes	Yes	Yes			
N	31882	31882	31882	27434	27434	27434
r2_o	0.126	0.126	0.126	0.263	0.263	0.263
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table B.3: Model 3 - Exit - controlling for core products in year t-1

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.210***	0.208***	0.208***	0.214***	0.212***	0.212***
	(0.0272)	(0.0273)	(0.0273)	(0.0169)	(0.0170)	(0.0170)
newUSA*lag1else	-0.102***	-0.102***	-0.101***	-0.151***	-0.150***	-0.150***
	(0.0288)	(0.0288)	(0.0288)	(0.0200)	(0.0200)	(0.0200)
lag1*core50	0.194***	0.194***	0.198***	-0.167***	-0.166***	-0.165***
	(0.0181)	(0.0181)	(0.0184)	(0.0176)	(0.0176)	(0.0179)
newUSA*lag1core50	0.0507	0.0605*	0.0570*	0.0758***	0.0832***	0.0823***
	(0.0309)	(0.0315)	(0.0316)	(0.0218)	(0.0222)	(0.0224)
fta	-0.0468	-0.0440	-0.0971	-0.181	-0.180	-0.194
	(0.245)	(0.245)	(0.258)	(0.170)	(0.170)	(0.173)
fta*new_USA	0.991**	0.807*	0.862*	0.785***	0.645**	0.659**
	(0.412)	(0.445)	(0.452)	(0.262)	(0.280)	(0.282)
fta*lag1core50			0.569			0.141
			(0.469)			(0.407)
ftanewUSA*lag1core50		1.252**	0.682		0.952**	0.811
		(0.531)	(0.706)		(0.419)	(0.587)
lag_ln_real_ev				0.0530***	0.0530***	0.0530***
				(0.00192)	(0.00192)	(0.00192)
Year FE				Yes	Yes	Yes
Sector FE				Yes	Yes	Yes
ATPDEA and MFN dummies				Yes	Yes	Yes
N	27547	27547	27547	27434	27434	27434
r2_o	0.0637	0.0637	0.0637	0.192	0.192	0.192
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level; ***Denotes statistical significance at the 1% level.

Table B.4: Model 3 - Exit (core competence in t-1) - additional regressions

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.318***	0.316***	0.316***	0.141***	0.139***	0.139***
	(0.0206)	(0.0207)	(0.0207)	(0.0179)	(0.0180)	(0.0180)
fta	-0.385*	-0.385*	-0.427*	0.0648	0.0672	0.0603
	(0.221)	(0.221)	(0.230)	(0.162)	(0.162)	(0.166)
fta*new_USA	1.123***	0.993***	1.036***	0.652**	0.488*	0.496*
	(0.348)	(0.378)	(0.384)	(0.270)	(0.287)	(0.289)
newUSA*lag1else	-0.0889***	-0.0886***	-0.0885***	-0.176***	-0.176***	-0.176***
	(0.0244)	(0.0244)	(0.0244)	(0.0212)	(0.0212)	(0.0212)
lag1*core50	0.0619***	0.0623***	0.0652***	-0.165***	-0.164***	-0.164***
	(0.0160)	(0.0160)	(0.0162)	(0.0182)	(0.0182)	(0.0184)
newUSA*lag1core50	0.0896***	0.0965***	0.0937***	0.0590**	0.0677***	0.0672***
	(0.0248)	(0.0251)	(0.0252)	(0.0240)	(0.0246)	(0.0248)
fta*lag1core50			0.447			0.0750
			(0.405)			(0.442)
ftanewUSA*lag1core50		0.882*	0.435		1.110**	1.035*
		(0.479)	(0.623)		(0.431)	(0.622)
lag_ln_real_ev				0.0651***	0.0651***	0.0651***
				(0.00202)	(0.00202)	(0.00202)
Year FE	Yes	Yes	Yes			
Sector FE	Yes	Yes	Yes			
ATPDEA and MFN dummies	Yes	Yes	Yes			
N	27547	27547	27547	27434	27434	27434
r2_o	0.0672	0.0673	0.0673	0.204	0.204	0.204
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Appendix C Models 2 and 3 Including Interactions Between Core50 Dummies and Firm Size - Additional Estimations

Table C.1: Model 2 - Extensive Margin (Entry) - including interactions between core50 and firm size - additional estimations

Dependent Variable	Entry_ijt											
Estimation	LPM											
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
new_USA	0.0310	0.0309	0.0206	0.0206	0.0314	0.0312	0.0207	0.0208	0.113***	0.113***	0.107***	0.107***
	(0.0315)	(0.0315)	(0.0313)	(0.0313)	(0.0317)	(0.0317)	(0.0315)	(0.0315)	(0.0203)	(0.0203)	(0.0204)	(0.0203)
fta	-0.254	-0.241	-0.279	-0.289	-0.242	-0.230	-0.268	-0.278	-0.423**	-0.401*	-0.439*	-0.460**
	(0.209)	(0.212)	(0.229)	(0.226)	(0.210)	(0.213)	(0.230)	(0.227)	(0.214)	(0.217)	(0.232)	(0.228)
fta*new_USA	0.228	0.214	0.0937	0.104	0.224	0.211	0.0906	0.100	0.351	0.324	0.171	0.192
	(0.340)	(0.345)	(0.385)	(0.381)	(0.339)	(0.345)	(0.384)	(0.380)	(0.345)	(0.351)	(0.390)	(0.387)
similar_prod	0.0158	0.0158	0.0106	0.0106	0.0154	0.0154	0.00969	0.00974	0.0562***	0.0562***	0.0602**	0.0603**
	(0.0137)	(0.0137)	(0.0182)	(0.0182)	(0.0137)	(0.0137)	(0.0182)	(0.0182)	(0.0180)	(0.0181)	(0.0261)	(0.0261)
ln_lag_n_sec_exp_USA					0.110	0.110	0.113	0.113				
					(0.0747)	(0.0747)	(0.0746)	(0.0745)				
gr_ln_real_sector_USA_exports					0.0112	0.0112	0.0109	0.0109				
					(0.0137)	(0.0137)	(0.0137)	(0.0137)				
newUSA*lag1else	0.0991***	0.0992***	0.0950***	0.0949***	0.0988***	0.0988***	0.0945***	0.0945***	0.0771**	0.0771**	0.0748**	0.0748**
	(0.0344)	(0.0344)	(0.0345)	(0.0345)	(0.0345)	(0.0344)	(0.0345)	(0.0345)	(0.0344)	(0.0344)	(0.0344)	(0.0344)
core50	0.568***	0.566***	0.573***	0.574***	0.568***	0.566***	0.573***	0.574***	0.563***	0.560***	0.565***	0.568***
	(0.0240)	(0.0244)	(0.0245)	(0.0241)	(0.0239)	(0.0243)	(0.0245)	(0.0240)	(0.0215)	(0.0220)	(0.0220)	(0.0216)
core50*small	-0.149***	-0.149***	-0.141***	-0.141***	-0.149***	-0.149***	-0.142***	-0.142***	-0.156***	-0.155***	-0.149***	-0.149***
	(0.0365)	(0.0365)	(0.0351)	(0.0351)	(0.0365)	(0.0365)	(0.0351)	(0.0351)	(0.0354)	(0.0353)	(0.0339)	(0.0340)
core50*medium	-0.248***	-0.249***	-0.236***	-0.236***	-0.248***	-0.249***	-0.237***	-0.236***	-0.268***	-0.268***	-0.260***	-0.259***
	(0.0432)	(0.0432)	(0.0421)	(0.0422)	(0.0432)	(0.0433)	(0.0422)	(0.0422)	(0.0386)	(0.0386)	(0.0375)	(0.0376)
core50*large	-0.440***	-0.438***	-0.409***	-0.410***	-0.441***	-0.439***	-0.410***	-0.411***	-0.440***	-0.438***	-0.415***	-0.417***
	(0.0732)	(0.0733)	(0.0666)	(0.0664)	(0.0733)	(0.0734)	(0.0666)	(0.0665)	(0.0645)	(0.0646)	(0.0590)	(0.0588)
newUSA*core50	-0.0954**	-0.0937**	-0.0665*	-0.0676*	-0.0945**	-0.0928**	-0.0657	-0.0668*	-0.113***	-0.110***	-0.0819**	-0.0841**
	(0.0370)	(0.0376)	(0.0400)	(0.0397)	(0.0370)	(0.0376)	(0.0400)	(0.0397)	(0.0364)	(0.0370)	(0.0395)	(0.0392)
newUSA*core50*small	0.0666	0.0669	0.105	0.105	0.0661	0.0662	0.104	0.104	0.0837	0.0849	0.121*	0.121*
	(0.0712)	(0.0710)	(0.0691)	(0.0691)	(0.0712)	(0.0710)	(0.0691)	(0.0691)	(0.0682)	(0.0682)	(0.0654)	(0.0653)
newUSA*core50*medium	-0.0990	-0.0977	-0.0862	-0.0864	-0.101	-0.0995	-0.0882	-0.0883	-0.0232	-0.0192	-0.00376	-0.00368
	(0.0895)	(0.0908)	(0.0902)	(0.0902)	(0.0893)	(0.0905)	(0.0899)	(0.0899)	(0.0873)	(0.0890)	(0.0890)	(0.0890)
newUSA*core50*large	0.167	0.166	0.175	0.176	0.166	0.165	0.174	0.175	0.196*	0.194*	0.214*	0.216*
	(0.122)	(0.122)	(0.124)	(0.124)	(0.122)	(0.122)	(0.123)	(0.123)	(0.116)	(0.116)	(0.118)	(0.118)
core50*similar		-0.247	-0.184			-0.242	-0.179			-0.412	-0.358	
		(0.460)	(0.466)			(0.460)	(0.466)			(0.437)	(0.442)	
fta*core50		0.317	0.411	0.228		0.299	0.390	0.211		0.689	0.788	0.432
		(1.586)	(1.427)	(1.354)		(1.583)	(1.425)	(1.352)		(1.596)	(1.417)	(1.348)
ftanewUSA*core50			-0.200***	-0.201***			-0.200***	-0.200***			-0.193***	-0.194***
			(0.0551)	(0.0551)			(0.0552)	(0.0552)			(0.0510)	(0.0511)
newUSA*similar			0.0568**	0.0568**			0.0580**	0.0580**			0.0370	0.0370
			(0.0285)	(0.0285)			(0.0285)	(0.0285)			(0.0322)	(0.0322)
fta*similar			0.280	0.287			0.282	0.289			0.320	0.336
			(0.437)	(0.436)			(0.437)	(0.436)			(0.433)	(0.432)
ftanewUSA*similar			0.401	0.394			0.402	0.395			0.462	0.447
			(0.613)	(0.613)			(0.614)	(0.613)			(0.622)	(0.621)
lag_ln_real_ev_USA_tot	0.00710*	0.00710*	0.00754*	0.00754*	0.00699*	0.00699*	0.00743*	0.00743*				
	(0.00423)	(0.00423)	(0.00421)	(0.00421)	(0.00422)	(0.00422)	(0.00420)	(0.00420)				
Firm Size dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ATPDEA and MFN dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	24530	24530	24530	24530	24530	24530	24530	24530	28488	28488	28488	28488
r2_o	0.208	0.208	0.210	0.210	0.208	0.208	0.210	0.210	0.229	0.229	0.230	0.230
N_clust	1158	1158	1158	1158	1158	1158	1158	1158	1158	1158	1158	1158

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table C.2: Model 3 - Exit (core competence in t) - including interactions between core50 and firm size - additional estimations

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.103***	0.104***	0.103***	0.116***	0.116***	0.116***
	(0.0249)	(0.0249)	(0.0249)	(0.0181)	(0.0181)	(0.0181)
fta	0.0917	0.0917	0.135	0.0332	0.0324	0.0456
	(0.270)	(0.270)	(0.291)	(0.164)	(0.164)	(0.181)
fta*new_USA	-0.139	-0.0608	-0.104	0.530*	0.588**	0.574*
	(0.425)	(0.450)	(0.463)	(0.276)	(0.288)	(0.298)
newUSA*lag1else	0.0288	0.0290	0.0290	-0.0951***	-0.0950***	-0.0950***
	(0.0317)	(0.0317)	(0.0317)	(0.0230)	(0.0230)	(0.0230)
core50	-0.616***	-0.616***	-0.618***	-0.371***	-0.371***	-0.371***
	(0.0157)	(0.0157)	(0.0158)	(0.0151)	(0.0151)	(0.0152)
core50*small	0.204***	0.203***	0.202***	-0.00243	-0.00317	-0.00358
	(0.0212)	(0.0212)	(0.0211)	(0.0205)	(0.0205)	(0.0204)
core50*medium	0.264***	0.263***	0.263***	-0.0425	-0.0433	-0.0434
	(0.0257)	(0.0258)	(0.0257)	(0.0310)	(0.0310)	(0.0310)
core50*large	0.363***	0.362***	0.362***	-0.145**	-0.146**	-0.146**
	(0.0350)	(0.0351)	(0.0351)	(0.0568)	(0.0568)	(0.0568)
newUSA*core50	0.0139	0.00712	0.00872	-0.174***	-0.179***	-0.178***
	(0.0347)	(0.0347)	(0.0347)	(0.0304)	(0.0306)	(0.0306)
newUSA*core50*small	-0.0854**	-0.0883**	-0.0877**	-0.0303	-0.0326	-0.0324
	(0.0369)	(0.0370)	(0.0369)	(0.0366)	(0.0367)	(0.0366)
newUSA*core50*medium	-0.122***	-0.122***	-0.122***	0.0481	0.0478	0.0478
	(0.0423)	(0.0421)	(0.0422)	(0.0410)	(0.0409)	(0.0409)
newUSA*core50*large	-0.104*	-0.103*	-0.104*	0.228***	0.228***	0.228***
	(0.0582)	(0.0582)	(0.0582)	(0.0567)	(0.0568)	(0.0568)
fta*core50			-0.352			-0.110
			(0.340)			(0.294)
ftanewUSA*core50		-0.778	-0.427		-0.550	-0.441
		(0.530)	(0.620)		(0.444)	(0.529)
lag_ln_real_ev				0.0596***	0.0596***	0.0596***
				(0.00174)	(0.00174)	(0.00174)
Firm Size dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes			
Sector FE	Yes	Yes	Yes			
ATPDEA and MFN dummies	Yes	Yes	Yes			
N	31882	31882	31882	27434	27434	27434
r2_o	0.0559	0.0560	0.0559	0.200	0.200	0.200
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table C.3: Model 3: Exit (core competence in t-1) - including interactions between core50 and firm size

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.201***	0.200***	0.200***	0.203***	0.203***	0.203***
	(0.0273)	(0.0274)	(0.0275)	(0.0170)	(0.0171)	(0.0171)
fta	-0.0509	-0.0499	-0.0996	-0.156	-0.156	-0.169
	(0.245)	(0.245)	(0.258)	(0.169)	(0.169)	(0.173)
fta*new_USA	0.974**	0.895**	0.946**	0.736***	0.692**	0.705**
	(0.410)	(0.446)	(0.453)	(0.261)	(0.278)	(0.281)
newUSA*lag1else	-0.0369	-0.0370	-0.0369	-0.109***	-0.109***	-0.109***
	(0.0310)	(0.0310)	(0.0310)	(0.0210)	(0.0211)	(0.0210)
lag1*core50	0.489***	0.489***	0.492***	0.123***	0.123***	0.124***
	(0.0279)	(0.0279)	(0.0281)	(0.0256)	(0.0256)	(0.0257)
lag1core50*small	-0.365***	-0.365***	-0.362***	-0.349***	-0.349***	-0.348***
	(0.0372)	(0.0372)	(0.0373)	(0.0328)	(0.0328)	(0.0328)
lag1core50*medium	-0.520***	-0.519***	-0.519***	-0.510***	-0.510***	-0.510***
	(0.0365)	(0.0365)	(0.0365)	(0.0360)	(0.0361)	(0.0361)
lag1core50*large	-0.659***	-0.658***	-0.659***	-0.631***	-0.631***	-0.631***
	(0.0379)	(0.0380)	(0.0381)	(0.0532)	(0.0532)	(0.0532)
newUSA*lag1core50	-0.0226	-0.0192	-0.0221	-0.0393	-0.0375	-0.0382
	(0.0393)	(0.0396)	(0.0398)	(0.0287)	(0.0288)	(0.0290)
newUSA*lag1core50*small	-0.146***	-0.142***	-0.144***	-0.0890**	-0.0870**	-0.0875**
	(0.0454)	(0.0455)	(0.0455)	(0.0398)	(0.0400)	(0.0400)
newUSA*lag1core50*medium	-0.0978**	-0.0963*	-0.0958*	0.0262	0.0270	0.0272
	(0.0495)	(0.0496)	(0.0496)	(0.0440)	(0.0440)	(0.0440)
newUSA*lag1core50*large	-0.116*	-0.117*	-0.116*	0.177***	0.177***	0.177***
	(0.0607)	(0.0608)	(0.0609)	(0.0610)	(0.0610)	(0.0610)
fta*lag1core50			0.536			0.134
			(0.449)			(0.389)
ftanewUSA*lag1core50		0.539	0.00254		0.300	0.166
		(0.502)	(0.666)		(0.393)	(0.555)
lag_ln_real_ev				0.0540***	0.0540***	0.0540***
				(0.00193)	(0.00193)	(0.00193)
Firm Size dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year FE				Yes	Yes	Yes
Sector FE				Yes	Yes	Yes
ATPDEA and MFN dummies				Yes	Yes	Yes
N	27547	27547	27547	27434	27434	27434
r2_o	0.0846	0.0846	0.0845	0.195	0.195	0.195
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level; ***Denotes statistical significance at the 1% level.

Table C.4: Model 3 - Exit (core competence in t-1) - including interactions between core50 and firm size - additional estimations

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.309***	0.309***	0.309***	0.133***	0.133***	0.133***
	(0.0209)	(0.0209)	(0.0209)	(0.0180)	(0.0180)	(0.0180)
fta	-0.370*	-0.370*	-0.409*	0.0676	0.0683	0.0602
	(0.222)	(0.222)	(0.231)	(0.161)	(0.161)	(0.165)
fta*new_USA	1.094***	1.047***	1.086***	0.613**	0.560**	0.569**
	(0.349)	(0.379)	(0.385)	(0.269)	(0.285)	(0.288)
newUSA*lag1else	-0.0495*	-0.0496*	-0.0495*	-0.120***	-0.120***	-0.120***
	(0.0260)	(0.0260)	(0.0260)	(0.0225)	(0.0225)	(0.0225)
lag1*core50	0.326***	0.326***	0.328***	0.151***	0.151***	0.151***
	(0.0256)	(0.0256)	(0.0257)	(0.0262)	(0.0262)	(0.0263)
lag1core50*small	-0.327***	-0.327***	-0.325***	-0.373***	-0.373***	-0.372***
	(0.0348)	(0.0349)	(0.0349)	(0.0340)	(0.0340)	(0.0340)
lag1core50*medium	-0.459***	-0.459***	-0.459***	-0.557***	-0.557***	-0.557***
	(0.0335)	(0.0336)	(0.0336)	(0.0392)	(0.0392)	(0.0392)
lag1core50*large	-0.527***	-0.527***	-0.527***	-0.728***	-0.728***	-0.728***
	(0.0421)	(0.0421)	(0.0421)	(0.0559)	(0.0559)	(0.0560)
newUSA*lag1core50	-0.0154	-0.0134	-0.0156	-0.0450	-0.0428	-0.0432
	(0.0328)	(0.0329)	(0.0331)	(0.0305)	(0.0307)	(0.0309)
newUSA*lag1core50*small	-0.0584	-0.0563	-0.0578	-0.137***	-0.134***	-0.135***
	(0.0426)	(0.0427)	(0.0427)	(0.0404)	(0.0406)	(0.0406)
newUSA*lag1core50*medium	0.0279	0.0287	0.0291	-0.0297	-0.0287	-0.0286
	(0.0463)	(0.0464)	(0.0464)	(0.0445)	(0.0445)	(0.0445)
newUSA*lag1core50*large	0.0968	0.0962	0.0972	0.0949	0.0942	0.0944
	(0.0623)	(0.0622)	(0.0623)	(0.0615)	(0.0615)	(0.0615)
fta*lag1core50			0.412			0.0878
			(0.396)			(0.414)
ftanewUSA*lag1core50		0.321	-0.0919		0.361	0.273
		(0.460)	(0.600)		(0.398)	(0.579)
lag_ln_real_ev				0.0652***	0.0652***	0.0652***
				(0.00203)	(0.00203)	(0.00203)
Firm Size dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes			
Sector FE	Yes	Yes	Yes			
ATPDEA and MFN dummies	Yes	Yes	Yes			
N	27547	27547	27547	27434	27434	27434
r2_o	0.0909	0.0910	0.0910	0.222	0.222	0.222
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Appendix D Estimations Including Core25 Variables

Table D.1: Model 1 - Intensive Margin - including core25 variables

Dependent Variable	gr_ln_real_ev							
Estimation	FE Robust							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	2.327***	2.382***	2.228***	2.227***	1.247***	1.282***	1.208***	1.208***
	(0.273)	(0.271)	(0.270)	(0.269)	(0.237)	(0.233)	(0.229)	(0.230)
fta	-5.236**	-5.256**	-5.208*	-5.010*	-3.188	-3.193	-3.128	-3.085
	(2.665)	(2.665)	(2.676)	(2.934)	(2.400)	(2.400)	(2.402)	(2.553)
fta*new_USA	6.809	10.30*	11.04*	10.84*	2.688	4.796	4.972	4.930
	(4.754)	(5.876)	(5.932)	(6.022)	(4.054)	(5.062)	(5.038)	(5.117)
newUSA*lag2else	-2.373***	-2.367***			-0.888**	-0.885**		
	(0.429)	(0.428)			(0.357)	(0.356)		
lag1_core25	-3.941***	-3.948***	-3.882***	-3.888***	-2.276***	-2.281***	-2.253***	-2.255***
	(0.180)	(0.180)	(0.179)	(0.181)	(0.137)	(0.137)	(0.136)	(0.137)
newUSA*lag1core25	0.311	0.153	-0.222	-0.216	0.0549	-0.0400	-0.177	-0.176
	(0.316)	(0.318)	(0.334)	(0.333)	(0.273)	(0.274)	(0.272)	(0.274)
fta*lag1core25				-0.956				-0.197
				(4.239)				(3.372)
ftanewUSA*lag1core25		-10.82*	-11.12**	-10.16		-6.497	-6.573	-6.376
		(5.597)	(5.592)	(6.878)		(5.090)	(5.080)	(6.083)
lag_ln_real_ev_USA_tot					-0.540***	-0.540***	-0.540***	-0.540***
					(0.0204)	(0.0204)	(0.0205)	(0.0205)
Year FE					Yes	Yes	Yes	Yes
Sector FE					Yes	Yes	Yes	Yes
ATPDEA and MFN dummies					Yes	Yes	Yes	Yes
N	17077	17077	17077	17077	17077	17077	17077	17077
r2_o	0.0421	0.0420	0.0417	0.0417	0.172	0.172	0.172	0.172
N_clust	1000	1000	1000	1000	1000	1000	1000	1000

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table D.2: Model 2 - Extensive Margin (Entry) - including core25 variables

Dependent Variable	Entry_ijt							
Estimation	LPM							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	0.170***	0.170***	0.191***	0.190***	0.167***	0.167***	0.188***	0.187***
	(0.0360)	(0.0362)	(0.0378)	(0.0378)	(0.0360)	(0.0362)	(0.0379)	(0.0378)
fta	-0.655***	-0.721***	-0.839***	-0.766***	-0.553***	-0.618***	-0.735***	-0.663***
	(0.214)	(0.216)	(0.232)	(0.230)	(0.213)	(0.215)	(0.232)	(0.230)
fta*new_USA	1.283***	1.344***	1.258**	1.183**	1.256***	1.317***	1.235**	1.162**
	(0.442)	(0.456)	(0.501)	(0.498)	(0.440)	(0.454)	(0.499)	(0.496)
similar_prod	0.204***	0.204***	0.331***	0.332***	0.202***	0.201***	0.329***	0.329***
	(0.0206)	(0.0206)	(0.0277)	(0.0277)	(0.0207)	(0.0208)	(0.0278)	(0.0278)
ln_lag_n_sec_exp_USA					0.0409***	0.0407***	0.0390***	0.0392***
					(0.00684)	(0.00684)	(0.00689)	(0.00689)
gr_ln_real_sector_USA_exports					-0.0314**	-0.0313**	-0.0320**	-0.0321**
					(0.0150)	(0.0150)	(0.0150)	(0.0150)
newUSA*lag1else	0.0680*	0.0681*	0.0884**	0.0884**	0.0685*	0.0685*	0.0888**	0.0888**
	(0.0387)	(0.0387)	(0.0379)	(0.0379)	(0.0386)	(0.0386)	(0.0379)	(0.0379)
core25	0.522***	0.528***	0.540***	0.534***	0.520***	0.525***	0.537***	0.532***
	(0.0181)	(0.0186)	(0.0178)	(0.0174)	(0.0182)	(0.0186)	(0.0178)	(0.0174)
newUSA*core25	-0.0868**	-0.0911**	0.000960	0.00654	-0.0859**	-0.0903**	0.00186	0.00728
	(0.0403)	(0.0424)	(0.0422)	(0.0418)	(0.0402)	(0.0423)	(0.0422)	(0.0418)
fta*core25		0.779	0.814			0.755	0.789	
		(0.516)	(0.517)			(0.516)	(0.518)	
ftanewUSA*core25		-0.664	-0.619	0.199		-0.663	-0.615	0.179
		(1.125)	(0.975)	(0.812)		(1.121)	(0.973)	(0.810)
core25*similar			-0.282***	-0.282***			-0.283***	-0.283***
			(0.0501)	(0.0499)			(0.0502)	(0.0499)
newUSA*similar			-0.241***	-0.241***			-0.240***	-0.240***
			(0.0398)	(0.0398)			(0.0398)	(0.0398)
fta*similar			1.561***	1.522***			1.547***	1.510***
			(0.454)	(0.457)			(0.457)	(0.459)
ftanewUSA*similar			-1.123*	-1.085			-1.132*	-1.095
			(0.670)	(0.671)			(0.670)	(0.671)
N	28488	28488	28488	28488	28488	28488	28488	28488
r2_o	0.120	0.120	0.127	0.127	0.121	0.121	0.128	0.128
N_clust	1158	1158	1158	1158	1158	1158	1158	1158

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table D.3: Model 3 - Exit (core competence in t) - including core25 variables

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.165***	0.167***	0.166***	0.176***	0.176***	0.177***
	(0.0248)	(0.0249)	(0.0249)	(0.0177)	(0.0177)	(0.0177)
fta	0.154	0.153	0.252	-0.255	-0.255	-0.271
	(0.257)	(0.257)	(0.303)	(0.170)	(0.170)	(0.190)
fta*new_USA	0.662	0.802*	0.700	0.681***	0.711**	0.727**
	(0.415)	(0.457)	(0.483)	(0.261)	(0.283)	(0.296)
newUSA*lag1else	0.0426	0.0424	0.0423	-0.0366*	-0.0367*	-0.0367*
	(0.0307)	(0.0307)	(0.0307)	(0.0206)	(0.0206)	(0.0205)
core25	-0.502***	-0.502***	-0.506***	-0.356***	-0.356***	-0.356***
	(0.0112)	(0.0112)	(0.0114)	(0.0105)	(0.0105)	(0.0108)
newUSA*core25	-0.0675**	-0.0768***	-0.0739***	-0.147***	-0.149***	-0.149***
	(0.0280)	(0.0280)	(0.0280)	(0.0210)	(0.0212)	(0.0212)
fta*core25			-0.484			0.0762
			(0.324)			(0.234)
ftanewUSA*core25		-0.801*	-0.317		-0.163	-0.239
		(0.471)	(0.563)		(0.380)	(0.439)
lag_ln_real_ev				0.0496***	0.0495***	0.0495***
				(0.00157)	(0.00157)	(0.00157)
Year FE				Yes	Yes	Yes
Sector FE				Yes	Yes	Yes
ATPDEA and MFN dummies				Yes	Yes	Yes
N	31882	31882	31882	27434	27434	27434
r2_o	0.0986	0.131	0.0986	0.275	0.275	0.275
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Appendix E Estimations Including Core10 Variables

Table E.1: Model 1 - Intensive Margin - including core10 variables

Dependent Variable	gr_ln_real_ev							
Estimation	FE Robust							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	2.574***	2.615***	2.493***	2.495***	1.391***	1.413***	1.354***	1.358***
	(0.290)	(0.289)	(0.289)	(0.288)	(0.245)	(0.239)	(0.235)	(0.236)
fta	-6.812***	-6.820***	-6.739***	-7.000**	-4.213*	-4.216*	-4.148*	-4.623*
	(2.510)	(2.510)	(2.522)	(2.892)	(2.320)	(2.320)	(2.323)	(2.661)
fta*new_USA	9.128**	11.67*	12.21**	12.47**	3.733	5.016	5.112	5.578
	(4.608)	(6.153)	(6.163)	(6.259)	(4.008)	(5.416)	(5.395)	(5.548)
newUSA*lag2else	-2.271***	-2.272***			-0.814**	-0.815**		
	(0.439)	(0.439)			(0.363)	(0.362)		
lag1_core10	-3.994***	-3.997***	-3.942***	-3.936***	-2.412***	-2.413***	-2.390***	-2.379***
	(0.179)	(0.179)	(0.178)	(0.178)	(0.135)	(0.135)	(0.134)	(0.135)
newUSA*lag1core10	0.0335	-0.0550	-0.393	-0.398	-0.211	-0.255	-0.373	-0.383
	(0.305)	(0.307)	(0.321)	(0.320)	(0.251)	(0.247)	(0.247)	(0.249)
fta*lag1core10				0.780				1.368
				(3.772)				(2.932)
ftanewUSA*lag1core10		-5.846	-5.814	-6.595		-2.929	-2.885	-4.253
		(5.479)	(5.346)	(6.450)		(5.015)	(4.975)	(5.784)
lag_ln_real_ev_USA_tot					-0.518***	-0.518***	-0.519***	-0.519***
					(0.0199)	(0.0199)	(0.0199)	(0.0199)
Year FE					Yes	Yes	Yes	Yes
Sector FE					Yes	Yes	Yes	Yes
ATPDEA and MFN dummies					Yes	Yes	Yes	Yes
N	17077	17077	17077	17077	17077	17077	17077	17077
r2_o	0.0644	0.0643	0.0650	0.0651	0.182	0.182	0.182	0.182
N_clust	1000	1000	1000	1000	1000	1000	1000	1000

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table E.2: Model 2 - Extensive Margin (Entry) - including core10 variables

Dependent Variable	Entry_ijt							
Estimation	LPM							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	0.164***	0.164***	0.182***	0.182***	0.161***	0.161***	0.179***	0.179***
	(0.0370)	(0.0373)	(0.0389)	(0.0388)	(0.0370)	(0.0373)	(0.0389)	(0.0389)
fta	-0.484**	-0.543***	-0.644***	-0.582***	-0.392**	-0.448**	-0.549**	-0.490**
	(0.200)	(0.202)	(0.215)	(0.214)	(0.199)	(0.201)	(0.216)	(0.214)
fta*new_USA	1.074**	1.125**	1.051**	0.988**	1.049**	1.099**	1.029**	0.969*
	(0.432)	(0.461)	(0.504)	(0.500)	(0.430)	(0.460)	(0.503)	(0.499)
similar_prod	0.190***	0.189***	0.325***	0.325***	0.188***	0.187***	0.323***	0.323***
	(0.0206)	(0.0206)	(0.0279)	(0.0279)	(0.0208)	(0.0208)	(0.0280)	(0.0280)
ln_lag_n_sec_exp_USA					0.0356***	0.0356***	0.0339***	0.0340***
					(0.00655)	(0.00655)	(0.00663)	(0.00664)
gr_ln_real_sector_USA_exports					-0.0293**	-0.0292**	-0.0299**	-0.0300**
					(0.0145)	(0.0145)	(0.0145)	(0.0145)
newUSA*lag1else	0.0442	0.0443	0.0652*	0.0652*	0.0446	0.0446	0.0656*	0.0655*
	(0.0399)	(0.0400)	(0.0392)	(0.0392)	(0.0398)	(0.0399)	(0.0391)	(0.0391)
core10	0.550***	0.553***	0.565***	0.562***	0.548***	0.551***	0.563***	0.560***
	(0.0168)	(0.0170)	(0.0164)	(0.0161)	(0.0168)	(0.0171)	(0.0164)	(0.0161)
newUSA*core10	-0.0646*	-0.0669	0.00955	0.0128	-0.0631*	-0.0653	0.0111	0.0142
	(0.0382)	(0.0409)	(0.0403)	(0.0399)	(0.0381)	(0.0408)	(0.0402)	(0.0398)
fta*core10		0.375	0.380			0.356	0.362	
		(0.395)	(0.391)			(0.395)	(0.391)	
ftanewUSA*core10		-0.290	-0.174	0.208		-0.285	-0.166	0.197
		(0.822)	(0.727)	(0.593)		(0.820)	(0.725)	(0.591)
core10*similar			-0.270***	-0.270***			-0.270***	-0.270***
			(0.0418)	(0.0418)			(0.0418)	(0.0418)
newUSA*similar			-0.232***	-0.232***			-0.231***	-0.231***
			(0.0396)	(0.0396)			(0.0396)	(0.0396)
fta*similar			1.416***	1.395***			1.404***	1.384***
			(0.440)	(0.444)			(0.442)	(0.446)
ftanewUSA*similar			-1.062	-1.041			-1.071	-1.051
			(0.653)	(0.656)			(0.654)	(0.656)
N	28488	28488	28488	28488	28488	28488	28488	28488
r2_o	0.162	0.162	0.170	0.170	0.163	0.163	0.171	0.171
N_clust	1158	1158	1158	1158	1158	1158	1158	1158

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table E.3: Model 3 - Exit (core competence in t) - including core10 variables

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.150***	0.152***	0.151***	0.160***	0.160***	0.160***
	(0.0251)	(0.0252)	(0.0253)	(0.0185)	(0.0185)	(0.0185)
fta	0.0481	0.0477	0.112	-0.295*	-0.295*	-0.301
	(0.238)	(0.238)	(0.319)	(0.164)	(0.164)	(0.202)
fta*new_USA	0.719*	0.877*	0.812*	0.685***	0.712**	0.718**
	(0.381)	(0.448)	(0.493)	(0.242)	(0.276)	(0.301)
newUSA*lag1else	0.0721**	0.0720**	0.0719**	-0.0144	-0.0144	-0.0144
	(0.0298)	(0.0298)	(0.0298)	(0.0201)	(0.0201)	(0.0201)
core10	-0.527***	-0.527***	-0.528***	-0.387***	-0.387***	-0.387***
	(0.0113)	(0.0113)	(0.0113)	(0.0103)	(0.0103)	(0.0105)
newUSA*core10	-0.0619**	-0.0693**	-0.0680**	-0.124***	-0.125***	-0.125***
	(0.0271)	(0.0271)	(0.0271)	(0.0209)	(0.0210)	(0.0210)
fta*core10			-0.203			0.0188
			(0.315)			(0.223)
ftanewUSA*core10		-0.609	-0.406		-0.0984	-0.117
		(0.440)	(0.531)		(0.342)	(0.398)
lag_ln_real_ev				0.0493***	0.0493***	0.0493***
				(0.00146)	(0.00146)	(0.00146)
Year FE				Yes	Yes	Yes
Sector FE				Yes	Yes	Yes
ATPDEA and MFN dummies				Yes	Yes	Yes
N	31882	31882	31882	27434	27434	27434
r2_o	0.182	0.182	0.182	0.314	0.314	0.314
N_clust	2599	2599	2599	2599	2599	2599

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Appendix F Estimations Considering Transactions Greater than US$ 1,000

Table F.1: Model 1 - Intensive Margin - transactions greater than US$ 1,000

Dependent Variable	gr_ln_real_ev							
Estimation	FE Robust							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	2.606***	2.654***	2.380***	2.376***	1.365***	1.363***	1.225***	1.226***
	(0.332)	(0.335)	(0.334)	(0.334)	(0.293)	(0.295)	(0.289)	(0.289)
fta	-6.575*	-6.599*	-6.518*	-6.007	-2.376	-2.375	-2.294	-2.382
	(3.455)	(3.456)	(3.468)	(3.831)	(2.935)	(2.935)	(2.941)	(3.145)
fta*new_USA	10.07*	12.70*	14.07**	13.55*	4.972	4.849	5.295	5.387
	(5.876)	(6.944)	(7.016)	(7.194)	(4.742)	(5.760)	(5.681)	(5.789)
newUSA*lag2else	-2.951***	-2.925***			-1.231***	-1.232***		
	(0.498)	(0.502)			(0.415)	(0.417)		
lag1_core50	-4.522***	-4.528***	-4.436***	-4.455***	-2.186***	-2.185***	-2.141***	-2.138***
	(0.220)	(0.220)	(0.220)	(0.224)	(0.175)	(0.176)	(0.174)	(0.178)
newUSA*lag1core50	0.412	0.281	-0.117	-0.0981	-0.00775	-0.00158	-0.165	-0.168
	(0.399)	(0.410)	(0.428)	(0.428)	(0.352)	(0.361)	(0.360)	(0.362)
fta*lag1core50				-3.131				0.538
				(6.026)				(4.613)
ftanewUSA*lag1core50		-9.855	-11.96	-8.813		0.462	-0.361	-0.902
		(7.453)	(7.636)	(9.554)		(6.872)	(6.870)	(8.284)
lag_ln_real_ev_USA_tot					-0.612***	-0.612***	-0.613***	-0.613***
					(0.0229)	(0.0229)	(0.0229)	(0.0229)
Year FE					Yes	Yes	Yes	Yes
Sector FE					Yes	Yes	Yes	Yes
ATPDEA and MFN dummies					Yes	Yes	Yes	Yes
N	10765	10765	10765	10765	10765	10765	10765	10765
r2_o	0.0393	0.0393	0.0392	0.0392	0.201	0.201	0.201	0.201
N_clust	875	875	875	875	875	875	875	875

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table F.2: Model 2 - Extensive Margin (Entry) - transactions greater than US$ 1,000

Dependent Variable	Entry_ijt							
Estimation	LPM							
Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
new_USA	0.124***	0.123***	0.161***	0.161***	0.121***	0.120***	0.158***	0.158***
	(0.0288)	(0.0289)	(0.0322)	(0.0322)	(0.0286)	(0.0288)	(0.0321)	(0.0321)
fta	-0.521**	-0.516**	-0.788***	-0.787***	-0.400*	-0.394*	-0.663***	-0.663***
	(0.210)	(0.219)	(0.242)	(0.232)	(0.211)	(0.221)	(0.244)	(0.233)
fta*new_USA	1.406***	1.359***	1.530***	1.528***	1.380***	1.334***	1.503***	1.504***
	(0.427)	(0.439)	(0.510)	(0.504)	(0.428)	(0.440)	(0.508)	(0.502)
similar_prod	0.279***	0.279***	0.395***	0.395***	0.275***	0.274***	0.389***	0.389***
	(0.0186)	(0.0186)	(0.0251)	(0.0251)	(0.0186)	(0.0186)	(0.0253)	(0.0253)
ln_lag_n_sec_exp_USA					0.0976***	0.0975***	0.0929***	0.0929***
					(0.0179)	(0.0179)	(0.0176)	(0.0176)
gr_ln_real_sector_USA_exports					-0.0334*	-0.0334*	-0.0352**	-0.0352**
					(0.0178)	(0.0178)	(0.0178)	(0.0178)
newUSA*lag1else	0.0404	0.0417	0.0652	0.0652	0.0404	0.0417	0.0649	0.0649
	(0.0426)	(0.0427)	(0.0414)	(0.0414)	(0.0425)	(0.0426)	(0.0413)	(0.0413)
core50	0.548***	0.547***	0.563***	0.563***	0.544***	0.544***	0.560***	0.560***
	(0.0216)	(0.0222)	(0.0208)	(0.0202)	(0.0217)	(0.0223)	(0.0209)	(0.0202)
newUSA*core50	-0.0505	-0.0412	0.0666	0.0667	-0.0493	-0.0402	0.0668	0.0667
	(0.0418)	(0.0433)	(0.0454)	(0.0449)	(0.0416)	(0.0431)	(0.0453)	(0.0448)
fta*core50		-0.0699	0.0145			-0.0859	-0.00151	
		(0.483)	(0.491)			(0.483)	(0.490)	
ftanewUSA*core50		1.128	0.776	0.791		1.110	0.763	0.762
		(1.498)	(1.620)	(1.548)		(1.491)	(1.612)	(1.541)
core50*similar			-0.308***	-0.308***			-0.306***	-0.306***
			(0.0585)	(0.0585)			(0.0586)	(0.0586)
newUSA*similar			-0.237***	-0.237***			-0.233***	-0.233***
			(0.0401)	(0.0401)			(0.0402)	(0.0402)
fta*similar			1.804***	1.804***			1.793***	1.793***
			(0.421)	(0.419)			(0.421)	(0.419)
ftanewUSA*similar			-1.670**	-1.670**			-1.660**	-1.660**
			(0.675)	(0.674)			(0.675)	(0.674)
N	16466	16466	16466	16466	16466	16466	16466	16466
r2_o	0.136	0.136	0.147	0.147	0.138	0.138	0.149	0.149
N_clust	1054	1054	1054	1054	1054	1054	1054	1054

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.

Table F.3: Model 3 - Exit (core competence in t) - transactions greater than US$ 1,000

Dependent Variable	Exit_ijt					
Estimation	LPM					
Column	(1)	(2)	(3)	(4)	(5)	(6)
new_USA	0.0695***	0.0715***	0.0704***	0.0660***	0.0665***	0.0663***
	(0.0230)	(0.0231)	(0.0231)	(0.0152)	(0.0153)	(0.0152)
fta	0.250	0.248	0.354	-0.00371	-0.00428	0.0122
	(0.281)	(0.281)	(0.320)	(0.180)	(0.180)	(0.199)
fta*new_USA	-0.0136	0.126	0.0157	0.170	0.204	0.187
	(0.440)	(0.480)	(0.502)	(0.272)	(0.289)	(0.301)
newUSA*lag1else	0.0292	0.0294	0.0295	-0.0469**	-0.0469**	-0.0469**
	(0.0293)	(0.0293)	(0.0294)	(0.0212)	(0.0212)	(0.0212)
core50	-0.567***	-0.567***	-0.571***	-0.380***	-0.380***	-0.381***
	(0.0132)	(0.0132)	(0.0132)	(0.0115)	(0.0115)	(0.0117)
newUSA*core50	0.0301	0.0201	0.0238	-0.0746***	-0.0769***	-0.0762***
	(0.0276)	(0.0282)	(0.0281)	(0.0216)	(0.0222)	(0.0221)
fta*core50			-0.641*			-0.0992
			(0.384)			(0.330)
ftanewUSA*core50		-0.889	-0.247		-0.207	-0.107
		(0.545)	(0.661)		(0.473)	(0.575)
lag_ln_real_ev				0.0496***	0.0495***	0.0495***
				(0.00152)	(0.00153)	(0.00153)
Year FE				Yes	Yes	Yes
Sector FE				Yes	Yes	Yes
ATPDEA and MFN dummies				Yes	Yes	Yes
N	17816	17816	17816	15368	15368	15368
r2_o	0.117	0.117	0.117	0.275	0.275	0.275
N_clust	2160	2160	2160	2160	2160	2160

Robust standard errors adjusted for clusters in firms.
*Denotes statistical significance at the 10% level; **Denotes statistical significance at the 5% level;
***Denotes statistical significance at the 1% level.