Economic Development and the Margins of Trade

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Abstract

We use the Exporter Dynamics Database to identify differences in the margins of export growth for high-income, middle-income, and least-developed countries. The growing literature on trade dynamics suggests the relative contributions of the extensive margin (number of exporters) and the intensive margin (average exporter size) change as countries reach higher levels of economic development. In the data, higher levels of GDP per capita are associated with increases in the number of exporters for only the least developed countries (LDCs). We also find that the pattern of increasing average exporter size with increasing GDP per capita is weakest for LDCs and strongest for high-income countries. The findings imply that the drivers of export growth and economic development for the poorest countries differ significantly from growth drivers in middle-income and high-income economies. The poorest countries may benefit most by engaging the "missing middle" (smaller, lower-productivity exporters), rather than by providing resources to their larger, super-productive firms.

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I Introduction

Two main developments stand out in the growing literature on trade and economic development: [1] a greater focus on the dynamics of trade and [2] increased emphasis on the contributions of firms to export growth on the intensive and extensive margins. Armed with firm-level export data, scholars now specify and measure the contributions of incumbents, exiters and entrants to export growth (e.g. Fernandes, Freund, and Pierola, 2016; Díez, Mora, and Spearot, 2017). With increased access to disaggregated data, the literature has grown - expanding from early papers on high income economies (e.g Bernard, Jensen, Redding, and Schott, 2007; Eaton, Kortum, and Kramarz, 2011), to recent papers that cover countries from a broader set of stages of economic development (e.g. Freund and Pierola, 2015; Fernandes et al., 2016). This growing literature on trade dynamics reveals notable differences between countries at different stages of economic development in the extensive margin and intensive margins of trade.

Our research question is: "how do export margins at the firm-level change with countries' stages of economic development?" We contribute to the existing literature in two ways. First, we focus on least developed countries (LDCs) - and adopt standard classifications of countries into LDCs, Middle Income Countries (MICs) and High Income Countries (HICs), as described in section II. Second, we emphasize variation in observations within the same country to explain the relationship between the margins of trade growth and economic development. In sum, our tests recognize the limits of inter-country comparisons, while following conventional definitions for the stages of economic development.[1]

We find the strongest correlation between GDP per capita and the extensive margin — the number of exporters — for the least-developed countries. Increasing GDP per capita is not associated with more exporting firms for high income countries and middle income countries. The positive correlation between the extensive margin and GDP per capita is not observed in specifications that use country fixed effects. One implication from this finding is that export growth policies that stimulate economic development for LDCs should be those that also increase the number of exporters.

[1]The main motivation for grouping countries and emphasizing within-country comparisons is that high-income countries tend to remain high-income countries and most poor countries have not yet made the leap to being middle-income countries. A large body of literature shows that claims of convergence for aggregate GDP (per capita) between countries fail, even if the manufacturing sectors of many countries are converging in productivity (Durlauf, Johnson, and Temple, 2005; Rodrik, 2011, 2012; Subramanian, 2011).

This agrees with prior work that suggests bridging the *missing middle* to achieve economic growth (Tybout, 2000, 2014).[2] We also find the strongest correlation between the intensive margin (i.e. average exporter size) and GDP per capita in high-income countries. The pattern of increasing average exporter size with economic development is weakest for LDCs, once we control for country and year. The implication is that increasing exports by export superstars may be more associated with growth in high-income economies than in poor countries.

For our analysis, we use the Exporter Dynamics Database, a rich collection of firm-level export characteristics from high-income, middle-income and low-income countries. The data cover exports for 69 countries between 1997 and 2014, with most countries featuring for fewer than 10 years, and the most common years being 2006 to 2012. Cebeci, Fernandes, Freund, and Pierola (2012) and Fernandes et al. (2016) provide detailed descriptions of the database, created with support from the World Bank.

This paper makes two contributions to the literature on how exports change with economic development, using firm-level definitions for the intensive and extensive margins, complimenting earlier work by Fernandes et al. (2016). First, we contrast LDCs against MICs and HICs (Fernandes et al. (2016) do not distinguish country groups). Putting countries into groups recognizes the economic reality of large gaps between countries in terms of economic development, and the other differences between countries, institutional and otherwise, that sustain those differences. Second, we emphasize tests of the relationship between economic development (measured as GDP per capita) and trade margins that use only *within-country* variation. The rationale behind this second difference is that, even with increasing GDP per capita, several features of an economy remain unchanged in the short run. These time-invariant country features influence the margins of export growth, and call for regression specifications with country fixed-effects or similar controls.

This paper also provides empirical evidence to help address a debate on how growth in developing countries reflects institutional and policy distortions. The two leading arguments in this literature are: [1] the missing middle and [2] the truncated top. The *missing middle* argument assumes that what holds back developing countries are distortions that prevent smaller and mid-sized firms from growing, and

[2]The sectoral composition of exports may be one possible reason for the differences between country groups in the margins of export growth. This will be consistent with earlier papers that explain differences in the economic development of countries (e.g. Hausmann, Hwang, and Rodrik, 2007). Rather than speculate further, we leave the question of why the patterns of export margins differ for a separate paper.

growing enough to enter and survive in export markets. As countries develop, the costly distortions decrease and small firms enter the export market, driving down average exporter size and decreasing export concentration. On the other hand, the *truncated top* argument assumes that what holds back developing countries is the relative lack of superstar firms. As countries develop in this hypothetical framework, superstars grow and enter the export market, driving up average exporter size and increasing export concentration. Several notable papers frame this discussion about the missing middle or truncated top of firm-size distributions in developing economies (e.g. Tybout, 2000; Hsieh and Klenow, 2009; Hsieh and Olken, 2014; Fernandes et al., 2016).

Our findings imply that medium productivity firms are missing for LDCs, while Fernandes et al. (2016) conclude that the top of the distribution is truncated for developing countries. The differences in our findings reflect our approach to identifying how the distribution of firm sizes and exporters change with economic development. Our findings reflect short-run relationships and theirs appear to reflect long-run relationships. In that sense, our paper is complementary.

Our paper also contributes to the literature on the margins of trade. Exporting firms are the basis for our extensive and intensive margins definitions. Therefore, the extensive margin captures export entrants - firms that were not exporters in prior periods, while the intensive margin captures the growth of export incumbents, through increases in the average exports per exporting firm, (which we term average exporter size from hereon). The theoretical models that underpin the arguments for the margins of trade growth in our paper, and the distribution of firm sizes in the related relation draw on scholarship on the margins of trade growth (Helpman, Melitz, and Rubinstein, 2008), and reallocation of trade between firms (Melitz, 2003).

The shift to firm-dynamics in understanding export growth provokes several policy-relevant questions: should countries grow *on the extensive margin* by stimulating more firms to export? Or, should they grow *on the intensive margin* by helping existing exporters to increase average export values? The argument for having more exporters by promoting the missing middle, for example, suggests that policymakers help a different subset of exporting firms, than the argument for helping incumbents grow or supporting export superstars (Freund and Pierola, 2015).

The rest of the paper is organized as follows. Section II describes the data and provides stylized facts about economic development and margins of trade. Section III presents the baseline estimates, and provides robustness checks. Section IV con-

cludes.

II Data

Our primary data source is the Exporter Dynamics Database (EDD), a collection of the basic firm-level characteristics of exports for a broad set of countries. Variables in the EDD include the number of exporters, average exporter size and total exports — these allow us to measure growth and the contributions of the intensive and extensive margin. The EDD also describes export diversification, in terms of the Herfindahl-Hirschmann Index (HHI), share of top exporters, as well as the number of products and destinations per exporter. Country of origin and year are also included in the database, among other measures of exporter dynamics.[3]

The database covers the years 1997 to 2014 for 69 countries. Not all countries are present for all years in the data; the most common years in the data are between 2003 and 2010. Countries like Belgium, Cameroon and Peru have data for more than 15 years, while others like Kuwait, Thailand and Niger have fewer than four. In the data we have 20 LDCs, 37 middle-income countries and 12 high-income countries. Classification of these countries by stages of development follows the United Nations (UN) definitions of LDCs and the World Bank definition of high-income countries. Countries outside the LDC and HIC categories are classified as middle-income developing countries. Table A.1 in the appendix lists the countries, years covered, and classification into development stages (LDCs, MICs, HICs).[4]

Real GDP per capita data and other country-year information come from World Bank (2017). Our measure of market size is GDP (constant 2010 US$) from the same source. Our summaries and regression estimates are limited to the years cov-

[3]A copy of the data is maintained by the World bank at (http://data.worldbank.org/data-catalog/exporter-dynamicsdatabase). Details on how the EDD was sourced, cleaned and compiled are outlined in Fernandes et al. (2016) and Cebeci et al. (2012). The Database provides detail on the export dynamics and composition of aggregate export flows, while protecting information that could be traceable to any specific firm.

[4] The classifications of countries into stages of economic development are available at the following links: (http://data.worldbank.org/region/least-developed-countries:-un-classification) and (https://datahelpdesk.worldbank.org/knowledgebase/articles/906519).Both classification schemes are largely driven by GDP per capita. The UN defines countries as LDCs based on a rating system that combines low GDP per capita with macroeconomic vulnerability and low human capacity indices. The World Bank defines a HIC as an economy with a gross national income per capita above US$12,475 in 2015. Even though Asian countries and high-income countries are underrepresented in the data, the EDD is the largest collection of country-level data indicating the firm-level composition of exports.

ered by both data sources: World Bank (2017) provides GDP per capita data for most country-years between 1960 and 2015, and as mentioned, the EDD covers an unbalanced panel between 1997 and 2014. The two sources leave us with 623 usable country-year observations for our baseline test specifications.

There are two main difference between the data selection for this paper and Fernandes et al. (2016): We use more years of data and more countries. Our selection uses more recent data, thanks to the efforts of Fernandes et al. (2016) and members of the World Bank team to update the EDD. The methodology for collecting and cleaning the data stayed the same, as described in Cebeci et al. (2012), which provides confidence in interpreting our estimates. The second difference is that their estimates use observations grouped below the country-year level. Country pair-firm-sector observations, country-destination and country-sector observations all feature in their paper, while we emphasize country-year observations, as explained in Section I.

II.1 Data Summary and Descriptives

Table 1 summarizes the main variables used for the paper. The first panel in the table shows the averages within each of the three country groups, for variables measured across the years available for each country; to avoid biasing these averages for countries with more years of available data, the table shows averages of country-averages. To create this table, we first represent each country with its average value across the years for each variable. Then we report the averages of these country-averages for the country groups — LDCs, MICs, and HICs. This means that the regression tables that follow report 623 observations, but Table 1 uses only 69 observation of country-averages.

The main variables in Table 1 are export value, and its margins — the intensive margin (average exporter size) and the extensive margin (the number of exporters). The definitions follow the rationale that as countries develop, exports grow when one or both of these margins improve: the number of exporters increase, average exporter size rises or we have average exports increasing while the number of exporters is also increasing.

We begin by looking at these variables separately for countries in each of the country groups that represent stages of development. Describing export margins in separate columns for LDCs, MICs and HICs creates a novel opportunity to address differences in how exports respond to economic growth drivers for countries at differ-

ent income levels. Section I introduces the idea that economic structure and exports differ by stage of economic development - likely due to country-specific features. It is difficult to ignore the fact that the last 50 years have shown little to no evidence of economic convergence (Durlauf et al., 2005). Therefore, the summary table shows differences between the country groups' averages, in addition to measures of dispersion for the key variables within each group.

There are notable differences in the extensive and intensive margins of exports. LDCs have fewer, and smaller exporters. While both the extensive margin (number of exporters) and the intensive margin (average export per exporter) are smaller for LDCs, the intensive margin is relatively much smaller. The extensive margin, i.e. the average number of exporters in each country-year ranged from just over 1,000 for LDCs to nearly 30,000 for the twelve high-income countries. The number matters because if all exporters in all countries shipped the same dollar value of goods, this difference means that high-income countries will export 27 times as much as LDCs. The minimum observed number of exporters was 18, for Timor Leste and the maximum observed was 110,000, for Germany (2009–2012). Similarly, the intensive margin when averaged across countries, ranged from $1.7m for LDCs to nearly $3.8 m for HICs. The minimum average exporter size was $141,000 for Sao Tome and Principe, and the highest was $11.7 million for Belgium. In sum, average exporter sizes for LDCs are slightly less than those of MIC and about half of those of HIC, but the number of exporters is seven times larger for MICs and almost 30 times larger for HICs.

As expected, LDCs have smaller economies, and are poorer. GDP per capita is on average almost 50 times larger in HICs than in LDCs. For LDCs, GDP in the 2010 dollars for the average country-year was $19 billion, with the comparable figure for MICs roughly ten times larger, and HICs being 30 times larger. We use logged values of the real GDP and GDP per capita variables in the tests that follow.

The variables that describe export concentration yield some of the most interesting contrasts in our data. The share of aggregate exports controlled by the top 5% of exporters seem to suggest that concentration is highest in high income countries, 85% on average. However, the Herfindahl-Hirschmann Index (HHI) of exports is consistently higher for the poorer countries. The average HHI of 0.12 for LDCs is almost ten times larger than the comparable number for HICs and three times larger than the comparable number for MICs. This contrast between HHI and the export share of the top 5% provides vital context for the debate on whether firm size

Table 1: Summary Statistics

Variables	LDCs	MICs	HIC
Values			
Real GDP (1mn USD)	18,840	174,976	590,458
GDP per capita (USD)	716	5,847	34,636
Number of exporters	1,102	7,668	29,999
Exports per firm (USD)	1,713,362	2,511,569	3,805,557
Exporter value of median firm (USD)	79,054	55,945	64,018
Export per firm: entrant	248,921	315,780	466,518
Share of Top 5%	0.74	0.82	0.85
Herfindahl-Hirschman Index	0.118	0.046	0.013
Dest. per firm	2.66	2.78	4.22
Prod. per firm	4.97	5.67	7.70
Countries	20	37	12
Minimum Values			
Real GDP (1mn USD)	237	4,678	17,715
GDP per capita (USD)	342	866	8,029
Number of exporters	18	221	5,722
Exports per firm (USD)	140,857	515,682	1,204,122
Exporter value of median firm (USD)	6,405	1,336	13,075
Export per firm: entrant	65,858	58,902	87,349
Share of Top 5%	0.45	0.64	0.76
Herfindahl-Hirschman Index	0.002	0.002	0.004
Dest. per firm	1.53	1.37	2.54
Prod. per firm	1.60	1.67	4.62
Maximum Values			
Real GDP (1mn USD)	114,299	1,879,604	3,450,702
GDP per capita (USD)	1,270	39,378	85,833
Number of exporters	6,995	44,607	110,366
Exports per firm (USD)	4,049,447	7,488,207	11,700,000
Exporter value of median firm (USD)	380,882	277,919	230,154
Export per firm: entrant	621,736	1,587,558	2,413,773
Share of Top 5%	0.94	0.99	0.92
Herfindahl-Hirschman Index	0.396	0.450	0.043
Dest. per firm	7.02	4.55	8.92
Prod. per firm	22.81	13.32	13.29

distributions in poorer economies are distorted in ways that create a *truncated top* or leave a *missing middle*.

Fernandes et al. (2016) argue that concentration of export value increases with GDP per capita, using this to support the idea that distortions in poor economies lead to a *truncated top*. However, the HHI data suggests the contrary, with the higher export concentrations in poorer countries. The HHI data is more consistent with a model of a *missing middle*. This decrease in concentration with economic development matches pattern in Table 1, where the median exporter size decreases with economic development. These descriptive patterns could simply be due to the differences in exporter numbers. HICs and MICs, having larger numbers of exporters are expected to have lower export HHIs, all other things equal. On the other hand, the share of exports by the top 5% may not be a truly informative measure — it allows only a limited insight into how exports are allocated between firms, while HHI as a measure uses the full distribution of exporter sizes.[5]

Similarly, median export size patterns in the data are more consistent with the case for a missing middle. The increases in export size (i.e. exports per firm) observed as GDP per capita increases also led Fernandes et al. (2016) to suggest that the data supports a model of the truncated top. However, the median exporter size is higher in LDCs followed by HICs and then MICs, this hump-shaped pattern implies that as countries develop, smaller firms enter the export market in LDCs, and decrease the export value of the median firm. As countries develop further, the largest firms all grow, so that the median export size increases. In sum, the median export size data is consistent with a model of the missing middle, not the truncated top.

In terms of firm-level export diversification, firms in low-income countries appear to be more specialized. Firms in LDCs and MICs export to about three destination countries, and export about five products, and HICs have larger averages — four destination countries and almost eight product categories. We must emphasize that these averages do not reflect the fact that firm sizes and scope vary widely, such that the distribution of these variables are skewed, with the average being typically much higher than the median for each country. The presence of intermediaries, firms that export goods produced by other firms should also be considered in interpreting these

[5] Consider a scenario in which the top three firms in an LDC is responsible for 50% of the country's exports — for a country like Zambia with most exports coming from a few multinationals in the copper business, this scenario is not far-fetched. Export size drops off rapidly after this top three, so that the top 5% of exporters accounts for less than 75% of aggregate exports. In a higher-income country, exports are less concentrated at the very top, but the top 5%, in this case 1,500 firms out of 30,000, account for more than 85% of aggregate exports.

variables, as discussed in Fernandes et al. (2016) and Freund and Pierola (2015).

II.2 Export Patterns by Stage of Development

Figure 1 recreates Figure 2 in Fernandes et al. (2016), with two modifications: graphs are plotted separately for the country groups (LDC, MIC, and HIC), and the graphs show both cross-country variation and within-country variation (not just cross-country variation figures). The three panels of the figure are consistent with the summaries of average values in Table 1. The figures on the left of each panel show cross-country variation — correlations using the average GDP per capita and the average of the relevant variable for each country. The figures on the right show the within-country variation — correlations using the demeaned GDP per capita and the demeaned relevant variable for each country.

Our approach contributes a novel perspective with two clear advantages: First, the relationships described above need not be linear, and second, those relationships may hold in a long term scenario that allows an LDC to become a MIC, but not necessary in the short term. Additionally, those differences may differ between LDCs, MICs, and HICs. Examining within-country variation in that sense, complements previous studies that emphasize cross-country variation.

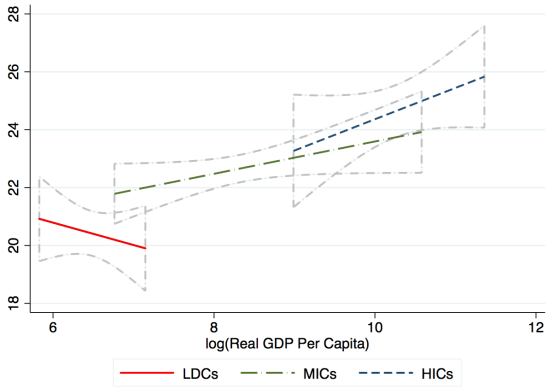
The figures that show within-country variation convey a very different relationship between economic development and the variables of interest than the cross-country figures. For the most part, the figures that show cross-country variation match those in Fernandes et al. (2016), with a few key differences between the country groups. Total exports (panel a), average exporter size (panel b) and the number of exporters (panel c) increases as countries develop. This pattern, however, is not true for LDCs (but there is much variation among LDC countries, as seen by the large confidence intervals). Just as with the cross-country variation figures, the top right panel of Figure 1 also shows a strong and positive relation between increases in real GDP per capita and total exports. The relationship is strong and positive for all country groups. It is at the intensive and extensive margins that the country differences show up. In those figures we see that the relationship between the intensive margin and GDP per capita is slightly stronger for HICs and MICs, and, more importantly, that the relationship between the extensive margin and economic development is positive and significant only for the LDC countries.

The demeaned figures and non-demeaned figures in Figure 2 look very different

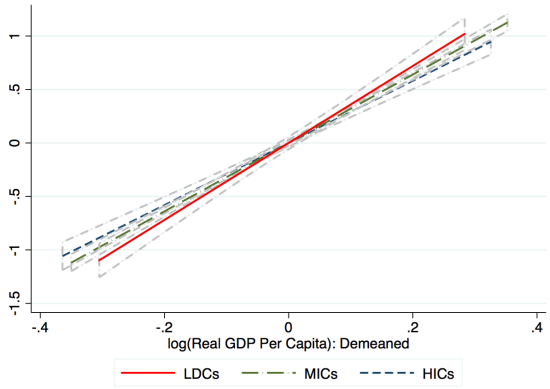
Figure 1: Total Exports and The Margins of Trade

a Export Value

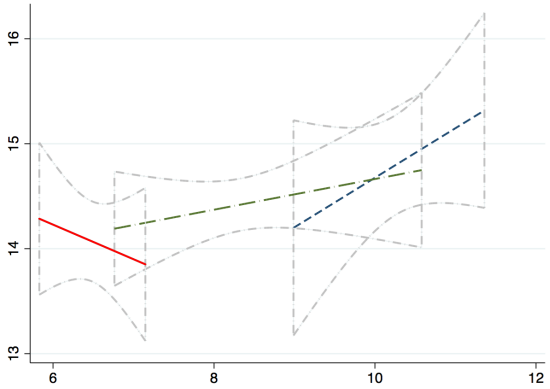
Cross-country variation

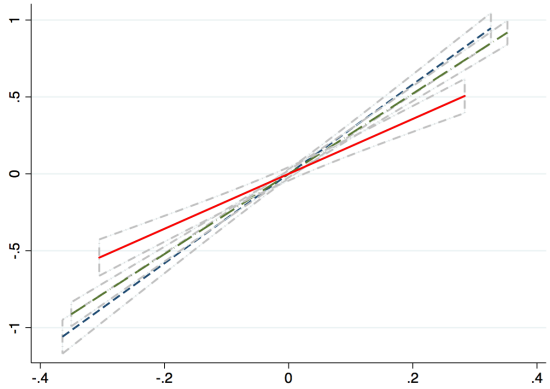


Within-country variation

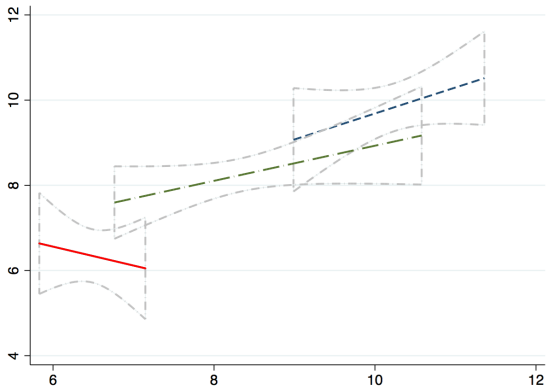


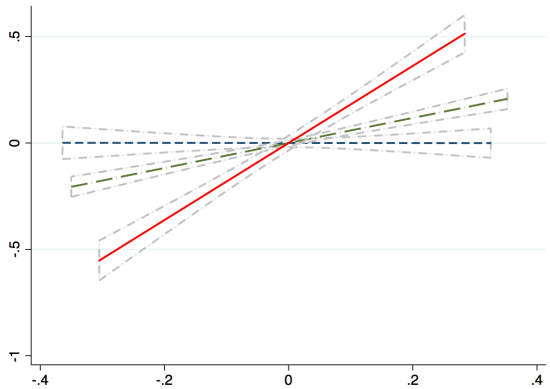
b Average Export Value per Firm





c Number of Exporters



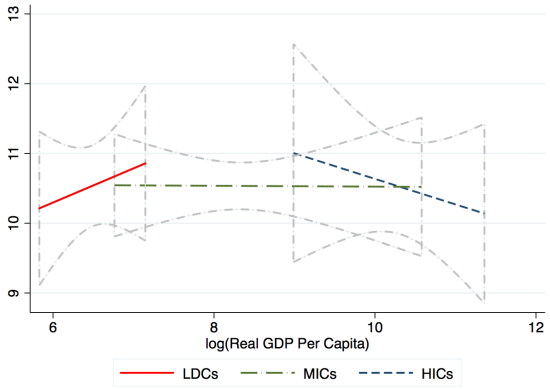


Note: For the cross-country figures (the left hand side) we first create a country's average for the variable and then correlate this average with each country's average GDP per capita, and for the within-country figures (the right hand side) we subtract from each observation the country average for the same variable and then correlate these observations with the demeaned GDP per capita. All variables are in logs.

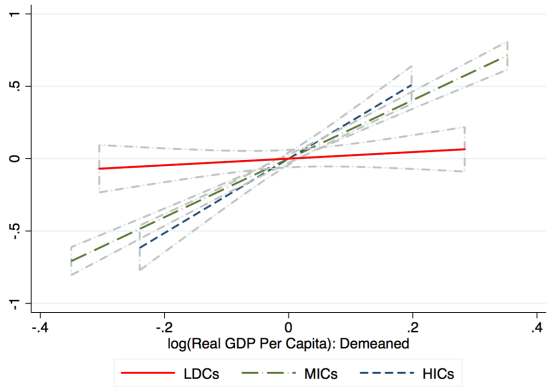
Figure 2: The Intensive Margin and Its Alternatives

a Median Firm Export Value

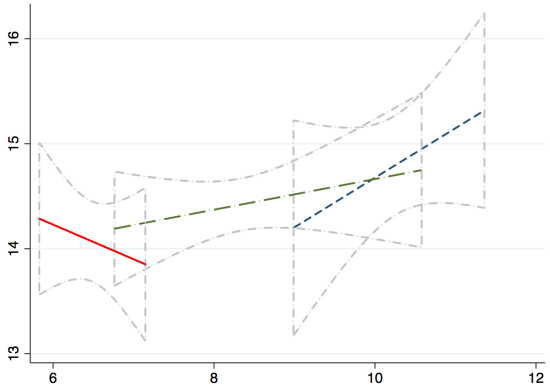
Cross-country variation

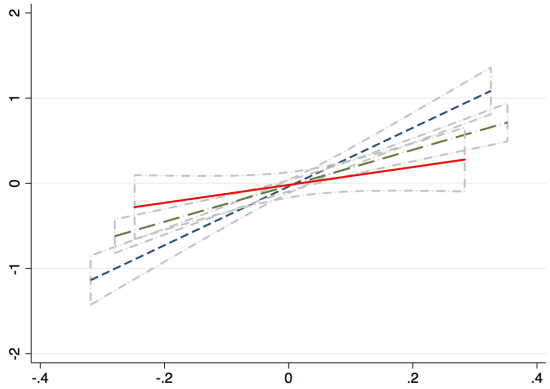


Within-country variation

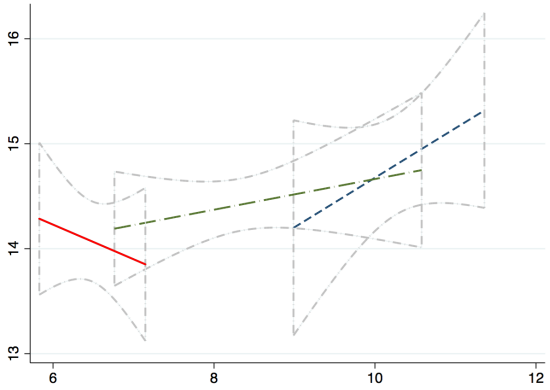


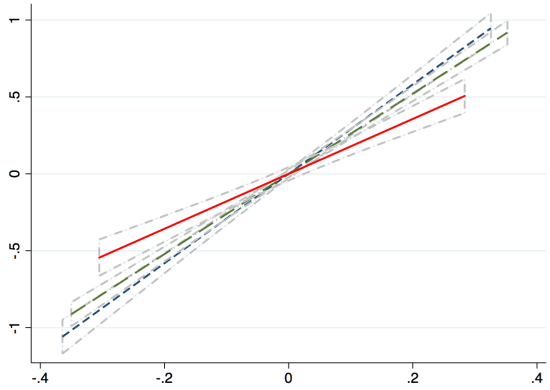
b Average Export Value per Firm: Entrant





c Average Export Value per Firm



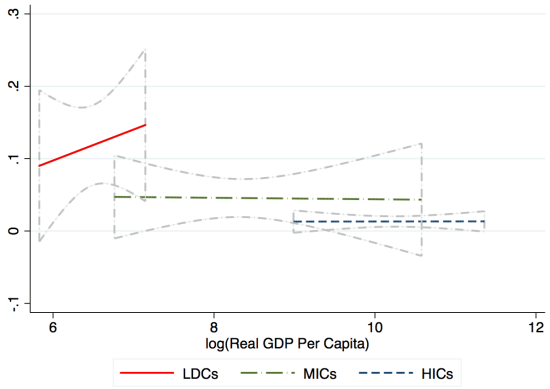


Note: For the cross-country figures (the left hand side) we first create a country's average for the variable and then correlate this average with each country's average GDP per capita, and for the within-country figures (the right hand side) we subtract from each observation the country average for the same variable and then correlate these observations with the demeaned GDP per capita. All variables are in logs.

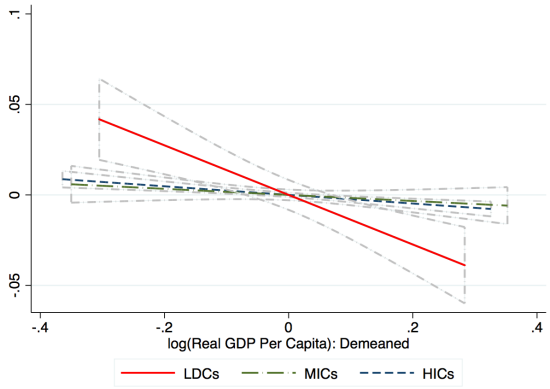
Figure 3: Export Concentration

a Herfindahl-Hirschman Index

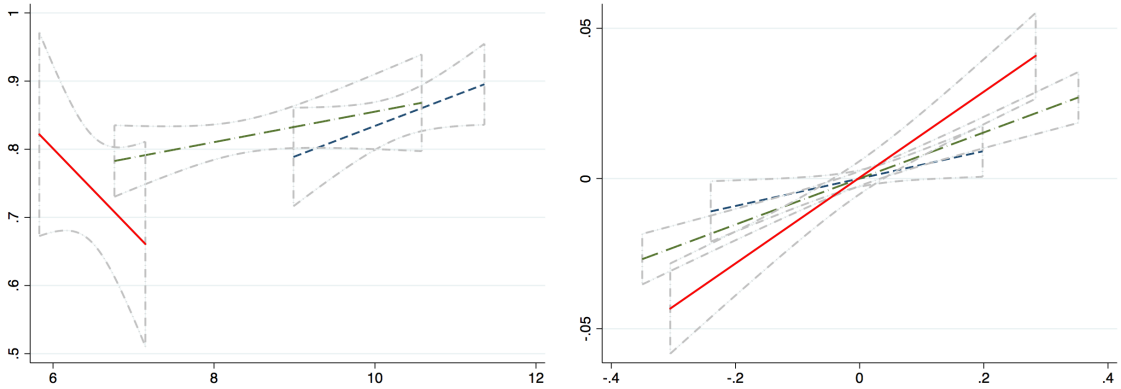
Cross-country variation



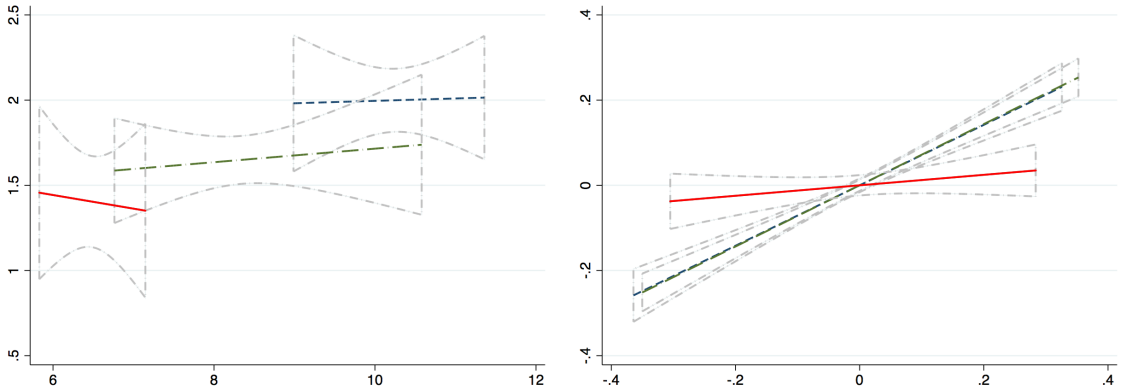
Within-country variation



b Export Share of Top 5% of Firms



c Average Products per Firm



Note: For the cross-country figures (the left hand side) we first create a country's average for the variable and then correlate this average with each country's average GDP per capita, and for the within-country figures (the right hand side) we subtract from each observation the country average for the same variable and then correlate these observations with the demeaned GDP per capita. The average products per Firm are in logs.

and provide more evidence for a model of the missing middle than a truncated top. Previous tables and graphs may suggest that the intensive margin is important for export growth in LDCs, but this changes if we look at alternative measures of the intensive margin. Specifically, there is no association between the size of the median exporter and economic development for LDCs (see top panel of Figure 2), while the association is positive for MICs and HICs. We see a similar figure when looking entrants, exiters, and successful entrants (see Appendix Figure A.1); the association for LDC countries is only strong for incumbents.

In Figure 3, we see an overall decrease in concentration with GDP per capita on the top right panel, which conflicts with Fernandes et al. (2016). The conflict exists because of how we measure concentration (i.e. we measure export concentration as HHI, and our results match theirs if we use the share of the top 5%, see panel b). More importantly, we see differences between the country groups: Concentration decreases for LDCs with economic development (the opposite of what we find with the cross-country variation figures). There appears to be no relationship between concentration and GDP per capita for MICs and HICs. As described, panel b, which shows the pattern for the share of top 5% of exporters, follows the opposite pattern. One last variable that could describe export concentration, average products per firm, follows a somewhat different pattern from the top 5% export share. Increasing GDP per capita tends to come with more products per firm, on average, but the association is weakest for LDCs.

In sum, the within-country variation figures imply that the growth margins of LDCs, MICs, and HICs are different. A development strategy that may make sense to a developing-MIC country like Mexico may not make sense for a developing-LDC country like Zambia.

III Empirics

In the previous section, we showed that the contribution of trade growth margins to GDP per capita differs for countries at different stages of economic development. We also found different patterns of correlation when we change from cross-comparisons to within-country comparisons. In that section, we focused on the differences within countries and identified two key patterns when comparing LDCs with MICs and HICs: [1] Changes in GDP per capita are linked to stronger response on the extensive margin for LDCs, and [2] the intensive margin and concentration are less correlated

with GDP per capita for LDCs. This section provides more rigorous support for these patterns.

III.1 Empirical Model

To determine how the various margins of trade differ for countries at different stages of economic development, we must account for other factors that may correlate with both. Therefore, we use the following baseline model:

$$Y_{it} = \alpha_i + \delta_t + \beta_1 (RGDP_{PC})_{it} + \beta_2 MIC_i (RGDP_{PC})_{it} + \beta_3 HIC_i (RGDP_{PC})_{it} + u_{it} \quad (1)$$

In Equation (1), α_i represents country fixed effects, to control for country-specific characteristics that may correlate with our dependent variable. δ_t are calendar year fixed effects; this controls for variables that affect all countries in a given year, e.g. the Great Recession years, which is covered in our data sample. As expected, i indexes the country and t the calendar year. Y_{it} captures the outcome variable of interest —the various measures of the margins of trade. We include [1] traditional measures of the margins of trade (*total exports, average exporter size, and number of exporting firms*), [2] extended measures of the intensive margin (*export value of the median firm and average exports per entrant*), [3] measures of export concentration (*Herfindahl-Hirschman Index, export share of the top 5% of firms, and average number of products per firm*). Section II includes definitions for these variables. $(RGDP_{PC})_{it}$ is the log real GDP per capita (GDP per capita at constant 2010 US$) for each country i in year t. MIC_i equals one if the country is a middle-income country, and zero otherwise; HIC_i equals one if the country is a high-income country, and zero otherwise. As mentioned earlier, Appendix Table A.1 shows the list of countries in our data sample and their country groups.

As LDCs make up the omitted group, β_1 shows the correlation between real GDP per capita and the measures of margins of trade for LDCs. $MIC_i \cdot (RGDP\ PC_{it})$ captures the difference between LDCs and MICs as real GDP per capita changes, and $HIC_i \cdot (RGDP\ PC_{it})$ captures this same difference for LDCs and HICs. Thus, β_2 and β_3 are the difference-in-difference estimators of interest. Lastly, u_{it} is the error term.

The expected sign for β_1, β_2, and β_3 depends on the variable of interest and the model of how economic development shapes firm and exporter size distributions. As outlined in section I, measures of the intensive margin and concentration can help

to test whether the data is consistent with a model of the missing middle or a model of the truncated top. In either scenario, the extensive margin increases as a country develops. For the missing middle, we expect a negative association ($\beta_1 < 0$) for the intensive margin and concentration estimates; the model does not differentiate by the level of economic development, so β_2 and β_3 should not be statistically significant. For the truncated top, we would expect a positive association ($\beta_1 > 0$) for the intensive margin and concentration estimates; the model does not differentiate by the level of development, so β_2 and β_3 should also not be statistically significant. In this paper, we find more support for a model of the missing middle for LDCs ($\beta_1 < 0$), and, more importantly, we find significant differences between LDCs and both MICs and HICs ($\beta_2 \neq 0$ and $\beta_3 \neq 0$).

III.2 Estimates

Exports and Margins of Trade

Table 2 shows the relationship between economic development and total exports (as well as the relationships with both the intensive and extensive margins of trade). For each outcome variable we run a regression without controlling for the country of origin (Columns 1, 4, and 7); i.e., we exclude the country fixed effects (α_i). We can think of these as estimates of cross-country variation, the results that most closely resemble those in Fernandes et al. (2016). Column (1) shows that total exports and economic development are highly correlated across countries and, unsurprisingly, that both the extensive (Column 4) and the intensive margin (Column 7) contribute to this growth. These results are consistent with the truncated top argument, and led Fernandes et al. (2016) to suggest that developing countries may export less because of a truncated firm-size distribution.

We include country fixed-effects in Columns (2), (5), and (8), and the results show a few changes. The link between exports and economic development increases in size while keeping its positive sign. However, the estimate in extensive margin regression is no longer statistically significant. This implies, as has been suggested, that the key to economic development is increasing average exporter sizes (Freund and Pierola, 2015). That is, countries may benefit most from efforts to help existing exporters – especially those that are already successful – grow, rather than providing resources to potential and smaller exporters, to raise the number of exporters.

Table 2: Trade and Margins of Trade: LDCs vs MICs and HICs

Dep. Var.⇒	ln(export value)			ln(num. exporters)			ln(avg. exp. per firm)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln($RGDP_{PC}$)	1.01***	1.42***	2.07***	0.76***	0.44	1.40***	0.24***	0.99***	0.67**
	(0.04)	(0.26)	(0.58)	(0.03)	(0.29)	(0.46)	(0.02)	(0.22)	(0.31)
MIC*ln($RGDP_{PC}$)			-1.01			-1.37***			0.36
			(0.64)			(0.46)			(0.40)
HIC*ln($RGDP_{PC}$)			-1.25*			-2.27***			1.02**
			(0.74)			(0.57)			(0.41)
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	623	623	623	623	623	623	623	623	623
Num. of clusters		69	69		69	69		69	69
Adjusted R^2	0.548	0.781	0.795	0.506	0.251	0.438	0.254	0.708	0.716

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. GDP per person is in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

Finally, we interact real GDP per capita with the country-group dummies for middle- and high-income countries to see how the above association depends on the degree of development. These results show that the association between trade and GDP per capita is even stronger for LDCs (Column 3), is much less important for middle-income countries and even less for high-income countries. Looking at the extensive margin (Column 6) we see that economic development comes with higher exporter numbers for LDCs, even if the same relationship is not true for MICs and is even more negative for HICs. The intensive margin, while less important than the extensive margin, is still positive and significantly associated with GDP per capita for LDCs (Column 9). The intensive margin is significantly more important for HICs. Comparing LDCs with MICs, the relationship between the intensive margin of exports and economic development is stronger for MICs, but the difference is not statistically significant.

Intensive Margin and Its Alternatives

Table 3 shows the relationship between economic growth and alternative measurements for the intensive margin. It replicates the intensive margin results from Table 2, but also include the median export value for firms and the average export value for entrants. If exporter size distributions have a truncated top, not only should the average exporter size increase, but so should the median value. Additionally, if we had a truncated top, the average entrant's export value should also increase. As the firm size distribution becomes less truncated hypothetically, the subset of firms that become new exporters should be larger and export more.

The estimates using these alternative variables for the intensive margin reinforce of finding that the case for a truncated top is not so clear. The estimates in Column (4) show that even before controlling for the country of origin, the median value is not increasing with GDP per capita. Column (7) shows that there is a positive association between average exporter size for entrants and real GDP per capita, although the association is weaker than for the overall intensive margin (Column 2) . These results change in magnitude, but not significance, once we control for the country of origin (Columns 5 and 8). However, our interest is not in the overall correlation but rather on the relationship for LDCs and whether the correlation differs by stage of economic development.

Once we interact real GDP with HICs and MICs, the country groups that capture stages of economic development, we get very different results. In Column 6, we see

Table 3: Intensive Margin and Its Alternatives: LDCs vs MICs and HICs

Dep. Var.⇒	ln(avg. exports per firm)			ln(avg. exp. per firm): Median			ln(avg. exp. per firm): Entrant		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln($RGDP_{PC}$)	0.24***	0.99***	0.67**	0.01	0.71	-0.17	0.15***	1.46**	0.45
	(0.02)	(0.22)	(0.31)	(0.03)	(0.47)	(0.68)	(0.03)	(0.56)	(0.92)
MIC*ln($RGDP_{PC}$)			0.36			1.60**			1.02
			(0.40)			(0.69)			(0.95)
HIC*ln($RGDP_{PC}$)			1.02**			2.95***			3.18***
			(0.41)			(1.07)			(1.05)
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	623	623	623	608	608	608	540	540	540
Num. of clusters		69	69		68	68		66	66
Adjusted R^2	0.254	0.708	0.716	0.041	0.250	0.314	0.100	0.123	0.143

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. GDP per person is in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

that the median exporter size actually decreases for LDCs (-.17), but the difference is not statistically significant. The median exporter size increases for middle-income countries (with the difference-in-difference estimate of 1.60), and increases even more for high-income countries (with the difference-in-difference estimate of 2.95). In Column 9, we see that while the average export value per firm for entrants does increase, it is not significantly different from zero. Middle income countries, on the other hand, see a greater increase, but the difference is not statistically significant. Finally, the difference with high-income countries is large (3.18), and statistically significant. These findings do not support the argument for a truncated top, especially in the case of LDC countries.

Other Margins of Trade

We now turn to another testable prediction for the truncated top and the missing middle arguments: the relationship between trade concentration and economic development. In Table 4, we provide three measurements for concentration of exports: [1] the export share of the top 5% firms, [2] the Herfindahl-Hirschman Index and 3) the average number of products exported per firm. Export concentration should increase with GDP per capita if the correct model is a truncated top, and decrease if it is the missing middle. We would interpret an increase in the average number of products exported per firm with GDP per capita as support for a model of the truncated top, if we assume the most productive firms are multi-product firms (Bernard et al., 2007). On the other hand, we would interpret a decrease in this average as support for a model of the missing middle: as countries develop and grow by acquiring more, smaller-scale (and likely single-product) exporters, the average number of products per exporter falls.

The two measures of export concentration provide contrasting results, (just as we observed in Section II). Using the share of the top 5% of firms as a measurement of concentration gives a positive relationship between concentration and economic development (Column 1), but we get a negative one when using the HHI (Column 4). Interestingly, both of these measurement lose statistical significance when we control for the country of origin (see Column 2 for the top 5% and Column 5 for HHI). The results, however, depend on the stage of development, which becomes clear when we interact country groups with real GDP per capita. For the top 5% variable (Column 3), there is a positive, but insignificant relationship between concentration and economic development for LDCs, and, more importantly, the difference is negative

Table 4: Other Margins of Trade: LDCs vs MICs and HICs

Dep. Var.⇒	Top 5% Share			Herfindahl-Hirschman Index			ln(products per firm)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln($RGDP_{PC}$)	0.03***	0.04	0.09	-0.02***	-0.05	-0.12*	0.13***	-0.08	-0.32
	(0.00)	(0.03)	(0.06)	(0.00)	(0.04)	(0.07)	(0.01)	(0.18)	(0.24)
MIC*ln($RGDP_{PC}$)			-0.09*			0.13*			0.45
			(0.05)			(0.06)			(0.28)
HIC*ln($RGDP_{PC}$)			-0.21***			0.08			0.30
			(0.08)			(0.06)			(0.28)
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	602	602	602	623	623	623	616	616	616
Num. of clusters		68	68		69	69		68	68
Adjusted R^2	0.114	0.180	0.222	0.061	0.025	0.053	0.143	0.316	0.336

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. GDP per person is in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

and statistically significant for the difference-in-difference estimates. For HHI (Column 6), there is a negative relationship (with a 10% level of significance) between concentration and economic development for LDCs, and the difference-in-difference estimate is positive for MICs and positive, but not statistically significant, for HICs.

Finally, we observe a positive and statistically significant relationship between the average number of products exported per firm as a measurement of concentration and economic development (Column 7). The difference becomes negative, but not statistically different than zero, when controlling for the country of origin (Column 8). Interacting real GDP per capita with the country group (Column 9), gives us a negative, but not statistically significant, relationship for LDCs. The difference-in-differences estimates between LDCs and HICs and MICs are positive, but not statistically significant.

III.3 Robustness Checks

Appendix Tables A.2 – A.4 replicate the three tables in this section (Tables 2 – 4), but uses data at the country-destination level. Using this data does not alter our results significantly, and allows us to control for variables typically included in a gravity equation (distance, similarities in language, history, etc.). Table A.2 shows that the relationship between GDP per capita and the margins of trade (total exports, the extensive margin, and the intensive margin) does not change much, both in significance and magnitude whether we use country-level data or country-destination-level data. The only major difference is that some of the difference-in-difference estimates become significant. For example, the negative difference-indifference estimates for total exports become significance (Column 3), this implies that the relationship between trade and economic development is greatest for LDC countries. The other change in estimate is at the extensive margin (Column 6); the negative difference-indifference estimate between MICs and LDCs becomes significant. This also reinforces the point that trade, and especially the extensive margin, is much more important for the economic development of LDCs.

We find similar reinforcing estimates for the alternative definitions of the intensive margin (Appendix Table A.3) and for the measures of concentration (Appendix Table A.4). For the alternative definition of the intensive margin, we see that the estimates for the association between GDP per capita and the median firm's export value are negative when not controlling for country-destination (Column 4), and the positive

association in Column (5), where we control for country-destination, becomes positive and statistically significant. For the measurements of concentration, we see that the average number of products per firm is negatively associated with GDP per capita for LDCs; and the difference-in-difference estimates are positive and significant for MICs and HICs. This implies that smaller firms (in terms of the number of products exported) are entering the export market as LDC countries develop.[6]

Appendix Tables A.5 – A.7 replicate the three baseline tables and include real GDP in all regressions, just as in Fernandes et al. (2016). Fernandes et al. (2016) include this variable as a measure of country size. However, our regressions with country fixed effects partially control for country size, by definition. Including GDP as a control only helps to control for changes to country size that are not fixed over time, and not captured by GDP per capita. In the regressions that do not use country fixed effects (Columns 1, 4, and 7 in Appendix Table A.5), the only effect of adding real GDP is to decrease the correlation between real GDP per capita and total exports, the intensive margin, and the extensive margin. The signs and significance are not affected. Once we control for both country of origin and real GDP, we find no correlation between total exports and real GDP per capita (Column 2). It may seem that once we control for GDP, there is no impact of real GDP per capita, but as the estimates of the intensive and extensive margin show, the real reason is that these margins have opposing correlations with total exports. As GDP per capita increases, the extensive margin decreases (-1.39 in Column 5) and the intensive margin increases (1.23 in Column 8). However, once we interact GDP per capita with MICs and HICs, the associations are eliminated for both margins for LDCs. Looking at the difference-in-difference estimates, however, we observe negative estimates for MICs and HICs for the extensive margin and positive estimates for HICs for the intensive margin. Thus, the findings that the intensive margin is relatively more important for richer countries, and the extensive margin is relatively more important for LDCs still holds. Using alternative measurements of the intensive margin (Appendix Table A.6) reinforces this point. Finally, we lose the significance for most of the estimates in our various measures of concentration (Appendix Table A.7) for LDCs .

Appendix Tables A.8 – A.10 replicate the three tables, but uses a different definition for least developed countries. As there is some GDP per capita overlap between

[6]We do not repeat the same tests with country-sector level data because identifying an aggregate effect is less straightforward. Changes in exports due to changes in endownments in one sector will affect other sectors according to Rybczynski's Theorem (Rybczynski, 1955). In general, interactions between the sectors make identifying a relationship between economic development and trade margins at the sector-level less reliable.

LDCs and MICs, we created a new variable for the least-developed countries that avoids this issue. We calculate each country's GDP per capita and divide the countries in our sample into quintiles, based on their average GDP per capita. In this table, instead of excluding LDCs, we exclude the lowest quintile countries. Splitting countries this way allows us to see that the relationship between economic development and the country groups is not perfectly monotonic. Nonetheless, the findings for the poorest countries in these tables are consistent with our previous findings. Exports and GDP per capita are highly correlated for the poorest countries (Column 3 of Appendix Table A.8), and the extensive margin (Column 6) is relatively more important than the intensive margin (Column 9) for the poorest group of countries. Using alternative measure of the the intensive margin (Appendix Figure A.9) shows that the relationship between economic growth and the intensive margin is still not clear. Concentration (Appendix Figure A.10) also does not increase for the poorest countries using either the top 5% share or the HHI; the number of products per firm (Column 9) decreases for the poorest countries. These findings show that the case for a truncated top, at least for the poorest countries, finds little support in the data.

IV Conclusion

In this paper we discuss the association between GDP per capita and the margins of trade; and specifically, whether this association depends on a country's stage of development. We find that GDP per capita growth for LDCs is linked to a stronger response on the extensive margin (the number of exporters), and that the intensive margin (average exporter size) and export concentration are less correlated with economic development for LDCs. For high-income countries, development has a stronger correlation with average exporter size. The findings provides additional empirical evidence that the patterns of growth and development in LDCs differs from other developing countries, and implies, that growth policies that work for Mexico need not work for Zambia.

This paper also provides empirical evidence on how exports grow in developing countries that may face costly distortions to resource allocation between firms, including exporters. The two leading arguments in this literature are: [1] the missing middle and [2] the truncated top. The missing middle argument holds that developing countries are held back by costly distortions that prevent smaller and mid-sized firms from growing, and growing enough to enter and survive in export markets. As

countries develop, the distortions decrease and small firms enter the export market, driving down average exporter size and decreasing export concentration. On the other hand, the truncated top argument assumes that what holds back developing countries is the lack in relative terms of superstar exporters, such that as countries develop, superstars grow and enter the export market, driving up average exporter size and increasing export concentration. Our findings imply that the missing middle is holding back LDCs (at least for exports).

The work here can be expanded in several ways. First, as noted earlier, the arguments for either a *missing middle* or *truncated top* do not distinguish between stages of development. As we find that the association between real GDP per capita and the various margins of trade depend on the stage of development, the literature would benefit from a theoretical model that matches these facts. Finally, while the aim here is not to identify why the associations depend on the stage of development, we think it is important to explain 'why' the associations exists. Thus, future work should seek to develop an empirical framework that identifies causes for differences in the growth of trade margins by stage of development.

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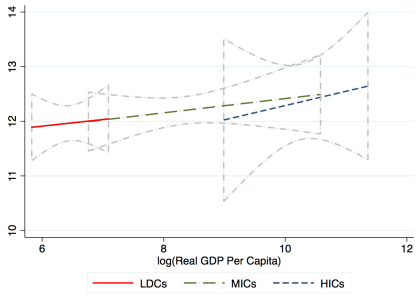
Appendix A

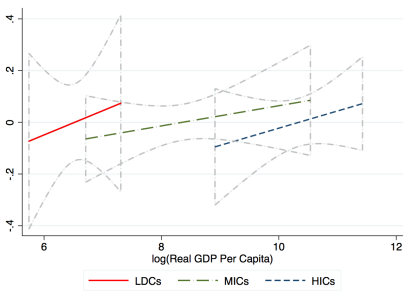
Figure A.1: Average Exports Per Firm by Firm type

a Entrant

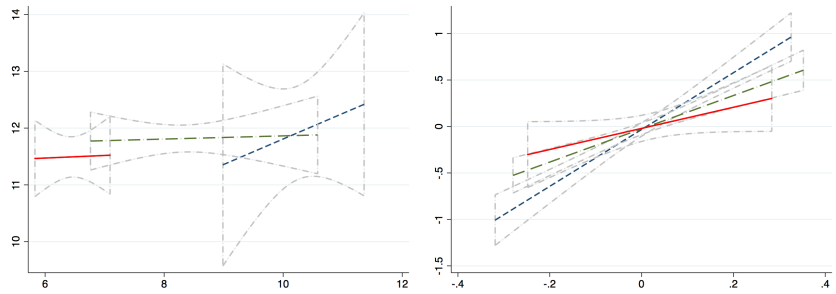
Cross-country variation



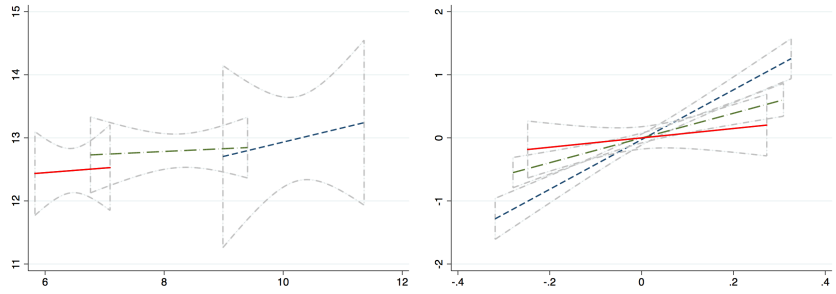
Within-country variation



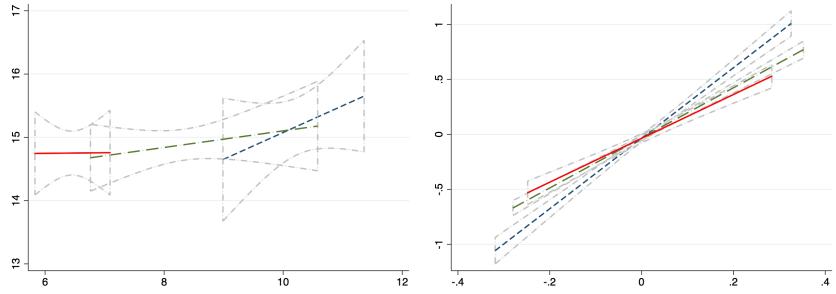
b Exiter



c Successful Entrant



d Incumbent

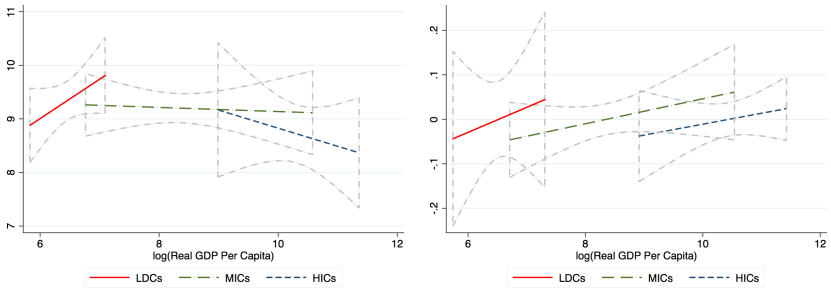


Note: For the cross-country figures (the left hand side) we first create a country's average for the variable and then correlate this average with each country's average GDP per capita, and for the within-country figures (the right hand side) we subtract from each observation the country average for the same variable and then correlate these observations with the demeaned GDP per capita. All variables are in logs.

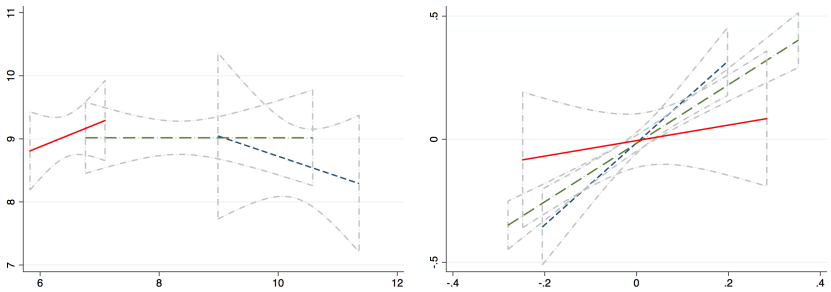
Figure A.3: Median Firm Export Value

a Entrant

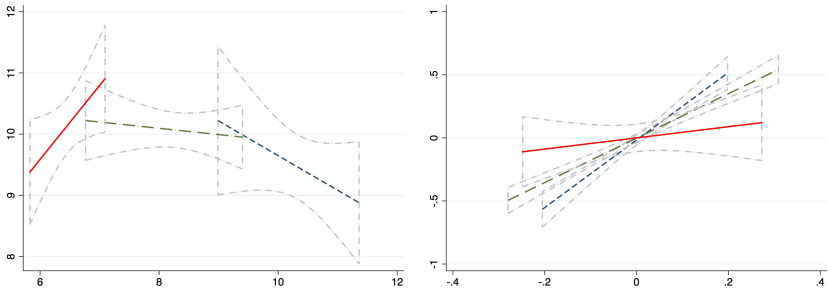
Cross-country variation | Within-country variation



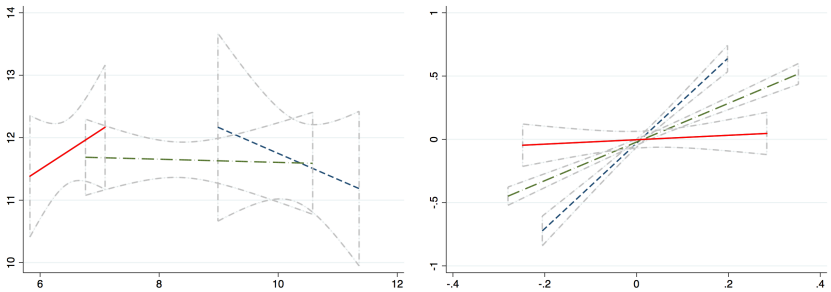
b Exiter



c Successful Entrant



d Incumbent



Note: For the cross-country figures (the left hand side) we first create a country's average for the variable and then correlate this average with each country's average GDP per capita, and for the within-country figures (the right hand side) we subtract from each observation the country average for the same variable and then correlate these observations with the demeaned GDP per capita. All variables are in logs.

Table A.1: Countries by Income Category

Country	Code	First year	Last year	Country	Code	First year	Last year
Least Developed Countries (LDCs)							
Burkina Faso	BFA	2005	2012	Niger	NER	2008	2010
Bangladesh	BGD	2005	2014	Nepal	NPL	2011	2014
Ethiopia	ETH	2008	2012	Rwanda	RWA	2001	2012
Guinea	GIN	2009	2012	Senegal	SEN	2000	2012
Cambodia	KHM	2000	2009	Sao Tome and Principe	STP	2014	2014
Laos	LAO	2006	2010	Timor-Leste	TLS	2006	2012
Madagascar	MDG	2007	2012	Tanzania	TZA	2003	2012
Mali	MLI	2005	2008	Uganda	UGA	2000	2010
Myanmar	MMR	2011	2013	Yemen	YEM	2008	2012
Malawi	MWI	2006	2012	Zambia	ZMB	1999	2011
Middle Income Countries (MICs)							
Albania	ALB	2004	2012	Kyrgyzstan	KGZ	2006	2012
Bulgaria	BGR	2001	2006	Lebanon	LBN	2008	2012
Bolivia	BOL	2006	2012	Sri Lanka	LKA	2013	2013
Brazil	BRA	1997	2014	Morocco	MAR	2002	2013
Botswana	BWA	2003	2013	Mexico	MEX	2000	2012
Cote d'Ivoire	CIV	2009	2012	Macedonia	MKD	2001	2010
Cameroon	CMR	1997	2013	Mauritius	MUS	2002	2012
Colombia	COL	2007	2013	Nicaragua	NIC	2002	2014
Costa Rica	CRI	1998	2012	Pakistan	PAK	2002	2010
Dominican Republic	DOM	2002	2014	Peru	PER	1997	2013
Ecuador	ECU	2002	2014	Paraguay	PRY	2007	2012
Egypt	EGY	2006	2012	Kosovo*	QOS	2011	2014
Gabon	GAB	2002	2008	Romania	ROU	2005	2011
Georgia	GEO	2003	2012	El Salvador	SLV	2002	2009
Guatemala	GTM	2005	2013	Swaziland	SWZ	2012	2012
Iran	IRN	2006	2010	Thailand	THA	2012	2014
Jordan	JOR	2003	2012	Turkey	TUR	2002	2013
Kenya	KEN	2006	2014	South Africa	ZAF	2001	2012
High Income Countries (HICs)							
Belgium	BEL	1997	2013	Kuwait	KWT	2009	2010
Chile	CHL	2003	2012	Norway	NOR	1997	2014
Germany	DEU	2009	2012	New Zealand	NZL	1999	2010
Denmark	DNK	2001	2012	Portugal	PRT	1997	2012
Spain	ESP	2005	2014	Slovenia	SVN	1997	2011
Estonia	EST	1997	2011	Sweden	SWE	1997	2006
Croatia	HRV	2007	2012	Uruguay	URY	2001	2012

The classifications are available at these links: LDC classifications and High-Income Country classifications. Countries that are neither in the LDC and HIC categories are classified as middle-income countries

Table A.2: Trade and Margins of Trade: Country-Destination Data

Dep. Var.⇒	ln(export value)			ln(num. exporters)			ln(avg. exp. per firm)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln($RGDP_{PC}$)	0.67***	1.47***	1.85***	0.60***	0.68***	0.88***	0.15***	0.80***	0.91***
	(0.01)	(0.10)	(0.18)	(0.00)	(0.05)	(0.07)	(0.00)	(0.08)	(0.15)
MIC*ln($RGDP_{PC}$)			-0.49**			-0.14*			-0.27
			(0.19)			(0.08)			(0.17)
HIC*ln($RGDP_{PC}$)			-0.96***			-1.65***			0.64***
			(0.24)			(0.12)			(0.20)
Country-Dest FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	73,050	73,050	73,050	85,693	85,693	85,693	73,050	73,050	73,050
Num. of clusters		9,848	9,848		11,925	11,925		9,848	9,848
Adjusted R^2	0.095	0.184	0.185	0.150	0.139	0.148	0.031	0.100	0.101

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country-destination level, shown in parenthesis. GDP per person is in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

Table A.3: Intensive Margin and Its Alternative: Country-Destination Data

Dep. Var.⇒	ln(avg. exports per firm)			ln(avg. exp. per firm): Median			ln(avg. exp. per firm): Entrant		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln($RGDP_{PC}$)	0.15***	0.80***	0.91***	-0.04***	0.43***	0.23	-0.08***	0.37***	-0.06
	(0.00)	(0.08)	(0.15)	(0.00)	(0.08)	(0.15)	(0.00)	(0.09)	(0.17)
MIC*ln($RGDP_{PC}$)			-0.27			0.26*			0.61***
			(0.17)			(0.16)			(0.18)
HIC*ln($RGDP_{PC}$)			0.64***			2.03***			3.39***
			(0.20)			(0.23)			(0.29)
Country-Dest FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	73,050	73,050	73,050	70,106	70,106	70,106	60,981	60,981	60,981
Num. of clusters		9,848	9,848		9,550	9,550		9,143	9,143
Adjusted R^2	0.031	0.100	0.101	0.018	0.021	0.024	0.021	0.006	0.010

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country-destination level, shown in parenthesis. GDP per person is in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

Table A.4: Other Margins of Trade: Country-Destination Data

Dep. Var.⇒	Top 5% Share			Herfindahl-Hirschman Index			ln(products per firm)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln(RGDP PC)	0.04***	0.03	0.01	-0.05***	-0.11***	-0.14***	0.09***	-0.16***	-0.27***
	(0.00)	(0.02)	(0.03)	(0.00)	(0.01)	(0.02)	(0.00)	(0.03)	(0.05)
MIC*ln(RGDP PC)			0.03			0.03			0.13**
			(0.03)			(0.03)			(0.05)
HIC*ln(RGDP PC)			-0.16***			0.21***			0.40***
			(0.05)			(0.03)			(0.08)
Country-Dest FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	40,522	40,522	40,522	73,079	73,079	73,079	71,945	71,945	71,945
Num. of clusters		4,907	4,907		9,852	9,852		9,668	9,668
Adjusted R^2	0.070	0.055	0.057	0.070	0.009	0.010	0.054	0.051	0.052

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country-destination level, shown in parenthesis. GDP per person is in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

Table A.5: Trade and Margins of Trade: Controlling for RGDP

Dep. Var.⇒	ln(export value)			ln(num. exporters)			ln(avg. exp. per firm)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln($RGDP_{PC}$)	0.28***	-0.16	0.56	0.21***	-1.39**	0.41	0.07***	1.23**	0.15
	(0.03)	(0.73)	(0.99)	(0.03)	(0.64)	(0.90)	(0.02)	(0.50)	(0.49)
MIC*ln($RGDP_{PC}$)			-0.63			-1.12**			0.49
			(0.61)			(0.48)			(0.37)
HIC*ln($RGDP_{PC}$)			-0.52			-1.80***			1.27***
			(0.68)			(0.57)			(0.38)
ln(RGDP)	0.90***	1.70**	1.31*	0.69***	1.96***	0.86	0.22***	-0.26	0.45
	(0.02)	(0.77)	(0.70)	(0.03)	(0.68)	(0.62)	(0.02)	(0.53)	(0.46)
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	623	623	623	623	623	623	623	623	623
Num. of clusters		69	69		69	69		69	69
Adjusted R^2	0.894	0.798	0.801	0.830	0.374	0.453	0.370	0.708	0.717

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. Both GDP per person and GDP are in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

Table A.6: Intensive Margin and Its Alternatives: Controlling for RGDP

Dep. Var.⇒	ln(avg. exports per firm)			ln(avg. exp. per firm): Median			ln(avg. exp. per firm): Entrant		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln($RGDP_{PC}$)	0.07***	1.23**	0.15	-0.20***	1.31	-1.54	-0.04	2.67*	-0.20
	(0.02)	(0.50)	(0.49)	(0.04)	(1.03)	(1.34)	(0.03)	(1.35)	(1.59)
MIC*ln($RGDP_{PC}$)			0.49			1.96**			1.18
			(0.37)			(0.80)			(1.03)
HIC*ln($RGDP_{PC}$)			1.27***			3.74***			3.48***
			(0.38)			(1.08)			(1.21)
ln(RGDP)	0.22***	-0.26	0.45	0.25***	-0.62	1.22	0.24***	-1.27	0.55
	(0.02)	(0.53)	(0.46)	(0.03)	(1.12)	(0.88)	(0.03)	(1.27)	(1.00)
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	623	623	623	608	608	608	540	540	540
Num. of clusters		69	69		68	68		66	66
Adjusted R^2	0.370	0.708	0.717	0.144	0.252	0.323	0.204	0.125	0.142

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. Both GDP per person and GDP are in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

Table A.7: Other Margins of Trade: Controlling for RGDP

Dep. Var.⇒	Top 5% Share			Herfindahl-Hirschman Index			ln(products per firm)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln($RGDP_{PC}$)	0.03***	-0.00	0.18	0.00	0.07	-0.02	0.09***	0.19	-0.25
	(0.00)	(0.06)	(0.11)	(0.00)	(0.06)	(0.13)	(0.02)	(0.42)	(0.54)
MIC*ln($RGDP_{PC}$)			-0.11*			0.10			0.43
			(0.06)			(0.07)			(0.27)
HIC*ln($RGDP_{PC}$)			-0.26***			0.04			0.26
			(0.09)			(0.08)			(0.32)
ln(RGDP)	-0.00	0.04	-0.08	-0.03***	-0.13**	-0.08	0.04**	-0.29	-0.07
	(0.00)	(0.06)	(0.06)	(0.00)	(0.06)	(0.07)	(0.02)	(0.41)	(0.45)
Country FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	602	602	602	623	623	623	616	616	616
Num. of clusters		68	68		69	69		68	68
Adjusted R^2	0.113	0.181	0.227	0.200	0.040	0.056	0.154	0.320	0.335

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. Both GDP per person and GDP are in 2010 US dollars. MIC equals 1 if the country is a middle income country and and HIC equals 1 if the country is a high income countries; $LDCs$ are the omitted group where relevant.

Table A.8: Trade and Margins of Trade: LDC Alternative

Dep. Var.⇒	ln(export value)			ln(num. exporters)			ln(avg. exp. per firm)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln(RGDP PC)	1.01***	1.42***	1.59***	0.76***	0.44	1.17**	0.24***	0.99***	0.42*
	(0.04)	(0.26)	(0.40)	(0.03)	(0.29)	(0.49)	(0.02)	(0.22)	(0.24)
D2nd*ln(RGDP PC)			1.99***			0.16			1.83***
			(0.71)			(0.85)			(0.50)
D3rd*lnR(GDP PC)			-0.15			-0.92*			0.77**
			(0.48)			(0.52)			(0.31)
D4th*ln(RGDP PC)			-1.10*			-1.22**			0.13
			(0.64)			(0.52)			(0.59)
D5th*ln(RGDP PC)			-0.59			-1.84***			1.25***
			(0.49)			(0.57)			(0.28)
Country-Dest FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	623	623	623	623	623	623	623	623	623
Num. of clusters		69	69		69	69		69	69
Adjusted R2	0.548	0.781	0.822	0.506	0.251	0.390	0.254	0.708	0.740

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. GDP per person is in 2010 US dollars. Quintiles are based on real GDP per capita, with the countries with the lowest GDP per capita (*Developed* 1*st*) omitted where relevant.

Table A.9: Intensive Margin and Its Alternatives: LDC Alternative

Dep. Var.⇒	ln(avg. exports per firm)			ln(avg. exp. per firm): Median			ln(avg. exp. per firm): Entrant		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln(RGDP PC)	0.24***	0.99***	0.42*	0.01	0.71	0.04	0.15***	1.46**	1.06
	(0.02)	(0.22)	(0.24)	(0.03)	(0.47)	(0.72)	(0.03)	(0.56)	(0.80)
D2nd*ln(RGDP PC)			1.83***			0.08			-0.98
			(0.50)			(1.47)			(1.74)
D3rd*lnR(GDP PC)			0.77**			1.51**			0.46
			(0.31)			(0.75)			(0.86)
D4th*ln(RGDP PC)			0.13			0.42			-0.57
			(0.59)			(0.81)			(1.14)
D5th*ln(RGDP PC)			1.25***			1.89*			2.33**
			(0.28)			(1.08)			(0.90)
Country-Dest FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	623	623	623	608	608	608	540	540	540
Num. of clusters		69	69		68	68		66	66
Adjusted R2	0.254	0.708	0.740	0.041	0.250	0.292	0.100	0.123	0.142

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. GDP per person is in 2010 US dollars. Quintiles are based on real GDP per capita, with the countries with the lowest GDP per capita (*Developed* 1*st*) omitted where relevant.

Table A.10: Other Margins of Trade: LDC Alternative

Dep. Var.⇒	Top 5% Share			Herfindahl-Hirschman Index			ln(products per firm)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ln(RGDP PC)	0.03***	0.04	0.08	-0.02***	-0.05	-0.11	0.13***	-0.08	-0.49**
	(0.00)	(0.03)	(0.07)	(0.00)	(0.04)	(0.07)	(0.01)	(0.18)	(0.22)
D2nd*ln(RGDP PC)			0.02			0.04			0.94***
			(0.07)			(0.11)			(0.28)
D3rd*lnR(GDP PC)			-0.08			0.11			0.61*
			(0.07)			(0.07)			(0.30)
D4th*ln(RGDP PC)			-0.08			0.07			0.76***
			(0.07)			(0.09)			(0.28)
D5th*ln(RGDP PC)			-0.18*			0.07			0.45*
			(0.09)			(0.07)			(0.26)
Country-Dest FE	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Num. of obs.	602	602	602	623	623	623	616	616	616
Num. of clusters		68	68		69	69		68	68
Adjusted R2	0.114	0.180	0.217	0.061	0.025	0.036	0.143	0.316	0.366

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; robust standard errors, cluster at the country level, shown in parenthesis. GDP per person is in 2010 US dollars. Quintiles are based on real GDP per capita, with the countries with the lowest GDP per capita (*Developed* 1*st*) omitted where relevant.