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Micro Dynamics of Turkey's Export Boom in the 2000s

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Abstract

This paper examines the microeconomics behind the dramatic export boom experienced by Turkey during the 2000s. Using disaggregated customs data covering the universe of export transactions for Turkey during the period 2002–2011, it characterizes firm-level dynamics in the export sector and decomposes export growth at the aggregate, sector, and destination market levels to identify the role of firm turnover, destination turnover, and product turnover. The paper shows that in the short-run, aggregate export growth is dominated by growth in continuous exporters, and for these, growth is dominated by exports to their continued destinations and of their continued products. However, the observed high degree of churning across firms, destinations, and products accounts in the long run for a substantial part of Turkey's export growth. The patterns of micro-dynamics of export growth are verified across sectors and across groups of destination markets with some exceptions regarding exports to new emerging markets where net entry by Turkish-based exporters plays a more critical role for long-run growth.

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Micro Dynamics of Turkey's Export Boom in the 2000s[#]

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1. Introduction

Sustained export growth is a major economic goal for most developing and developed economies. The link between strong export performance and strong growth performance is obvious in the case of China in the last two decades, following on the evidence for other East Asian economies in earlier decades. Following a shift in the theoretical trade literature to models where firm heterogeneity plays a critical role in shaping trade flows such as those of Melitz (2003) or Bernard, Eaton, Jensen, and Kortum (2003), a burgeoning empirical trade literature has explored the increased availability of very disaggregated exporter-level datasets from customs agencies and several stylized facts have been uncovered for multiple countries.[1] For example, studies such as Eaton, Eslava, Kugler, and Tybout (2008) for Colombia and Amador and Opromolla (2013) for Portugal document a tremendous degree of churning in export markets, with a large proportion of exporters in a given year not having exported in the previous year.[2] Understanding the micro-economic dynamics behind episodes of strong export growth can help to identify the types of policies that can promote export growth.

In this paper we examine the microeconomics behind the dramatic export boom experienced by Turkey from 2002 to 2008 as well as the underlying forces for the strong contraction ensuing from the 2008-2009 global financial crisis and for the recovery thereafter. Turkish exports grew by 265% between 2002 and 2008, a very strong export performance compared to the average for peers in the same income group (Brazil, China, Mexico, and South Africa) whose exports grew by only 212%. Interestingly, Turkey was much more negatively affected by the global financial crisis than its peers since its aggregate export growth between 2002 and 2011 was 279% while that of peers at the same income level was 294%.[3] This was also a period when Turkey's exports experienced a structural shift away from traditional textiles and clothing towards machinery and metals, as well as a movement across destination markets with the EU and EFTA losing ground to new markets in the Middle East and North Africa (MENA) as well as in Europe and Central Asia.

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[1] The datasets are sometimes referred to as 'transactions-level' trade datasets. See Bernard, Jensen, Redding, and Schott (2007, 2011) for reviews of the literature.

[2] See also Iacovone and Javorcik (2008) for Mexico; Andersson, Lööf, and Johansson (2008) for Sweden, Freund and Pierola (2010) for Peru; Masso and Vahter (2011) for Estonia, De Lucio, Mínguez-Fuentes, Minondo, and Requena-Silvente (2011) for Spain, Fabling and Sanderson (2012) for New Zealand, Fernandes, Lederman, and Gutierrez-Rocha (2013) for a set of 11 Latin America countries, among others.

[3] The growth rates are calculated for each country as $100 * X_{end\ year} - X_{2002} \big/ X_{2002}$ where X designates exports.

Some of the rationales for the Turkish export boom of the 2000s are the abandonment of the currency peg after 2001 which allowed the Turkish lira to devaluate (even though later in the 2000s the Turkish real exchanged rate appreciated), improved macroeconomic conditions more generally, improved 'competitiveness' of the Turkish economy captured in sustained increases in labor productivity while unit labor costs remained well below those of competitors, and the entry into force of the European Union-Turkey Customs Union which also brought strong competitive pressure domestically.[4] In this paper we take the rationales for the episode of strong export growth as given and we provide stylized facts on the micro dynamics behind this growth. Using very disaggregated exporter-level customs data from Turkey for the period 2002-2011 we characterize the firm-level dynamics in the export sector and we decompose export growth at the aggregate, sectoral, and destination market levels to examine the role of firm turnover, destination turnover, and product turnover.[5]

Our key findings are as follows. First, short-run aggregate export growth in Turkey is dominated by growth in exports of continuing exporters, i.e., the firm intensive margin. For these continuing exporters, short-run growth is dominated by exports to their continuing destinations, i.e., the destination intensive margin, and for these continuing destinations, short-run growth is dominated by exports of continuing products, i.e., the product intensive margin. However, the dynamics across firms, destinations, and products play an important role as very high degrees of firm entry and exit into export markets and of churning along destination and HS 6-digit and 12-digit product dimensions from year to year characterize both the export boom period and the financial crisis and subsequent recovery period.

Second, despite a dominance of the firm intensive margin in accounting for the Turkish long-run aggregate export growth over the whole 2002-2008 period, net exporter entry plays a more substantive role for long-run growth than it does for short-run growth. Similarly, the churning across destination markets accounts for about a third of long-run growth of continuing

[4] See Aysan and Hacihasanoglu (2007) for a macro perspective on the Turkish export boom in the 2000s and Erdal, Günçavdi, and Kayam (2012) for a sectoral perspective.

[5] While writing this paper we became aware of a study by Lo Turco and Maggioni (2012) which uses a subset of the same exporter-level data to examine the effects of the global financial crisis of 2008-2009 in Turkey by decomposing manufacturing exports into the contribution of the extensive and intensive margins at the firm and firm-product level. Our focus here is, however, different, as we are interested in understanding the export boom, and moreover we do not focus our analysis exclusively on manufacturing firms with more than 19 employees as that study does but rather we cover all exporters of manufacturing but also agricultural and mining products. See also World Bank (2012) for a broader analysis of Turkey's recent trade performance and competitiveness.

exporters over the whole 2002-2008 period and this proportion is even higher over the whole 2008-2011 period. The HS 6-digit product intensive margin accounts for the majority of long-run export growth of continuing exporters in their continuing destinations over the whole 2002-2008 period but the churning across new and dropped products played a meaningful role, accounting for close to a quarter of that growth and an even larger share over the whole 2008-2011 period. When the extensive margin refers to HS 12-digit products, the percentage of long-run growth of continuing exporters in their continuing destinations accounted for by net product entry is actually 60%, which reveals a substantial degree of experimentation and resource reallocation within Turkish exporters.

Third, the micro-dynamics of sectoral export growth reveal across all sectors a dominance of the firm intensive margin in accounting for both short-run and long-run export growth and a dominance of the destination intensive margin in accounting for both short-run and long-run export growth of continuing exporters. In all sectors net exporter entry accounts for a larger proportion of long-run growth than short-run growth, whereas net destination entry accounts for a larger proportion of continuing exporters' long-run growth than short-run growth. The uniformity of patterns across sectors is a novel finding in the literature which is interesting and perhaps even curious in light of the heterogeneity during the 2000s in global demand, trade policies, technological developments, and other policies and shocks affecting different sectors.

Fourth, the micro-dynamics of bilateral export growth shows across all groups of destination markets a broad preeminence of the firm intensive margin in accounting for both short-run and long-run export growth and a preeminence of the HS 6-digit product intensive margin in accounting for both short-run and long-run export growth of continuing exporters. Noteworthy exceptions to the former are the importance of net exporter entry in accounting for long-run growth in exports to the Rest of the World (which covers for example China and India) over the whole 2002-2008 period and in exports to the EU and EFTA over the whole 2008-2011 period. In all groups of destinations, net exporter entry accounts for a larger proportion of long-run growth than short-run growth whereas net product entry accounts for a larger proportion of continuing exporters' long-run growth than short-run growth between 2002 and 2008.

Fifth, our evidence shows a differential role of the intensive versus the extensive margin in explaining long-run export growth over the whole 2003-2011 period for different cohorts of firms: churning across destination markets and churning across HS 6-digit products (for

continuing destinations) is critical in explaining growth of the cohort of exporter entrants in 2003 that continue to export until 2011 but is less important in explaining growth of the 2002-2011 continuing exporters.

Comparing the stylized facts on the micro dynamics of export growth in Turkey identified by our study to those identified by previous studies for other countries highlights two interesting differences. The larger contribution of net exporter entry to long-run export growth than to average short-run export growth over the export boom period in Turkey is less dramatic than what is found for emerging economies in Latin America such as Costa Rica by Lederman, Rodriguez-Clare and Xu (2010), suggesting that the size of entrant and exiting exporters is less distant from the size of incumbent exporters in Turkey than it is in Costa Rica (since average entry and exit rates are of similar magnitude in the two countries, close to 30% per year). The importance of churning across destination markets in accounting for the growth of continuing exporters is substantially larger in Turkey than in Costa Rica.

Overall, our evidence points to a substantial degree of experimentation by Turkish firms of the export market per se, of new destination markets and new products by continuing exporters with high rates of entry and exit registered at all levels both in periods of boom as well as in periods of crisis. This great dynamism suggests that obstacles to entry in the export market per se, in new destination markets, or in new products in the form of sunk costs seem to be relatively low. Our evidence of substantial trial and error is consistent both with an important role of idiosyncratic uncertainty on the profitability of exporting as modeled e.g., by Freund and Pierola (2010) and Blum, Claro, and Horstmann (2013), as well as of learning about export markets as modeled e.g., by Albornoz, Calvo, Corcos, and Ornelas (2012) and Timoshenko (2013). From a policy perspective, an implication from the micro dynamics underlying the Turkish export boom is the need to better understand the drivers of export entry and exit decisions at the firm, destination market, and product levels, how learning takes place, but also what helps survival in export markets, given the intensive margin dominance. The roles of trade costs, exchange rate movements, and other policy dimensions for learning processes and for survival in export markets will be particularly relevant to assess.

The rest of the paper is organized as follows. Section 2 describes the data and some summary statistics. Sections 3 and 4 examine the dynamics of Turkish export boom, one

characterizes exporter dynamics and the other conducts a series of export growth decompositions. Section 5 concludes.

2. Data and Summary Statistics

We use data covering the universe of export transactions by all Turkish-based firms between 2002 and 2011 collected by the Turkish Customs Authority and transferred to the national statistical institute *Turkstat* for revision and cleaning before being used for policy or research purposes.[6] The variables included in the dataset are the identification code of the exporting firm, the year of the transaction, the exported product code at the HS 12-digit level, the destination market, the value of the transaction (in USD), and the quantity of the transaction (in kilograms).[7] Given that the exporting firm identification codes can be followed over time, our dataset is a panel of firms at the firm-product-destination-year disaggregation level.[8] The export transactions cover agricultural, mining, and manufacturing products but we will exclude from our analysis exports in HS Chapter 27 (hydrocarbons such as oil, petroleum, natural gas, coal).

The cleaning procedures that we applied to the dataset are as follows. First, although the data is collected at the HS 12-digit level and we will conduct some analysis at this level, we also aggregate it up to the HS 6-digit level which is a classification that is comparable to those used in other countries and will thus facilitate benchmarking of the stylized facts for Turkey. To our knowledge, our study uses the most disaggregated HS classification for products among recent empirical studies relying on exporter-level customs data.[9] Second, Turkey uses the special trade regime which means that customs record the sales from inland to their own free zones/customs warehouses as exports.[10] We drop from our dataset the observations for sales to free zones since

[6] Note that the data is available to researchers but can be accessed only in *Turkstat*'s premises. The universe of export transactions is defined as all export transactions above 100 USD.

[7] The value of the transaction is provided as a Free on Board (FOB) figure.

[8] An exporting firm in the dataset may be an actual producer of the products exported or an intermediary exporting products on behalf of other (possibly smaller) producers. As in most other export customs transaction datasets it is impossible to identify which firms are actual producers and which firms are intermediaries in our dataset. Thus our results can only be interpreted as reflecting direct export transactions. Note also that according to the Turkish Exporters Association's Top 1000 Exporters Survey, there were in 2011 7 trader companies among the top 50 exporters and another 9 firms were trading companies selling the products manufactured by the corporation to which they belong (see http://www.tim.org.tr/tr/ihracat-arastirma-raporlari-ilk-1000-ihracatci-arastirmasi.html#).

[9] The only other study using a very disaggregated HS classification level that we are aware of is that of Fabling and Sanderson (2010) for New Zealand for which products defined at the HS 10-digit level.

[10] The "special trade regime" considers transactions where the goods are sold from the domestic territory *only* to both third countries and free zones/customs warehouses of the origin country as exports. In contrast, the "General

we do not know their ultimate destination which makes these export transactions difficult to compare to the rest of the transactions.[11] Sales to free zones/customs warehouses represent about 2-5 percent of aggregate exports in Turkey. Also regarding the destination variable, we account for the changes in name that some statistical territories have undergone over time due to spatial divisions.[12] After applying the cleaning procedures the dataset includes a total of 8.8 million firm-HS 12-digit product-destination-year observations and 7.3 million firm-HS 6-digit product-destination-year observations for the 2002-2011 period.

To assess the quality of our dataset we compare the corresponding aggregate export flows versus the aggregate export flows available in the WITS/COMTRADE. The ratios indicate that the exporter-level customs data represents 100% of the export flows reported in WITS/COMTRADE, which is not surprising since both are sourced from the same institution *Turkstat*.

Table 1 provides summary statistics on the cleaned exporter-level dataset. The number of exporters in Turkey increases substantially from 30,219 in 2002 to 45,818 in 2007 before the global trade collapse that accompanied the global financial crisis, and 51,371 in 2011. Turkey has a very large number of exporters for its income level, its size in terms of GDP, and its degree of openness (Cebeci, Fernandes, Freund, and Pierola, 2012). Over the sample period, Turkish exporters send as a whole more than 4,500 HS 6-digit products to more than 200 destinations.[13] The range of HS 6-digit products exported and the range of destinations served increases over the sample period. The range of products and destinations is substantially larger than that of exporters in Costa Rica shown in Lederman, Rodriguez-Clare, and Xu (2011), which is not surprising given Turkey's economic size, level of development, and strategic geographical location.

At the firm-level, the average exporter in Turkey exports 1.1 Million USD in 2002, 2.2 Million USD in 2007, and 2.5 Million USD in 2011. However, the distribution of average

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trade regime" considers transactions where goods are sold from any national territory (*including free zones*) to third countries only as exports (see p. 32 of United Nations, 2008).

[11] See p. 34 of United Nations (1998).

[12] The Former Republic of Yugoslavia was divided into Bosnia, Croatia and Serbia in 1996 and Serbia was further divided into Serbia and Montenegro in 2006. Some countries recognize Kosovo as an independent state rather than a part of Serbia since 2009. For technical and consistency purposes we treat Serbia, Montenegro and Kosovo as a single destination. While some other territories have undergone changes in names, those changes either occurred before the beginning of our sample period or do not involve the merger or separation of states (e.g., Zaire changed its name to Democratic Republic of Congo in 2006).

[13] This number of HS 6-digit products is based on original non-consolidated HS codes as described earlier.

exports per firm is highly skewed - as is the case in most countries as shown by Freund and Pierola (2012) - since the median exporter in Turkey exports just 50,000 USD in 2002, 100,000 USD in 2007, and 125,000 USD in 2011. The figures for the share of the top 1% or the top 5% of exporters are indicative of a high degree of concentration across exporters - in any given year between 2002 and 2011, just the top 1% of exporters (i.e., the largest 1% of exporters according to their export values) account for close to 60% of total exports while just the top 5% account for close to 80% of total exports. However this degree of concentration of the export sector is not particularly high from a cross-country perspective: data from the Exporter Dynamics Database described in Cebeci, Fernandes, Freund, and Pierola (2012) for year 2007 shows that concentration is much higher in Mexico, New Zealand, South Africa, or Spain.[14]

Regarding diversification at the firm-level, the average number of HS 12-digit products exported per firm increased strongly and steadily from 9.2 in 2002 to 11.8 in 2011 while the average number of HS 6-digit products exported per firm increased strongly and steadily from 7.9 in 2002 to 10.4 in 2011. The average number of export destinations served per firm also increased continuously from 3.4 in 2002 to 4.4 in 2011.[15]

Figure 1 shows Turkey's aggregate exports in nominal terms and in real terms based on the exporter dataset. Turkey experienced very strong export growth, with aggregate exports in nominal terms quadrupling over the 2002-2008 period. Aggregate exports declined importantly with the global financial crisis in 2009, but then recovered strongly in 2010-2011. The average annual growth rate of aggregate nominal exports during the 2002-2011 period was 16%. Focusing on growth in aggregate real exports - the change in aggregate exports deflated by the U.S. producer price index in constant values of 1997 - the qualitative pattern is similar as shown in Figure 1. Interestingly, our sample period covers the period of explosive Chinese export growth subsequent to its WTO accession but that did not prevent Turkey from also experiencing a boom in aggregate exports, even if Turkish exports of textiles and clothing to the EU and the US were hurt by that accession.

Table 2 shows the composition of Turkey's aggregate exports across broad sectors and across groups of destination markets, the numbers of exporters in each of those categories as well

[14] The values for the share accounted for by the top 1% [*top 5%*] of exporters in those countries are: 69%[91%] in Mexico, 72%[*90%*] in New Zealand, 79%[*92%*] in South Africa, and 63%[*85%*] in Spain.

[15] The median number of HS 6-digit products exported by firm was stable at 3 between 2002 and 2010 increasing to 4 in 2011, while the median number of destination countries by firms was stable at 2 between 2002 and 2011.

as the corresponding export growth figures.[16] Panel A of Table 2 shows that the importance of the major traditional export sector in Turkey - textiles and clothing - declined substantially from 2002 when it represented a third of the country's exports to 2011 when it represented only a fifth of the country's exports. A structural shift in Turkish exports towards exports of machinery and metals is evident as their shares in total exports increased steadily over the period, representing, respectively, 16% and 20% of total exports by 2011. The number of exporters per sector follows closely the patterns observed for the sectors' shares in total exports.[17] The transportation, metals, machinery and chemicals sectors experienced very large cumulative export growth during the 2002-2006 period. Interestingly, all sectors except transportation and textiles experienced very large - above 60% growth rates even during the 2006-2011 period, indicating a strong recovery in the latter years after the global recession.

Panel B of Table 2 shows that a structural shift happened also in terms of Turkey's export destination markets with the EU and EFTA losing importance from 2002 to 2011, as their share in total exports declined from 60% in 2002 to 49% in 2011. This reduction in the importance of one of the traditional destination markets was compensated by a large increase in the importance of newer destination markets in the MENA region – whose share of total exports increased from 14% in 2002 to a quarter of Turkish exports by 2011. Exports to the rest of Europe and Central Asia also gained importance over the period while exports to the rest of the world lost importance but that was entirely due to the relatively small rate of growth of exports to the U.S. (35%) because exports to the dynamic emerging market areas of Latin America, India, China increased (ten-fold in the case of China and India). However, interestingly, the numbers of exporters even to the rest of the world almost doubled between 2002 and 2011 while the number of exporters to EU and EFTA increased by only 40% over that period.

3. Dynamics of Turkey's Export Boom: Characterizing Exporter Dynamics

Our main objective in this paper is to understand the micro-dynamics behind the export boom experienced by Turkey over the 2000s. We want to assess the roles of the intensive margin - i.e., growth in the size of continuing exporters - versus the extensive margin - i.e., related to the entry and exit of exporters which means to understand the role of churning among Turkish

[16] The broad sectors are defined in Appendix Table 1.
[17] Incidentally this suggests that the average size of exporters does not differ substantially across sectors.

exporters in explaining the country's export boom. But we also want to understand the roles played by churning across destination markets and by churning across products exported. Before discussing the export growth decomposition and its results, it is necessary to characterize the exporting firms in Turkey according to their status in the export market as continuing, entrants, or exiters from year to year following the definitions provided below:

- $Exporter_t$: any firm that exports in year t;
- $Entrant_t$: a firm that does not export in year t-1 but exports in year t;
- $Exiter_t$: a firm that exports in year t-1 but does not export in year t;
- $Continuing_t$: a firm that exports in both years t-1 and t;
- $Survivor_t$: a firm that does not export in year t-1 but exports in both years t and t+1.

Table 3 provides the number of firms and average exports per firm across their status in the export market. The first column reproduces the information on the total number of exporters in Turkey also shown in Table 1. In any sample year, about two-thirds of firms are continuing exporters that exported also in the previous year. The number of continuing exporters increases steadily from 21,655 in 2003 to 36,529 in 2011. The rates of entry into and exit from the export market in Turkey are high, close to 30%. This high degree of exporter churning is similar to that observed in other emerging markets (Cebeci, Fernandes, Freund, and Pierola, 2012). The number of entrants is consistently larger than the number of exiters in every year, even though the gap between these numbers shrinks towards the end of the sample period. Both entrants and exiters exhibit substantially smaller average exports than continuing exporters.[18] This evidence is similar to that for exporters in Colombia and Portugal characterized by Eaton, Eslava, Kugler, Tybout (2008) and Amador and Opromolla (2012), respectively. Interestingly, average exports per continuing exporter in Turkey experienced a substantial increase - almost doubled - from 2003 to 2008 followed by a decline in 2009 and a strong recovery in 2010- 2011. Average exports per entrant and per exiter increased by 60% and 90%, respectively, over the 2003-2008 period. While average exports per entrant remained almost unchanged after 2009, average exports per exiter increased dramatically between the years 2008 and 2009 suggesting that some large Turkish exporters stopped operating in export markets as a result of the global financial crisis.[19]

[18] The same finding is verified for the comparison of median exports of continuing exporters relative to median exports of entrants and exiters.
[19] This hypothesis is validated by our finding of unchanged median exports for exiters between 2008 and 2009.

Table 3 also shows that despite the large total number of exporters in Turkey in each year, the substantially smaller number of continuous exporters that export in every single year between 2002 and 2011 - 7,423 - do account for the bulk of Turkish exports, on average 65% in any sample year.

The pattern in Table 3 of presence of a very large number of entrants and exiters in every year that are very small in terms of their exports - thus in terms of their revenues in export markets - and account for a small proportion of total exports can only be rationalized by relatively small sunk entry costs into export markets. However, papers such as Das, Roberts, and Tybout (2007) estimate high sunk entry costs into export markets. Eaton, Eslava, Kugler, and Tybout (2008) argue that the only way to reconcile these two facts is if the costs of experimenting in export markets are low relative to the costs of guaranteeing major export contracts. Several theoretical models have emerged that explain such pattern of export dynamics by emphasizing the role of idiosyncratic uncertainty and sunk entry costs in export markets and the importance of learning through a 'testing of the waters' – i.e., firms start by sending small shipments to foreign markets and then learn how profitable they are and how much demand there is for their products, and if successful they grow their shipment size, otherwise they exit export markets (e.g., Freund and Pierola, 2010; Albornoz, Pardo, Corcos, and Ornelas, 2012).

Table 4 shows in the first column the share of total exports across the years accounted for by firms that were exporting in 2002, the first year of our sample (thus those are firms for which we cannot determine whether they are continuing exporters or entrants) and in the rest of the columns the share of total exports across the years accounted for by entrants into export markets in each year between 2003 and 2011. For all cohorts the share of export entrants increases in the first two or three years in export markets but generally declines thereafter: e.g., the cohort of entrants in 2003 account for 5.7% of total exports in 2003 but only 4.5% of total exports by 2011. Interestingly, entrants that survive in export markets for many years eventually account for an important share of total exports. For example, in 2011, 35% of total exports are accounted for by cohorts of exporters that entered from 2003 onwards and survived in export markets until 2011 (the other 65% are accounted for by the firms that were already exporting in 2002).

4. Dynamics of Turkey's Export Boom: Export Growth Decompositions

4.1. Universe of Export Transactions

In order to assess the roles of continuing exporters, new exporters, and exiting exporters in explaining total annual export growth, we conduct a traditional decomposition following Eaton, Eslava, Kugler, and Tybout (2008), Bernard, Jensen, and Schott (2009), Lederman, Rodriguez-Clare, and Xu (2011), and Amador and Opromolla (2012) whereby Turkey's aggregate export growth between years *t-k* and *t* is decomposed as in:

$$\frac{X_t - X_{t-k}}{0.5\left(X_{t-k} + X_t\right)} = \left(\frac{0.5\left(X_{t-k}^{C} + X_t^{C}\right)}{0.5\left(X_{t-k} + X_t\right)} * \frac{X_t^{C} - X_{t-k}^{C}}{0.5\left(X_{t-k}^{C} + X_t^{C}\right)}\right) + \left(\frac{NE_{t-k} * \overline{X_{t-k}}}{0.5\left(X_{t-k} + X_t\right)} + \frac{X_t^{E} - NE_{t-k} * \overline{X_{t-k}}}{0.5\left(X_{t-k} + X_t\right)}\right) + \left(-\frac{NX_{t-k} * \overline{X_{t-k}}}{0.5\left(X_{t-k} + X_t\right)} - \frac{X_{t-k}^{X} - NX_{t-k} * \overline{X_{t-k}}}{0.5\left(X_{t-k} + X_t\right)}\right) \quad (1)$$

where X_t are exports in year *t*, $\overline{X_{t-k}}$ are average exports (across exporters) in year *t-k*, C indexes variables for continuing exporters (active in export markets in both *t-k* and *t*), E indexes variables for entrant/new exporters (active in export markets in *t* but not in *t-k*), and D indexes variables for exiting/dropping exporters (active in export markets in *t-k* but not in *t*), while NE and NX are the numbers of entrant and exiting exporters, respectively. The first term in Eq. (1) captures the contribution of continuing exporters, i.e., the firm intensive margin, while the second and third terms capture the contribution of new and exiting exporters to total export growth, i.e., the firm extensive margin.[20]

Panel A of Table 5 presents the decomposition in Eq. (1) for year-to-year aggregate export growth between 2002 and 2011. Short-run aggregate export growth is entirely dominated by the growth of continuing exporters over the export boom period: the firm intensive margin accounts on average for more than 80% of year-to-year aggregate export growth in Turkey. This pattern is similar to those found for rich countries such as the U.S. by Bernard, Jensen, Redding, and Schott (2009) or Spain by Lucio, Minguez, Minondo, and Requena (2012), but also for emerging economies such as Colombia by Eaton, Eslava, Kugler, and Tybout (2008). This pattern was unaltered - if anything it was strengthened - during the global financial crisis as year-to-year export growth in Turkey (negative in 2008-2009) was entirely dominated by the decline or

[20] The first term is the product of the share of exports of continuing exporters and their average export growth. The second term is the sum of (i) the number of new exporters as a share of the average number of exporters in the 2 years and (ii) the deviation of the average exports of new exporters from the average exports of continuing exporters. The third term is the sum of (i) the number of exiting exporters as a share of the average number of exporters in the 2 years and (ii) the deviation of the average exports of exiting exporters from the average exports of continuing exporters.

slower growth in exports of continuing exporters. This finding might appear as surprising given the impressive degree of firm turnover in export markets documented in Table 3. However, it is easily rationalized once the relatively small size of entrant and exiting exporters - also documented in Table 3 - is taken into account. Even if entrants and exiting exporters experience (on net) very high growth rates, the larger size of continuing exporters implies that the intensive margin dwarfs the extensive margin in accounting for aggregate export growth. The positive contribution of new exporters is larger than the negative contribution of exiting exporters to aggregate export growth in Turkey - hence the contribution of net exporter entry is positive - in all pairs of consecutive years except 2009-2010. Entry in gross terms makes a particularly large contribution to aggregate export growth - about a third in 2004-2005 and in 2005-2006 - and not surprisingly exit makes a large (negative) contribution to aggregate export growth in 2009-2010 at the peak of the global crisis. The importance of entry in gross terms suggests that, conditional on survival, new exporters grow fast and play a key role in aggregate exports over the longer-term.

The last rows of Panel A of Table 5 show a decomposition of long-run aggregate export growth over the whole 2002-2008 and the whole 2008-2011 periods. These long-run patterns are particularly relevant to examine in light of the high degree of firm churning in export markets. Continuing exporters that survive from 2002 to 2008 are the main contributors to the 113.9% aggregate export growth over the period.[21] However, new exporters in 2008 (not present in 2002) contribute with 38% of long-run aggregate export growth, which is a higher proportion than the average of 25% across pairs of consecutive years within the 2002-2008 period. Aggregate export growth was low (3.6%) over the 2008-2011 period due to the global recession and continuing exporters accounted for most of that growth, although the period was also characterized by tremendous exporter churning. The negative contribution of exporter exit between 2008 and 2011 was very large though it was compensated by a strong positive contribution of new exporters, indicating that the recovery from the global financial crisis seems to have brought export opportunities to Turkish firms.

[21] Total export growth in the row labeled '2002-2008' of Panel A of Table 5 is obtained as $X_{2008} - X_{2002} / 0.5(X_{2002} + X_{2008})$ (which is the dependent variable in Eq. (1)). Hence the percentage of 113.9% shown differs from that of 265% discussed in Section 1 which was obtained as $X_{2008} - X_{2002} / X_{2002}$.

In general, extensive margins are expected to contribute less to export growth over the short-run than the long-run if entrant and exiting exporters are small, a fact which is clearly established in the case of Turkey in Table 3. Still, it is interesting to note that the difference in the contribution of net entry over the long-run relative to the short-run in Turkey (38% versus 25%) is less dramatic than what is found for emerging economies in Latin America such as Costa Rica.

Given the aforementioned importance of continuing exporters in accounting for short-run and long-run export growth in Turkey between 2002 and 2011, it is essential to understand how their expansion in export activities came about, namely whether those firms replicated 'more of the same' - serving their traditional destination markets with their well-established products - or whether churning across destination markets and across products exported played a substantial role. We consider another decomposition in Eq. (2) to explore the role of destination dynamics in the export growth of continuing exporters:

$$\frac{X_t^C - X_{t-k}^C}{0.5\left(X_{t-k}^C + X_t^C\right)} = \left(\frac{0.5\left(X_{t-k}^{CCD} + X_t^{CCD}\right)}{0.5\left(X_{t-k}^{CCD} + X_t^{CCD}\right)} * \frac{X_t^{CCD} - X_{t-k}^{CCD}}{0.5\left(X_{t-k}^C + X_t^C\right)}\right) + \left(\frac{NED_{t-k} * \overline{X_{t-k}^C}}{0.5\left(X_{t-k}^C + X_t^C\right)} + \frac{X_t^{CED} - NED_{t-k} * \overline{X_{t-k}^C}}{0.5\left(X_{t-k}^C + X_t^C\right)}\right)$$
$$+ \left(-\frac{NXD_{t-k} * \overline{X_{t-k}^C}}{0.5\left(X_{t-k}^C + X_t^C\right)} - \frac{X_{t-k}^{CXD} - NXD_{t-k} * \overline{X_{t-k}^C}}{0.5\left(X_{t-k}^C + X_t^C\right)}\right) \quad (2)$$

where the variables and indexes are defined as above, $\overline{X_{t-k}^C}$ are average exports of continuing exporters in year *t-k*, *CCD* indexes variables for continuing destinations (served by continuing exporters both *t-k* and *t*), *CED* indexes variables for new destinations (served by continuing exporters in *t* but not in *t-k*), and *CXD* indexes variables for exiting destinations (served by continuing exporters in *t-k* but not in *t*), while *NED* and *NXD* are the numbers of new and exiting destinations of continuing exporters, respectively. The first term in Eq. (2) provides the contribution of continuing destinations, i.e, the destination intensive margin, while the second and third terms provide the contribution of new and exiting destinations to export growth of continuing exporters in Turkey, i.e., the destination extensive margin.

Panel B of Table 5 presents the results from the decomposition in Eq. (2) which reveal that the destination intensive margin accounts for more than 80% of short-run export growth of continuing exporters between 2002 and 2008. At the peak of the global financial crisis in 2008-2009 this percentage was even higher with the strong export decline for continuing exporters

being almost entirely driven by a decline in their exports to continuing destination markets, most likely the EU countries which were experiencing a severe recession. The prominence of traditional destination markets for continuing exporters persists as Turkey recovers from the crisis after 2009. However, it is crucial to note that while the net contribution of new and dropped destinations for export growth of continuing exporters is small throughout Panel B, the degree of churning across destinations is very high. In 2004-2005 and in 2005-2006 growth in exports to new destinations in gross terms represents 60% of the export growth of continuing exporters, though this is counteracted by the negative contribution of dropped destinations which represents more than 40% of their export growth.

To get a long-run perspective, the last rows of Panel B of Table 5 show the decomposition of export growth of continuing exporters across the destination dimension over the whole 2002-2008 and the whole 2008-2011 periods. Continuing destinations served both in 2002 and 2008 account for the bulk of long-run export growth of continuing exporters over the boom. But the net effect of venturing into new destination markets and dropping (possibly less profitable) destination markets by continuing exporters is very important, representing a third of their export growth between 2002 and 2008. The major role of new destinations in gross terms suggests that those new destinations that do survive exhibit strong export growth subsequently. In the crisis and the subsequent recovery period of 2008-2011, a structural shift is observed with continuing destination markets accounting for only 41% of export growth due to a reduction in the dominance of traditional markets such as the EU for continuing exporters and the emergence of new regional markets in the Middle East and North Africa region, as was documented at the aggregate level in Panel B of Table 2, and which will be pursued further in Section 4.2.

In sum, there is a high degree of experimentation by Turkish continuing exporters across destination markets and some diversification in the short-run and especially in the long-run during the boom period and the crisis and recovery period, suggesting a high degree of reallocation of resources within those firms, even if continuing destinations account for the bulk of growth. This pattern of turnover across export destinations for Turkish exporters reveals greater importance of the destination extensive margin than is the case for Costa Rica where exports to continuing destinations account for 95% or more of continuing exporters' short-run export growth between 1998 and 2007 as shown by Lederman, Rodriguez-Clare, and Xu (2010).

In Eq. (3) we consider a final decomposition that exploits the role of product dynamics in the export growth of continuing exporters in their continuing destinations:

$$\frac{X_t^{CCD} - X_{t-k}^{CCD}}{0.5\left(X_{t-k}^{CCD} + X_t^{CCD}\right)} =$$

$$\left(\frac{0.5\left(X_{t-k}^{CCDCP} + X_t^{CCDCP}\right)}{0.5\left(X_{t-k}^{CCDCP} + X_t^{CCDCP}\right)} * \frac{X_t^{CCDCP} - X_{t-k}^{CCDCP}}{0.5\left(X_{t-k}^{CCD} + X_t^{CCD}\right)}\right) + \left(\frac{NEP_{t-k} * \overline{X_{t-k}^{CCD}}}{0.5\left(X_{t-k}^{CCD} + X_t^{CCD}\right)} + \frac{X_t^{CCDEP} - NEP_{t-k} * \overline{X_{t-k}^{CCD}}}{0.5\left(X_{t-k}^{CCD} + X_t^{CCD}\right)}\right)$$

$$+\left(-\frac{NXP_{t-k} * \overline{X_{t-k}^{CCD}}}{0.5\left(X_{t-k}^{CCD} + X_t^{CCD}\right)} - \frac{X_{t-k}^{CCDXP} - NXP_{t-k} * \overline{X_{t-k}^{CCD}}}{0.5\left(X_{t-k}^{CCD} + X_t^{CCD}\right)}\right) \tag{3}$$

where the variables and indexes are defined as above, $\overline{X_{t-k}^{CCD}}$ are average exports of continuing exporters in their continuing destinations in year *t-k*, *CCDCP* indexes variables for continuing products (exported by continuing exporters in both *t-k* and *t*), *CCDEP* indexes variables for new products (exported by continuing exporters in *t* but not in *t-k*), *CCDDP* indexes variables for exiting products (exported by continuing exporters in *t-k* but not in *t*), and *NEP* and *NXP* are the numbers of new and exiting products of continuing exporters, respectively. The first term in Eq. (3) provides the contribution of continuing products, i.e., the product intensive margin, while the second and third terms provide the contribution of new and exiting products to export growth of continuing exporters, i.e., the product extensive margin.

Panel C of Table 5 presents the decomposition in Eq. (3) focusing on products at the HS 6-digit level and indicates that the product intensive margin accounts on average for 90% of short-run export growth of continuing exporters in their continuing destinations between 2002 and 2008. At the height of the global financial crisis in 2008-2009 this percentage increased to 97% suggesting that the traditional products sent by Turkish continuing exporters to their continuing destinations were severely hurt by the recession and explain almost entirely the strong decline (-22.1%) experienced. Interestingly, the dominance of continuing products for continuing exporters declines in 2009-2010 as the recovery from the crisis begins. Although on net the contribution of new products and dropped products is low throughout Panel C, there is a high degree of churning along the HS 6-digit product dimension. In 2004-2005 and in 2005-2006, the growth in exports of new products in gross terms makes up about 70% of the growth of continuing exporters in their continuing destinations, though this is counteracted by a strong negative contribution of dropped products which make up around 60% of export growth.

The last rows of Panel C of Table 5 show the decomposition of long-run export growth of continuing exporters in their continuing destinations across the HS 6-digit product dimension. Continuing products account for 77% of the growth of continuing exporters in their continuing destinations during the whole 2002-2008 period. But the introduction of new products by continuing exporters in their continuing destinations in gross terms plays a meaningful role, accounting for more than a third of that growth. This implies that the new products that survive see their export volumes grow fast subsequently. During the whole 2008-2011 period the thin export growth of continuing exporters in continuing destinations (1.6%) is entirely driven by the positive contribution of net entry of products given that growth in continuing products is actually negative (-1.2%).

Overall, there is a high degree of churning across HS 6-digit products, thus a high degree of reallocation of resources within continuing Turkish exporters in their continuing destinations. The pattern of turnover across HS 6-digit products for Turkish continuing exporters in their continuing destinations shows a similar role for the product extensive margin as what is shown for Portuguese continuing exporters for which Amador and Opromolla (2012) report that exports of continuing products account for about 75% of short-run export growth in continuing destinations.

Finally, to exploit the unique highly disaggregated nature of the product classification in the Turkish dataset, we present in Panel D of Table 5 the decomposition in Eq. (3) focusing on products at the HS 12-digit level. While continuing HS 12-digit products represent the bulk of short-run export growth in continuing destinations by continuing exporters in every pair of consecutive years from 2002 to 2011, the role of net entry is much larger than was the case in Panel C for HS 6-digit products. This can be rationalized by the fact that firms can innovate in their continuing destinations by introducing small variants of their products through a new HS 12-digit variety within the same HS 6-digit and dropping other variants of their products at relatively low cost. Interestingly, the last rows of Panel D of Table 5 show that over the long-run continuing HS 12-digit products make up only 40% of export growth in continuing destinations by continuing exporters between 2002 and 2008 while the majority of growth is due to the experimentation with success and failure of HS 12-digit products. During the crisis and recovery period the pattern is even more dramatic as growth of continuing exporters in their continuing

destinations (1.6%) is entirely accounted for by net entry of HS 12-digit products given that growth of continuing HS 12-digit products is negative and stronger (-2.3%).

4.2. By Sectors

The export growth decompositions discussed in Section 4.1 consider the universe of exporters in Turkey, regardless of their sector. However, there may be important differences across sectors in the micro dynamics underlying export growth given the degree of heterogeneity over the 2002-2011 period in global demand, trade policies, technological developments, and other policies and shocks affecting the sectors. To examine such differences we present in Table 6 the decomposition of export growth in each of seven sectors along the firm dimension (applying Eq. (1) to each sector) in Panel A and along the destination dimension for continuing exporters in each sector (applying Eq. (2) to the continuing exporters in each sector) in Panel B.[22] To our knowledge our study is the first to consider such sectoral decompositions.

For all sectors, short-run export growth is dominated by the growth of continuing exporters during the export boom period, as shown by Panel A. The firm intensive margin accounts on average for 73% of year-to-year export growth in textiles and clothing, 77% in other, 80% in agriculture, and close to 90% in machinery, metals, textiles, and transportation. This pattern is intensified in all sectors during the global financial crisis with year-to-year growth being entirely dominated by slow or negative growth for continuing exporters. During the export boom there is, however, some heterogeneity across sectors in the contribution of exporter entry in gross terms to short-run growth: entrants account for a very large proportion of growth averaging 60% in agriculture and 20% to 30% in the other sectors except textiles and clothing. The latter sector exhibits an interesting pattern with entry in gross terms accounting for about 50% of export growth until 2007 but for more than 400% of export growth in 2007-2008 (though that is compensated by exit accounting for minus 370% of export growth).

The last rows of Panel A of Table 6 show that the firm intensive margin accounts for close to 70% of long-run export growth over the whole 2002-2008 period in agriculture, chemicals, machinery, and metals but for a much higher percentage in transportation (83%) and for a much lower percentage in textiles and clothing (55%). Exporter entry in gross terms

[22] Note that firms may export multiple HS 6-digit products belonging to different sectors (as defined in Appendix Table 1). In such cases, firms will be counted multiple times since they will enter the export growth decompositions of all the sectors to which their exported HS 6-digit products belong.

represents a larger proportion of long-run export growth than of average short-run export growth in all sectors except agriculture and transportation, in the former due to a more negative contribution of exit in the long-run than the short-run and in the latter due to a much higher contribution of continuing exporters in the long-run than the short-run. However, in all sectors net exporter entry represents a larger proportion of long-run growth than of average short-run growth.

In all sectors short-run growth of continuing exporters is dominated by growth in exports to their continuing destinations during the export boom period, as shown by Panel B of Table 6. The destination intensive margin makes up on average more than 80% of year-to-year export growth of continuing exporters in chemicals, machinery, metals, and transportation. The percentages are lower on average for agriculture due to an idiosyncratic pattern in 2005-2006.[23] In textiles and clothing, the percentages are also lower possibly due to the end of the Multi-Fiber Agreement at the beginning of 2005 and the ensuing removal of all quotas for Chinese textiles exports to the EU, the major traditional market for Turkish exports of textiles and clothing.[24] In all sectors at the peak of the global financial crisis, the decline in exports to continuing destinations (which tend to be the EU markets) was particularly key in accounting for the decline in exports of continuing exporters. There is some heterogeneity across sectors in the contribution of new destinations in gross terms to short-run export growth of continuing exporters during the export boom: they accounted on average for 30% to 40% of that growth in most sectors but for a larger percentage (70%) in metals. In agriculture and textiles and clothing the same idiosyncratic patterns referred to above imply that new destinations accounted for a particularly large proportion of the export growth of continuing exporters in a few years.

The last rows of Panel B of Table 6 show that in agriculture, chemicals, machinery, and textiles and clothing, the destinations served by continuing exporters both in 2002 and in 2008

[23] In 2005-2006, the growth of continuing exporters in continuing destinations in agriculture (namely Italy, Spain, Germany, and France) was negative but that was compensated by a strong positive contribution of turnover in destinations (namely with a large increase in agriculture exports to Iraq, Iran, Russia, Saudi Arabia, and Ukraine), hence export growth overall was positive though low (0.7%).

[24] In 2005-2006 textiles and clothing exports from Turkey were still protected from Chinese competition in the EU (due to a EU-China agreement limiting Chinese exports in EU markets until 2007) but the corresponding growth of continuing exporters to continuing destinations accounted for only one third of their export growth. In 2007-2008 textiles and clothing exports from Turkey were exposed to intense Chinese competition in EU markets and therefore it is not surprising to verify that the growth of continuing exporters to continuing destinations was negative even if it was compensated by a strong positive contribution of turnover in destinations thus export growth of continuing exporters overall was positive though low (0.7%).

make up 61% to 73% of their long-run export growth over the whole 2002-2008 period. However, that percentage is much higher in transportation at 82% and much lower at 51% in metals and 52% in other sectors. Across sectors, new destinations served by continuing exporters in 2008 that were not served in 2002 account for a rather similar proportion of continuing exporters' long-run growth and short-run growth over the period. However, net destination entry represents a larger proportion of long-run growth than of average short-run growth of continuing exporters in all sectors except agriculture and textiles and clothing where the opposite is verified.

4.3. By Destination Markets

Turkey experienced an interesting reorientation of its trade flows away from traditional export markets such as the countries in the EU and EFTA, as shown in Panel B of Table 2. It is thus important to examine the forces dominating export growth in different destination markets during the 2002-2011 period. Table 7 presents the decomposition of export growth in each of four groups of destination markets along the firm dimension (applying Eq. (1) to each group of destinations) in Panel A and along the HS 6-digit product dimension for continuing exporters serving each group of destination markets (applying Eq. (3) to the continuing exporters in each group of destinations) in Panel B.[25] To our knowledge our study is the first to consider decompositions of export growth to a comprehensive set of destinations as Bernard, Jensen, Redding, and Schott (2009) provided results from a decomposition of export growth from the U.S. to Asian countries only.

For all destination markets, growth of continuing exporters dominates short-run export growth during the export boom period in Panel A. The firm intensive margin takes up from 76% of year-year export growth to the Rest of the World to 89% of year-year export growth to Central Asia and Other Europe. This pattern is maintained during the global financial crisis, as the slow or negative growth of continuing exporters accounts entirely for short-run growth to all destination markets. Exporter entry in gross terms represents 30% to 40% of short-run growth in exports to the EU and EFTA, to Central Asia and Rest of Europe, and to Middle East and North Africa. Entrants play a much more substantive role in accounting for export growth to the Rest of the World from 2004 onwards and particularly in 2006-2007 at the early stage of the global

[25] Note that firms may export to multiple countries belonging to different groups of destinations (as defined in Table 2). In such cases, firms will be counted multiple times as they will enter the export growth decompositions of all the groups of destinations to which they export products.

financial crisis when new exporters in Turkey likely begun to focus more on export opportunities outside the country's traditional trading partners.

The last rows of Panel A of Table 7 show that continuing exporters present both in 2002 and in 2008 contribute with close to 60% of long-run growth over the whole period in exports to EU and EFTA and to Middle East and North Africa and 70% in Central Asia and the Rest of Europe. The pattern described above for growth in exports to the Rest of the World between 2007 and 2008 is verified also in the long-run: i.e., the churning across exporters accounts for 56% of export growth over the whole 2002-2008 period. However, there is a dramatic change in the findings for some destination markets over the whole 2008-2011 period. Export growth to the EU and EFTA (7.2%) is mostly driven by substantial exporter entry as growth of continuous exporters is actually negative (2.2%) while negative export growth to Central Asia and Other Europe (-3.4%) is mostly driven by substantial exporter exit since growth of continuous exporters is actually positive (1.4%). However, note that net exporter entry represents in all destination markets a larger proportion of long-run growth than of average short-run growth.

For all destination markets, growth of continuing exporters in the short-run is dominated by the growth of their continuing HS 6-digit products during the export boom period, as shown by Panel B. The HS 6-digit intensive margin accounts on average for at least 83% of short-run export growth for continuing exporters up to 2008. At the peak of the global financial crisis, a strong decline in exports of continuing HS 6-digit products was the major factor behind the strong decline in exports of continuing exporters to any group of destination markets. New HS 6-digit products in gross terms account on average for 50% of short-run export growth of continuing exporters serving the EU and EFTA and the Middle East and North Africa, and the proportion is a third for continuing exporters serving Central Asia and Other Europe. For export growth to the Rest of the World, 2004-2005 and 2006-2007 are exceptional years when new HS 6-digit products introduced by continuing exporters account for a substantially larger proportion.

The last rows of Panel B of Table 7 show that HS 6-digit products exported by continuing exporters in both 2002 and 2008 contribute with most of the long-run growth of exports to all destination markets. In particular, the HS 6-digit product intensive margin accounts for 86% of long-run export growth of continuing exporters to Central Asia and Other Europe. New HS 6-digit products introduced by continuing exporters account for a smaller proportion of continuing exporters' long-run growth than they do of their average short-run growth between 2002 and

2008 in all destination markets due essentially to a stronger role of continuing products in the long-run than the short-run. However, net product entry represents in all destination markets a larger proportion of long-run growth than of average short-run growth.

4.4 Export Growth for the Cohort of 2003 Entrants into Export Markets and for the Cohort of 2002-2011 Continuous Exporters

To characterize further the export boom in Turkey during the 2000s, we examine the evolution of exports, destination and product dynamics for two cohorts of firms - following the exercise conducted by Lederman, Rodriguez-Clare, and Xu (2010) and in Amador and Opromolla (2012). We consider the cohort of continuous exporters that are exporting in 2002 and continue to do so uninterruptedly until 2011 and the cohort of entrants into export markets in 2003 that survive until 2011 to understand how the exports of those two cohorts grow.[26] The cohort of 2002-2011 continuous exporters includes 7,423 firms while the cohort of 2003 entrants includes 12,317 firms in 2003 but dwindles to 5,054 by 2006 and 3,043 by 2011, as shown in Appendix Table 2. These figures complement the evidence so far on the high degree of experimentation in export markets - thus the low survival in export markets for many firms - even during a (mostly) export boom period. But the new exporters that do survive grow very fast, as shown by the steep increase over time in the average size of the survivors from the 2003 cohort of entrants in Appendix Table 2. It is also the case that 2002-2011 continuous exporters grow fast over the period, but not as fast as entrant exporters before 2009.

We decompose export growth along the destination dimension and the HS 6-digit product dimension (for continuing destinations) for the cohort of 2002-2011 continuous exporters in Table 8 and for the cohort of 2003 exporter entrants that survive until 2011 in Table 9. For 2002-2011 continuous exporters Panel A of Table 8 shows that the destination intensive margin accounts for 90% of their short-run export growth but for a smaller proportion - 66% - of their long-run export growth between 2002 and 2011. The product intensive margin accounts for 92% of short-run export growth of 2002-2011 continuous exporters in their continuous destinations but also for just 66% of their long-run export growth in those destinations between 2002 and 2011, as seen in Panel B of Table 8.

[26] By defining these cohorts as firms exporting until 2011, we are placing a somewhat stringent criterion on the selected exporters in that they need to have survived the global financial crisis, in addition to surviving during the export boom.

For the cohort of exporter entrants in 2003 that survive until 2011 the patterns are qualitatively similar but quantitatively different. Specifically, Panel A of Table 9 shows that the destination intensive margin accounts for 80% of the short-run export growth of the cohort of exporter entrants in 2003 but for just 50% of their long-run export growth between 2003 and 2011. The product intensive margin accounts for 88% of short-run export growth of the cohort of exporter entrants in their continuous destinations but for less just 46% of their long-run export growth in those destinations between 2003 and 2011, as seen in Panel B of Table 9. So over the long-run churning in destination markets and churning in HS 6-digit products (for continuing destinations) is critical in explaining export growth of the cohort of new exporters but less so in explaining export growth of the 2002-2011 continuing exporters.

5. Conclusion

This paper examines the micro dynamics behind the dramatic export boom experienced by Turkey from 2002 to 2008 as well as the underlying forces for the strong contraction ensuing from the 2008-2009 global financial crisis and for the recovery thereafter using a novel and rich exporter-level customs dataset. Growth in exports of continuing exporters accounts for the majority of short-run export growth during the entire period. For these continuing exporters, short-run growth is dominated by exports to their continuing destinations, and for these continuing destinations, short-run growth is dominated by exports of continuing products. However, there is a high degree of dynamism across firms, destinations, and products from year to year. More importantly, churning across exporters, destination markets and products account for an important part of Turkey's long-run export growth in the whole 2002-2008 period, even if the intensive margins still dominate. The patterns of micro-dynamics of export growth are verified across all sectors, a finding which is novel to the literature. These patterns are also mostly verified across groups of destination markets, a noteworthy exception being the greater prominence of net exporter entry in accounting for long-run growth in exports to the Rest of the

World which includes emerging markets such as China and India. Finally, our evidence also shows that churning across destination markets and across HS 6-digit products (for continuing destinations) is much more important to explain long-run export growth in the whole 2003-2011 period for the cohort of exporter entrants in 2003 that continue to export until 2011 than it is to explain long-run growth of 2002-2011 continuing exporters.

Our evidence points to a substantial degree of experimentation by Turkish firms of the export market as well as of new destination markets and new products by continuing exporters, both in the boom period as well as the crisis and recovery period. This great dynamism suggests sunk entry costs into export markets seem to be relatively low. Our evidence of important trial and error is consistent both with an important role of idiosyncratic uncertainty on the profitability of exporting as modeled e.g., by Freund and Pierola (2010) and Blum, Claro, and Horstmann (2013), as well as of learning about export markets as modeled e.g., by Albornoz, Calvo, Corcos, and Ornelas (2012) and Timoshenko (2013). From a policy perspective, an implication from the micro dynamics underlying the Turkish export boom is that there is a need to better understand the drivers of export entry and exit choices at the firm, destination market, and product levels, how learning about export markets takes place, but also what helps survival in export markets, given the preeminence of the intensive margin. Assessing the roles of trade costs, exchange rate movements, and other policy dimensions for learning processes and for survival in export markets is a fruitful avenue for future research.

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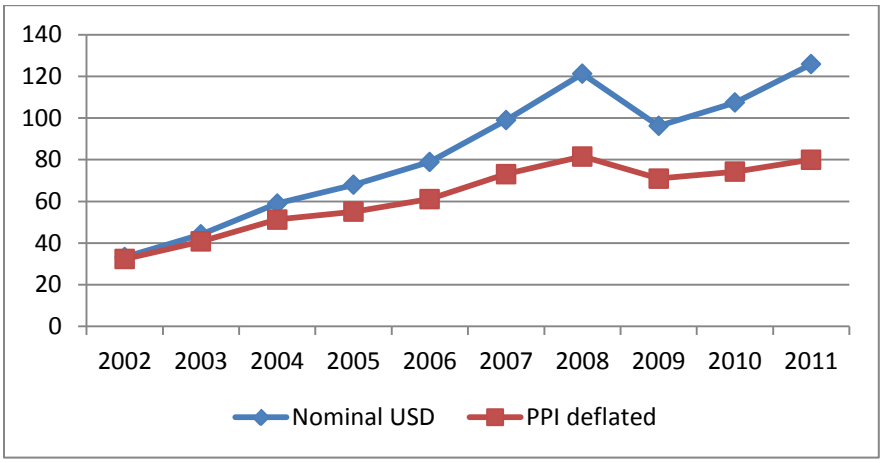
Figure 1. Growth in Turkey's Aggregate Exports - 2002-2011



Source: Authors' calculations using exporter-level data from *Turkstat* and World Development Indicators.
Note: PPI deflated exports are aggregate exports divided by the U.S. producer price index in constant values of 1997.

Table 1. Summary Statistics on Turkish Exporter-Level Dataset

	Total Exports (Billion USD)	Number of Exporters	Number of HS 6-digit Products	Number of HS 12-digit Products	Number of Destinations	Average Exports per Firm (Million USD)	Median Exports per Firm (Million USD)	Share of Top 1% of Exporters	Share of Top 5% of Exporters	Average Number of HS-6 Products per Exporter	Average Number of HS-12 Products per Exporter	Average Number of Destinations Served per Exporter	Average Number of Exporters per HS-6 Product	Average Number of Exporters per HS-12 Product	Average Number of Exporters per Destination Served
2002	33	30,219	3,820	9,569	207	1.10	0.05	59	80	7.9	9.2	3.4	62	29	500
2003	44	33,938	3,895	9,889	209	1.30	0.06	59	80	8.5	10	3.6	74	34	578
2004	59	37,580	3,904	10,081	213	1.57	0.07	61	81	8.6	10.1	3.7	83	38	645
2005	68	40,203	3,931	10,124	209	1.69	0.08	60	80	8.8	10.2	3.8	90	41	726
2006	79	41,966	3,950	10,093	211	1.88	0.09	59	80	9.3	10.8	3.9	99	45	775
2007	99	45,818	3,968	10,103	211	2.16	0.10	59	80	9.6	11	3.9	111	50	846
2008	121	46,270	3,987	10,061	213	2.62	0.12	60	81	9.9	11.4	4.1	115	52	882
2009	96	46,944	3,998	9,572	216	2.05	0.11	56	78	10.1	11.4	4.1	118	56	885
2010	107	48,609	4,024	9,587	215	2.21	0.12	55	78	10.3	11.7	4.3	125	59	956
2011	126	51,371	4,040	9,556	215	2.45	0.12	55	78	10.4	11.8	4.4	132	63	1,041

Table 2. Turkish Exports across Sectors and Destination Markets - 2002-2011

Panel A. By Sector

	Share of Total Exports of Turkey in 2002	Share of Total Exports of Turkey in 2006	Share of Total Exports of Turkey in 2011	Number of Exporters in 2002	Number of Exporters in 2006	Number of Exporters in 2011	Growth in Turkey's Exports between 2002 and 2006	Growth in Turkey's Exports between 2006 and 2011
Agriculture	11	10	11	3,562	4,442	5,474	120	80
Chemicals	7	7	10	7,786	12,922	18,551	155	112
Machinery	14	16	16	9,232	15,081	20,751	168	62
Metals	14	17	20	7,361	12,393	17,148	194	83
Transportation	11	17	14	2,677	3,593	4,748	278	30
Textiles and Clothing	36	25	20	11,945	15,464	17,186	62	31
Other	8	8	9	10,514	16,004	20,937	137	84

Panel B. By Destination Markets

	Share of Total Exports of Turkey in 2002	Share of Total Exports of Turkey in 2006	Share of Total Exports of Turkey in 2011	Number of Exporters in 2002	Number of Exporters in 2006	Number of Exporters in 2011	Growth in Turkey's Exports between 2002 and 2006	Growth in Turkey's Exports between 2006 and 2011
EU and EFTA	61	60	49	20,595	27,669	29,471	132	30
Middle East and North Africa	14	18	25	11,765	18,337	26,013	203	127
Rest of Europe and Central Asia	8	10	12	7,258	12,303	19,771	194	99
Rest of the World	17	13	14	7,150	10,073	13,296	78	77

Note: EU stands for European Union, EFTA stands for European Free Trade Area, and MENA stands for Middle East and North Africa. The HS chapters belonging to each sector used in Panel A are listed in Appendix Table 1.

Table 3. Characterization of Firms across Exporter Status in Export Market

	Number of Exporters	Number of Incumbents	Average Size of Incumbents (million USD)	Number of Entrants	Entry Rate	Average Size of Entrants (million USD)	Number of Exiters	Exit Rate	Average Size of Exiters (million USD)	Number of Survivors	Survival Rate	Average Size of Survivors (million USD)	Share of Continuous Exporters over 2002-2011 Period in Total Exports (%)
2002	30,219												66
2003	33,938	21,655	1.97	12,317	0.36	0.21	8,610	0.28	0.13	7,005	0.57	0.29	66
2004	37,580	24,584	2.37	13,049	0.35	0.18	9,388	0.28	0.14	7,346	0.56	0.24	68
2005	40,203	27,156	2.5	13,105	0.33	0.2	10,477	0.28	0.16	7,263	0.55	0.28	67
2006	41,966	29,075	2.71	12,936	0.31	0.29	11,186	0.28	0.17	6,947	0.54	0.43	68
2007	45,818	29,790	3.3	16,085	0.35	0.33	12,221	0.29	0.2	9,250	0.58	0.45	68
2008	46,270	32,369	3.8	13,964	0.30	0.34	13,506	0.29	0.25	7,489	0.54	0.49	67
2009	46,944	32,975	2.89	14,046	0.30	0.32	13,358	0.29	0.27	7,939	0.57	0.46	63
2010	48,609	34,617	3.1	14,079	0.29	0.33	12,404	0.26	0.43	8,120	0.58	0.46	64
2011	51,371	36,529	3.48	14,929	0.29	0.34	12,167	0.25	0.24				63

Note: the number of continuous exporters from 2002 to 2011 whose share in total exports is shown in the last column is 7,423.

Table 4. Share of Exports Accounted for by Entrant Cohorts

Share by Cohorts

	Cohort of Exporters in 2002	Cohort of Export Entrants in 2003	Cohort of Export Entrants in 2004	Cohort of Export Entrants in 2005	Cohort of Export Entrants in 2006	Cohort of Export Entrants in 2007	Cohort of Export Entrants in 2008	Cohort of Export Entrants in 2009	Cohort of Export Entrants in 2010	Cohort of Export Entrants in 2011
Export Year										
2002	100.0									
2003	94.3	5.7								
2004	90.2	6.4	3.4							
2005	85.9	6.4	4.6	3.1						
2006	82.8	5.4	4.6	3.9	3.3					
2007	78.4	5.2	4.4	3.6	4.2	4.1				
2008	73.7	5.2	4.3	3.3	5.2	5.4	2.9			
2009	66.8	5.3	4.5	3.7	6.8	5.5	3.9	3.5		
2010	66.7	4.8	4.4	3.5	3.9	4.9	3.6	4.8	3.4	
2011	65.6	4.5	4.1	3.3	3.8	4.7	3.0	3.8	4.4	2.8

Table 5. Export Growth Decomposition

Panel A. Across Firms

	Aggregate Export Growth	Continuing Exporters	New Exporters	Exiting Exporters
2002-2003	28.1	24.3	6.5	-2.8
2003-2004	29.0	27.2	4.3	-2.5
2004-2005	13.6	11.9	4.1	-2.5
2005-2006	15.2	12.7	5.0	-2.5
2006-2007	22.7	19.7	5.8	-2.8
2007-2008	20.3	19.1	4.3	-3.1
2008-2009	-23.1	-24.0	4.2	-3.3
2009-2010	10.9	11.7	4.5	-5.3
2010-2011	15.9	14.2	4.1	-2.5
2002-2008	113.9	78.7	43.0	-7.8
2008-2011	3.6	3.8	13.2	-13.5

Panel B. For Continuing Exporters Across Destinations

	Growth of Continuing Exporters	Continuing Destinations	New Destinations	Exiting Destinations
2002-2003	24.3	20.6	8.6	-5.0
2003-2004	27.2	23.5	8.1	-4.5
2004-2005	11.9	10.2	7.2	-5.4
2005-2006	12.7	10.4	7.6	-5.4
2006-2007	19.7	17.0	8.1	-5.5
2007-2008	19.1	13.7	10.4	-5.0
2008-2009	-24.0	-22.1	7.3	-9.2
2009-2010	11.7	10.2	7.3	-5.8
2010-2011	14.2	12.8	7.1	-5.8
2002-2008	78.7	51.6	33.7	-6.5
2008-2011	3.8	1.6	13.3	-11.0

Panel C. For Continuing Exporters' Continuing Destinations Across HS 6-digit Products

	Growth of Continuing Exporters' Continuing Destinations	Continuing HS 6-digit Products	New HS 6-digit Products	Exiting HS 6-digit Products
2002-2003	20.6	19.5	7.6	-6.4
2003-2004	23.5	20.8	8.3	-5.6
2004-2005	10.2	9.6	7.1	-6.5
2005-2006	10.4	8.9	7.5	-6.0
2006-2007	17.0	15.2	7.7	-5.8
2007-2008	13.7	12.3	7.1	-5.8
2008-2009	-22.1	-21.7	6.9	-7.3
2009-2010	10.2	8.5	7.7	-5.9
2010-2011	12.8	11.7	7.2	-6.0
2002-2008	51.6	39.8	18.5	-6.7
2008-2011	1.6	-1.2	12.4	-9.7

Panel D. For Continuing Exporters' Continuing Destinations Across HS 12-digit Products

	Growth of Continuing Exporters' Continuing Destinations	Continuing HS 12-digit Products	New HS 12-digit Products	Exiting HS 12-digit Products
2002-2003	20.6	18.5	11.2	-9.1
2003-2004	23.5	19.3	12.5	-8.2
2004-2005	10.2	8.3	13.2	-11.3
2005-2006	10.4	8.7	14.8	-13.1
2006-2007	17.0	14.2	13.6	-10.8
2007-2008	13.7	12.3	10.1	-8.7
2008-2009	-22.1	-19.5	14.7	-17.3
2009-2010	10.2	7.1	12.4	-9.3
2010-2011	12.8	11.3	10.3	-8.7
2002-2008	51.6	31.1	33.0	-12.6
2008-2011	1.6	-2.3	23.2	-19.3

Table 6. Export Growth Decomposition for Different Sectors

Panel A. Across Firms

	Total Export Growth	Cont. Exp.	New Exp.	Exiting Exp.	Total Export Growth	Cont. Exp.	New Exp.	Exiting Exp.	Total Export Growth	Cont. Exp.	New Exp.	Exiting Exp.	Total Export Growth	Cont. Exp.	New Exp.	Exiting Exp.	Total Export Growth	Cont. Exp.	New Exp.	Exiting Exp.	Total Export Growth	Cont. Exp.	New Exp.	Exiting Exp.	Total Export Growth	Cont. Exp.	New Exp.	Exiting Exp.
	Agriculture				Chemicals				Machinery				Metals				Textiles and Clothing				Transportation				Other			
2002-2003	26.6	22.0	7.9	-3.3	26.7	23.7	5.2	-2.1	29.5	27.5	4.4	-2.4	25.3	23.8	8.1	-6.6	20.9	18.2	5.1	-2.4	51.3	40.4	16.0	-5.1	28.7	23.3	7.7	-2.3
2003-2004	23.0	22.8	4.5	-4.3	28.2	25.0	5.2	-2.1	31.6	29.1	4.6	-2.1	48.4	45.1	5.0	-1.7	14.3	12.1	4.8	-2.6	42.7	42.9	6.4	-6.6	27.5	22.5	7.5	-2.5
2004-2005	26.5	22.2	6.9	-2.7	17.9	16.5	4.6	-3.2	18.0	15.6	5.0	-2.5	7.1	5.9	4.1	-2.9	7.2	6.2	4.0	-3.1	15.4	12.2	8.3	-5.1	16.2	12.3	7.0	-3.1
2005-2006	2.8	0.7	5.4	-3.2	21.3	19.3	4.5	-2.5	19.1	16.0	5.2	-2.1	25.5	21.9	5.5	-1.9	5.9	2.9	6.9	-3.8	21.7	21.4	6.0	-5.7	14.0	11.0	6.6	-3.7
2006-2007	12.6	11.3	5.8	-4.5	23.4	19.2	6.6	-2.3	23.6	20.8	5.2	-2.4	27.4	25.3	4.7	-2.7	15.6	12.4	6.9	-3.7	30.0	26.7	7.8	-4.5	26.6	17.4	13.2	-4.0
2007-2008	17.1	16.8	4.0	-3.7	21.7	20.8	4.2	-3.3	12.7	11.5	4.4	-3.1	48.1	45.8	5.0	-2.7	1.3	0.7	5.4	-4.7	15.4	13.0	6.6	-4.2	22.6	18.4	7.8	-3.6
2008-2009	-1.2	-2.3	3.8	-2.6	-14.3	-15.1	3.8	-2.9	-20.4	-21.0	3.9	-3.3	-35.3	-36.6	4.2	-2.9	-16.7	-18.8	6.7	-4.6	-38.3	-35.1	4.2	-7.4	-14.8	-16.1	7.0	-5.7
2009-2010	11.9	10.5	4.7	-3.3	23.4	20.8	4.8	-2.2	13.2	11.9	4.9	-3.6	1.3	6.9	6.8	-12.4	13.3	13.7	4.4	-4.7	5.7	9.0	4.2	-7.6	17.3	14.1	7.0	-3.7
2010-2011	18.3	15.3	5.0	-2.0	19.9	18.3	3.8	-2.2	18.5	15.9	5.4	-2.8	17.9	15.8	4.4	-2.2	13.6	11.7	5.3	-3.4	13.6	12.9	5.0	-4.4	8.5	8.5	5.7	-5.7
2002-2008	99.4	68.3	44.9	-13.8	120.7	79.4	48.1	-6.7	117.7	81.6	39.8	-3.6	145.2	99.0	52.0	-5.8	63.1	35.1	45.3	-17.4	142.6	119.1	26.3	-2.8	118.5	52.1	73.0	-6.6
2008-2011	28.9	18.1	20.2	-9.3	29.0	22.6	13.4	-7.1	11.3	7.9	12.3	-8.9	-16.3	-11.2	13.4	-18.5	10.2	14.9	18.5	-23.2	-19.4	-17.4	8.8	-10.8	11.0	5.5	20.1	-14.5

Panel B. For Continuing Exporters Across Destinations

	Export Growth of Cont. Exp.	Cont. Destin.	New Destin.	Exiting Destin.	Export Growth of Cont. Exp.	Cont. Destin.	New Destin.	Exiting Destin.	Export Growth of Cont. Exp.	Cont. Destin.	New Destin.	Exiting Destin.	Export Growth of Cont. Exp.	Cont. Destin.	New Destin.	Exiting Destin.	Export Growth of Cont. Exp.	Cont. Destin.	New Destin.	Exiting Destin.	Export Growth of Cont. Exp.	Cont. Destin.	New Destin.	Exiting Destin.	Export Growth of Cont. Exp.	Cont. Destin.	New Destin.	Exiting Destin.
	Agriculture				Chemicals				Machinery				Metals				Textiles and Clothing				Transportation				Other			
2002-2003	22.0	15.9	11.8	-5.8	23.7	20.6	8.0	-4.9	27.5	22.9	8.9	-4.4	23.8	20.1	14.7	-11.0	18.2	16.2	5.3	-3.2	40.4	35.8	8.3	-3.7	23.3	19.2	10.7	-6.7
2003-2004	22.8	22.0	8.2	-7.3	25.0	22.0	7.6	-4.6	29.1	25.3	7.5	-3.6	45.1	37.0	15.1	-7.0	12.1	10.8	5.1	-3.8	42.9	38.0	7.5	-2.6	22.5	18.4	8.9	-4.8
2004-2005	22.2	20.2	7.4	-5.4	16.5	13.7	7.4	-4.6	15.6	13.1	6.9	-4.5	5.9	6.6	10.3	-11.1	6.2	5.5	4.9	-4.1	12.2	10.9	4.8	-3.5	12.3	10.2	7.5	-5.5
2005-2006	0.7	-0.8	8.1	-6.6	19.3	16.8	7.8	-5.3	16.0	13.2	7.6	-4.9	21.9	17.6	12.6	-8.3	2.9	1.0	5.9	-4.1	21.4	19.0	5.5	-3.2	11.0	8.8	8.1	-5.8
2006-2007	11.3	11.8	6.6	-7.1	19.2	15.5	7.8	-4.2	20.8	17.3	8.1	-4.7	25.3	19.0	13.8	-7.5	12.4	12.7	5.1	-5.5	26.7	25.2	6.1	-4.6	17.4	12.9	10.5	-6.0
2007-2008	16.8	15.1	7.8	-6.0	20.8	18.3	8.3	-5.8	11.5	8.1	8.3	-5.0	45.8	33.3	18.8	-6.3	0.7	-0.7	6.3	-4.9	13.0	9.5	8.2	-4.7	18.4	16.3	9.2	-7.1
2008-2009	-2.3	-5.1	8.1	-5.3	-15.1	-15.8	6.8	-6.1	-21.0	-20.7	7.2	-7.5	-36.6	-29.0	9.9	-17.4	-18.8	-19.2	6.4	-6.1	-35.1	-34.2	5.4	-6.3	-16.1	-15.4	8.7	-9.4
2009-2010	10.5	8.5	6.7	-4.7	20.8	17.9	7.6	-4.7	11.9	10.0	7.5	-5.6	6.9	6.1	9.2	-8.4	13.7	12.0	6.0	-4.3	9.0	5.3	8.9	-5.1	14.1	11.5	9.0	-6.4
2010-2011	15.3	15.1	6.5	-6.3	18.3	16.7	6.5	-5.0	15.9	13.7	7.8	-5.5	15.8	13.4	12.1	-9.7	11.7	10.8	5.3	-4.4	12.9	12.6	3.5	-3.2	8.5	6.8	7.6	-5.9
2002-2008	68.3	41.8	34.7	-8.2	79.4	53.3	32.1	-5.9	81.6	59.7	29.3	-7.5	99.0	50.6	54.5	-6.0	35.1	24.5	20.2	-9.5	119.1	97.1	26.2	-4.3	52.1	27.1	34.8	-9.9
2008-2011	18.1	12.3	14.5	-8.8	22.6	16.7	13.7	-7.8	7.9	5.1	12.9	-10.1	-11.2	-10.6	18.6	-19.3	14.9	10.6	12.3	-8.1	-17.4	-18.2	8.9	-8.1	5.5	2.2	14.4	-11.1

Table 7. Export Growth Decomposition for Different Destination Markets

Panel A. Across Firms

	Total Export Growth	Cont. Exporters	New Exporters	Exiting Exporters	Total Export Growth	Cont. Exporters	New Exporters	Exiting Exporters	Total Export Growth	Cont. Exporters	New Exporters	Exiting Exporters	Total Export Growth	Cont. Exporters	New Exporters	Exiting Exporters
	EU and EFTA				Central Asia and Other Europe				Middle East and North Africa				Rest of the World			
2002-2003	36.5	23.4	16.6	-3.5	29.6	25.9	5.9	-2.2	28.1	28.6	12.7	-13.2	14.2	10.5	9.0	-5.3
2003-2004	36.1	29.8	9.9	-3.6	28.5	27.1	3.9	-2.5	28.5	22.6	10.9	-5.0	23.9	21.9	8.2	-6.2
2004-2005	21.9	18.5	7.9	-4.5	12.0	10.1	4.2	-2.3	23.3	19.3	9.5	-5.5	4.5	3.4	8.5	-7.3
2005-2006	15.5	11.3	8.1	-3.9	14.0	12.2	4.8	-3.0	29.9	24.8	9.7	-4.6	9.3	6.8	9.0	-6.5
2006-2007	24.6	21.4	8.2	-5.0	22.8	19.6	5.5	-2.3	37.1	28.0	13.5	-4.4	4.1	3.4	11.1	-10.4
2007-2008	46.4	43.2	7.1	-3.9	7.1	6.8	3.6	-3.3	29.0	24.0	10.0	-5.0	29.5	17.6	18.4	-6.6
2008-2009	-15.2	-17.7	7.1	-4.6	-24.6	-24.1	4.0	-4.4	-42.4	-40.0	6.7	-9.0	-13.1	-11.7	7.3	-8.7
2009-2010	12.1	8.3	8.0	-4.1	7.2	10.8	3.9	-7.5	20.3	16.3	9.8	-5.8	15.4	14.8	7.5	-6.9
2010-2011	10.3	8.0	6.9	-4.5	14.1	13.5	3.0	-2.4	24.5	19.6	9.7	-4.8	24.9	22.1	8.2	-5.4
2002-2008	144.7	88.4	62.4	-6.2	103.4	72.1	39.9	-8.6	141.9	80.1	71.5	-9.8	80.9	35.8	60.8	-15.7
2008-2011	7.2	-2.2	21.7	-12.3	-3.4	1.4	10.9	-15.8	1.9	-4.5	23.0	-16.6	27.1	27.7	18.3	-18.9

Panel B. For Continuing Exporters Across HS 6-Digit Products

	Export Growth of Cont. Exp.	Cont. HS 6-digit Products	New HS 6-digit Products	Exiting HS 6-digit Products	Export Growth of Cont. Exp.	Cont. HS 6-digit Products	New HS 6-digit Products	Exiting HS 6-digit Products	Export Growth of Cont. Exp.	Cont. HS 6-digit Products	New HS 6-digit Products	Exiting HS 6-digit Products	Export Growth of Cont. Exp.	Cont. HS 6-digit Products	New HS 6-digit Products	Exiting HS 6-digit Products
	EU and EFTA				Central Asia and Other Europe				Middle East and North Africa				Rest of the World			
2002-2003	23.4	22.2	10.2	-9.1	25.9	24.4	5.2	-3.7	28.6	25.8	11.5	-8.7	10.5	9.1	7.2	-5.9
2003-2004	29.8	24.7	12.5	-7.5	27.1	24.6	5.5	-3.0	22.6	17.9	12.2	-7.6	21.9	20.7	9.1	-7.9
2004-2005	18.5	14.8	11.6	-7.8	10.1	9.5	4.5	-3.9	19.3	17.1	10.6	-8.4	3.4	2.9	6.9	-6.5
2005-2006	11.3	11.0	9.5	-9.3	12.2	11.1	4.4	-3.3	24.8	19.5	13.1	-7.8	6.8	4.2	8.8	-6.2
2006-2007	21.4	20.1	8.5	-7.2	19.6	19.2	4.6	-4.1	28.0	24.0	11.0	-6.9	3.4	3.0	6.8	-6.4
2007-2008	43.2	38.9	10.0	-5.7	6.8	6.1	4.4	-3.7	24.0	21.2	10.8	-8.0	17.6	13.9	9.0	-5.3
2008-2009	-17.7	-19.8	8.1	-6.0	-24.1	-23.5	3.7	-4.3	-40.0	-38.3	8.9	-10.6	-11.7	-14.7	9.7	-6.8
2009-2010	8.3	6.0	9.2	-6.9	10.8	10.4	3.9	-3.5	16.3	15.1	9.9	-8.7	14.8	13.3	6.3	-4.9
2010-2011	8.0	7.7	7.8	-7.6	13.5	12.5	4.2	-3.3	19.6	17.9	10.1	-8.5	22.1	20.4	7.0	-5.3
2002-2008	88.4	69.5	24.0	-5.1	72.1	61.8	17.3	-7.0	80.1	55.8	29.5	-5.1	35.8	29.3	16.1	-9.6
2008-2011	-2.2	-6.3	12.6	-8.5	1.4	-1.0	8.8	-6.4	-4.5	-3.1	12.9	-14.3	27.7	20.7	15.7	-8.7

Table 8. Export Growth Decomposition for Cohort of Continuous Exporters in 2002-2011

Panel A. Across Destinations

	Growth of Continuing Exporters 2002-2011	Continuing Destinations	New Destinations	Exiting Destinations
2002-2003	28.3	23.9	8.3	-3.9
2003-2004	33.3	29.7	6.6	-3.1
2004-2005	11.6	10.8	4.9	-4.1
2005-2006	15.8	13.9	5.8	-3.8
2006-2007	22.4	19.7	6.1	-3.4
2007-2008	17.6	13.3	7.4	-3.2
2008-2009	-28.1	-26.6	5.5	-7.0
2009-2010	12.8	11.9	4.9	-4.0
2010-2011	13.9	13.0	4.9	-4.0
2003-2011	113.1	75.0	48.5	-8.4

Panel B. For Continuing Destinations Across HS 6-digit Products

	Growth of Continuing Exporters 2002-2011's Continuing Destinations	Continuing HS 6-digit Products	New HS 6-digit Products	Exiting HS 6-digit Products
2002-2003	23.9	22.7	7.1	-5.9
2003-2004	29.7	26.5	7.9	-4.6
2004-2005	10.8	10.8	5.7	-5.7
2005-2006	13.9	12.2	6.5	-4.7
2006-2007	19.7	18.0	6.4	-4.6
2007-2008	13.3	11.9	5.9	-4.5
2008-2009	-26.6	-26.6	6.0	-6.0
2009-2010	11.9	10.0	6.6	-4.7
2010-2011	13.0	12.5	5.1	-4.7
2003-2011	75.0	49.6	32.2	-8.9

Table 9. Export Growth Decomposition for Cohort of 2003 Exporter Entrants Surviving Until 2011

Panel A. Across Destinations

	Growth of Cohort of 2003 Exporter Entrants that Survive until 2011	Continuing Destinations	New Destinations	Exiting Destinations
2003-2004	65.6	44.1	27.9	-6.4
2004-2005	20.1	15.9	18.0	-13.9
2005-2006	10.8	7.6	12.4	-9.2
2006-2007	28.7	23.3	14.7	-9.3
2007-2008	30.4	23.2	14.5	-7.2
2008-2009	-17.5	-17.9	10.5	-10.2
2009-2010	10.1	8.2	9.1	-7.2
2010-2011	14.4	13.3	6.7	-5.6
2003-2011	135.9	68.2	78.7	-11.0

Panel B. For Continuing Destinations Across HS 6-digit Products

	Growth of Continuing Exporters' Continuing Destinations	Continuing HS 6-digit Products	New HS 6-digit Products	Exiting HS 6-digit Products
2003-2004	44.1	35.9	19.5	-11.3
2004-2005	15.9	13.4	12.5	-10.0
2005-2006	7.6	9.1	10.9	-12.4
2006-2007	23.3	16.8	16.0	-9.5
2007-2008	23.2	22.5	8.7	-8.1
2008-2009	-17.9	-16.2	8.9	-10.5
2009-2010	8.2	6.3	9.8	-7.9
2010-2011	13.3	11.3	11.9	-9.9
2003-2011	68.2	31.5	49.0	-12.3

Appendix Table 1: Definition of Sectors

Sectors	HS Chapters
Agriculture	01-24
Chemicals	28-40
Machinery	84, 85, 90-92
Metals	71-83
Transportation Vehicles	86-89
Textile & Clothing	41-43, 50-67
Other	25, 26, 44-49, 68-70, 93-97

Appendix Table 2: Characterization of Cohort of 2002-2011 Continuous Exporters and 2003 Exporter Entrants

	Cohort of Export Entrants in 2003		Continuous Exporters 2002-2011	
	Number of Firms	Average Export Value (million USD) per Firm	Number of Firms	Average Export Value (million USD) per Firm
Export Year				
2002			7,423	1.1
2003	12,317	0.2	7,423	2.0
2004	7,005	0.6	7,423	2.9
2005	5,728	0.8	7,423	3.5
2006	5,054	0.9	7,423	4.3
2007	4,422	1.2	7,423	5.7
2008	3,894	1.7	7,423	7.3
2009	3,473	1.5	7,423	5.6
2010	3,241	1.7	7,423	6.6
2011	3,043	2.0	7,423	8.1