Export Superstars: Why Size Matters*

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Summary: Using a novel dataset containing firm-level information on exports from a diverse group of 33 developing countries, we show that exports are dominated by a small group of very large exporters – Superstars. These firms, defined as the top one percent of exporters, account for over 50 percent of exports on average, as well as the lion's share of trade growth and diversification. They explain a large portion of the variation in the sectoral distribution of trade across countries. In addition, the share of the superstars' exports in a sector is an important determinant of a country's revealed comparative advantage, and its economic significance is greater than the total number of exporters in that sector. We also show that superstars are normally born large and when they are not, they typically grow into the role in less than three years. Details from three countries where we can trace the origin of superstars show that the majority are foreign owned, most began operations in the export sector, and very few are only traders. The results underscore the weight of individual firms in determining both trade volumes and trade patterns, and provide information on the characteristics and development of these important firms.

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1. Introduction

Large firms define exports. The top one percent of firms accounts for over two thirds of total exports in Mexico, 61 percent in Tanzania and Macedonia and 57 percent in Lebanon during the period 2006-2009. The top one percent of exporters accounts for 53 percent of exports on average across 33 developing countries during the same period. And the remaining volume of trade is mainly concentrated in the next tier of large firms. Specifically, the top five percent of firms accounts for almost 80 percent of exports on average and the top ten percent accounts for almost 90 percent. Using a novel firm-level panel, based on highly disaggregated customs data at the exporter level for 33 developing countries, across all regions of the world, we demonstrate the importance of these "superstars" in defining trade patterns and uncover their origins.

The first contribution of this paper is revealing the importance of export superstars—the top one percent of firms—in defining comparative advantage. We examine the role of large firms in determining trade patterns in two ways. First, we explore their influence on the variation in the sectoral distribution of total exports and of the number of firms across countries, and second we estimate their correlation with revealed comparative advantage. The distribution of exports by product-group (HS 2-digit) is very different across countries, as would be expected given comparative advantage. For example, some countries export more footwear and others more fertilizer. Surprisingly, however, the distribution of the number of firms across sectors looks strikingly similar in all countries. In the example above, this implies that despite differences in the exports of footwear relative to fertilizers, the number of footwear exporters relative to fertilizer exporters is very similar across countries. Specifically, we calculate all country-pair correlations on the number of firms and on the total exports by product-group. The average correlation across country pairs on the distribution of the number of firms by sector is

almost 0.60 and highly significant, while the average correlation of distributions of export size by sector is 0.18 and only occasionally significant. This means that the wide variation in sectoral trade patterns across countries is driven by average firm size as opposed to firm count. As a consequence, some firms or all firms must be relatively larger in comparative advantage sectors. We show that large firms drive this result. Excluding the values exported by the top 10 percent of firms in a given country almost doubles the average correlation of export patterns across country pairs, and by far the biggest jump occurs in the top 1 percent. This implies that while the distribution of large firms across export product groups differs by country, the distribution of the remaining (smaller) firms looks remarkably similar across country-products.

An alternative way to examine the effect of large firms on trade patterns is to look at how they affect revealed comparative advantage. We regress an index of revealed comparative advantage at the country-sector level (again, sectors considered at the HS 2-digit level) on the share of exports by superstars and the log number of firms. The share of exports by superstars explains more of the variation in revealed comparative advantage and the magnitude of the coefficient is much larger than of log number of firms. In particular, a one percentage point increase in the share of exports by superstars is associated with a 0.11 increase in revealed comparative advantage. In contrast, one percent more firms increases revealed comparative advantage by 0.03. Put differently, expanding the presence of superstars in a sector is more important for revealed comparative advantage than expanding the number of exporters.

Our second contribution is to show the importance of superstars for export growth and diversification. Over a period of three years, superstars account for three quarters of export growth and almost 60 percent of the growth driven by product-markets new to the country (the

extensive margin). Thus, stimulating trade growth and diversification largely depends on creating an environment where large firms can thrive.

Our third and final contribution is to explore the origin of new superstars. Using the latest three-year period for which we have available data in 23 countries, we find that over 80 percent of the new superstars entered the export sector very large—in the top 5 percent of exporters. For three countries where the time series allow analysis over a decade (Costa Rica, Peru and Morocco), we also find that superstars are born relatively large and they grow quickly into the top one percent. In particular, over half of the superstars (as defined at the end of the period) that entered within the previous decade started very large (within the top 5 percent of exporters) and on average they grew into superstars within three years of their entry into the export markets. In addition, the incumbent superstars were nearly all large one decade ago—so the cases of firms/exporters that transitioned slowly from the bottom to the top of the size-distribution are very rare. These results imply that superstars start big as exporters and grow fast—suggesting they are already highly productive when they enter the export sector and there is not a long period of learning to become a superstar.

Unfortunately, the data do not allow us to systematically examine superstars *before* they began exporting to learn about their potential previous experience in domestic markets. However, for three countries where we can identify the superstars by name (Jordan, Peru and Tanzania) we research their origins in order to understand how they start as exporters. Specifically, this allows us to determine whether they grew slowly in the domestic market before becoming exporters, whether they are domestic or foreign owned, and it also alleviates potential

concerns about traders (non producers) in the sample.[1] We find that the majority are foreign owned, began operations as exporters, and only a small share are only traders. This further supports the argument that superstars are unique—they are born as large exporters, they did not learn from domestic production or exporting to become superstars. Coupled with the large foreign share in ownership of superstars, this also highlights the role of multinationals in exports.

Our results have important implications for trade theory. Comparative advantage is at the heart of gains from trade. The typical assumption is that for each country there exists a sector where relative production costs are lower than in other countries, and products from that sector will be exported. The incredibly skewed firm-size distribution in any given country, where most firms are similar across countries suggests that is not the entire story. Specifically, in comparative advantage sectors there are some firms that have a much lower production cost, which are large, while other firms are similar. This could be achieved in a heterogeneous firm framework with firms having a small probability of getting a very high productivity draw in comparative advantage sectors. Alternatively, it could be evidence of returns to scale in many tradable sectors. In either case, the results suggest that models that treat individual firms as insignificant are not consistent with the evidence, as large firms do significantly impact export levels, export growth, diversification, and comparative advantage. Given that superstars tend to start large and growth fast, and that a large share is foreign owned, it implies that they are inherently different from other exporting firms.

Three related theoretical papers that explore such issues are Neary (2009), di Giovanni and Levchenko (2010), and Eaton, Kortum and Sotelo (2012). Eaton, Kortum and Sotelo (2012)

[1] There could be many producers that effectively export, but an intermediary firm that coordinates the process. This would have implications about the interpretation of the results in terms of exporting not closely capturing production for the export sector.

is the most closely related, as it develops a model where shocks to individual firms can have aggregate effects. They further show that this model performs well in explaining both the extreme skewness in trade volumes and zeros in international trade. In contrast, Di Giovanni and Levchenko use a more standard heterogeneous model framework with a continuum of firms. They show that if productivities follow a Zipf's law—a fat-tailed distribution—there are important welfare consequences. In particular, entry costs are relatively less important than trade costs, because inframarginal firms make up the bulk of exports. Neary (2009) shows that the importance of large firms in trade can be explained by various forms of oligopoly. This leads to the implication that generating exports is not about promoting domestic entrepreneurship, but rather, about attracting large multinationals. Given the broad, global scope of our empirical results, our analysis supports this type of theoretical work, highlighting the need for international trade theory to match a world where superstar firms largely define export volumes, growth, and trade patterns.

This paper also relates to the large and growing empirical literature on exporting firms, which finds that exporters are larger and more productive firms than their domestic counterparts (Bernard et al 2007). Recently, evidence of the skewed distribution of exporters has also been highlighted in a several studies of individual countries.[2] While much of the original literature focused on documenting how exporters are distinct from non-exporters, in terms of productivity, size, and wages—the evidence presented here shows an additional pronounced split *within* exporters between the handful of large firms that drive trade volumes, trade growth, trade patterns, and diversification, and the rest.

[2] See, for example, Bernard, Jensen, Redding and Schott (2007) on the U.S. and Eaton, Eslava, Kugler and Tybout, (2007) on Colombia. Similarly, Mayer and Ottaviano (2007) analyze the firm-size distribution in seven European countries and also find that a small number of exporters hold the largest shares of exports in all countries.

Our results have policy implications for measures aimed at promoting export growth and diversification. First, reducing variable trade costs is likely to have a bigger impact than reducing fixed costs, since marginal firms are relatively unimportant in trade. Second, domestic regulations that disproportionately target large firms or restrict rapid firm growth will hold back export growth and diversification. And third, policies to attract large multinational firms may be vital for small countries interested in expanding exports.

This paper is organized as follows. In Section 2 we introduce the data utilized in the paper. Section 3 highlights the role of superstars in comparative advantage and characterizes those exporters we consider "Superstars". In Section 4 we analyze superstars' contribution to export growth and diversification. Section 5 delves into the origin of superstars. Finally Section 6 concludes.

2. Data on Firm Exports in 33 Countries

The data used for this paper is exporter-level information on non-oil exports from 33 countries in different regions of the world. This information has been gathered as part of the World Bank Export Dynamics Database.[3] In most cases, the data have been collected directly from Customs Authorities, Ministries of Finance or Commerce and National Statistics Institutes. In other instances, the data have been collected indirectly through think tank institutions (Egypt) or purchased from a private company based on inputs from customs authorities (Chile, Colombia and Ecuador).

[3] See Cebeci, Fernandes, Freund and Pierola (2012) for a detailed description of the data and the cleaning process operated in it. This cleaning process includes the use of a "consolidated" product classification that takes into account the transformations made to product codes according to the HS classification throughout the years. In addition, in order to mitigate the risk of including transactions that correspond to the shipping of samples or personal belongings, we dropped the observations corresponding to exporters that, in a given year, had total sales below $1,000. We also dropped all the observations belonging to Chapter 27 according to the HS classification –Mineral fuels, oils and product of their distillation; etc.

To assess the quality of the data, we compared the total values obtained from aggregating the customs data mentioned above at the country level, with the total values obtained at the country level from Comtrade. We dropped the years in which the total values obtained from the customs data represented less than 70 percent or more than 30 percent of the total values obtained from Comtrade aggregates. Appendix 1 has the complete list of countries and years for which data are excluded.

Table 1 shows the summary statistics with annual averages for the period available for each country. There is significant variation in the number and size of exporters across countries and also within countries. For example, Cambodia (KHM) has a relatively small number of exporters, yet they are relatively large on average. In contrast, Bulgaria (BGR) has a relatively large number of exporters that are relatively smaller. The correlation between number and size is 0.36. Within countries, we also observe a large difference between the median and the mean values per exporter--the mean values are, on average, 51 times larger than the median values per exporter. This reflects the incredibly skewed size distribution of firms.

Figure 1 shows the average distribution of the 200 largest firms by size (in logs) across countries in the sample. We observe that even within this subsample of top firms, the distribution is highly skewed around the largest firms. A small number of very large firms co-exist with a large number of smaller and more similar firms–in terms of their size. This distribution is almost identical regardless of the year we consider, and becomes flatter if we consider a larger rank of firms across countries.

3. Superstars and Trade Patterns

The evidence above highlights the presence of disproportionally larger exporters in all countries. In this Section, we examine how these large firms influence trade patterns. We look at three things: (i) the similarity in distributions of total values exported and the number of firms by product groups across countries, (ii) large firms and revealed comparative advantage and (iii) the similarity in the relative size of all other firms across countries or sectors.

Table 2 reports country-pair correlations for the number of exporters and the total values exported per product group, where each product group (or sector) is taken at the HS2 level.[4] Each entry in Table 2a is the correlation between the distribution of firm count for 97 products in two countries. For example, as shown in the upper left side of the table, the correlation between the distribution of the number of firms across products in Burkina Faso (BFA) and Albania (ALB) is 0.56 and significant. Overall, the distribution of the number of firms by product group is extraordinarily similar across countries: 89 percent of all correlations coefficients are highly significant (at the 5% level) and the average correlation is almost 0.60. In contrast, the total values exported per product group show much less similarity (Table 2b). Only 36 percent of the correlations coefficients are significant, and the average correlation is 0.18.

This result is somewhat paradoxical. Given differences in comparative advantage sectors/products across countries, we would have expected that both the distribution in the number of firms and the values exported per product group would have followed different patterns across countries, precisely to reflect these differences. Instead, it appears that industry characteristics drive the distribution of firms across sectors but not the distribution of exports

[4] For the 33 countries, there are 528 possible correlations (33*33-33)/2).

across sectors. This means that firm size and not scope largely explains the variation in trade patterns across countries and implies two possible scenarios. Either there are differences in the size of all the exporters in a given country-product group, or there are differences in the size of only some exporters in a given country-product group.

To explore this, we examine how these correlations change as we drop firms, starting by dropping the largest firms. Figure 2a reports the average evolution of the correlation of the number of exporting firms and total values exported per product group starting from an scenario where we include absolutely all exporters–left-side of the graph— and moving towards scenarios where we drop successive percentiles of top (larger) firms in every country–right-end of the graph. The left-side graph shows the evolution of the average correlations as we drop successive deciles and the right-side graph focuses on the evolution as we drop firms percent by percent only within the first decile.

A surprising fact arises from these graphs. If we drop the total values exported by the firms in the top 10 percent (graph a.i), the average correlation of the total values exported per product group immediately goes up by over 80 percent! Then, the average correlation continues going up as we drop successive deciles but at a much slower pace, until reaching average levels close to those observed in the distribution of the number of firms. Therefore, there is an alignment in product structures across countries when we drop the top 10 percent firms. In order to evaluate this is more in detail, we repeat the exercise above but instead of dropping successive deciles, we drop firms percent by percent within the first top decile. We find that half of the jump mentioned above (41 percent) comes from dropping only the top one percent of firms in each country (graph ii).

The figures in 2b shows the evolution of the percent of significant coefficients under each scenario as described above. We observe the exact same trend as in 2a: the percent of coefficients that are significant within the country-pair correlations for values exported by product group jumps up immediately especially after dropping the largest firms in every country, particularly, the top one percent of firms.[5]

The fact that, once we drop the top one percent of firms, the distribution of the values exported in a given product group looks remarkably more similar across countries implies that that top performers, or what we call "superstars", are the ones generating the main differences across countries. Combining this with the observation that comparative advantage is one of the explanations for the differences in values exported across countries, we argue that it is precisely the superstars who explain comparative advantage.

To analyze this in more detail, we explore the link between the presence of superstars and revealed comparative advantage in a given country-product group-year. For that purpose, we calculate the share of superstars' exports in total exports in a given country-product group-year and estimate the correlation between these shares and the Revealed Comparative Advantage (RCA) index in that corresponding country-product group-year.[6] The RCA index of a country in a particular product group shows the relative size of that country in the exports of that product with respect to the world. In particular, it is calculated as the ratio of the share of a particular product in a country's total exports over the share of that same product in world's total exports.

[5] To check the robustness of the evidence observed above, we explore whether these results hold over the sample of firms operating only in the manufacturing sector, to ensure that the results are not driven by large firms operating in sectors driven by natural resources. We find the exact same pattern (Appendix 2).
The calculations for manufacturing sector include all the products that correspond to divisions 15-37 of the International Standard Industrial Classification of All Economic Activities (ISIC), Rev.3. The table used for concordance between the HS Classification and the ISIC Rev3 has been taken from http://wits.worldbank.org/wits/

[6] The product groups considered for these estimation are HS at 2 digits.

Table 3 column 1 shows the results from this estimation controlling for country, product-group and year fixed effects. In column 2 we present the results from the estimation of the relationship between the RCA index and the number of exporters, also controlling for country product-group and year fixed effects. We find that a 10 percentage-point increase in the share of superstars is associated with a 1.1 increase in the RCA index (which on average is 2.35 and has a standard deviation of 9.91 for the whole sample). If we instead use the number of exporters (in logs) in column 3, we note that a 10 percent increase in the number of exporters increases the RCA index in 0.3, and the variation explained is slightly lower (R-squared = 0.17) than with the share of superstars (R-squared = 0.18). In column 3, we include both variables and the coefficients remain roughly unchanged, suggesting they are picking up different aspects of comparative advantage. The results imply that concentration in large firms is at least as important as the scope of distribution for comparative advantage. To delve deeper into this point, in columns 4 to 6 we perform 0.75, 0.50 and 0.25 quantile versions of the same estimation. We note that while the magnitudes of both coefficients decrease, the correlation with the RCA is much higher on the upper parts of the sample distribution. In particular, at the 75^{th} percentile of the sample (where comparative advantage is very high), a 10 percentage-point increase in the share of superstars' exports is associated with a 0.6 increase in the RCA index. This increase goes down to 0.2 and 0.05 at the median and 25^{th} percentile respectively. Likewise, in terms of the number of exporters, we also note a positive association with changes in the RCA—though at a smaller magnitude. In sum, the correlation between RCA index and the share of superstars in exports is more economically significant than with the number of exporters, and in particular, this association is the strongest in those country-product groups where comparative advantage is more pronounced.

As a final robustness to the evidence on the importance of superstars in determining country-industry trade, we perform an analysis of variance on the number of exporters and values exported in a given product group, country and year (Table 4). In particular, we decomposed the variance of these two variables in country, product group and year effects. If we include all exporters, we observe that country and product group effects explain little of the variation in the values exported–6 and 5 percent respectively—and more of the variation in the number of exporters–26 and 17 percent respectively—though most of the variation in this variable is contained in the residual. However, if we drop the top one percent of firms, country and product variations suddenly explain significantly more of the total variation in the total values exported per product group–12 and 8 percent, respectively—while the variance decomposition in the number of firms remains unchanged. And dropping the top 5 percent of firms more than doubles the explanatory power of product groups. In other words, in the absence of superstars, country and product characteristics are more relevant. This implies that the other firms conform more to typical product group and country characteristics. This exercise also addresses another potential concern about the data, which has to do with the fact that the sample varies by year across countries. If this variation was really important, year effects would show a significant share in the variance decomposition. As shown in Table 4, the variation due to time effects is null in all cases.[7]

In sum, from this first analysis of the data, we identify superstars—a very unique group of firms—and their importance in defining trade patterns and comparative advantage. We begin with the observation that the relative number of firms by product group is similar across countries, but the relative exports by product groups are different across countries. We then show

[7] We also conduct this exercise over a sample of firms operating only in the manufacturing sector as described above and the results are almost identical.

that the explanation is that while most firms in a sector are similar in terms of size, superstars are very different. Superstars are also closely tied to the comparative advantage in a country. Their presence is very important especially in those sectors where comparative advantage is more pronounced.

4. Export Characteristics and Dynamics of Superstars

We have identified superstars—the top one percent of the firms in each country—as a group of firms remarkably different from the others in the same country.[8] They explain a disproportional share of the differences we observe in export/production structures across countries. In this section, we examine the characteristics of superstars, including size and sectoral distribution and their contribution to export growth and diversification.

Export Characteristics

Table 5 shows that depending on the size of the country and therefore the size of its export base, the number of superstars varies from a handful of firms, as it is the case of many African countries, to 319 in Mexico, the largest exporter in our sample.[9] These firms are remarkably bigger than the non-superstars: on average, 62 times bigger! And despite being a small number of firms, they represent, on average, 53 of total exports across countries (55 percent if we only consider the exporters operating in the manufacturing sector).

Superstars are also more diversified. Figure 3 shows the average number of product and destinations by type of exporter–superstars in red dots vs. non-superstars in black dots. We

[8] Alternatively, we have also tried defining superstars as the top 5 percent of firms and the results are very similar.
[9] The period considered for the averages presented in this table includes the latest three years of data available for each country-whether the years are consecutive or with a one or two-year gap in between.

observe that in any given country, the group of superstars always exports more products and serves more markets than their "non-superstars" counterparts. On average across countries, the group of superstars exports 20 more products and serves 12 more markets than non-superstars.[10]

Superstars are everywhere. We next look at the distribution of product groups where superstars participate, by broad sectors defined based on the HS classification. We find that on average across countries superstars are in various product groups, not particularly or disproportionately concentrated in one or a group. While a larger share of them participates in machinery, they can also be found in a relatively even way in other products like apparel, metals, chemicals, wood and plastic and rubber (Figure 4).

Export Dynamics

Superstars are the main driver of export growth. Table 6 shows their contribution to overall export growth and to the growth observed in each margin of trade—intensive and extensive—within the latest three-year period available for each country.[11] Regarding overall growth, we observe that, despite being a small group, superstars' export growth represents three quarters of the overall export growth observed across countries.

We also evaluate superstars' contribution to export growth by margins of trade. For that purpose, we define the intensive and the extensive margin in the following way: for a comparison between Year 1 and Year 3 within the period considered for each country, the intensive margin is composed of all those export flows at the country-product (HS6-digit)-destination-year level that existed in Year 1 and Year 3. All other flows in Year 3 at the product-market level that did not exist in Year 1 are considered the extensive margin. Thus, this is about

[10] Figure 3 presents the results for year 2008, however, results are similar for other years.
[11] The actual period varies per country depending on the latest three-year period available for each country. In this case we are only considering the latest three *consecutive* years (see Appendix 3 for more detail).

developing new goods or markets at the *country* level. This allows us to determine how much of export diversification is driven by superstars. The second and third columns in Table 6 show the export growth decomposition by margin for each country. Considering the median within our sample, we note that superstars are in most cases the main contributors to the growth in the intensive margin. In terms of the extensive margin, the difference between superstars and non-superstars is less pronounced; however, superstars still emerge slightly on top of non-superstars in terms of their contribution. These results are more pronounced in favor of superstars if we consider the sample of firms operating exclusively in the manufacturing sector.

5. Origin of Superstars

Given their role in defining comparative advantage, export growth and diversification we consider important to understand superstars' origins. For that purpose, we look at the three countries where we have a longer time series—Costa Rica, Peru, and Morocco—and we analyze the origin of superstars within a decade. Table 7 presents the distribution of the superstars of 2009 in terms of their size in 2000 for Costa Rica and Peru, and of superstars of 2010 in 2002 for Morocco. Table 7a shows that the top one percent of firms in 2009 for Costa Rica and Peru and 2010 for Morocco, were either a) already large firms operating 10 years ago, or b) new firms that appeared in the sample sometime during the years within. In fact, we observe that the percent of 2009/2010's superstars who were superstars already almost 10 years before is 22 percent for Costa Rica and even higher for Morocco and Peru, 48 and 37 percent, respectively. Also, in all countries, there is a non-trivial percent of superstars that appeared sometime within the sample period evaluated.[12] This percent reaches 41 percent in Costa Rica. Digging deeper into these

[12] Appendix 4 includes the tables with the full percent distribution for the firms in the remaining percentile categories, for each of the three countries.

"new" superstars, we observe that over half of them started as large firms—52 percent of the superstars "born" within the period analyzed in the three countries were born straight into the top 5 percent of exporters (Table 7b).

Finally, if we look backwards, in Table 7c we note that most of the superstars of 2000 in Costa Rica and Peru and of 2002 in Morocco remained large and within the top 5 percent in 2009 and 2010 respectively. In the case of Morocco and Peru the percents are the highest; over 80 percent of superstars of the past remained large in recent years. Although there is a considerable number of exits within the superstars group in Costa Rica—which could also respond to mergers or changes in names of the companies involved—the exits within the group of superstars are not high for the other two countries.

In any case, the evidence indicates that superstars are born large, also, they stay large or exit; shrinking is rare. All these results are similar if we take into the consideration the firms in the manufacturing sector only.[13]

Although we are limited by the length of the time series available for each country, it is worth noting that the patterns observed are very similar in the three countries analyzed above, regardless of their differences in terms of size and geographical location.

From these results we have learned that most superstars of the present were already superstars/large firms in the past or simply new firms that became superstars. Regarding the latter, we also analyze the speed at which the firms that entered into the sample sometime after 2000 became superstars. We find that in Costa Rica, for all firms that were superstars in 2009 but

[13] The tables in Appendix 4 contain the full distribution of firms—in percents– by percentile. Another feature that can be observed from these tables is that there seems to be little rotation between the different percentile groups analyzed. Judging by the concentration of firms along the diagonal in the tables, it seems that most firms stay in their same percentile group regardless of the time. The vast majority of large firms were already large 10 years ago, the same way that most of the small firms stayed small. There is also more churning (firms that go out of the exporting sector and other that come in) within the lower quartiles in the distribution.

did not exist in the sample in 2000, it typically took 2.5 years to reach this levels. The pace was 3 years on average for the new superstars firms in Peru. In Morocco, it took new firms 1.5 years to reach superstar status in 2010. Again, these results reflect that regardless of the region we are able to analyze; patterns are similar and the superstars of the present were born relatively large and grew fast.

On this last point and as a final test to the validity of this observation across countries, we also analyzed the distribution of the new superstars that appear in the sample sometime within the latest three-year period (consecutive years) available for each country.[14] Table 8 shows the distribution of these new superstars across countries—upper table. We find once again that most of the firms that appear sometime after Year 1 of the period in analysis, enter at a relatively large size. In fact, in the aggregate, over 80 percent of them appeared within the top 5 percent of firms. The cases of firms that started small and then became superstar are rare. These results hold for the sample including manufacturing exporters only.

Unfortunately, the data do not allow us to observe superstars *before* they begin exporting, as we do not have information on domestic sales or how they became exporters. However, given that in a number of countries it was possible to identify the superstars by name, we selected three countries from our sample—each from a different region: Jordan, Peru and Tanzania—and contacted their superstars to learn more about who they are and how they started exporting.[15] Table 9 presents a summary of the findings from this investigation.[16] In the three cases, we learned that the overwhelming majority of the superstars are either a producers or

[14] The periods used in each country are the same used in Table 6 and that are listed in Appendix 3.
[15] The total sample of firms that fall under the "superstars" category are 25 in Jordan, 69 in Peru and 16 in Tanzania.
[16] Appendix 5 has the percent of superstars whose information was accounted for in each of the issues investigated and presented in Table 9.

manufacturers—only in Peru we find a few traders.[17] This result is consistent with the evidence by Ahn et al. (2011) who find that that intermediaries are more likely to be used by firms of intermediate levels of productivity in China while the most productive firms choose to export directly.

We also find that superstars are very linked to the presence of foreign capital and this association seems to be stronger in the countries with lower GDP per capita. Finally, while the evidence is mixed, most of them become exporters almost immediately after they begin operations. The case of domestic firms that turn to export markets and become superstars over time is important only in the case of Tanzania; in Jordan and Peru, most are born to be exporters.

To sum up, the group of superstars is a unique group of firms, they explain most of the export growth and diversification observed across countries, they drive comparative advantage, and they are born big or very rapidly become so. The cases of small firms making it to the top are rare.

6. Conclusions

Using a novel dataset containing firm-level information on exports from a very diverse group of 33 developing countries, this paper contributes to the literature on firm-level analysis of trade by providing more compelling evidence on a striking feature of the distribution of firms. Exports are dominated by a small group of very large exporters: Superstars.

Superstars are part of a unique group. Superstars are remarkably larger and more diversified than the rest of firms; they account for more than half of export growth and

[17] For the purpose of this investigation, we consider a firm a trader if it only acts as an intermediary, without engaging in any activity that implies any type of transformation of the merchandised traded. If a firm engages in packaging or basic processing of goods (for example, sorting or drying) we consider that firm a "transformer" and in that sense it is not counted as a trader.

diversification; they are often linked to foreign capital; and a good part of them are born to be exporters. Most importantly, superstars are important in defining the export structures and their presence is very important in industries where revealed comparative advantage is more pronounced. Superstars themselves do not grow as the result of a lengthy process. In fact, they seem to be born large and when they are not, it does not take them long to become superstars.

This implies that creating an environment where future or potential superstars can thrive is fundamental to promote export growth and diversification. In that sense, measures that aim at reducing variable trade costs are likely to have a bigger impact than reducing fixed costs to exporting, since marginal firms are relatively unimportant in trade. In fact, on this latter point, given the evidence on the very rare occurrence of small exporting firms thriving to superstar levels, policies that disproportionately allocate resources to programs in support of SMEs might prove to be a misguided effort if the quest is to achieve higher levels of export development and diversification. On the same line of thought, domestic regulations that disproportionately target large firms will also hold back export growth. Finally, policies to attract large multinational firms may be key for small countries interested in expanding exports.

Our results are consistent with recent work using census data, which also points to a critical role for large firms. In particular, Hsieh and Klenow (2012) show that an important difference in firm dynamics in India, Mexico, and the US relates to the ability for firms to grow very large. Firms in the US are much larger, and weak life-cycle dynamics have constrained productivity in Mexico and India by an estimated 25 percent. Similarly, Haltiwanger, Jarmin, and Miranda (2012) show that young, fast-growing and large firms are the primary job creators in the US. Our work implies similar dynamics exist for trade, with highly productive firms growing quickly into large firms that dominate exports. Taken together this implies that jobs,

productivity, export growth, and diversification all rely heavily on the ability of an economy to foster the development of large firms. Further research is needed in order to understand the process of how such superstars are born and what factors determine their evolution.

References

Ahn, JaeBin & Khandelwal, Amit K. & Wei, Shang-Jin, 2011. "The role of intermediaries in facilitating trade," Journal of International Economics, Elsevier, vol. 84(1), pages 73-85, May.

Bernard, Andrew & Bradford Jensen and Peter Schott, 2007. "Firms in International Trade". Journal of Economic Perspectives, 21(3): 105-130.

Di Giovanni, Julian& Andrei A. Levchenko, 2010. "Firm Entry, Trade, and Welfare in Zipf's World," NBER Working Papers 16313, National Bureau of Economic Research, Inc.

Eaton, Jonathan, Eslava Marcela, Kugler, Maurice and James Tybout, 2007. "Export Dynamics in Colombia: Firm-Level Evidence," NBER Working Papers 13531, National Bureau of Economic Research, Inc.

Eaton, Jonathan, Kortum, Samuel and Sebastian Sotelo 2012. "International Trade: Linking Micro and Macro" NBER Working Paper 17864.

Gabaix, Xavier 2011. "The Granular Origins of Aggregate Fluctuations," Econometrica, Econometric Society, vol. 79(3), pages 733-772, 05.

Haltiwanger, John, Ron Jarmin and Javier Miranda, 2012. "Who Creates Jobs? Small vs. Large vs. Young" *Review of Economics and Statistics*, forthcoming.

Hsieh, Chang-Tai and Pete Klenow, 2012. "The Life-cycle of Plants in India and Mexico". NBER Working Paper 18133.

Levchenko, Andrei & Julian di Giovanni & Romain Ranciere, 2010. “Power Laws in Firm Size and Openness to Trade: Measurement and Implications,” IMF Working Papers 10/109, International Monetary Fund.

Neary, Peter, 2010. “Two and a Half Theories of Trade,” The World Economy, 33: 1–19. Doi: 10.1111/j.1467-9701.2009.01255.x

Manasse, P. & A. Turrini, 2001. "Trade, wages and 'superstars'," Journal of International Economics, 9, 508-523.

Mayer, Thierry & Ottaviano, Gianmarco, 2007. “The Happy Few: The Internationalisation of European Firms, New Facts based on Firm-level Evidence,” Open Access publications from Sciences Po.

Rosen, Sherwin, 1981. "The Economics of Superstars". American Economic Review. 71(5): 845-858.

Figure 1: Size Distribution of Exporters – Average Value Exported by Rank

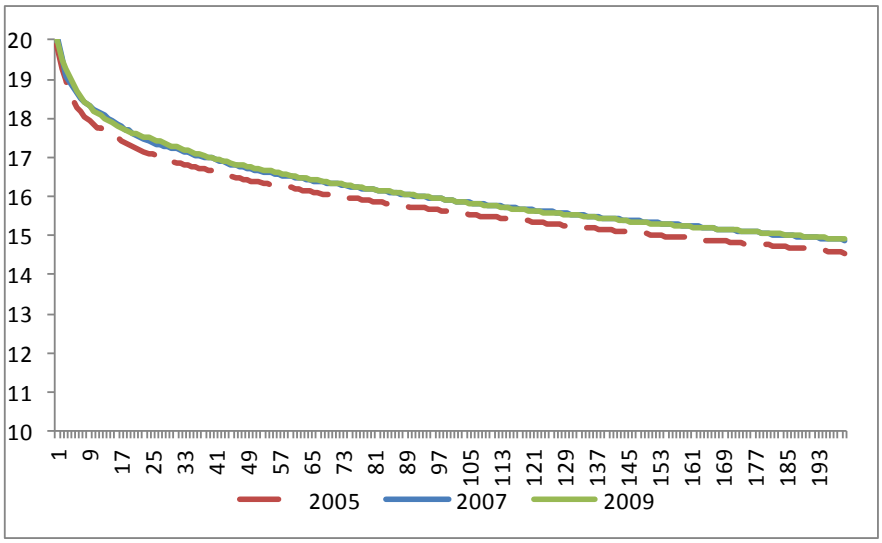
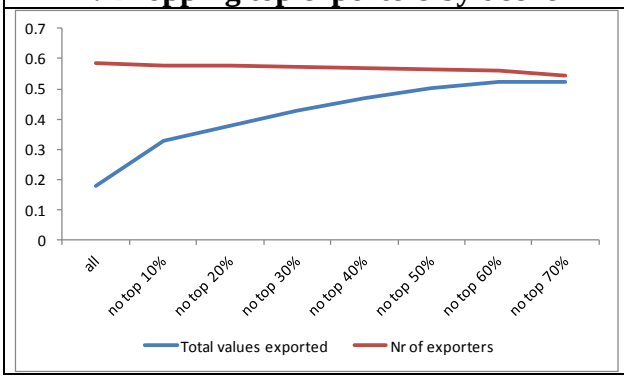


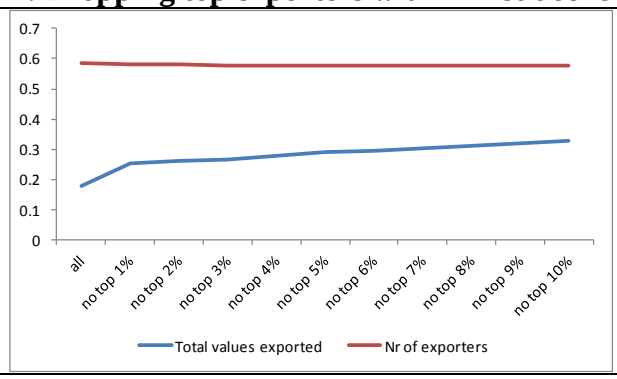
Figure 2: Country-Pair Average Correlations

a) Average correlations

i. Dropping top exporters by decile

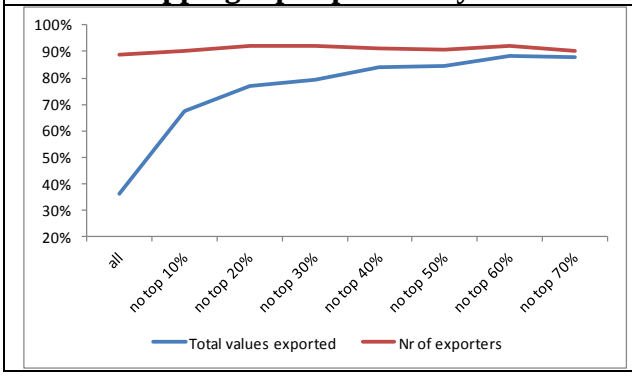


ii. Dropping top exporters within first decile



b) Significant correlation coefficients (in percent)

i. Dropping top exporters by decile



ii. Dropping top exporters within first decile

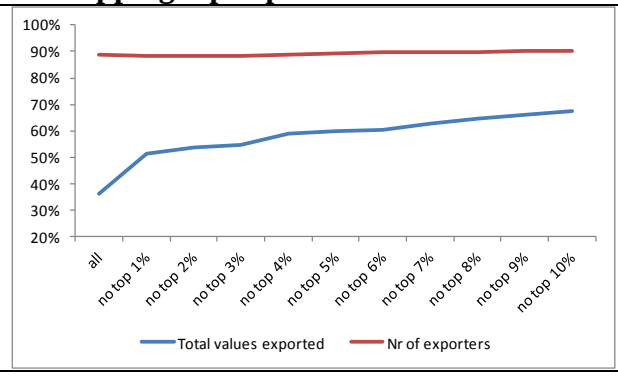


Figure 3: Average Number of Products and Destinations, by Type of Exporter (year 2008)

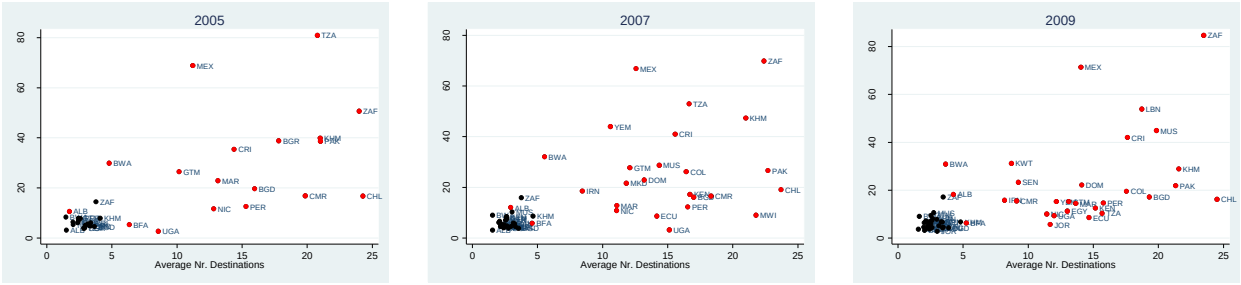


Figure 4: Distribution of Product Sections where Superstars are (Year 2009)

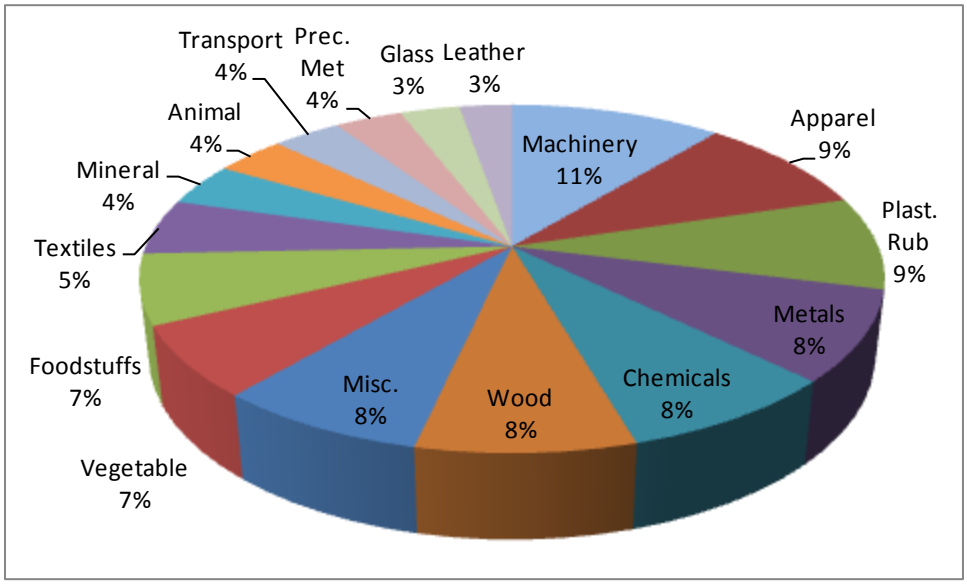


Table 1: Summary Statistics

Country	Period	Nr. Firms	Total Exports (US$ millions)	Median Value per Exporter (US$)	Average Value per Exporter (US$)
ALB	2004 - 2009	1,615	943	51,926	574,725
BFA	2005 - 2010	390	623	46,342	1,571,228
BGD	2004 - 2010	6,055	12,040	296,686	1,915,489
BGR	2004 - 2006	11,920	10,825	35,644	909,326
BWA	2004 - 2010	1,074	4,053	11,379	3,807,576
CHL	2004 - 2009	7,037	51,013	65,155	7,150,644
CMR	2004 - 2009	794	1,568	31,466	1,981,628
COL	2007 - 2009	10,267	18,828	49,610	1,831,925
CRI	2004 - 2009	2,544	7,888	75,834	3,087,771
DOM	2007 - 2009	2,647	4,681	36,734	1,779,652
ECU	2006 - 2009	2,942	6,083	40,361	2,054,853
EGY	2008- 2010	7,787	18,011	115,369	2,313,283
GTM	2004 - 2010	4,141	6,170	47,008	1,482,062
IRN	2006 - 2010	12,487	15,237	114,396	1,264,421
JOR	2008 - 2010	2,269	4,817	73,862	2,125,788
KEN	2006 - 2009	4,417	4,052	26,565	925,687
KHM	2004 - 2009	566	2,786	528,709	4,915,641
KWT	2009 - 2010	3,077	3,052	33,075	991,271
LBN	2008 - 2010	4,906	3,728	42,873	762,525
MAR	2004 - 2010	5,250	13,775	104,763	2,628,580
MEX	2004 - 2009	32,327	204,460	51,967	6,331,319
MKD	2006 - 2008, 2010	2,768	2,231	29,957	802,273
MUS	2004, 2006 - 2009	1,944	2,769	32,802	1,425,523
MWI	2006 - 2008	473	629	15,984	1,389,175
NER	2008, 2010	131	389	23,853	3,021,953
NIC	2004 - 2005, 2007, 2009 - 2010	1,120	1,257	34,109	1,110,097
PAK	2004 - 2010	14,538	16,290	64,776	1,115,478
PER	2004 - 2009	6,039	21,349	44,865	3,479,996
SEN	2008 - 2010	761	1,225	93,657	1,610,052
TZA	2004 - 2009	1,513	2,144	31,149	1,401,241
UGA	2004 - 2005, 2007 - 2010	769	985	32,761	1,294,379
YEM	2006 - 2010	480	421	66,046	874,771
ZAF	2004 - 2009	19,465	49,963	39,297	2,559,203

Table 2: Country-Pair correlations

a) Number of exporters

	ALB	BFA	BGD	BGR	BWA	CHL	CMR	COL	CRI	DOM	ECU	EGY	GTM	IRN	JOR	KEN	KHM	KWT	LBN	NER	MAR	MEX	MKD	MUS	MWI	NIC	PAK	PER	SEN	TZA	UGA	YEM	ZAF
ALB	1																																
BFA	0.5617*	1																															
BGD	0.4077*	0.0538	1																														
BGR	0.9190*	0.6067*	0.2951*	1																													
BWA	0.8434*	0.6485*	0.1358	0.9232*	1																												
CHL	0.7939*	0.7284*	0.063	0.8536*	0.8898*	1																											
CMR	0.7355*	0.6778*	0.0243	0.7837*	0.7850*	0.7819*	1																										
COL	0.7946*	0.4042*	0.3949*	0.8147*	0.7683*	0.7254*	0.5627*	1																									
CRI	0.7679*	0.6185*	0.0833	0.8354*	0.8149*	0.8709*	0.7610*	0.7871*	1																								
DOM	0.6839*	0.6481*	0.3408*	0.6834*	0.6057*	0.7209*	0.6386*	0.6657*	0.8014*	1																							
ECU	0.7700*	0.4591*	0.5177*	0.7360*	0.6187*	0.6416*	0.5681*	0.7501*	0.6595*	0.6756*	1																						
EGY	0.6006*	0.6209*	0.2294*	0.5837*	0.5176*	0.6073*	0.6427*	0.5288*	0.7225*	0.8603*	0.5687*	1																					
GTM	0.8224*	0.5299*	0.2548*	0.8933*	0.8445*	0.7571*	0.7072*	0.8531*	0.8660*	0.6885*	0.7273*	0.6264*	1																				
IRN	0.4469*	0.4923*	0.0299	0.4257*	0.4184*	0.5642*	0.5347*	0.3661*	0.6214*	0.7098*	0.3815*	0.8214*	0.4920*	1																			
JOR	0.6778*	0.4606*	0.2066*	0.7025*	0.6465*	0.6741*	0.6353*	0.7237*	0.8078*	0.7614*	0.5097*	0.7771*	0.7729*	0.6635*	1																		
KEN	0.7941*	0.6520*	0.1431	0.8626*	0.8710*	0.8193*	0.8381*	0.7752*	0.9071*	0.7331*	0.6829*	0.7165*	0.8944*	0.5646*	0.7661*	1																	
KHM	0.5103*	0.1264	0.9386*	0.4532*	0.2928*	0.1953	0.1327	0.5127*	0.1846	0.3860*	0.5794*	0.2296*	0.3735*	0.0414	0.2739*	0.2578*	1																
KWT	0.7619*	0.7056*	0.0879	0.8591*	0.9016*	0.8301*	0.7467*	0.6777*	0.7249*	0.5551*	0.5545*	0.5088*	0.7784*	0.4226*	0.6446*	0.8098*	0.2233*	1															
LBN	0.8114*	0.6015*	0.1217	0.8898*	0.9021*	0.8464*	0.7829*	0.7861*	0.8683*	0.7146*	0.6499*	0.6939*	0.8966*	0.5813*	0.8105*	0.8899*	0.2490*	0.8480*	1														
NER	0.2446*	0.5347*	0.1186	0.1863	0.1692	0.2550*	0.2641*	0.1662	0.2617*	0.4024*	0.1687	0.4273*	0.1639	0.3290*	0.2697*	0.2381*	0.0882	0.2001	0.1944	1													
MAR	0.7844*	0.4308*	0.5210*	0.7688*	0.6507*	0.5935*	0.5307*	0.7525*	0.6295*	0.6655*	0.7630*	0.6762*	0.7932*	0.4971*	0.6554*	0.7033*	0.5843*	0.6125*	0.7391*	0.2074*	1												
MEX	0.8221*	0.6164*	0.09	0.8907*	0.9213*	0.9029*	0.7595*	0.8332*	0.8922*	0.6841*	0.6485*	0.6097*	0.8645*	0.5117*	0.7490*	0.8725*	0.2361*	0.8173*	0.9074*	0.3054*	0.6951*	1											
MKD	0.8362*	0.6854*	0.1326	0.8660*	0.8435*	0.8795*	0.8469*	0.7160*	0.9113*	0.8303*	0.6646*	0.8236*	0.8306*	0.7238*	0.8407*	0.8912*	0.2383*	0.7801*	0.9113*	0.3176*	0.7125*	0.8872*	1										
MUS	0.8381*	0.4591*	0.4681*	0.9036*	0.8490*	0.7525*	0.6318*	0.8968*	0.7821*	0.6852*	0.7900*	0.5488*	0.9006*	0.3720*	0.7095*	0.8279*	0.5966*	0.7333*	0.8567*	0.1343	0.8228*	0.8497*	0.7765*	1									
MWI	0.6896*	0.6974*	0.0453	0.7415*	0.7709*	0.6873*	0.6966*	0.5907*	0.6260*	0.4979*	0.5517*	0.5004*	0.7739*	0.3878*	0.5033*	0.7673*	0.1605	0.8127*	0.7317*	0.2039*	0.5606*	0.6834*	0.6784*	0.6213*	1								
NIC	0.7604*	0.6401*	0.1026	0.7721*	0.7405*	0.7686*	0.8095*	0.6770*	0.7677*	0.7251*	0.6812*	0.7207*	0.7737*	0.5689*	0.6935*	0.8145*	0.1958	0.7168*	0.8136*	0.3363*	0.6975*	0.7961*	0.8341*	0.6747*	0.7631*	1							
PAK	0.5053*	0.2169*	0.7048*	0.4854*	0.3246*	0.2525*	0.1763	0.5634*	0.3039*	0.4489*	0.6338*	0.3778*	0.5171*	0.1922	0.3380*	0.3996*	0.7533*	0.3227*	0.3634*	0.1308	0.7062*	0.3414*	0.3367*	0.6480*	0.2925*	0.3197*	1						
PER	0.6794*	0.3480*	0.6415*	0.6782*	0.5532*	0.4885*	0.4571*	0.7289*	0.5395*	0.5951*	0.8861*	0.5444*	0.7386*	0.3301*	0.5435*	0.6132*	0.6989*	0.4756*	0.6073*	0.1463	0.7991*	0.5784*	0.5753*	0.8028*	0.5263*	0.6105*	0.7152*	1					
SEN	0.7240*	0.7445*	0.0226	0.7952*	0.8926*	0.9018*	0.8045*	0.6948*	0.7870*	0.6442*	0.5327*	0.5806*	0.7237*	0.5154*	0.6772*	0.8355*	0.1603	0.8715*	0.8288*	0.2513*	0.5264*	0.8511*	0.8209*	0.7178*	0.7139*	0.7280*	0.2131*	0.4201*	1				
TZA	0.7693*	0.7806*	0.0868	0.8152*	0.8412*	0.8244*	0.8005*	0.6315*	0.7556*	0.6465*	0.6243*	0.6174*	0.7573*	0.4696*	0.6052*	0.8440*	0.1943	0.8391*	0.8105*	0.3345*	0.6102*	0.7940*	0.7962*	0.6987*	0.8063*	0.8225*	0.2998*	0.5389*	0.8525*	1			
UGA	0.4895*	0.5933*	0.0837	0.4988*	0.5241*	0.5586*	0.6077*	0.4461*	0.6308*	0.6410*	0.4161*	0.7061*	0.6032*	0.5697*	0.5931*	0.7366*	0.1146	0.5125*	0.5976*	0.3877*	0.4967*	0.5488*	0.6613*	0.4849*	0.5864*	0.6790*	0.3087*	0.4063*	0.6322*	0.7027*	1		
YEM	0.0899	0.2102*	0.0892	0.0499	0.0206	0.2530*	0.1607	0.166	0.2401*	0.4273*	0.1913	0.5238*	0.1396	0.4696*	0.3534*	0.2060*	0.023	0.054	0.1877	0.2476*	0.2677*	0.1557	0.2666*	0.0868	0.0958	0.4237*	0.1027	0.19	0.2302*	0.2352*	0.5479*	1	
ZAF	0.8072*	0.6016*	0.0678	0.8970*	0.9681*	0.8826*	0.7852*	0.7605*	0.8602*	0.6047*	0.6184*	0.5307*	0.8680*	0.4453*	0.6688*	0.9014*	0.2172*	0.8439*	0.9051*	0.1491	0.6515*	0.9374*	0.8523*	0.8534*	0.7236*	0.7343*	0.3193*	0.5509*	0.8597*	0.8064*	0.5323*	0.0234	1

Average: 0.58

b) Total Exports

	ALB	BFA	BGD	BGR	BWA	CHL	CMR	COL	CRI	DOM	ECU	EGY	GTM	IRN	JOR	KEN	KHM	KWT	LBN	NER	MAR	MEX	MKD	MUS	MWI	NIC	PAK	PER	SEN	TZA	UGA	YEM	ZAF
ALB	1																																
BFA	-0.0273	1																															
BGD	0.6397*	-0.0276	1																														
BGR	0.6271*	0.0006	0.5945*	1																													
BWA	0.189	0.2862*	0.2441*	0.2101*	1																												
CHL	0.1021	0.0063	-0.0357	0.0853	0.4185*	1																											
CMR	-0.0132	0.0125	-0.0417	0.0444	-0.0644	0.0695	1																										
COL	0.154	0.3454*	0.1733	0.2387*	0.2315*	0.0433	0.0383	1																									
CRI	0.0999	0.0027	0.1109	0.2357*	-0.0062	0.0714	0.0657	0.3199*	1																								
DOM	0.4098*	0.3254*	0.3653*	0.5365*	0.167	-0.0285	0.0448	0.3484*	0.5386*	1																							
ECU	-0.003	0.0159	-0.0155	-0.0227	-0.0466	0.1784	0.1917	0.1921	0.6154*	0.0682	1																						
EGY	0.2562*	0.1584	0.3133*	0.5433*	0.2263*	0.142	-0.0317	0.3781*	0.3747*	0.3895*	0.1754	1																					
GTM	0.3993*	-0.0067	0.6544*	0.4188*	0.1532	0.0853	0.0748	0.5518*	0.3553*	0.2720*	0.2596*	0.3552*	1																				
IRN	0.0815	0.0219	-0.035	0.2929*	0.114	0.3733*	0.0439	0.3610*	0.5429*	0.1595	0.5484*	0.5359*	0.3157*	1																			
JOR	0.3260*	0.1163	0.5507*	0.4412*	0.2208*	-0.0185	-0.0313	0.3183*	0.2007*	0.3004*	-0.0184	0.4842*	0.5812*	0.1128	1																		
KEN	0.0874	-0.0191	0.1085	0.1327	-0.0172	-0.0371	0.0517	0.6902*	0.0983	0.1276	0.0343	0.2316*	0.5290*	0.1442	0.1367	1																	
KHM	0.4088*	-0.0145	0.7477*	0.3650*	0.2130*	-0.0315	-0.0238	0.1212	0.0466	0.1514	-0.0195	0.1891	0.7001*	-0.0183	0.6931*	0.0464	1																
KWT	0.0586	0.0859	-0.0408	0.4000*	0.0817	0.005	-0.0086	0.3152*	0.1233	0.1732	0.0277	0.3378*	0.0017	0.3536*	0.1577	0.0775	-0.0307	1															
LBN	0.1142	0.6439*	-0.002	0.3991*	0.3206*	0.0667	0.0146	0.5312*	0.2296*	0.4641*	0.0849	0.4728*	0.0715	0.2943*	0.3274*	0.0922	-0.0092	0.5624*	1														
NER	0.0808	0.4331*	-0.0302	-0.0314	0.2880*	0.5262*	-0.0433	0.1471	-0.0434	0.0786	-0.0303	0.0097	0.0642	0.1438	0.0403	-0.0292	-0.0175	-0.014	0.3019*	1													
MAR	0.5577*	0.0004	0.6115*	0.6087*	0.1639	0.0554	-0.0375	0.2278*	0.3869*	0.5608*	0.2345*	0.4324*	0.3645*	0.1866	0.3594*	0.17	0.2515*	0.1673	0.2992*	0.009	1												
MEX	0.1401	0.0426	0.021	0.4429*	0.0963	-0.0052	-0.0135	0.2674*	0.3573*	0.4334*	0.0511	0.2654*	0.0458	0.2087*	0.1747	0.0561	0.0078	0.6539*	0.5696*	-0.0051	0.5097*	1											
MKD	0.1448	-0.0046	-0.0253	0.5512*	0.0159	0.1409	0.0036	0.0804	0.1431	0.2550*	0.0558	0.3624*	0.1364	0.4199*	0.1743	0.1367	-0.0187	0.3119*	0.2664*	0.1086	0.114	0.1508	1										
MUS	0.4692*	0.0728	0.7792*	0.4636*	0.2364*	-0.0212	-0.0555	0.2017*	0.1262	0.3461*	0.0766	0.2572*	0.5998*	-0.0455	0.6047*	0.0589	0.7826*	0.0009	0.1641	0.0128	0.5130*	0.1644	-0.0121	1									
MWI	0.0741	0.0875	0.1482	0.1441	-0.0133	-0.06	0.0542	0.2680*	-0.0007	0.3390*	0.0064	0.0766	0.3402*	0.0002	0.0496	0.4369*	0.0989	-0.0786	-0.0264	-0.0397	0.0693	-0.0241	0.1007	0.1475	1								
NIC	-0.0185	0.2628*	0.0178	-0.0069	0.1434	0.0436	0.0357	0.5410*	0.0392	0.0806	0.1629	0.0787	0.3214*	0.0654	0.0146	0.5109*	-0.0313	-0.0425	0.162	0.1431	0.0819	-0.0316	0.0132	0.0451	0.3830*	1							
PAK	0.2346*	0.2633*	0.4435*	0.2397*	0.0814	-0.0519	0.0001	0.0707	0.0203	0.2669*	-0.0229	0.3192*	0.3003*	-0.0263	0.2394*	0.0097	0.3742*	-0.0532	-0.0191	-0.016	0.2251*	-0.0145	-0.0334	0.3632*	0.2020*	-0.0444	1						
PER	0.1346	0.5434*	0.0842	0.0631	0.4776*	0.6586*	-0.0235	0.2976*	-0.0088	0.1501	0.0319	0.1385	0.2073*	0.2037*	0.1804	0.0378	0.1368	0.0048	0.4496*	0.8356*	0.0656	0.0011	0.0863	0.1414	-0.0112	0.1937	0.0343	1					
SEN	0.0259	0.109	-0.0639	0.2889*	-0.0039	-0.0135	-0.0196	0.1587	0.047	0.2787*	-0.0074	0.3160*	0.0112	0.3107*	0.2035*	0.1702	-0.0359	0.3894*	0.3339*	-0.0154	0.2471*	0.1778	0.4747*	-0.042	0.2129*	-0.0157	0.0482	0.0013	1				
TZA	-0.0268	0.8707*	-0.0203	0	0.2944*	0.1017	0.0328	0.5056*	0.0693	0.3420*	0.1808	0.1892	0.1321	0.0978	0.1369	0.2137*	-0.0158	0.0688	0.6787*	0.4756*	0.0914	0.0705	0.0308	0.0786	0.2212*	0.4696*	0.1238	0.6275*	0.1447	1			
UGA	-0.0344	0.0954	-0.0217	-0.0099	-0.035	0.0165	0.0953	0.5557*	-0.0174	0.0708	0.1536	0.0218	0.4432*	0.0591	-0.0158	0.8151*	-0.0293	-0.029	0.0569	0.0097	0.0541	-0.0426	0.1097	-0.0009	0.4693*	0.6641*	0.0275	0.097	0.1341	0.3900*	1		
YEM	-0.0285	-0.0044	0.0184	-0.0518	-0.0506	0.1596	-0.0056	0.1041	0.1524	-0.0177	0.5566*	0.0189	0.1088	0.137	-0.0433	0.1283	-0.0222	-0.0388	-0.023	-0.0208	0.2027*	-0.0306	0.0093	0.0434	0.0419	0.4139*	-0.013	0.0405	-0.009	0.2920*	0.4581*	1	
ZAF	0.1137	0.5014*	-0.046	0.4444*	0.2964*	0.2521*	0.0217	0.3817*	0.1281	0.2535*	0.1025	0.3221*	0.0785	0.4453*	0.1586	0.0506	-0.0278	0.6540*	0.7586*	0.4527*	0.0893	0.4020*	0.5569*	0.0217	-0.0572	0.1139	-0.0502	0.5155*	0.3531*	0.5238*	0.0528	0.0162	1

Average: 0.18

Table 3: Superstars and Revealed Comparative Advantage - All Sectors

	Dependent variable: RCA ratio					
	All	All	All	Q(75)	Q(50)	Q(25)
	(1)	(2)	(3)	(4)	(5)	(6)
Share of SS in Exports	11.06***		10.01***	5.599***	1.895***	0.520***
	[0.626]		[0.596]	[0.0367]	[0.0160]	[0.00891]
Ln (Total Number of Exporters)		3.020***	2.680***	0.575***	0.308***	0.168***
		[0.185]	[0.179]	[0.0121]	[0.00471]	[0.00237]
Observations	14474	14474	14474	14474	14474	14474
R-squared	0.175	0.165	0.224			

Country and HS 2-digit FE included in all specifications

Robust standard errors in brackets

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Analysis of Variance – All Sectors

	All Exporter-Sectors		**Dropping Top 1 Percent**		**Dropping Top 5 Percent**	
	Total Exports	Nr. Exp-Sec	Total Exports	Nr. Exp-Sec	Total Exports	Nr. Exp-Sec
Country	6%	26%	12%	26%	11%	25%
Product	5%	17%	8%	17%	12%	17%
Year	0%	0%	0%	0%	0%	0%
Residual	89%	58%	80%	58%	78%	58%

Table 5: Size of Superstars

	Nr. Exporters	Average Size per HS2			Share in Exports (Top 1%)	
Country	**Superstars**	**Non-Superstars**	**Superstars**	**Ratio SS/N-SS**	**All Sectors**	**Manuf.**
ALB	18	230,121	3,476,997	15	33%	35%
BFA	5	310,161	25,706,974	83	63%	61%
BGD	70	1,101,159	17,742,050	16	21%	21%
BGR	120	149,979	4,882,883	33	55%	56%
BWA	12	90,195	31,078,646	345	88%	76%
CHL	76	829,198	117,400,192	142	78%	78%
CMR	9	458,960	13,375,955	29	43%	47%
COL	103	376,040	12,710,854	34	53%	52%
CRI	28	489,723	14,951,778	31	56%	62%
DOM	27	320,357	10,041,224	31	51%	50%
ECU	31	473,189	23,025,622	49	44%	47%
EGY	78	438,680	16,905,210	39	48%	49%
GTM	44	228,991	11,734,389	51	45%	45%
IRN	115	210,812	15,443,630	73	54%	61%
JOR	23	619,876	44,600,824	72	52%	51%
KEN	44	139,854	7,637,235	55	45%	47%
KHM	6	1,975,014	19,867,802	10	16%	15%
KWT	32	150,325	5,712,952	38	60%	60%
LBN	50	91,247	3,788,834	42	59%	58%
MAR	54	500,499	33,186,632	66	52%	51%
MEX	319	780,650	31,298,176	40	67%	66%
MKD	29	136,202	7,021,523	52	63%	66%
MUS	20	146,102	6,560,567	45	56%	60%
MWI	5	172,579	14,151,860	82	62%	67%
NER	2	458,806	12,427,122	27	66%	91%
NIC	12	248,097	9,557,997	39	43%	50%
PAK	152	274,877	9,826,319	36	41%	41%
PER	66	296,411	57,313,144	193	77%	74%
SEN	8	245,413	8,131,509	33	49%	50%
TZA	17	239,016	12,002,779	50	60%	62%
UGA	9	322,120	9,260,905	29	31%	38%
YEM	6	204,050	3,724,806	18	35%	39%
ZAF	201	123,489	18,135,144	147	77%	78%
Average	**54**	**388,854**	**19,172,198**	**62**	**53%**	**55%**

Note: The averages in this table correspond to the period including the latest three years of data available for each country –whether the years are consecutive or whether there is a one or two-year gap in between.

Table 6: Superstars' Share in Export Growth (Intensive, Extensive, All)

	Share in Total Growth						
	Int NSS	Int SS	Ext NSS	Ext SS	Total NSS	Total SS	Total Growth
ALB	(1.68)	(0.06)	1.41	1.33	(0.27)	1.27	8%
BFA	0.19	0.53	0.08	0.21	0.27	0.73	162%
BGD	0.68	0.21	0.10	0.01	0.78	0.22	25%
BGR	0.18	0.45	0.11	0.26	0.29	0.71	41%
CHL	(0.01)	1.10	(0.04)	(0.06)	(0.04)	1.04	-24%
CMR	3.71	0.78	(2.76)	(0.73)	0.96	0.04	-2%
COL	0.41	0.91	(0.19)	(0.13)	0.22	0.78	-11%
CRI	0.83	0.87	(0.31)	(0.38)	0.51	0.49	-7%
DOM	(1.22)	(0.46)	1.49	1.19	0.26	0.74	2%
ECU	0.30	0.34	0.29	0.07	0.59	0.41	29%
EGY	0.04	(0.57)	0.72	0.80	0.77	0.23	6%
GTM	(0.19)	0.49	0.25	0.45	0.06	0.94	10%
IRN	0.51	0.15	0.08	0.26	0.59	0.41	40%
JOR	0.30	(0.62)	0.92	0.40	1.21	(0.21)	8%
KEN	(0.22)	0.52	0.44	0.26	0.22	0.78	9%
KHM	14.88	(2.69)	(11.05)	(0.15)	3.83	(2.83)	0%
LBN	(0.23)	0.34	0.27	0.62	0.04	0.96	23%
MAR	0.46	1.37	(0.31)	(0.52)	0.15	0.85	-11%
MEX	0.23	0.86	(0.05)	(0.05)	0.19	0.81	-13%
MUS	0.90	0.55	(0.27)	(0.18)	0.63	0.37	-12%
MWI	0.13	0.27	0.21	0.39	0.34	0.66	54%
PAK	(0.16)	0.62	0.40	0.14	0.24	0.76	8%
PER	0.27	1.72	(0.28)	(0.70)	(0.01)	1.01	-5%
SEN	(7.68)	0.80	5.43	2.44	(2.25)	3.25	2%
TZA	0.03	0.57	0.19	0.21	0.22	0.78	41%
UGA	1.34	1.38	(1.32)	(0.40)	0.02	0.98	-6%
YEM	(0.23)	(0.51)	1.62	0.12	1.39	(0.39)	5%
ZAF	0.16	1.06	(0.07)	(0.14)	0.08	0.92	-26%
Median ALL	0.19	0.52	0.10	0.13	0.25	0.75	
Median Manuf.	0.08	0.47	0.10	0.17	0.24	0.76	

Note:
1) Negative values are in parenthesis
2) The averages in this table correspond to the period including the latest three **consecutive** years of data available for each country. This explains the more reduced sample of countries with respect to the full sample in previous tables.

Table 7: Origin of Superstars Over a Decade – Costa Rica, Morocco and Peru

a. What type of firms were 2009/2010's Superstars in 2000/2002?

	ALL			Manufacturing		
	Costa Rica	Morocco	Peru	Costa Rica	Morocco	Peru
top 1	22%	48%	37%	25%	47%	35%
top 02-05	22%	7%	31%	30%	9%	33%
top 06-25	15%	9%	6%	5%	11%	8%
quart 26-50	0%	5%	3%	0%	4%	5%
quart 51-75	0%	2%	1%	0%	2%	0%
bottom 25	0%	0%	0%	0%	0%	0%
NE	41%	29%	22%	40%	28%	18%

b. Size Distribution of 2009's and 2010's New Superstars at their Entry

				All Sectors	
	CRI	MAR	PER	Total	Percent
top1	3	3	1	7	17%
top 02-05	2	4	9	15	36%
top 06-25	5	2	3	10	24%
quart 26-50	1	4	2	7	17%
quart 51-75		1		1	2%
bottom25		2		2	5%

c. What happened with 2000/2002's Superstars in 2009/2010?

	ALL						
	top 1	top 02-05	top 06-25	quart 26-50	quart 51-75	bottom 25	NE
Costa Rica	30%	20%	0%	5%	0%	0%	45%
Morocco	55%	29%	4%	6%	0%	0%	6%
Peru	68%	14%	3%	0%	0%	0%	16%
	Manufacturing						
	top 1	top 02-05	top 06-25	quart 26-50	quart 51-75	bottom 25	NE
Costa Rica	36%	21%	0%	7%	0%	0%	36%
Morocco	54%	29%	5%	7%	0%	0%	5%
Peru	70%	7%	3%	0%	0%	0%	20%

Table 8: First-Year Size Distribution of 2009's New Superstars

	ALB	BGD	BGR	BWA	CHL	COL	CRI	DOM	ECU	EGY	GTM	IRN	JOR	KEN	LBN	MAR	MEX	MWI	PAK	PER	UGA	YEM	ZAF
top1		1	6			2	1		1	5	1	17	1		5	1	15		3			2	8
top 02-05	1		4		2	2	1	1	1	1	1	2		1		2	4	1	3	1			3
top 06-25		2				4						2	1				2	1	1		1		
quart 26-50						1							1			1							
quart 51-75										1							1						
bottom25										3													

	All Sectors		Manuf.	
	Total	Percent	Total	Percent
top1	69	57%	55	56%
top 02-05	31	25%	23	23%
top 06-25	14	11%	13	13%
quart 26-50	3	2%	4	4%
quart 51-75	2	2%	1	1%
bottom25	3	2%	2	2%

Table 9: Features of Superstars

		Tanzania	Jordan	Peru
Type of Exporter	Producer	100%	100%	91%
	Trader	0%	0%	9%
Ownership	Foreign	81%	67%	48%
	Domestic	19%	33%	52%
Age when first exported	0 to 2 years	53%	81%	71%
	3 to 5 years	0%	14%	16%
	More than 5 years	47%	5%	14%

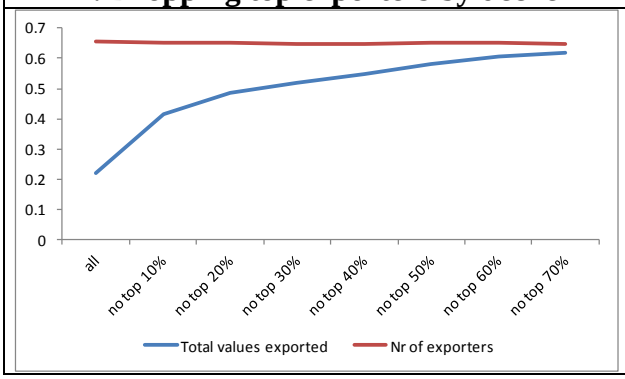
Appendix 1: Countries and Years Dropped from the original sample

Country	2004	2005	2006	2007	2008	2009
DOM	X	X	X			
ECU	X	X				
EGY			X	X		
JOR	X	X	X	X		
KWT					X	
MKD	X	X				X
MLI		X	X	X	X	
MUS		X				
MWI	X	X				X
NER	X	X	X	X		X
NIC			X		X	
SEN	X	X	X	X		
UGA			X			

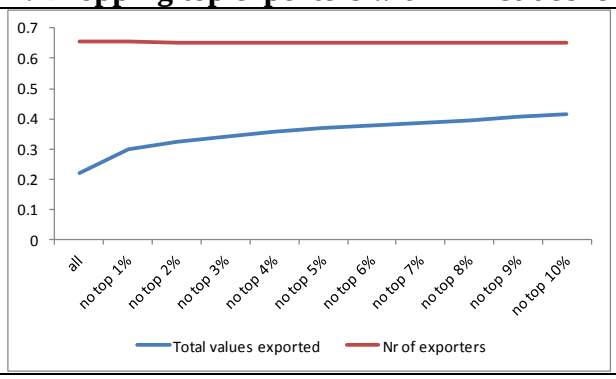
Appendix 2: Country-Pair Average Correlations – Only Manufacturing Sector

a) Average correlations

i. Dropping top exporters by decile

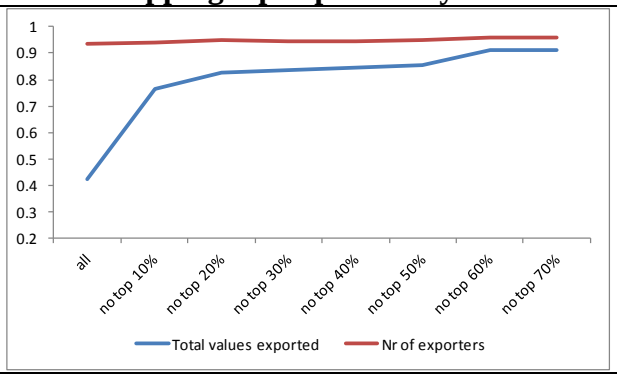


ii. Dropping top exporters within first decile

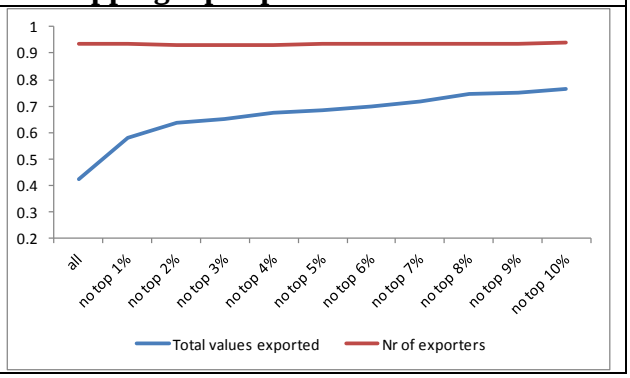


b) Significant correlation coefficients (in percent)

i. Dropping top exporters by decile



ii. Dropping top exporters within first decile



Appendix 3: Period considered for calculation in Table 6 and in Table 8

Country	Period
ALB	2007 - 2009
BFA	2008 - 2010
BGD	2008 - 2010
BGR	2004 - 2006
CHL	2007 - 2009
CMR	2007 - 2009
COL	2007 - 2009
CRI	2007 - 2009
DOM	2007 - 2009
ECU	2007 - 2009
EGY	2008 - 2010
GTM	2008 - 2010
IRN	2008 - 2010
JOR	2008 - 2010
KEN	2007 - 2009
KHM	2007 - 2009
LBN	2008 - 2010
MAR	2008 - 2010
MEX	2007 - 2009
MUS	2007 - 2009
MWI	2006 - 2008
PAK	2008 - 2010
PER	2007 - 2009
SEN	2008 - 2010
TZA	2007 - 2009
UGA	2008 - 2010
YEM	2008 - 2010
ZAF	2007 - 2009

Appendix 4: Origin of Superstars Over a Decade – Costa Rica, Morocco and Peru

a) Costa Rica

What type of firms were 2009's firms in 2000?

2000 \ 2009	top 1	top 02-05	top 06-25	quart 26-50	quart 51-75	bottom 25
top 1	22%	4%	0%	0%	0%	0%
top 02-05	22%	28%	2%	0%	0%	0%
top 06-25	15%	35%	27%	3%	1%	1%
quart 26-50	0%	2%	17%	14%	4%	2%
quart 51-75	0%	2%	5%	7%	8%	4%
bottom 25	0%	0%	2%	2%	3%	4%
NE	41%	30%	48%	74%	83%	89%

What happened with 2000's firms in 2009?

2000 \ 2009	top 1	top 02-05	top 06-25	quart 26-50	quart 51-75	bottom 25	NE
top 1	30%	20%	0%	5%	0%	0%	45%
top 02-05	8%	38%	13%	3%	0%	0%	39%
top 06-25	1%	9%	36%	5%	2%	1%	46%
quart 26-50	0%	0%	18%	19%	6%	3%	54%
quart 51-75	0%	0%	5%	10%	11%	6%	68%
bottom 25	0%	0%	2%	2%	5%	6%	85%

b) Morocco

What type of firms were 2010's firms in 2002?

2002 \ 2010	top 1	top 02-05	top 06-25	quart 26-50	quart 51-75	bottom 25
top 1	48%	6%	0%	0%	0%	0%
top 02-05	7%	28%	5%	1%	0%	0%
top 06-25	9%	19%	30%	7%	2%	0%
quart 26-50	5%	5%	11%	16%	5%	2%
quart 51-75	2%	3%	3%	7%	6%	5%
bottom 25	0%	1%	1%	2%	5%	3%
NE	29%	39%	50%	67%	82%	90%

What happened with 2002's firms in 2010?

2002 \ 2010	top 1	top 02-05	top 06-25	quart 26-50	quart 51-75	bottom 25	NE
top 1	55%	29%	4%	6%	0%	0%	6%
top 02-05	2%	32%	31%	4%	0%	0%	31%
top 06-25	1%	4%	35%	10%	3%	0%	47%
quart 26-50	0%	1%	10%	19%	6%	2%	62%
quart 51-75	0%	0%	2%	8%	7%	5%	77%
bottom 25	0%	0%	1%	3%	6%	4%	87%

c) Peru

What type of firms were 2009's firms in 2000?

2000 \ 2009	top 1	top 02-05	top 06-25	quart 26-50	quart 51-75	bottom 25
top 1	37%	2%	0%	0%	0%	0%
top 02-05	31%	21%	0%	0%	0%	0%
top 06-25	6%	30%	14%	3%	1%	0%
quart 26-50	3%	6%	8%	6%	3%	1%
quart 51-75	1%	1%	2%	3%	4%	2%
bottom 25	0%	1%	1%	2%	2%	2%
NE	22%	39%	74%	85%	90%	94%

What happened with 2000's firms in 2009?

2000 \ 2009	top 1	top 02-05	top 06-25	quart 26-50	quart 51-75	bottom 25	NE
top 1	68%	14%	3%	0%	0%	0%	16%
top 02-05	15%	41%	3%	1%	1%	0%	38%
top 06-25	1%	11%	27%	8%	2%	1%	49%
quart 26-50	0%	2%	12%	11%	6%	2%	66%
quart 51-75	0%	0%	4%	6%	7%	5%	78%
bottom 25	0%	0%	2%	5%	4%	4%	84%

Appendix 5: Percent of superstars that are accounted in the statistics presented in Table 9

	Jordan	Peru	Tanzania
Question on Producer vs. Trader	96%	96%	94%
Question on ownership structure	96%	97%	100%
Question on age at first export	84%	84%	94%
Total Nr. SS in last year in sample	25	69	16