Export Growth Drivers and Economic Development

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Abstract

We offer a new approach that explains long-run export growth, and how export growth varies by economic development. The approach relies on a heterogeneous-firm model that parses drivers of export growth along the following dimensions: comparative advantage changes, product demand growth, country-level growth, global growth, and growth in destinations reached. We show that aggregate trade growth for a product is a stronger driver of exports in the same product heading for high-income countries, but is less so for middle-income and low-income countries. Country-level export drivers explain more of export growth at the product-level in middle-income countries, compared to other country-groups. High-income countries appear to benefit more from secular trade growth trends, though the latter results are not as statistically robust. Finally, having more destinations is the most notable driver of the observed export growth in our analysis. Low-income countries appear to benefit the most from entering new markets. The main findings hold up to several robustness checks.

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I Introduction

The contours of global trade are changing, with developing countries' share of global exports surging from 21.4% in 1995 to 42% in 2015. Can the surge of the past two decades offer export growth lessons for the years to come? Aggregate exports increased by a factor of 3.4 between 1995 and 2015, but this ratio ranged from 2.3 for high-income countries, and 6 for middle income countries, to 7.5 for low-income countries. In that period, changing tastes and technology drove exports of cassette tapes (HS 852421) from more than \$540 million in 1995 to zero in 2015, just as exports of computers (HS 847120) increased almost tenfold, from \$15 billion to \$146 billion. Countries like Vietnam saw their exports increase by a factor of 33 in the two-decade period, while Gambia witnessed a decrease from \$185 to \$120 million. Given that GDP growth for most developing economies is tied to export growth, and with trade as a larger share of GDP for low-income countries, it is important to understand the internal or external factors driving export growth, and, how different countries benefit differently from growth drivers that may affect products and countries differently. The changes in global trade motivate us to ask whether studying how exports increased in economies like Vietnam, China and Colombia can be useful for economies like Gambia and Guatemala, where economic growth still remains a pressing challenge.[1]

To explain export growth in this period, and how it differed for countries at different levels of economic development, we offer a novel approach to export growth decomposition. The decomposition – effectively an imprecise growth accounting exercise, is derived from a heterogeneous-firm model that follows the productivity and aggregation assumptions in Spearot (2016), while associating the parameters of the assumed Pareto distribution of firm productivity in a country with its level of economic development, as in Mora and Olabisi (2020). Our contribution is to show that, with these assumptions, country-level export growth will depend on five growth drivers, and, more importantly, that the effect of these drivers will depend on the level of economic development.

In the model, country-level exports will respond to one or more of five growth drivers: [1] demand changes for specific products, exogenous to any specific country,

[1] The scale and scope of export growth in developing economies is a notable component of the extensive literature on trade and economic growth (e.g., Zymek, 2015; Hanson, 2012; Feenstra and Wei, 2010). Papers in this vein have emphasized a range of options for developing economies that include complementary government policies, trade openness and export product diversification (e.g., Chang et al., 2009; Harrison, 1996; Ventura, 1997).

usually from changing consumer tastes or technology, as in the motivating example of cassette tapes, [2] country-level changes that drive demand for all products in a national export portfolio, usually due to exchange rates, trade policies, or other advantages that affect all exports for a given country, [3] changes to comparative advantage for a specific set of products in a country, making them more attractive to consumers abroad, [4] broad-based export growth in trade-able products for all countries as real incomes grow globally, with connections between markets becoming easier, and [5] changes to the number of export destinations for a country. By this definition, a country's exports will grow because, its export portfolio has the "right" products, it uses the right policies to promote exports of all items, it gains the advantage in exporting for specific items, it shares in the broad pattern of global trade expansion, or it increases the number of export destinations. We use this approach to explain the export growth of 183 economies.

Model predictions: The theoretical model yields *three key propositions*: [1] any of the four growth drivers (excluding destination count growth) will lead to proportionally more exports for the least-developed countries, relative to high- and middle-income countries; [2] growth in destination numbers, all else equal, will leads to a similar increase in export values across country groups, and [3] country growth drivers play a greater role than product growth drivers in explaining export growth. The approach in the model differs notably from prior studies that focus on productivity, and fixed or variable trade costs.

The main contribution of this paper is a novel set of estimates of the relative importance of the principal drivers of export growth: which products are exported, the number of destinations served by each product, and secular demand growth across exported goods. In the context of a trade and development strategy, the framework matches the broad questions before a typical policymaker. The drivers of trade growth in the framework are *product-specific factors* – which fits policy questions about which products to export or to export next; *country-specific factors* and secular *global growth drivers* – in response to policy questions about how much domestic policy matters, or what policies to emulate from other economies; *comparative advantage* – to fit policy concerns about enabling specific sectors or products; and, finally, the number of *destinations reached* – which matches a broad of set of policy initiatives on expanding market access.

We use a framework that can help tailor policies to countries, given their product mix and their stage of economic development. The arguments that what you export matters (Hausmann et al., 2007; Hidalgo et al., 2007), and where you export to matters (Brambilla et al., 2012; Baliamoune-Lutz, 2011; Bastos and Silva, 2010), can be measured side-by-side in our framework, as a tool for guiding how growth priorities are set. Our work also helps to measure the relative importance of the export growth options documented in earlier work – specializing or diversifying products (Koren and Tenreyro, 2013; Besedeš and Prusa, 2011; Hummels and Klenow, 2005) and diversifying destinations (Newfarmer et al., 2009; Rose, 2007).

Our research question is closely related to the extensive body of work on the margins of export growth. Papers in this literature explain growth in terms of product variety (e.g., Hummels and Klenow, 2005; Besedeš and Prusa, 2011; Cadot et al., 2011), country-level and destination effects (Eaton et al., 2011; Di Giovanni and Levchenko, 2012), and changes at the firm-level or other combinations (e.g., Chaney, 2008; Eaton et al., 2007; Amiti and Freund, 2010). While work in this area has largely emphasized high-income and middle-income countries, we focus on countries with the greatest potential benefit from a new perspective on relevant margins for export growth. The decomposition approach proposed in this paper differs notably from earlier works that emphasize the intensive vs. extensive margins (e.g., Mora and Olabisi, 2020; Besedeš and Prusa, 2011; Schott, 2008), or studies that emphasize factor inputs and productivity in explaining export growth (e.g., Egger and Průša, 2016; Egger and Nigai, 2016, 2015).

We use the Base pour l'Analyse du Commerce International (BACI) database (Gaulier and Zignago, 2010). The dataset includes 21 years of exports (1995-2015), for more than 200 countries, at the detailed HS 6-digit product level. The roughly 20 million observations in the collapsed version of the data we use, represent unique exporter-product-year combinations that define both the patterns and the scale of trade at highly dis-aggregated levels. The data, and aggregates created from the data, allow us to observe the margins of export growth in great detail.

Findings: We find support for the model's predictions – and in particular, the prediction that trade works differently for countries at different income levels. First, developing countries may not benefit from increased global demand for products in their export portfolio as much as high-income countries exporting the same products. Second, we find that country-level drivers matter more for export growth in middle-income countries, and less so for high-income countries and low-income countries. This implies that developing countries can do more at the macro level to improve export competitiveness, but it also means that negative policies can have grave impact on exports in the same countries. Third, after accounting for the other drivers, high income countries seem to benefit the most from global growth drivers. Lastly, we find that growth in the number of export markets moves in unison with product growth, and accounts for much of the variation in export growth. The pattern of higher export growth with more destinations is strongest for low-income countries. This finding implies that countries could benefit from spending resources to help firms enter new markets, not just from increasing access in existing markets.

Our findings are consistent with papers that describe the rise of middle-income countries like China, linking export growth to product sophistication, export-product diversification, or market expansion (e.g., Amiti and Freund, 2010; Schott, 2008; Broda and Weinstein, 2006). Like the foregoing, we find that export growth in middle-income countries is more strongly linked to country-level exports, and by implication, domestic policies that are likely to help all exporters from the same country. This contrasts with the finding for high income countries where we find a negative trade off between export growth in a particular product and overall export growth. The findings for high-income countries fits the broad body of work that describe sectoral and export specialization for countries after an initial diversification (e.g., Parteka and Tamberi, 2013; Cadot et al., 2011; Imbs and Wacziarg, 2003), as well as papers that show export growth is strongly linked to the number of a country's export destinations (e.g., Onder and Yilmazkuday, 2016). Our findings are consistent with the results in Mora and Olabisi (2020), which showed that countries at different stages of economic development grow exports differently, when the margins are defined by new exporting firms, and average exports per firm. The findings in that paper are largely derived from firm-level data covering more than 60 countries. Mora and Olabisi (2020) showed that high-income countries grow exports through existing firms and products, while this paper shows the same set of countries growing exports in response to demand (product and global) growth for existing products; for lower-income countries, however, that paper suggests that it is more important to increase the number of exporters.

The rest of the paper is organized as follows. Section II presents the theoretical model that links export growth to its sources: comparative advantage, country, product, and global growth drivers. It also shows how the contributions of export growth drivers depend on a country's level of economic development. Section III describes the data and provides stylized facts about export growth drivers. Section IV presents the main results, and provides robustness checks. Section V concludes.

II Theoretical Framework

In this section, we present a tractable micro-founded framework for explaining export growth. The framework outlines our simplifying assumptions and their limitations. The section ends with a list of testable predictions, derived from the model.

Model: We develop a multi-sector, heterogeneous-firm, multi-country model, following the assumptions in prior work about productivity and aggregations to the country level (as in, Spearot, 2016). That is, the shape and location parameters of firm-size distributions vary by country; these impact the distribution of firms, the number of exporters, exporter size, and, thus, total export exports. We also associate the shape parameter of the assumed Pareto distribution of firm productivity in a country with its level of economic development, (c.f., Mora and Olabisi, 2020).

Consumer utility in the model depends on the consumption of differentiated varieties ($q_p(\nu)$) produced in each p sector (Q_p), and consumer preferences in all countries are defined by a standard constant elasticity of substitution (CES) utility function over varieties. Utility, in all countries, takes the following form:

$$U = \sum_{p=0}^{P} \theta_p \ln Q_p,$$

$$\text{where } Q_p = \left[\int_{\nu} q_p(\nu)^{\frac{\sigma_p - 1}{\sigma_p}} d\nu \right]^{\frac{\sigma_p}{\sigma_p - 1}}, \ \theta_p \geq 0 \text{ and } \sum_{p=0}^{P} \theta_p = 1.$$

θ_p is the share of income spent on sector p and $\sigma_p > 1$ is the elasticity of substitution between varieties in the same sector. To keep the model and the ensuing analysis tractable, we assume the share of income spent on each sector p is the same across countries; that is, θ_p is country-invariant.

Demand for each ν variety in any country is given by: $q_p(\nu) = \theta_p A p_p(\nu)^{-\sigma_p}$. Where, A is demand factors (income, overall price index, etc), and $p_p(\nu)$ being the price of variety ν in sector p.[2]

Firms in the model pay $w_j F_E$ to enter the market and get a cost draw (a), where w_j is wage in country j, a is the labor needed to produce one unit; and F_E is the number of labor units needed to pay the fixed costs of entry. Since each firm will only produce one variety, we can use the productivity draw (a) to identify both the

[2]Deriving demand closely follows Melitz and Redding (2014), except we leave the share spent on each sector (θ_p) as part of demand, not part of the A term.

firm and the variety (ν). To reach market g from j, firms in sector p must pay a fixed cost ($w_j F_{pjg}$) and iceberg trade costs ($d_{pjg} > 1$). When deciding whether to enter market g, firms within each sector maximize profits.[3]

Profits for variety a, from country j, exporting to country g in any sector are given by the following:

$$\pi_{pjg}(a) = p(a)q(a) - aw_j d_{pjg} q(a) - w_j F_{pjg}$$

Substituting demand ($q(a)$) and maximizing with respect to $p(a)$, for this firm in sector p, gives us equilibrium values for the following:

- Prices: $p_{pjg}(a) = \frac{\sigma}{(\sigma-1)} aw_j d_{pjg}$
- Quantity: $q_{pjg}(a) = \theta_p A_g \left(\frac{\sigma}{(\sigma-1)} aw_j d_{pjg}\right)^{-\sigma}$
- Export Revenue: $Rev_{pjg}(a) = \theta_p A_g \left(\frac{\sigma}{\sigma-1} aw_j d_{pjg}\right)^{1-\sigma}$
- Profits: $\pi_{pjg}(a) = \theta_p A_g \left(\frac{\sigma}{\sigma-1} aw_j d_{pjg}\right)^{1-\sigma} \left(\frac{1}{\sigma}\right) - w_j F_{pjg}$

The zero profit condition ($\pi_{pjg}(a) = 0$), implies the productivity cutoff for exporting is:

$$a^* = \frac{\sigma - 1}{\sigma} \frac{1}{w_j d_{pjg}} \left(\frac{\sigma w_j F_{pjg}}{\theta_p A_g}\right)^{\frac{-1}{\sigma-1}}$$

We use the revenue formula and productivity cutoff to calculate aggregate sector exports, taking N_{pj} as the total number of potential exporters in the sector. Aggregate sector exports from country j to country g can be expressed as follows:

$$V_{pjg} = N_{pj} \int_0^{a^*} Rev(a) dG(a) = N_{pj} \int_0^{a^*} \theta_p A_g \left(\frac{\sigma}{\sigma - 1} aw_j d_{pjg}\right)^{1-\sigma} dG(a)$$

Firms are assumed to be heterogeneous in terms of productivity (or cost a), with the latter following a Pareto distribution with parameters that vary by country, (as in Spearot, 2016; Mora and Olabisi, 2020):

$$g_j(a) = k_j \frac{a^{k_j - 1}}{(a^m_{pj})^{k_j}} \quad , \quad a \in [0, a^m_{pj}]$$

Lower values of k are associated with greater productivity dispersion, so that countries drawing from a distribution with a low k parameter will have a lower percentage of low-efficiency firms (firms with high a values).

[3]Subscript p was dropped for the elasticity of substitution for convenience.

In the *equilibrium* that follows, given the zero profit condition, and the foregoing assumptions about consumer utility and firm productivity, the value of country j's exports to destination g in a sector is given as follows:[4]

$$V_{pjg} = N_{pj} \left(\frac{a^*}{a_{pj}^m} \right)^{k_j} w_j F_{pjg} \frac{\sigma k_j}{k_j - \sigma + 1} \tag{1}$$

Where N_{pj} is the total number of firms in a sector, for country j; a_{pj}^m is the maximum unit-labor requirement in sector p; a^* is the export productivity cutoff for firms exporting a variety in a sector, from country j to destination g; k_j is the firm-size distribution parameter that varies by a country's level of economic development (c.f., Mora and Olabisi, 2020); $\sigma > 1$ is the elasticity of substitution between varieties. We will show that these variables, particularly σ and k_j, not only impact total exports, but also affect how countries respond to trade growth drivers.

Substituting in the definition of a^* and simplifying, we can dis-aggregate bilateral export levels:

$$V_{pjg} = N_{pj} (a_{pj}^m)^{-k_j} \left[\frac{\sigma - 1}{\sigma} \frac{1}{w_j d_{pjg}} \left(\frac{\sigma w_j F_{pjg}}{\theta_p A_g} \right)^{\frac{-1}{\sigma-1}} \right]^{k_j} w_j F_{pjg} \frac{\sigma k_j}{k_j - \sigma + 1}$$

So that:

$$V_{pjg} = \underbrace{\theta_p^{\frac{k_j}{\sigma-1}}}_{\text{Prod.}} \; \underbrace{w_j^{1-\frac{\sigma k_j}{\sigma-1}} \Phi_j}_{\text{Country}} \; \underbrace{A_g^{\frac{k_j}{\sigma-1}} d_{pjg}^{-k_j} F_{pjg}^{1-\frac{k_j}{\sigma-1}}}_{\text{Imp. Country}} \; \underbrace{(a_{pj}^m)^{-k_j} N_{pj}}_{\text{Comp. Adv.}} \tag{2}$$

In equation (2), we disaggregate total sector exports from country j to destination g into four categories: [1] product-specific variables, [2] exporting-country variables [3] importing-country variables, and [4] comparative advantage. Product-specific variables are represented by θ_p, which is the share spent on sector p and can represent demand for that sector; e.g., product-specific demand, insurance or transportation costs. exporting-country variables include wages, w_j, and other exporting-country variables $\left(\Phi_j = \left[\frac{\sigma k_j}{k_j - (\sigma - 1)} \right] \left[\sigma \left(\frac{1}{\sigma - 1} \right)^{\frac{\sigma-1}{\sigma}} \right]^{-\frac{k_j \sigma}{\sigma - 1}} \right)$; e.g., better in-country infrastructure. importing-country variables include income and prices (A_g) and trade

[4]We reintroduce the country subscripts for clarity, while continuing to exclude the sector subscripts.

costs to that destination for the exporting country – Fixed costs (F_{pjg}) and trade costs (d_{pjg}); we can think of these as destination/global trade costs (e.g., MFN tariffs/containerization). The last variable we denote as comparative advantage because these variables are exporter-product specific and help explain why given everything else equals, a country would export more or less of some products; in other words why a country has a relative advantage in some products.

In the empirics, we focus on total country exports, not bilateral exports. To match the model to the empirics, total exports of sector p from country j, ($V_{pj} = \sum_{g}^{M_{pj}} V_{jpg}$) will equal:

$$V_{pj} = \underbrace{\theta_p^{\frac{k_j}{\sigma-1}}}_{\text{Prod.}} \underbrace{w_j^{1-\frac{\sigma k_j}{\sigma-1}} \Phi_j}_{\text{Country}} \underbrace{\sum_{g=1}^{M_{pj}} \left(A_g^{\frac{k_j}{\sigma-1}} d_{pjg}^{-k_j} F_{pjg}^{1-\frac{k_j}{\sigma-1}} \right)}_{\text{Global Total}} \underbrace{(a_{pj}^m)^{-k_j} N_{pj}}_{\text{Comp. Adv.}}$$

So that:

$$V_{pj} = \underbrace{\theta_p^{\frac{k_j}{\sigma-1}}}_{\text{Product}} \underbrace{w_j^{1-\frac{\sigma k_j}{\sigma-1}} \Phi_j}_{\text{Country}} \underbrace{\mathbf{W}^{k_j}}_{\text{Global}} \underbrace{M_{pj}}_{\text{Dest.}} \underbrace{CA_{pj}}_{\text{Comp. Adv.}} \tag{3}$$

We define the total global shock element as the product of the number of destinations M_{pj} and an index that aggregates across destinations. The latter now represents global averages of shocks in country demand and trade costs (both fixed and variable); we refer to this as the global shock. The index that aggregates across destinations is as follows:

$$\mathbf{W} = M_{pj}^{-1/k} \left(\sum_{g=1}^{M_{pj}} A_g^{\frac{k}{\sigma-1}} d_{pjg}^{-k} F_{pjg}^{1-\frac{k}{\sigma-1}} \right)^{1/k}$$

Note that we also define $(a_{pj}^m)^{-k_j} N_{pj}$ as comparative advantage (CA_{pj}). Thus, we add one more growth driver when comparing to Equation (2): the number of destinations. Now, when we can disaggregate total sector exports from country j to the world into five categories: [1] product-specific variables, [2] exporting-country variables, [3] average importing-country variables (or global variables), [4] number of export destinations, and [5] comparative advantage, (as explained after Equation (2)).

Our simplifying assumptions, in aggregating exports to the country-product level, imply that having more export destinations will impact all countries in the same way, (unlike growth in the other margins, which depend on k_j). The limited approach helps to focus on how growth in destination counts affects exports, without adding more variables to Equation (3). Thus, (after taking logs), export growth for product p from j to the world $\left(\tilde{V}_{pj}\right)$ can be expressed as:

$$\widetilde{V}_{pj} = \underbrace{\frac{k_j}{\sigma - 1}\widetilde{\theta}_p}_{\text{Product}} + \underbrace{\left(1 - \frac{\sigma k_j}{\sigma - 1}\right)\widetilde{w}_j}_{\text{Country}} + \underbrace{k_j \widetilde{\mathbf{W}}}_{\text{Global}} + \underbrace{\widetilde{M}_{pj}}_{\text{Dest.}} + \underbrace{\widetilde{CA}_{pj}}_{\text{Comp. Adv.}} \tag{4}$$

This is the equation we will take to the data. The most important assumption is that k_j for lower-income countries (k_l) will be larger, compared to middle-income (k_m) or high-income countries (k_h): $k_h < k_m < k_l$ (as in, Mora and Olabisi, 2020). The k_j term represents distortions to both the shape and position of the Pareto distribution that describes firm sizes in different economies, capturing the fact that high-income countries tend to have a higher productivity floor, as well as a greater dispersion in the range for productivity (c.f., Mora and Olabisi, 2020; Di Giovanni and Levchenko, 2012). Countries drawing from a distribution with a low k parameter will have a lower percentage of low-productivity firms, such that k_j is effectively a proxy for how sensitive the mass of potential exporters of a product from country j is, to changes in the export markets. A few notable papers have tried to document the impacts of these differences between countries (e.g., Hsieh and Klenow, 2009; Hsieh and Olken, 2014). In the baseline empirical results, we control for the time-invariant element of comparative advantage using country-product fixed effects, this includes controlling for time-invariant growth trends. We take the residual as the time-varying component of comparative advantage. We are then free to focus on the other drivers: product, country, global trend, and number of destinations.

The model makes three key predictions for growth in exports at the country-product level: that low income countries should experience more growth from a proportional change on any of the margins (except destinations); that the growth in the number of destinations will play a critical role in explaining export growth; and that country-level drivers will dominate product and global growth drivers.

Proposition 1: A change in any of the three key drivers (product, county, and global) will lead to proportionally more export growth for low-income countries, relative to high- and middle-income countries.[5] That is:

[5]Trade costs, comparative advantage, the shape parameter, and distribution parameter as all assumed to be constant in the period analyzed by the data.

$$\frac{\delta V_{pj}}{\delta \eta} \propto k_j$$

where η is a proxy for any of the trade growth margins, θ_p (product shocks), w_j (country shocks) or $\mathbf{W}$ (global shocks). The proposition follows from prior statements that low-income countries have the highest k_j (that is, $k_h < k_m < k_l$). The effects of a positive country $\left(\frac{\delta(-V_{pj})}{\delta w_j} = \frac{\sigma k_j}{\sigma-1} - 1\right)$, product $\left(\frac{\delta V_{pj}}{\delta \theta_p} = \frac{k_j}{\sigma-1}\right)$, and global growth driver $\left(\frac{\delta V_{pj}}{\delta \mathbf{W}} = k_j\right)$ all increase with k_j. Developing countries are expected to be more sensitive to export markets, given their greater values for k_j, i.e., share of the mass of firms having productivity levels below the exporting threshold. The firm-size distribution relative to the export productivity threshold implies that an exogenous positive shock in global demand, or to costs and productivity at the country-level – which we term global, product, or country-level drivers, will stimulate more new exporters and higher export growth rates in countries with high k_j values, all else equal.

Proposition 2: Growth in the number of destinations, everything else being equal, will move in unison with growth in exports:

$$\frac{\delta V_{pj}}{\delta M_{pj}} \simeq 1$$

While the number of destinations reached by a country may depend on the level of economic development, the effect of a proportional increase in destinations will not depend on the level of economic development. According to Equation 4, with increasing numbers of export destinations for each product p, export values grow at approximately the same rate, (barring distortions from variables, including k_j, that affect the value of M_{pj}).

Proposition 3: For all countries, export growth will be more responsive to country-level drivers, compared to product-level drivers. That is:

$$\frac{\sigma(k_j - 1) + 1}{\sigma - 1} > \frac{k_j}{\sigma - 1}$$

In Equation (4), for a positive country-level shock term, $\tilde{w}_j < 0$. The coefficient for the term then equals $\frac{\sigma k_j}{\sigma-1} - 1$, which will be greater than the comparable product shock term $\frac{k_j}{\sigma-1}$, as long as the elasticity of substitution and the position parameter are greater than one ($\sigma > 1$ and $k_j > 1$). The country-level driver should have a greater impact on exports than the other drivers, given the same k_j. One policy implication of this prediction, is that developing economies looking for export growth are more likely to succeed with policies that broadly address export competitiveness and destination diversification, rather than a focus on selecting or promoting successful products.

III Data and Descriptives

From theory to empirics: We use proxies for the variables in Equation (4) to capture the drivers described in the previous section: [1] The global growth driver ($\widetilde{\mathbf{W}}$), is measured as growth in world exports in non-p products (minus those from country j): $\widetilde{V}_t^* = \widetilde{\mathbf{W}}_t$; [2] the product growth driver ($\widetilde{\theta}_p$) is measured as growth in world exports of product p (minus those from country j), $\widehat{V}_{pt}^*$, minus the global growth driver: $\widetilde{V}_{pt}^* = \widehat{V}_{pt}^* - \widetilde{V}_t^* = \theta_{pt}$, that is, we can only have a positive shock if exports of that product grow at a greater rate than that of overall world exports; [3] the country-level driver (w_j), is replaced with growth in total exports from country j (minus exports in product p), $\widehat{V}_{jt}^*$, minus the global growth driver: $\widetilde{V}_{jt}^* = \widehat{V}_{jt}^* - \widetilde{V}_t^* = -\widetilde{w}_{jt}$, here, as for products, we can only have a positive driver in a country if exports of that country grow at a greater rate faster than that of overall world exports; [4] comparative advantage, which we represent as the combination of constant trend changes (a term, Ω_{pj}, represents country-product fixed effects), and time-varying effects from the regression residual term. Trade costs, be they country-specific (e.g., infrastructure improvements), product-specific (e.g., MFN tariffs), or global (e.g., lower transportation costs), are captured by our proxies; with this method, the only trade costs we don't capture are those that are country-product specific. The only directly observable variable in our data is the growth in the exports destinations ($\widetilde{M}_{pjt}$).

With our proxies, we can express Equation 4 as follows:

$$\widetilde{V}_{pjt} = \underbrace{\frac{k_j}{\sigma - 1}\widetilde{V}_{pt}^*}_{\text{Product}} + \underbrace{\left(\frac{\sigma k_j}{\sigma - 1} - 1\right)\widetilde{V}_{jt}^*}_{\text{Country}} + \underbrace{k_j \widetilde{V}_t^*}_{\text{Global}} + \underbrace{\widetilde{M}_{pjt}}_{\text{Dest.}} + \underbrace{\Omega_{pj}}_{\text{Comp. Adv.}} \tag{5}$$

In the following section, we take Equation 5 and trade data from the BACI database to test the predictions of the model.

III.a Data

We use the BACI database for product-level international trade, developed by the *Centre d'études prospectives et d'informations internationales* (CEPII). The dataset is best described as the UN COMTRADE data at the 6-digit disaggregation level, harmonized to the 1992 HS schedule definitions, and with bilateral reporting differences in trade reconciled.[6] We have 21 years of data, 1995 to 2015. To match the data to the model, we collapse the export data to the country-product-year level.

We define country groups based on the World Bank categories for economic development: low-income, middle-income, or high-income. The original World Bank classification scheme had five categories, which we summarized to three: 1) 53 low-income countries, 2) 90 middle-income countries (includes lower-middle income and upper-middle income countries), and 3) 45 high-income countries (includes high-income OECD and high-income non-OECD countries). See Table A.1 for a complete list of the countries and income categories.

To compare broad sectors across countries, we concorded the more than 5,000 HS 6-digit product (HS-6) definitions to 10 SITC product sectors. This concordance allows us to group the HS-6 level data into sector sub-samples. The broad sector groups for analysis was motivated by the data. High-income countries are more likely to have the advantage in terms of industrial and manufactured goods, while low income countries tend to have comparative advantage in extractive industries and the agricultural sector, much like the evidence in a long-running body of literature (e.g., Balassa, 1979; Redding, 2002; Bernard et al., 2007).

We lose a few observations to our data-cleaning process. We drop HS products that do not convert to SITC Rev. 3 product categories. We also drop all observations for countries that do not report trade data consistently from year to year, e.g., Serbia and Montenegro, British Indian Territory. We keep the zeros for countries-product pairs, as long as the country reported trade in the given year. Additionally, because we organize countries by their level of economic development in the World Bank classification scheme, we drop countries not classified by the World Bank. The restrictions leave us with 183 countries – about 97% of our original observations, or data losses that we consider minor.

[6] For a description of the procedure developed to reconcile the data, see Gaulier and Zignago (2010).

III.b Descriptives

We identify margins of export growth that highlight the significant variation observed in the data at the product-level. Figure 1 shows that 2015 exports were higher than 1995 exports for most products, at the narrowly-defined HS6 level, but the growth ratio was higher than 10 for more than one hundred products (e.g., analog wristwatches, diesel-electric locomotives), while global exports declined for more than 500 products, with a few declining all the way to zero in 2015 (e.g., cassette tapes - HS 852421, and whole bovine skin leather - HS410410). This variation in the data for us, motivates an inquiry into how much of the observed historical growth in exports is explained by product-specific trends, or by the other margins of trade growth, after accounting for products.

[Figure 1 here.]

Our motivation to revisit the 'what drives export growth' question, and to develop a model with new margins of trade, rests largely on the data. Many of the products whose exports fell over time, like cassette tapes, dropped because of changing tastes and technology. Such changes do not affect all countries equally. Similarly, not all countries gained from the boom in computer exports, so it becomes important to explore how much of export growth is due to exporting the right products, compared to other potential drivers of export growth.

The second panel of Figure 1 highlights how export growth at the country-level also varies significantly. Fewer than ten countries increased exports by more than a factor of 50 between 1995 and 2015, but the most common increase was near the global average of 3.4. Exports declined for more than twenty countries. As posited earlier, the open question is, how much of the change can be attributed to the country, not just to product or aggregate trends. With the foregoing, do we expect that the rising tide of global trade lifts all countries? Or do we have some countries that do particularly well? Or are the changes limited to some sectors and products?

Sector Composition and Economic Development

The patterns in Figure 1 depend on economic development. The figure shows what share of the countries in each growth bin belongs to the low-income countries (LICs), middle-income countries (MICs) or high-income countries (HICs) categories. First, high-income countries' exports cover a broader range of products, as documented in related papers on export growth (e.g., Hummels and Klenow, 2005; Kehoe and Ruhl, 2013). Second, low income countries have more instances of product exports declining to zero, noted in the early literature as the extensive margin of trade (Besedeš and Prusa, 2011; Cadot et al., 2011). They also have more instances of exports increasing by a factor of 50 or more over two decades in the data, consistent with other papers that document the *big hits* in exports (Freund and Pierola, 2012; Cadot et al., 2014). Middle income countries seem to lie in the middle of the patterns for high-income and the lowest-income countries. As exports for middle-income countries grew faster than high-income countries, on average, by 2015, high income economies, even after 20 years of average positive trade growth, had less than 60% of the global export market.

We observe notable changes in the global export shares of country-groups, as well as changes in the sector composition of their exports. Table 1 shows the sector composition of export growth – both the importance of each sector for the country-groups, as well as changes to their shares of global exports between 1995 and 2015.

[Table 1 here.]

The sector composition of exports changed for low-income countries, challenging the low-income commodity-exporter narrative. For the group, the sector with the highest growth was sector 7 (Machinery and transport equipment), increasing by 13.7 percentage points from 4.4% of exports from the group in 1995. By comparison, sector 8 increased by 5.3 percentage points, to remain the largest export sector by value. Sector 0 (Food and live animals) and sector 6 (Manufactured goods) saw significant decreases in the share of low income countries' exports, -7.5 and -9.5 percentage points respectively. Low-income countries also improved their global export market share by almost 3 percentage points, more than doubling from their 2% share of global exports in 1995. The sector-level summaries reveal a pattern of broadly positive, if uneven growth. The countries improved market share in all sectors, ranging from increases of 1.2 percentage points for Sector 4 (Oils, fats and waxes) to 5.8 percentage points for Sector 8 (Miscellaneous manufactured articles).

Middle-income countries improved even more than low-income countries – increasing their global export market share by an impressive 18 percentage points, almost doubling their 1996 share of 19.4%. In the sector-level detail data, we see broad growth and increasing shares of global exports across the full range of sectors, ranging from 2.2 for items not classified, to 27.9 percentage points for Sector 7 (Machinery and transport equipment). While the data clearly shows significant changes in the sector composition of exports for middle-income countries, the changes appear to differ from those of low-income countries. The sector with the greatest increase in export market share for middle-income countries is also the sector with the greatest global export growth in the period; sector 7, which increased from 23% to 39% of MICs' exports. Sector 0 (Food and live animals) and sector 6 (Manufactured goods) saw significant decreases in export share, -4 and -4.6 percentage points respectively.

For HICs, the sector composition of exports varied little. The most notable changes include the smaller share of exports from Sectors 6, 7, and 8, falling 3.9, 6.3, and 1.1 percentage points respectively. The sector with the most increase in high-income country export shares is Sector 3 (5.1 percentage points), followed closely by Sector 5 (Chemicals and related products). Furthermore, high-income countries (HICs) lost a non-trivial share of global exports (20.7 percentage points) in the 1995–2015 period. The HICs lost export market share in all sectors, with the largest decrease (30 percentage points) in sector 7 and the smallest decline (5.7 percentage points) in sector 3 (Mineral fuels, lubricants and related materials).

In sum, Table 1 shows how trade changed over time, as well as how the changes could have occurred. Country-level drivers common to many developing countries could have increased exports across all sectors, and it could be that the developing countries that added sector 7 to their export portfolios enjoyed more growth as the world demanded more machinery and transport equipment.

Export Growth and Economic Development

Figure 2 gives a preview of our main empirical findings. In the figure, we compare the observed export growth between 1995 and 2015 with the product-level drivers, country-level drivers, and changes to the number of destinations. Specifically, we can observe how the effects of these largely positive shocks vary with the level of economic development of a country. For the first panel of the figure, the horizontal axis shows global product-level growth in a country's export portfolio (i.e., the average product-level growth); this variable is averaged across countries, in the same group for economic development. The vertical axis shows export growth – the log ratio of aggregate export values for the country (2015 *vs.* 1995). Each observation in the plot is a product. Each plot is de-meaned by country group. The vertical axis remains the same in the second and third panel of the figure, but the horizontal axis matches the product export growth with its average country-level driver and growth in destinations.

[Figure 2 here.]

The figures show economically significant differences across country groups. This is not obvious in the first panel, where the export growth associated with product-level drivers abroad have similar slopes for the three levels of economic development, with a slightly higher slope for low income countries, followed by high income countries. In the second panel, we see a notable difference between middle income countries and others in response to country-level drivers. The country-product averages suggest that changes at the country level that have the potential to benefit all export products, may have a greater effect in some developing countries, than in high-income countries. Lastly, we see that selling a product in more destinations, as predicted by the model, comes with export growth, in the same product, on a roughly one-to-one ratio. The graph implies that the export growth associated destination count growth is not dependent on the level of economic development. The similar slopes in the graph does not mean that this margin contributes equally across country groups, as we will explore later. Developing countries have expanded the number of their export destinations more than high income countries.

In the empirics, we test the relationship between export growth at the country-product level and each of the listed growth drivers.

IV Empirics

We begin with an empirical model derived from Equations (4) and (5), in log form, to explain export growth for product p from country j at time t:

$$\widetilde{V}_{pjt} = \beta_0 + \beta_1 \widetilde{V}^*_{pt} + \beta_2 \ \widetilde{V}^*_{jt} + \beta_3 \widetilde{V}^*_t + \beta_4 \widetilde{M}_{pjt} + \Omega_{pj} + \epsilon_{pjt} \tag{6}$$

Where, β_1 is the estimated effect of an external product driver $\left(\widetilde{V}^*_{pt}\right)$, β_2 is the estimated effect of a change in the exporting country's export competitiveness $\left(\widetilde{V}^*_{jt}\right)$, β_3 is the estimated effect of a global growth driver $\left(\widetilde{V}^*_t\right)$, and β_4 is the estimated effect of growing the number of destinations $\left(\widetilde{M}^*_{pjt}\right)$. Ω_{pj} captures country-product fixed effects and is our proxy for the time-invariant comparative advantage components. ϵ_{pjt} is the error term, which effectively captures the elements of comparative advantage that change from year to year (outside of constant trend changes).[7] As described in the previous section, we define the growth drivers, or dimensions, for country j exporting product p as: $\widetilde{V}_t^* = \frac{2*\sum_{i\neq j}\sum_{q\neq p}(V_{qit}-V_{qit-1})}{\sum_{i\neq j}\sum_{q\neq p}(V_{qit}+V_{qit-1})}$, $\widetilde{V}_{pt}^* = \frac{2*\sum_{i\neq j}(V_{pit}-V_{pit-1})}{\sum_{i\neq j}(V_{pit}+V_{pit-1})} - \widetilde{V}_t^*$, and $\widetilde{V}_{jt}^* = \frac{2*\sum_{q\neq p}(V_{qjt}-V_{qjt-1})}{\sum_{q\neq p}(V_{qjt}+V_{qjt-1})} - \widetilde{V}_t^*$.[8]

All four β terms are expected to be positive, as well as the comparative advantage measure that includes the residual and Ω_{pj}. We test for differences between developed and developing countries, by using interactions with country-group dummy variables for all growth variables.[9] Equation 6 is similar to the revealed comparative advantage (RCA) equation, with variables similarly defined, except that we exclude country j exports and add destination growth (c.f., Balassa, 1979).

The model, as stated earlier, predicts the following: [1] the same drivers will affect countries differently, depending on their level of economic development: $\beta_i^{LIC} > \beta_i^{HIC}$, $\forall i = 1, 2, 3$ (Proposition 1); [2] β_4, the effect of increasing the number of destinations, is not dependent on the level of economic development and should be equal to one: $\beta_4^{LIC} > \beta_4^{HIC}$ (Proposition 2); and [3] country-level drivers matter more than product-level drivers for all countries; $\beta_2 > \beta_1, \beta_3$ (Proposition 3). This distinction is important as it implies that institutional differences effect how exports grow in the countries, and also to what extent they benefit from globalization.

IV.a Baseline Results: Annual Export Growth

Table 2 provides the baseline estimates for Equation 6. Column 1 shows that export growth (for country-product combinations) increases with global product-level drivers in the same year after controlling for country product fixed effects. We see that a 1 percent increase in aggregate product demand results in an estimated 0.36 percent increase in exports of the same product. Changing the specification to include country-level drivers (column 2) lowers the correlation between product-level drivers and export growth slightly, while adding country and global growth drivers raises the estimated correlation between export growth and product-level drivers.

[7]We don't include year fixed-effects in Equation (6) as the global growth driver mostly captures the year effects; unsurprisingly, there is little variation, within a year, for the global growth driver across countries. Including year fixed effects has minimal impact on the estimated effect of the product and country-level drivers.

[8]We remove country j exports to avoid having the same export values in multiple variables and to avoid bias from having the same trade flow on both the right and left hand sides of the equation.

[9]While the theory states that the effect of adding destinations is the same for all country types, we include the interactions term to test this hypothesis.

Positive country-level drivers predict higher HS 6-digit product exports (see column 3); while exports have a stronger link to the country-level driver variable (0.6), than to product-level drivers (0.4). The global growth drivers variable, as expected, also has a positive effect. As we assign the residual in the empirical model to the comparative advantage term, the CA contribution is the residual that is not explained by the variables in the empirical model.

[Table 2 to go here.]

Specifications that extend Equation 6 to include interaction terms with the country groups, reveal interesting differences between high-income and developing countries. The variables (product, country, and global) are interacted with dummies for high-income countries and low-income countries, leaving middle-income countries as the omitted baseline (see column 4). The dummy variables highlight notable differences between countries at different stages of economic development, some of which is explained by the growth in the number of export destinations, as shown in column 5 of the table. First, the estimated effects of product-level drivers and country-level drivers diminish once we account for export destination growth, with middle-income countries having estimates of 0.11 for product-level drivers and 0.12 for country-level drivers. Product-level drivers for low-income and high-income countries are estimated to be 0.03 percent lower and 0.04 percent higher, respectively.

Country-level drivers, on the other hand, have a stronger link to exports for middle-income countries, more than high-income and even more than low-income countries. While the former fits the model's prediction, the latter suggests that structural barriers not included in our model assumptions diminish export growth in low income countries. As outlined in Mora and Olabisi (2020), having fewer firms and at the same time, a greater share of firms below the Melitz-style productivity threshold for exports, means that low-income countries should be more responsive to drivers of export growth. In principle, a larger share of resident firms make the transition into exports with such positive shocks, as implied by the k_j term in Equation (4). So, a country-level driver like trade reforms that increase exports across all products, should be more of a stimulus for export growth in a low-income country like Bangladesh, relative to a high-income country like Belgium.

Global growth drivers show larger estimated effects on exports than either product or country-level drivers, with the effect being lower for low-income and higher for high-income economies. The higher estimated effects for global and product-level drivers may imply that firms in high-income countries are not as constrained as in developing countries, and can take advantage of sudden changes in demand than the theory predicts – both for product-level drivers and global growth drivers. That said, our interpretation of this estimate comes with the caveat that it may be biased – the skewed nature of trade, where 20% of countries account for more than 70% of exports, mean that our measure of global growth drivers are not uniform across countries.[10]

Growth in the number of destinations decreases the effect of the product, country and global growth drivers (in column 5). It also increases the model's ability to explain the variation in export growth (R^2 jumps to .72). This implies that some of the gains from product-level drivers and country-level drivers translate to growth in the number of destinations for country-product combinations. Once we account for growth in the number of markets served by exporters of a product from a given country, the effects of the global growth driver overtakes those of product- and country-level drivers. Even if the sizes of the estimated coefficients decrease, the signs and statistical significance of the difference-in-difference estimates remain largely consistent.

Lastly, we test whether interacting the destinations variable with country type shows any difference across country groups (in column 6). Contrary to the model's prediction, there is a difference across groups: low-income countries benefit more, and high-income countries benefit less, relative to middle-income countries. The difference may be due to the fact that developing countries enter larger destinations, on average, relative to high-income countries, while adding new products at the same time they enter new markets. The difference is statistically significant, but the deviation is small (.014 for low-income countries and -.017 for high-income countries) relative to the estimates for middle-income countries (.977). These estimates are fairly close to the predicted value of 1.

[Table 3 to go here.]

The estimated effects of growth drivers are broadly similar across SITC sectors

[10] The deviation from the model's predictions for the estimated effects of product and global growth drivers may imply that the same constraints that shape the firm-size distributions and lead to larger k_j's in developing economies, may work outside the firm size distribution to prevent export growth. For product-level drivers, the observed estimates may simply be a reflection of portfolio size. The average numbers of HS6 products in 2015 export portfolios was roughly 1,100, 2,100 and 3,100 for LICS, MICS and HICs respectively. Having more items in the export portfolio means greater exposure to product-level drivers. It may also be that most export surges related to changing tastes consolidate the market shares of the incumbent market leaders, who are more likely to be in high-income countries.

in Table 3, especially when focusing on the manufacturing sectors (Sector 6 – 8). While the difference-in-difference effects for the product and world growth drivers are similar for the agricultural and resource sectors (Sectors 0 – 3), the estimates are not statistically significant. This similarity to the baseline results is unsurprising, in part because the regressions in Table 3 control for time-invariant comparative advantage level and constant growth rates through the use of product-country fixed effects.

The drivers yield positive and statistically significant effects on growth across most sectors in Table 3 for middle income countries. Country-level drivers for these countries are larger in magnitude than product-level drivers for half of the 10 sectors, (the exceptions are Sectors 0, 2, 4, 5, 9). The estimated effect of product-level drivers on Sector 1 (Beverages and Tobacco), and of country-level drivers on Sector 9, are positive but not statistically significant. Global secular growth appears to drive export growth more than either a similar product or country-level drivers, across the sectors, as in the last column of Table 2. As discussed for column 6 of Table 2, product-level drivers and global growth drivers have a higher impact for high-income countries, than for the developing economies. Finally, destination growth explains most of the variation in export growth for all sectors, just as it provides the largest predicted response. The response, as in are baseline results, are greatest for low-income countries and lowest for high-income countries; this effect is fairly consistent across sectors.

We follow related papers and re-estimate the main findings using a Poisson pseudo maximum likelihood (PPML) specification (c.f., Silva and Tenreyro, 2006; Yotov, 2012; Arvis and Shepherd, 2013); see Table 4. The PPML estimates use more observations (14.5m in all vs 0.9m in Table 3), as instances of zero-trade can be included as useful parts of the data, because the depended variable is included in levels. This new approach is also robust to various forms of heteroscedasticity, compared with OLS models.

[Table 4 to go here.]

The results in Table 4 do not differ much from column 6 of Table 2. The two tables show positive coefficients for product shocks, with more positive shows for high-income countries, just as they show positive estimates for country shocks, and number of destinations. The key differences between the two tables are: 1) global shocks are negative in the PPML estimate, while they are positive in the main specification, and 2) the country shocks signs are reversed for high-income countries across the two specifications. The product shock coefficient for low-income countries is not statistically significant in column 1 of Table 4, but it is negative in Table 2, while the product shock coefficients for high-income countries are positive and statistically significant for both tables. The differences are mostly reasonable – the negative country shocks in the PPML specification fits the fact that much of export growth is on the intensive margin, and that growth for high-income countries may even come from having more zeros in trade (through specialization) – the zeros are captured in the PPML specification, but not in Table 2 (c.f., Cadot et al., 2011). The negative global shocks coefficient follows an extension of the same argument about the impact of including zeros. The nuanced implication for our findings is that the stated drivers increase exports, but not always on all margins of trade, as countries begin to narrow their scope of products and destinations when incomes increase.

Predicted contributions to export growth: Table 5 shows the predicted share of export growth from each of the margins in our model. The estimates are derived from a version of Table 3 that is specific to country groups, where the coefficients are multiplied by the observed proxy for each of the margins to generate the expected contribution to growth. At this point, we also estimate the contribution of comparative advantage, i.e., the observed export growth minus the contributions of the product, country, world, and destination drivers. To aggregate the contribution for each of the drivers to the country-group level, we calculate the trade-weighted-average, across time and countries, of the various margins. Finally, to calculate the shares reported in the table, we take the trade-weighted average contributions and divide them by the observed trade-weighted average export growth for the country group and sector. Each row in the table represents one set of linear regression estimates, equivalent to a column in Table 3 for the subset of countries in each country group. The sector and country-level aggregates are reported separately for each of the country groups by level of economic development.

[Table 5 to go here.]

Table 5 follows expectations, as it translates the estimated regression coefficients, using what we know about trade growth. Product-level drivers contributed the least to export growth in developing economies. For high-income economies, product-level drivers contributed more than than country-level drivers, but still represented less than 2.5% of all growth, with notable variation between sectors. The findings are consistent with the top panel of Figure 1, which shows exports for most products grew between 1995 and 2015, but only about half grew faster than the 3.4 ratio that was the global average for the period. Combining the coefficients for product-level drivers (which were the smallest of all the margins), with the small product-level drivers described in the Figure, gives the expected low contribution of product-level drivers to aggregate growth. In the low-income countries (LICs), the contribution of product-level drivers ranged from -0.3% for the Beverages and Tobacco sector, as commodities like coffee and cocoa saw increased price competition, to 1.8% for the crude materials sector, where other commodities saw booms in demand from countries like China.

The higher coefficients for country-level drivers (relative to product-level drivers, even if less than destination growth or global growth drivers), with the observed country-level drivers gives the expected result that country-level drivers contributed more than product-level drivers to export growth in developing economies in Table 5. Evidence for higher observed country-level drivers is in the second panel of Figure 1, which shows that exports for most countries grew between 1995 and 2015, with about 60% of countries growing faster than the 3.4 ratio that was the secular global average for the period.

Destination growth and global growth drivers contributed more than country or product-level drivers to export growth across all country groups in Table 5. The findings suggest that efforts focused on 'what you export' or national competitiveness have limited effects on prompting above-average export growth, outside of complementary efforts to sustain growth in the number of destinations. Secular growth over time accounted for nearly 5% of growth in low-income economies – in a pattern that varied across sectors, from a low of 0.9% for except for Sector 7 (Machinery and transport equipment) to a high of 16.1% for Sector 3 (Mineral fuels and related materials). The impact of global growth drivers differ for other country groups, accounting for 14.2% and 33.4% of growth for MICs and HICs, respectively, but with the highest impact for HICs is in Sector 6 (Manufactured goods). The implication is that export growth in a time of global trade recession is unlikely for any country or sector, especially if the country is a high-income country.

A notable share of export growth cannot be explained by the margins we proposed – product-level drivers, country-level drivers, global growth drivers, and destination growth. The comparative advantage term in our framework (captured by the residual combined with the country-product fixed effects), explains the greatest share of export growth in the data. About two-thirds of export growth in low-income, 60% of that in middle-income, and 50% of that in high-income economies all come from factors specific to country-product combinations. The contributions of comparative advantage vary across sectors within the country-groups. Comparative advantage, which may relate to ability of Cote d'Ivoire to produce cocoa for example, accounted for 80% of export growth in sector 1 (Beverages and tobacco) for LICs, while the comparable number for MICs and HICs was less than 60%. The contribution of comparative advantage was highest for animal fats and chemicals sectors (4 and 5) in MICs , while it was highest in HICs for sectors 2 and 5 (Crude materials, and Chemicals). We ignored Sector 9 - Goods not classified elsewhere, in making the comparisons. The finding that comparative advantage contributes the most to export growth is notable, but not surprising.

Discussion: The results in Tables 2, 3, and 5 suggest that successful export growth strategies cannot rely on finding products that are big hits. The leading contributors to export growth in developing economies are efforts to find new destinations, as well as country-product-specific factors that drive comparative advantage, much like the firm-level productivity gains described in much of the empirical trade literature. For high income countries, the mix is different: the leading contributors to export growth are the secular global growth trend, and comparative advantage. Higher destination numbers contribute to export growth for high-income countries, but not at the same level as for developing countries. The reason for this is not hard to deduce, high-income countries served more destinations *ab initio*, with the average number of destinations reached with each product in 1995 at 4, 6 and 22 respectively for LICs, MICs and HICs. Doubling the number of destinations from a finite set is easier from a smaller base, like the LICs had in 1995.

Our results broadly imply that export success is more closely linked to factors that drive national export competitiveness across all products, at least compared to chasing positive product-level drivers. That said, country-specific drivers are not the biggest observed contributor to export growth in the past two decades. The results suggest that the dominance of country-level drivers over product-level drivers is clearest for the countries and sectors that experienced the greatest growth in the last two decades.

The contribution of global growth drivers in Table 5 implies one difference in growth strategies for LICs, compared with HICs: global export downturns are less of a barrier (and, also, less of a benefit) to growth for low-income countries than their wealthier counterparts. This idea is consistent with other papers that suggest trade in low income countries does not significantly respond to world income (e.g., Freund, 2009; Kose and Prasad, 2011). The sectoral regressions also show that exports for some sectors (e.g., manufactured goods) are more sensitive to global growth than others (e.g., miscellaneous manufactured articles). Similarly, the contributions of comparative advantage in the table implies that across country groups and sectors, policies that create local advantage consistently support export growth.

IV.b Robustness Checks

Our findings remain largely robust to several definitions of export growth rates (see Table 6). The first set of results repeats the findings in Table 2, with midpoint growth rates; "Midpoint 2" used the same growth rate measurement, but does not exclude own country/product/country-product exports from the variables, an approach that is easier to derive but is expected to be less precise. Export growth in the column labeled "Avg" uses a simple growth rate calculation $(V_t - V_{t-1})/V_{t-1}$; while the "$\Delta Arsinh$" calculates growth using inverse hyperbolic sine, which allows us to double the number of observations by including country-product-year triads with missing/zero values. Finally, the "Δlog" column calculates growth rates using the difference in logged values.

[Table 6 to go here]

The simple growth rate and hyper-sine specifications lead to large (and potentially frivolous) values for growth rates, in many cases – especially when trade increases from, or drops to very small values (absolute growth rates of more than 1000% are not impossible with this approach). The observations with zero trade also get dropped in the simple growth rate specification. With these two specifications, the estimated effects decrease and the difference-in-difference effect for the global growth driver switches sign for high-income countries. That said, the estimated coefficients of destination count growth are positive, statistically significant and close to 1, for all three specifications linked to log growth. The estimated coefficients are statistically significant for three, and positive for four of the five specifications, while the country-level drivers are positive and statistically significant for four of the five specifications. As predicted, country-level driver estimates are greater than product-level driver estimates in all but one specification.

In continuing the robustness checks, Table 7 uses long-run growth from 1995 to 2015 as the dependent variable. This reduces the number of observations in the regressions to the less than half-a-million unique non-zero country-product combinations in the data. (The observations increase to almost a million when zero-trade linkages are included, as in columns 4 and 5). The column definitions are identical to Table 6, with an additional column for log differences with one added in levels, to include country-product dyads with zero exports in either 1995 or 2015.

[Table 7 to go here]

Growth in destination numbers yields positive and statistically significant estimated effects in all columns of Table 7, as in the main results, with values close to 1 for the midpoint growth specification. As expected, given the longer time range and larger growth scale, the estimated effects are higher in the other specifications. All columns in Table 7 show positive predicted coefficients for product-level drivers, with country-group interactions in the first column consistent with previous tables. The country-level driver estimates are also robust to multiple specifications, when considering long-run growth over two decades. The exception is the average growth column, which suffers from inherent measurement bias. Global growth drivers in Table 7 look different from previous tables, but this is understandably because only between-comparisons are available for the country-product dyads. The specifications (in the last two columns) that include trade zeros show large and positive coefficients, as expected, because increasing global trade leads to more new exporters.

V Conclusion

The last two decades witnessed a remarkable increase in global trade, with developing countries increasing their share of global goods exports. The pattern of increasing trade was not uniform, and for developing economies the differences raise the broad question of how lessons from past export growth episodes can shape future growth strategies. Understanding the drivers of export growth matters, because knowing how exports and income levels increased in economies like China and Colombia can be useful for economies where export growth is needed to stimulate economic growth.

In this paper we take a new approach to defining how country-level exports grow. We use this approach to assess export growth and how each of the following reasons contribute: [a] a country exports during good economic times, when demand and exports are growing for all products (global growth drivers); [b] a country increases exports of a specific product in its export portfolio when technology or tastes drive up demand for the product, even when other products are not growing (product drivers);

[c] a country improves comparative advantage for a product, so that its export growth for the product is higher than average (comparative advantage drivers), [d] a country adopts policies designed to increase exports across the broad spectrum of products in its portfolio, e.g., trade facilitation and reduction (country-level drivers), or [e] a country expands its existing export portfolio to new markets. Exports growing primarily because of factors internal to a country means that policymakers can make a difference by committing to initiatives that increase the exports of all products from the country (c.f., Freund and Pierola, 2015), or making investments that increase their comparative advantage on a product-by-product basis.

We develop a heterogeneous-firm theoretical model that guides our thinking about the link between the aforementioned margins and exports at the country-product level. The model also explains how the links are affected by a country's stage of economic development. We estimate the correlation between the trade margins and export values (as well as growth), using BACI data. We find positive associations between exports and some of the trade drivers.

Discussion: Using the theory to guide our empirics, we test how growth drivers or shocks (product, country, and global) and the addition of export destinations are associated with own country exports after controlling for trend changes in comparative advantage, and whether or not this association depends on the level of economic development. As mentioned earlier, differences in the link between the growth margins and the level of economic development will have important policy implications. For example, how should developing countries spend limited government resources in attempts to improve exports? Countries could focus on improving external market access, facilitating exports for preferred products, or enhancing the country's advantage for a narrow set of products/sectors. Alternatively, countries could be more broadly focused on policies that benefit all exports – infrastructure improvements, easier business licensing standards, and fewer export licensing restrictions. Lastly, it may be that export growth depends on the global environment, and the role of government in promoting exports is minimal.

We find that countries at different stages of economic development generally have different drivers of export growth. Relative to middle-income countries, product and global growth drivers are more important in driving exports for high-income countries, and less so for low-income countries. At the same time, country-level drivers are more important for middle income countries' exports, and less so for high-income and low-income countries. Finally, the number export destinations is an important driver of export growth (particularly for developing countries). For better or worse, for developing countries, country-level factors explain export growth better than product-level factors in our analysis. One could read the result to imply that paths to export growth for developing countries are more likely to go through processes that support exports broadly, rather than efforts to catch waves of export booms for specific products. Notably, we find a strong connection between growth and the number of export destinations, which makes the case for efforts to improve market access abroad, and resonates with prior work that links growth to export diversification (Eicher and Kuenzel, 2016).

Our findings also point to differences in the export growth patterns of developing countries (relative to high-income countries). Low income countries do not benefit as much from exogenous positive demand shocks relative to their high-income peers (product or global). Our model suggests that institutional differences and barriers shape firm-level growth and firm-size distributions, and thus limit the responsiveness of developing countries to export opportunities. Therefore, we expect more substantial export growth in developing economies (compared to high-income countries), from policy actions that reduce growth constraints on firms. We expect in future papers to clarify how these findings could be tied to policy.

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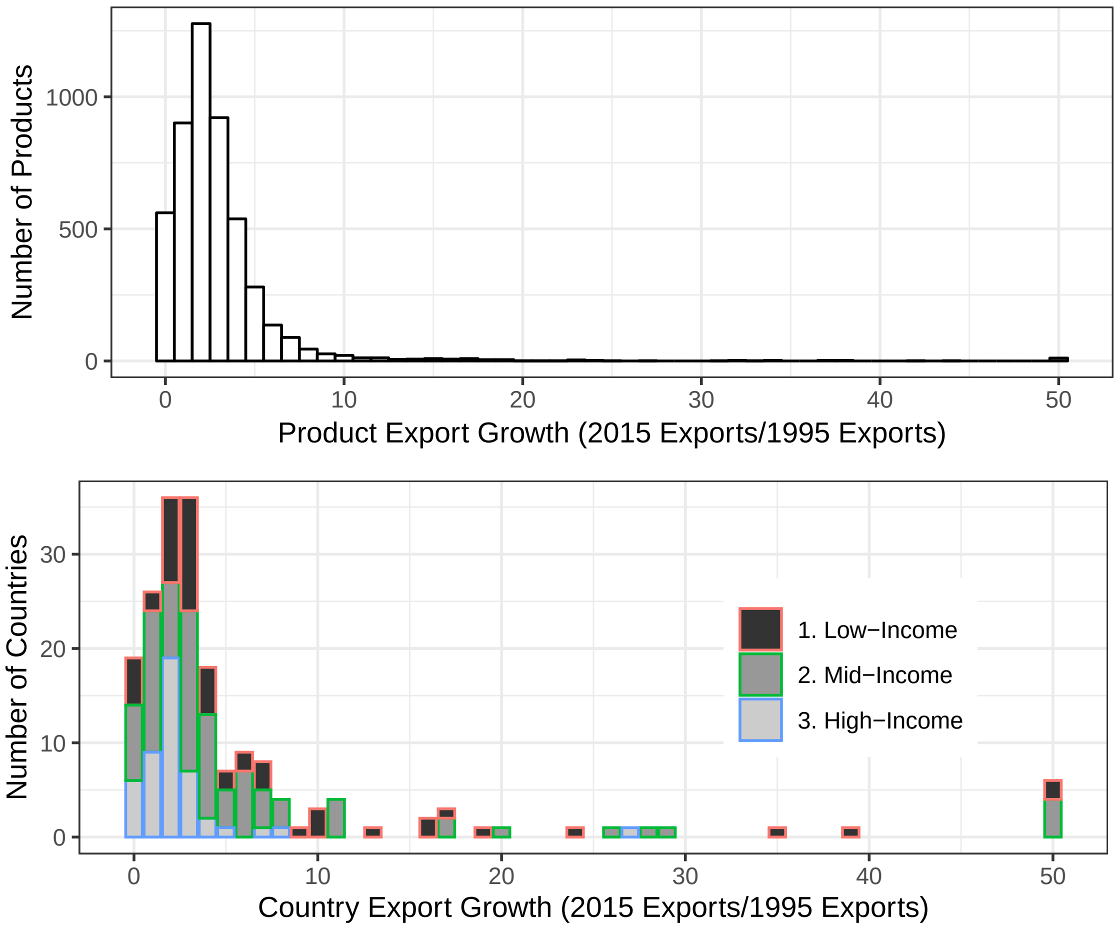
Appendix A

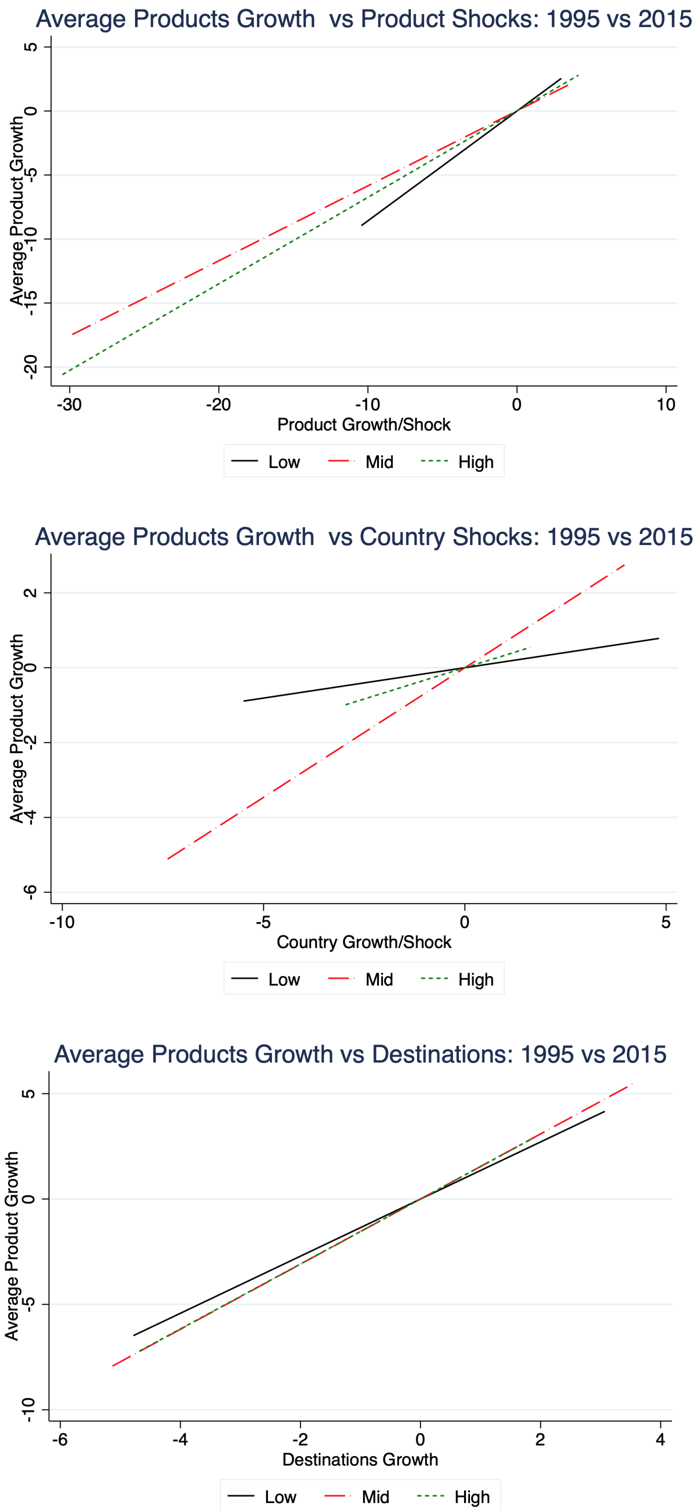
Figures

Figure 1: Export Growth Distribution for HS6 Products and Countries



Note that export growth ratio on the x-axis was top-coded at 50.
Data Source: BACI UN Trade Data

Figure 2: Export Growth From 1995-2015 Countries



The vertical axis shows the ratio of exports per product for each country – 2015 *vs.* 1995. The plot is a fitted line over observations at the product (HS-6-digit) level. The plot shows logs of the growth values, demeaned by level of economic development. The horizontal axis shows global product-level growth, average country-level growth and destination number growth respectively [TO DO explain, may be with formulas].

Data Source: BACI UN Trade Data.

Tables

Table 1: Economic Development and SITC Sectors: 1995 vs. 2015

	Share of Country Total			Share of World Total		
Sector	1995	2015	Diff	1995	2015	Diff
Low-Income Country						
0 Food and live animals	18.4	11.1	-7.3	5.0	8.1	3.1
1 Beverages and tobacco	1.1	0.7	-0.5	2.0	3.7	1.7
2 Crude materials, inedible, except fuels	10.9	5.5	-5.4	4.7	6.6	1.9
3 Mineral fuels, lubricants and related materials	15.6	14.5	-1.1	4.2	6.0	1.9
4 Animal and vegetable oils, fats and waxes	0.8	0.5	-0.3	2.7	3.8	1.2
5 Chemicals and related products, n.e.s	4.3	7.0	2.7	0.8	2.7	1.9
6 Manufactured goods	26.9	17.5	-9.5	3.2	6.4	3.2
7 Machinery and transport equipment	4.4	18.1	13.7	0.2	2.3	2.1
8 Miscellaneous manufactured articles	16.7	22.1	5.3	2.6	8.4	5.8
9 Goods not classified elsewhere	0.8	3.3	2.4	2.5	7.5	5.1
Country Total	100	100	0	2.0	4.7	2.8
Middle-Income Country						
0 Food and live animals	10.52	6.6	-4.0	28.1	37.6	9.6
1 Beverages and tobacco	0.8	0.6	-0.2	14.5	27.3	12.7
2 Crude materials, inedible, except fuels	6.8	4.1	-2.7	29.0	39.3	10.3
3 Mineral fuels, lubricants and related materials	13.6	12.1	-1.5	35.9	39.7	3.8
4 Animal and vegetable oils, fats and waxes	1.4	0.9	-0.4	47.3	63.0	15.7
5 Chemicals and related products, n.e.s	5.8	6.3	0.5	10.8	19.3	8.5
6 Manufactured goods	18.4	13.9	-4.6	21.7	40.3	18.6
7 Machinery and transport equipment	23.1	39.3	16.2	11.5	39.4	27.9
8 Miscellaneous manufactured articles	18.9	15.1	-3.8	28.8	45.1	16.3
9 Goods not classified elsewhere	0.6	1.1	0.5	17.3	19.5	2.2
Country Total	100	100	0	19.4	37.3	18.0
High-Income Country						
0 Food and live animals	6.2	6.1	-0.1	66.9	54.3	-12.6
1 Beverages and tobacco	1.2	1.0	-0.1	83.5	69.1	-14.4
2 Crude materials, inedible, except fuels	3.9	3.6	-0.2	66.3	54.1	-12.3
3 Mineral fuels, lubricants and related materials	5.6	10.7	5.1	60.0	54.3	-5.7
4 Animal and vegetable oils, fats and waxes	0.4	0.3	0.0	50.0	33.2	-16.9
5 Chemicals and related products, n.e.s	11.6	16.3	4.7	88.4	78.0	-10.4
6 Manufactured goods	15.7	11.8	-3.9	75.1	53.3	-21.8
7 Machinery and transport equipment	43.7	37.4	-6.3	88.3	58.3	-30.0
8 Miscellaneous manufactured articles	11.1	10.0	-1.1	68.6	46.5	-22.1
9 Goods not classified elsewhere	0.7	2.6	1.9	80.2	73.0	-7.2
Country Total	100	100	0	78.6	57.9	-20.7

Note: Author's own calculations.

Table 2: Product, Country, and Global Shocks Explain Export Growth

Dep. ⇒ Exp Growth	(1)	(2)	(3)	(4)	(5)	(6)
Product Shock($\widetilde{V}_{pt}$)	0.359***	0.357***	0.412***	0.386***	0.114***	0.114***
	(0.003)	(0.003)	(0.003)	(0.004)	(0.002)	(0.002)
Product Shock($\widetilde{V}_{pt}$)*Low				-0.018**	-0.030***	-0.034***
				(0.009)	(0.004)	(0.004)
Product Shock($\widetilde{V}_{pt}$)*High				0.067***	0.038***	0.043***
				(0.005)	(0.003)	(0.003)
Country Shock($\widetilde{V}_{jt}$)		0.598***	0.600***	0.730***	0.121***	0.122***
		(0.003)	(0.003)	(0.004)	(0.002)	(0.002)
Country Shock($\widetilde{V}_{jt}$)*Low				-0.205***	-0.073***	-0.080***
				(0.008)	(0.003)	(0.003)
Country Shock($\widetilde{V}_{jt}$)*High				-0.294***	-0.013***	-0.008**
				(0.008)	(0.003)	(0.003)
Global Shock($\widetilde{V}_{t}$)			0.643***	0.655***	0.396***	0.396***
			(0.004)	(0.005)	(0.003)	(0.003)
Global Shock($\widetilde{V}_{t}$) *Low				-0.118***	-0.181***	-0.185***
				(0.013)	(0.006)	(0.006)
Global Shock($\widetilde{V}_{t}$) *High				0.010	0.095***	0.098***
				(0.007)	(0.004)	(0.004)
Destinations($\widetilde{M}_{pjt}$)					0.978***	0.977***
					(0.000)	(0.000)
Dest($\widetilde{M}_{pjt}$)*Low						0.014***
						(0.000)
Dest($\widetilde{M}_{pjt}$)*High						-0.017***
						(0.000)
Country-Product FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	8,982,409	8,982,409	8,982,409	8,982,409	8,982,409	8,982,409
Clusters	692,941	692,941	692,941	692,941	692,941	692,941
R^2	0.00	0.01	0.02	0.02	0.72	0.72

Table 3: Product, Country, and World Shocks Explain Export Growth: SITC Sectors

Dep. ⇒ Exp Growth	Sect 0	Sect 1	Sect 2	Sect 3	Sect 4	Sect 5	Sect 6	Sect 7	Sect 8	Sect 9
Product Shock($\widetilde{V}_{pt}$)	0.141***	0.043	0.149***	0.081***	0.144***	0.125***	0.116***	0.096***	0.075***	0.059*
	(0.006)	(0.034)	(0.006)	(0.016)	(0.015)	(0.005)	(0.003)	(0.004)	(0.004)	(0.032)
Product Shock($\widetilde{V}_{pt}$) *Low	-0.053***	0.020	-0.003	-0.025	-0.052	-0.038***	-0.038***	-0.045***	-0.014	-0.059
	(0.012)	(0.064)	(0.012)	(0.029)	(0.033)	(0.012)	(0.007)	(0.008)	(0.009)	(0.054)
Product Shock($\widetilde{V}_{pt}$) *High	0.021**	0.132**	0.012	0.043*	0.064***	0.019**	0.049***	0.072***	0.039***	0.020
	(0.009)	(0.051)	(0.009)	(0.025)	(0.022)	(0.007)	(0.005)	(0.007)	(0.006)	(0.049)
Country Shock($\widetilde{V}_{jt}$)	0.104***	0.129***	0.044***	0.109***	0.097***	0.110***	0.130***	0.143***	0.121***	0.059
	(0.006)	(0.020)	(0.008)	(0.023)	(0.021)	(0.005)	(0.004)	(0.004)	(0.004)	(0.058)
Country Shock($\widetilde{V}_{jt}$)*Low	-0.070***	-0.054*	-0.016	-0.010	-0.074**	-0.053***	-0.091***	-0.097***	-0.081***	-0.037
	(0.009)	(0.032)	(0.013)	(0.039)	(0.033)	(0.009)	(0.006)	(0.006)	(0.007)	(0.083)
Country Shock($\widetilde{V}_{jt}$)*High	0.011	-0.072*	0.045***	-0.030	-0.019	0.005	-0.004	-0.026***	-0.015**	-0.166*
	(0.011)	(0.037)	(0.016)	(0.044)	(0.038)	(0.009)	(0.007)	(0.007)	(0.007)	(0.095)
Global Shock($\widetilde{V}_{t}$)	0.368***	0.374***	0.526***	0.700***	0.479***	0.406***	0.453***	0.364***	0.292***	0.268***
	(0.009)	(0.039)	(0.013)	(0.041)	(0.034)	(0.008)	(0.006)	(0.007)	(0.007)	(0.101)
Global Shock($\widetilde{V}_{t}$)*Low	-0.119***	-0.154*	-0.127***	-0.324***	-0.145**	-0.176***	-0.225***	-0.236***	-0.119***	0.030
	(0.018)	(0.079)	(0.025)	(0.086)	(0.069)	(0.017)	(0.011)	(0.013)	(0.013)	(0.171)
Global Shock($\widetilde{V}_{t}$)*High	0.072***	0.028	0.074***	0.018	0.119**	0.147***	0.100***	0.102***	0.059***	0.234
	(0.014)	(0.059)	(0.019)	(0.063)	(0.050)	(0.012)	(0.008)	(0.010)	(0.010)	(0.149)
Destinations($\widetilde{M}_{pjt}$)	0.973***	0.964***	0.971***	0.971***	0.980***	0.982***	0.977***	0.983***	0.971***	0.963***
	(0.001)	(0.003)	(0.001)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.005)
Dest($\widetilde{M}_{pjt}$)*Low	0.014***	0.025***	0.011***	0.018***	0.012***	0.011***	0.016***	0.012***	0.018***	0.017**
	(0.001)	(0.004)	(0.001)	(0.004)	(0.003)	(0.001)	(0.000)	(0.001)	(0.001)	(0.007)
Dest($\widetilde{M}_{pjt}$)*High	-0.020***	-0.007	-0.018***	-0.017***	-0.022***	-0.019***	-0.022***	-0.010***	-0.008***	-0.014
	(0.001)	(0.006)	(0.002)	(0.005)	(0.004)	(0.001)	(0.001)	(0.001)	(0.001)	(0.013)
Country-Product FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	938,772	62,627	541,925	58,982	74,839	1,220,495	2,498,579	1,907,872	1,666,194	12,124
Clusters	72,685	4,388	44,740	4,805	6,287	98,993	196,996	140,427	122,672	948
R^2	0.71	0.69	0.72	0.69	0.73	0.74	0.73	0.71	0.71	0.65

LICs, and HICs in the table represent dummy variables for low-income, and high-income countries. Middle income countries are the baseline categories.

Table 4: PPML in levels

Dep. ⇒ Exp	All	Sect 0	Sect 1	Sect 2	Sect 3	Sect 4	Sect 5	Sect 6	Sect 7	Sect 8	Sect 9
Product Shock($\widetilde{V}_{pt}$)	0.664***	0.673***	0.384**	0.799***	0.553***	0.291***	0.533***	0.618***	0.630***	0.652***	0.478***
	(0.032)	(0.045)	(0.155)	(0.051)	(0.075)	(0.112)	(0.029)	(0.036)	(0.058)	(0.038)	(0.178)
Product Shock($\widetilde{V}_{pt}$)*Low	0.030	-0.002	0.625**	-0.307***	0.221**	0.104	0.010	0.294***	0.011	0.216**	0.075
	(0.063)	(0.102)	(0.282)	(0.106)	(0.112)	(0.164)	(0.081)	(0.100)	(0.110)	(0.104)	(0.374)
Product Shock($\widetilde{V}_{pt}$)*High	0.113***	-0.119**	-0.005	0.101	0.135	0.437***	0.158***	0.077*	0.077	0.026	0.337
	(0.041)	(0.058)	(0.175)	(0.090)	(0.151)	(0.131)	(0.044)	(0.044)	(0.066)	(0.049)	(0.222)
Country Shock($\widetilde{V}_{jt}$)	0.443***	0.284***	0.366***	0.167**	0.382***	0.483***	0.350***	0.262***	0.818***	0.442***	0.515
	(0.046)	(0.046)	(0.118)	(0.067)	(0.097)	(0.126)	(0.057)	(0.037)	(0.126)	(0.053)	(0.327)
Country Shock($\widetilde{V}_{jt}$)*Low	-0.250**	-0.066	0.329	0.019	-0.588***	0.339*	0.639***	0.276***	-0.006	0.120	-0.769*
	(0.108)	(0.080)	(0.226)	(0.108)	(0.106)	(0.203)	(0.196)	(0.096)	(0.158)	(0.075)	(0.428)
Country Shock($\widetilde{V}_{jt}$)*High	0.192**	0.092	-0.203	0.347***	0.011	-0.082	0.273***	0.305***	0.034	0.204**	-1.176*
	(0.087)	(0.067)	(0.210)	(0.129)	(0.193)	(0.212)	(0.070)	(0.054)	(0.150)	(0.086)	(0.619)
Global Shock($\widetilde{V}_{t}$)	-0.232***	-0.133*	0.011	0.048	0.170	0.366*	0.126	-0.068	-0.613***	-0.505***	0.260
	(0.067)	(0.074)	(0.160)	(0.111)	(0.193)	(0.210)	(0.080)	(0.071)	(0.141)	(0.062)	(0.680)
Global Shock($\widetilde{V}_{t}$)*Low	0.368**	0.090	-0.503*	0.396*	0.530**	-0.777**	-0.550***	-0.440***	0.172	0.101	0.722
	(0.168)	(0.134)	(0.283)	(0.228)	(0.260)	(0.348)	(0.202)	(0.142)	(0.233)	(0.129)	(0.857)
Global Shock($\widetilde{V}_{t}$)*High	-0.338***	-0.030	0.008	-0.484***	-0.143	-0.630**	-0.467***	-0.411***	-0.146	-0.079	0.462
	(0.090)	(0.089)	(0.226)	(0.159)	(0.397)	(0.261)	(0.093)	(0.081)	(0.159)	(0.079)	(0.775)
Destinations($\widetilde{M}_{pjt}$)	0.018***	0.019***	0.021***	0.025***	0.016***	0.011**	0.024***	0.021***	0.017***	0.015***	0.070***
	(0.001)	(0.001)	(0.004)	(0.002)	(0.003)	(0.006)	(0.001)	(0.001)	(0.001)	(0.001)	(0.009)
Dest($\widetilde{M}_{pjt}$)*Low	0.005***	0.001	0.006	0.024***	0.006	0.004	-0.013***	-0.001	0.007***	-0.004	0.052**
	(0.002)	(0.003)	(0.007)	(0.008)	(0.004)	(0.010)	(0.005)	(0.002)	(0.002)	(0.003)	(0.021)
Dest($\widetilde{M}_{pjt}$)*High	-0.008***	-0.008***	-0.002	-0.019***	-0.006	-0.001	-0.013***	-0.010***	-0.007***	-0.005***	-0.050***
	(0.001)	(0.002)	(0.006)	(0.005)	(0.005)	(0.006)	(0.001)	(0.001)	(0.001)	(0.002)	(0.012)
Country-Product FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,551,824	1,526,385	92,148	939,540	100,905	132,027	2,078,874	4,136,958	2,948,967	2,576,112	19,908
Clusters	692,944	72,685	4,388	44,740	4,805	6,287	98,994	196,998	140,427	122,672	948
R^2	0.98	0.97	0.98	0.97	0.99	0.97	0.98	0.97	0.98	0.98	0.95

Table 5: Contribution by Growth Margin and Country Group

Code - Sector Name	Prod.	Country	Global	Dest.	CA
		Low-Income Countries			
0 - Food and live animals	0.6	1.0	5.8	29.9	62.6
1 - Beverages and tobacco	-0.3	1.1	4.5	14.2	80.6
2 - Crude materials, inedible, except fuels	1.8	0.6	9.8	22.7	65.0
3 - Mineral fuels and related materials	0.8	3.9	16.1	28.0	51.2
4 - Animal and vegetable oils, fats and waxes	0.6	0.4	5.7	28.8	64.5
5 - Chemicals and related products, n.e.s	0.1	1.3	4.6	28.6	65.4
6 - Manufactured goods	0.6	0.8	5.2	30.0	63.4
7 - Machinery and transport equipment	0.5	1.0	0.9	37.7	59.9
8 - Miscellaneous manufactured articles	0.4	1.7	3.8	29.9	64.2
9 - Goods not classified elsewhere	0.0	0.2	2.2	18.8	78.8
ALL - Total	0.7	1.2	4.6	29.8	63.6
		Middle-Income Countries			
0 - Food and live animals	0.9	1.4	13.2	29.5	54.9
1 - Beverages and tobacco	-0.1	1.7	12.8	26.6	59.0
2 - Crude materials, inedible, except fuels	2.2	0.4	21.0	17.7	58.8
3 - Mineral fuels and related materials	1.7	1.6	37.2	11.8	47.6
4 - Animal and vegetable oils, fats and waxes	3.3	-0.1	17.9	16.8	62.1
5 - Chemicals and related products, n.e.s	0.7	1.8	11.6	23.7	62.2
6 - Manufactured goods	-0.1	3.2	16.8	23.5	56.7
7 - Machinery and transport equipment	0.4	3.3	10.4	28.6	57.3
8 - Miscellaneous manufactured articles	0.1	5.0	11.8	27.9	55.2
9 - Goods not classified elsewhere	2.2	0.3	3.3	28.6	65.6
ALL - Total	0.6	0.9	7.5	24.6	66.4
		High-Income Countries			
0 - Food and live animals	2.0	-2.0	30.0	22.4	47.7
1 - Beverages and tobacco	-0.7	-1.6	39.1	16.3	47.0
2 - Crude materials, inedible, except fuels	0.6	-1.2	36.9	9.1	54.6
3 - Mineral fuels and related materials	2.6	0.6	37.3	14.9	44.5
4 - Animal and vegetable oils, fats and waxes	4.1	-0.9	29.1	21.7	46.0
5 - Chemicals and related products, n.e.s	2.0	-1.9	34.4	12.6	52.9
6 - Manufactured goods	0.0	-2.6	43.8	20.4	38.4
7 - Machinery and transport equipment	2.6	-2.5	35.3	21.2	43.4
8 - Miscellaneous manufactured articles	1.5	-2.4	28.6	20.3	52.0
9 - Goods not classified elsewhere	3.0	0.1	8.7	13.8	74.4
ALL - Total	1.1	-0.6	14.2	18.5	66.7

Table 6: Export Growth: Robustness Checks

	Midpoint	Midpoint2	Avg	ΔArsinh	ΔLog
Product Shock($\widetilde{V}_{pt}$)	0.114***	0.153***	0.000	-0.000	0.221***
	(0.002)	(0.002)	(0.000)	(0.001)	(0.006)
Product Shock($\widetilde{V}_{pt}$)*Low	-0.034***	-0.045***	-0.000	0.001	-0.015
	(0.004)	(0.004)	(0.000)	(0.001)	(0.013)
Product Shock($\widetilde{V}_{pt}$)*High	0.043***	0.067***	0.000***	-0.000	0.058***
	(0.003)	(0.003)	(0.000)	(0.001)	(0.008)
Country Shock($\widetilde{V}_{jt}$)	0.122***	0.125***	2.311*	0.021***	0.394***
	(0.002)	(0.002)	(1.349)	(0.002)	(0.006)
Country Shock($\widetilde{V}_{jt}$)*Low	-0.080***	-0.079***	-1.813	-0.039***	-0.211***
	(0.003)	(0.003)	(1.674)	(0.002)	(0.011)
Country Shock($\widetilde{V}_{jt}$)*High	-0.008**	-0.011***	-3.769*	0.038***	-0.109***
	(0.003)	(0.003)	(1.958)	(0.004)	(0.010)
Global Shock($\widetilde{V}_{t}$)	0.160***	0.406***	-4.545	0.050***	0.622***
	(0.004)	(0.003)	(2.821)	(0.005)	(0.006)
Global Shock($\widetilde{V}_{t}$)*Low	-0.071***	-0.187***	11.114**	-0.076***	-0.107***
	(0.007)	(0.006)	(5.613)	(0.008)	(0.016)
Global Shock($\widetilde{V}_{t}$)*High	0.063***	0.106***	-0.264	-0.027***	0.037***
	(0.006)	(0.004)	(3.827)	(0.009)	(0.008)
Destinations($\widetilde{M}_{pjt}$)	0.977***	0.977***	22.852***	6.925***	1.163***
	(0.000)	(0.000)	(3.626)	(0.005)	(0.002)
Dest($\widetilde{M}_{pjt}$)*Low	0.014***	0.015***	1.253	1.021***	0.097***
	(0.000)	(0.000)	(5.115)	(0.008)	(0.005)
Dest($\widetilde{M}_{pjt}$)*High	-0.017***	-0.018***	29.401*	-0.806***	-0.043***
	(0.000)	(0.000)	(16.252)	(0.010)	(0.004)
Country-Product FE	Yes	Yes	Yes	Yes	Yes
Observations	8,982,409	8,982,514	7,847,054	18,848,880	6,763,666
Clusters	692,941	692,944	688,243	942,444	533,664
R^2	0.72	0.72	0.01	0.76	0.21

Table 7: Long-Run Growth: 1995 – 2015

	Midpoint	Avg	ΔLog	ΔLog(x+1)	ΔArsinh
Product Shock($\widetilde{V}_{pt}$)	0.082***	3.890	0.201***	0.036***	0.016***
	(0.002)	(4.941)	(0.009)	(0.001)	(0.001)
Product Shock($\widetilde{V}_{pt}$)*Low	-0.042***	61.566*	-0.020	-0.019***	-0.008***
	(0.003)	(34.244)	(0.020)	(0.001)	(0.001)
Product Shock($\widetilde{V}_{pt}$)*High	0.064***	-1.825	0.049***	0.045***	0.030***
	(0.003)	(5.499)	(0.011)	(0.002)	(0.002)
Country Shock($\widetilde{V}_{jt}$)	0.061***	-2.476***	0.133***	0.087***	0.048***
	(0.003)	(0.876)	(0.009)	(0.003)	(0.003)
Country Shock($\widetilde{V}_{jt}$)*Low	-0.027***	0.345	-0.011	-0.117***	-0.094***
	(0.005)	(1.901)	(0.019)	(0.005)	(0.004)
Country Shock($\widetilde{V}_{jt}$)*High	-0.044***	0.906	0.017	0.342***	0.266***
	(0.006)	(3.189)	(0.016)	(0.011)	(0.010)
Global Shock($\widetilde{V}_{t}$)	-2.035***	309.165***	-1.336***	24.112***	21.638***
	(0.090)	(74.981)	(0.169)	(0.337)	(0.314)
Global Shock($\widetilde{V}_{t}$)*Low	-0.033***	28.837	0.083***	0.214***	0.222***
	(0.003)	(20.135)	(0.015)	(0.006)	(0.005)
Global Shock($\widetilde{V}_{t}$)*High	0.062***	22.976**	0.077***	0.059***	0.061***
	(0.003)	(10.321)	(0.009)	(0.008)	(0.007)
Destinations($\widetilde{M}_{pjt}$)	0.996***	106.593***	1.699***	5.398***	5.348***
	(0.001)	(20.543)	(0.006)	(0.010)	(0.008)
Dest($\widetilde{M}_{pjt}$)*Low	-0.003***	36.075	-0.039***	1.244***	0.957***
	(0.001)	(43.294)	(0.015)	(0.022)	(0.017)
Dest($\widetilde{M}_{pjt}$)*High	-0.024***	-39.607*	-0.152***	-0.838***	-0.731***
	(0.002)	(23.060)	(0.010)	(0.015)	(0.013)
Number of observations	464,217	347,584	282,813	942,444	942,444
R^2	0.78	0.02	0.49	0.66	0.74

Appendix

Table A.1: Countries and Economic Development Classification

No	ISO	Country Name	No	ISO	Country Name	No	ISO	Country Name
					Low-Income Country			
1	AFG	Afghanistan	19	GNB	Guinea-Bissau	37	PAK	Pakistan
2	BGD	Bangladesh	20	HTI	Haiti	38	PNG	Papua New Guinea
3	BEN	Benin	21	IND	India	39	RWA	Rwanda
4	BTN	Bhutan	22	KEN	Kenya	40	STP	Sao Tome and Principe
5	BFA	Burkina Faso	23	PRK	Korea, Dem. Rep.	41	SEN	Senegal
6	BDI	Burundi	24	KGZ	Kyrgyz Republic	42	SLE	Sierra Leone
7	KHM	Cambodia	25	LAO	Lao PDR	43	SLB	Solomon Islands
8	CAF	Central African Republic	26	LBR	Liberia	44	SOM	Somalia
9	TCD	Chad	27	MDG	Madagascar	45	TJK	Tajikistan
10	COM	Comoros	28	MWI	Malawi	46	TZA	Tanzania
11	ZAR	Congo, Dem. Rep.	29	MLI	Mali	47	TGO	Togo
12	CIV	Cote d'Ivoire	30	MRT	Mauritania	48	UGA	Uganda
13	TMP	East Timor	31	MNG	Mongolia	49	UZB	Uzbekistan
14	ERI	Eritrea	32	MOZ	Mozambique	50	VNM	Vietnam
15	ETH	Ethiopia(excludes Eritrea)	33	MMR	Myanmar	51	YEM	Yemen
16	GMB	Gambia, The	34	NPL	Nepal	52	ZMB	Zambia
17	GHA	Ghana	35	NER	Niger	53	ZWE	Zimbabwe
18	GIN	Guinea	36	NGA	Nigeria			
					Middle-Income Country			
1	ALB	Albania	31	EST	Estonia	61	MNP	Northern Mariana Islands
2	DZA	Algeria	32	FJI	Fiji	62	OMN	Oman
3	AGO	Angola	33	GAB	Gabon	63	PLW	Palau
4	ARG	Argentina	34	GEO	Georgia	64	PAN	Panama
5	ARM	Armenia	35	GRD	Grenada	65	PRY	Paraguay
6	AZE	Azerbaijan	36	GTM	Guatemala	66	PER	Peru
7	BRB	Barbados	37	GUY	Guyana	67	PHL	Philippines
8	BLR	Belarus	38	HND	Honduras	68	POL	Poland
9	BLZ	Belize	39	HUN	Hungary	69	ROM	Romania
10	BOL	Bolivia	40	IDN	Indonesia	70	RUS	Russian Federation
11	BIH	Bosnia and Herzegovina	41	IRN	Iran, Islamic Rep.	71	WSM	Samoa
12	BRA	Brazil	42	IRQ	Iraq	72	SYC	Seychelles
13	BGR	Bulgaria	43	JAM	Jamaica	73	SVK	Slovak Republic
14	CMR	Cameroon	44	JOR	Jordan	74	ZAF	South Africa
15	CPV	Cape Verde	45	KAZ	Kazakhstan	75	LKA	Sri Lanka
16	CHL	Chile	46	KIR	Kiribati	76	KNA	St. Kitts and Nevis
17	CHN	China	47	LVA	Latvia	77	LCA	St. Lucia
18	COL	Colombia	48	LBN	Lebanon	78	VCT	St. Vincent and the Grenadines
19	COG	Congo, Rep.	49	LBY	Libya	79	SUR	Suriname
20	CRI	Costa Rica	50	LTU	Lithuania	80	SYR	Syrian Arab Republic
21	HRV	Croatia	51	MKD	Macedonia, FYR	81	THA	Thailand
22	CUB	Cuba	52	MYS	Malaysia	82	TON	Tonga
23	CZE	Czech Republic	53	MDV	Maldives	83	TTO	Trinidad and Tobago
24	DJI	Djibouti	54	MHL	Marshall Islands	84	TUN	Tunisia
25	DMA	Dominica	55	MUS	Mauritius	85	TUR	Turkey
26	DOM	Dominican Republic	56	MEX	Mexico	86	TKM	Turkmenistan
27	ECU	Ecuador	57	FSM	Micronesia, Fed. Sts.	87	UKR	Ukraine
28	EGY	Egypt, Arab Rep.	58	MDA	Moldova	88	URY	Uruguay
29	SLV	El Salvador	59	MAR	Morocco	89	VUT	Vanuatu
30	GNQ	Equatorial Guinea	60	NIC	Nicaragua	90	VEN	Venezuela
					High-Income Country			
1	AND	Andorra	16	FRA	France	31	NLD	Netherlands
2	ATG	Antigua and Barbuda	17	PYF	French Polynesia	32	NCL	New Caledonia
3	ABW	Aruba	18	DEU	Germany	33	NZL	New Zealand
4	AUS	Australia	19	GRC	Greece	34	NOR	Norway
5	AUT	Austria	20	GRL	Greenland	35	PRT	Portugal
6	BHS	Bahamas, The	21	HKG	Hong Kong, China	36	QAT	Qatar
7	BHR	Bahrain	22	ISL	Iceland	37	SAU	Saudi Arabia
8	BLX	Belgium-Luxembourg	23	IRL	Ireland	38	SGP	Singapore
9	BMU	Bermuda	24	ISR	Israel	39	SVN	Slovenia
10	BRN	Brunei	25	ITA	Italy	40	ESP	Spain
11	CAN	Canada	26	JPN	Japan	41	SWE	Sweden
12	CYM	Cayman Islands	27	KOR	Korea, Rep.	42	CHE	Switzerland
13	CYP	Cyprus	28	KWT	Kuwait	43	ARE	United Arab Emirates
14	DNK	Denmark	29	MAC	Macao	44	GBR	United Kingdom
15	FIN	Finland	30	MLT	Malta	45	USA	United States

Declarations

I.a Conflict of Interest

No conflict of interest exists. We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support or incentives for this work that could have influenced its outcome.

I.b Funding

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I.c Intellectual Property

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

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