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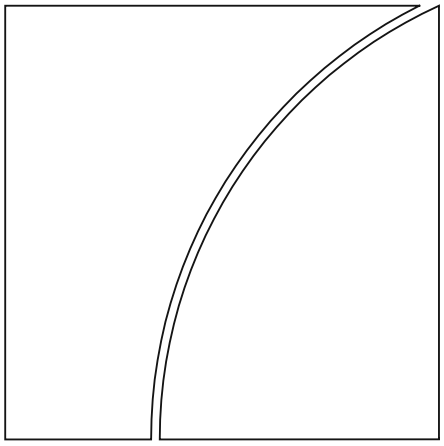

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Industry heterogeneity and exchange rate pass-through

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Industry Heterogeneity and Exchange Rate Pass-Through[1]

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Abstract

In the presence of price rigidities, nominal exchange rate fluctuations can have real effects on the economy. External shocks may have differentiated effects across economic sectors depending on firms' marginal cost structure and features of the demand they face, such as strategic complementarities. I analyze the relationship between the exchange rate pass-through into export and import prices and volumes and the use of imported inputs in production, an important determinant of marginal cost. Using microdata from Colombia, I show that manufacturing industries differ significantly in their use of imported inputs and in the estimated exchange rate pass-through. I find a clear correlation between the use of imported inputs and the response of prices to changes in exchange rates. That is, the exchange rate pass-through into prices tends to be larger for industries in which firms use a larger share of imported inputs. The link is stronger in the case of exports, but the effect on the pass-through into import prices is also positive. In contrast, I do not find a clear correlation between the use of imported inputs and the response of traded quantities to changes in exchange rates.

JEL Classification: F1; F2; L2; L6

Keywords: Exchange rate pass-through; export and import prices; export and import volumes; intermediate inputs

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1. Introduction

In the presence of price rigidities, fluctuations in nominal exchange rates can have real effects on a country's economy. Changes in a country's currency price can impact output, prices and trade flows, and the effects will vary according to the nature of the price rigidities. Furthermore, external shocks may have differential effects across economic activities depending on firms' productive structures and the particular features of the demand they face. Two of the structural determinants of the exchange rate pass-through into export and import prices are the use of imported inputs in production and the ability of firms to charge variable markups across markets and over time (Goldberg and Hellerstein (2008)). Given that variations in the effects of international shocks across economic agents can create winners and losers and a reallocation of productive factors may take place, it is important for policymakers to understand any potential differences and their underlying causes.

In this paper I analyze the response of export and import prices and volumes to exchange rate changes. First, I use detailed firm-level operational data to examine two potential sources of heterogeneity across 2-digit manufacturing industries in the use of imported inputs: differences in the share of imported inputs in firms' total input purchases, and differences in the elasticity of output with respect to intermediate inputs that reflects the relative importance of inputs for a firm's productive process. Then, I use transaction-level trade data to estimate the pass-through of exchange rate fluctuations into export and import prices for each industry, and I analyze the relationship between these estimates and the use of imported inputs at the sector level.

Finally, I study the effects of exchange rate changes on traded quantities to understand the extent of expenditure switching in different sectors.

My main results can be summarized as follows. First, there are significant variations in industries' use of imported inputs that can be explained mainly by differences in the share of imported inputs in firms' total input purchases. While domestic inputs account for over 90% of total purchases in some industries, other sectors import over 30% of their inputs. Second, the exchange rate pass-through into export prices varies significantly across industries; variations in the exchange rate pass-through into import prices are smaller. Third, the pass-through estimates correlate positively with the use of imported inputs at the 2-digit manufacturing industry level: industries with a larger share of imported inputs tend to have a higher exchange rate pass-through into both export and import prices. The correlation appears, however, to be stronger for export prices, since fluctuations in the exchange rate have a direct effect on the marginal cost of production of firms using imported inputs. In the case of imports, the exchange rate has an indirect effect on prices through local competitors' marginal cost due to the presence of strategic complementarities. Finally, the response of export quantities to changes in the exchange rate varies widely across industries, whereas the effect on imports is fairly uniform. Changes in exported volumes are found to be almost negligible for some industries, while a peso depreciation is associated with a decline in exports across destinations for others. In the case of imports, albeit heterogeneous in magnitude, the estimated effect of a peso depreciation is negative for the manufacturing sector as a whole and for almost all individual industries. I do not find a clear correlation between the estimated elasticities of traded quantities and the use of imported inputs.

This paper aims to contribute to the extensive literature on incomplete pass-through and its determinants.[2] Several studies have shown that exchange rate fluctuations are only partially transmitted to the prices of traded goods. For instance, Campa and Goldberg (2005) show that pass-through into import prices for the OECD countries is, on average, close to one-half. Using a larger sample of countries that also includes emerging economies, Bussière, Delle Chiaie and Peltonen (2014) show that pass-through is incomplete for both export and import prices, and that the two are correlated. And for Colombia, Rincón-Castro and Rodríguez-Niño (2018) show that pass-through into import prices is incomplete along the distribution chain. These papers emphasize the role of macroeconomic factors such as inflation, the stability of the exchange rate and trade composition.

A strand of the literature has used microdata to focus on the link between pass-through and microeconomic variables. Among firm-level variables that have been found to affect pass-through are the currency of invoicing (Gopinath, Itskhoki and Rigobon (2010)); market structure and the ability of exporters to charge variable markups (Amiti, Itskhoki and Konings (2018); Atkeson and Burstein (2008); Auer and Schoenle (2016); Fitzgerald and Haller (2014)); and features that affect marginal cost. These include the use of imported inputs in production (Amiti, Itskhoki and Konings (2014); Fauceglia, Shingal, and Wermelinger (2014)) heterogeneous productivity (Berman, Martin and

[2] See Burstein and Gopinath (2014) for a survey of the literature.

Mayer (2012); Garetto (2016)); heterogeneous levels of quality (Chen and Juvenal (2016)); and distribution costs (Burstein, Neves and Rebelo (2003)).

The widespread use of global value chains has put a spotlight on the role of imported inputs in determining trade prices and volumes. The paper contributes to this topic in several ways. First, my results for import prices complement those for export prices in Amiti, Itskhoki and Konings (2014) and Fauceglia, Shingal and Wermelinger (2014).[3] As Amiti, Itskhoki and Konings (2018) show, firms adjust their prices in reaction to their competitors' price changes. In this context, exchange rate shocks affecting the marginal cost of local producers using imported inputs can affect not the price of their exports, but also the price of imports competing with them. I explore this indirect channel on import prices. Second, although I use detailed firm-level data for my estimations, the relationship between the use of imported inputs and the exchange rate pass-through is examined at the industry level. The sector-level analysis can be useful for policymakers whenever detailed firm-level data is not available. A third contribution is the analysis of two separate sources of heterogeneity in the effects of imported inputs on trade prices and volumes. The literature has studied the share of imports in total input purchases as a source of heterogeneity in firms' marginal cost.[4] Besides that, I analyze the heterogeneity generated by differences across sectors in the

[3] Fauceglia, Shingal and Wermelinger (2014) analyze the pass-through of a subset of import prices—those for intermediate inputs. These estimates are then used in the analysis of the pass-through into export prices for the full set of exported goods.

[4] Measured in the data as in Amiti, Itskhoki and Konings (2014) and Berman, Martin and Mayer (2012), or approximated from input-output tables as in Greenaway, Kneller and Zhang (2010) and Fauceglia, Shingal and Wermelinger (2014).

elasticity of output with respect to intermediate inputs; that is, in the relative importance of inputs for firms' production.

The remainder of the paper is organized as follows. Section 2 presents the theoretical background that guide the empirical strategy. Section 3 describes the data sources for the empirical analysis. Section 4 contains sectoral statistics on the share and use of imported inputs in production, regression results on exchange rate pass-through, and the link between these two sets of results. Finally, Section 5 concludes.

2. Theoretical Background

The contribution of this paper is essentially empirical, but the work is guided by the Dominant Currency Paradigm (DCP) model developed in Casas, Díez, Gopinath and Gourinchas (2017). Based on the evidence from granular trade data, the model incorporates three key features. First, regardless of the origin or destination of trade, firms set their prices in a dominant currency and change them infrequently. Second, firms use both domestic and imported intermediate inputs for production. And third, firms face strategic complementarities and set flexible markups that vary across time and markets (see Casas et al. (2017) for the details). In this section I present the key elements of the model to show how the key variables relate to each other and thus set the course for the empirical strategy.

2.1. The Model

Consider a three-country world: a small open economy (H, home) and two large countries (U, the dominant currency country, and R, the rest). H trades goods and assets with U and R, and from the perspective of H the traded quantities and prices of U and R are exogenous.

Households

Consumers have a per-period utility function that depends on their consumption of a bundle of goods and on their labor supply,

$$U(C_t, N_t) = \frac{1}{1-\sigma_c} C_t^{1-\sigma_c} - \frac{\kappa}{1+\varphi} N_t^{1+\varphi}, \tag{1}$$

where σ is the coefficient of relative risk aversion; φ is the inverse of the Frisch elasticity of labor supply; and κ scales the disutility of labor. C is assumed to be a Kimball homothetic demand aggregator implicitly given by

$$\sum_i \frac{1}{|\Omega_i|} \int_{\omega \in \Omega_i} \gamma_i \Upsilon \left(\frac{|\Omega_i| C_{iH}(\omega)}{\gamma_i C} \right) d\omega = 1, \tag{2}$$

where C_{iH} is the consumption in H of variety ω produced in country $i \in \{H, U, R\}$; Ω is a measure of the varieties produced in i; and γ_i is a parameter that measures the home bias in H, with $\sum_i \gamma_i = 1$. These preferences are a way of introducing strategic complementarities (and variable markups) since, with the resulting kinked demand functions, producers do not want to deviate from their competitors' prices.

The optimality conditions of the household's problem yield the following demand system:

$$C_{iH,t}(\omega) = \gamma_i \psi\left(D_t \frac{P_{iH,t}(\omega)}{P_t}\right) C_t, \tag{3}$$

where $\psi(.) \equiv \Upsilon'^{-1}(.) > 0$; $D_t \equiv \sum_i \int_{\Omega_i} \Upsilon'\left(\frac{|\Omega_i| C_{iH,t}(\omega)}{\gamma_i C_t}\right) \frac{C_{iH,t}(\omega)}{C_t} d\omega$ is a measure of the aggregate demand, and $P_{iH,t}(\omega)$ denotes the home price of variety ω produced in country i and sold in H.

Some further notation is useful for the empirical predictions. Define the elasticity of demand $\sigma_{iH,t}(\omega) \equiv -\frac{\partial \log C_{iH,t}(\omega)}{\partial \log Z_{iH,t}(\omega)}$, where $Z_{iH,t}(\omega) \equiv D_t \frac{P_{iH,t}(\omega)}{P_t}$. The log of the optimal flexible price markup is $\mu_{iH,t}(\omega) \equiv \log\left(\frac{\sigma_{iH,t}}{\sigma_{iH,t}-1}\right)$. Finally, the elasticity of that markup is denoted by $\Gamma_{iH,t}(\omega) \equiv \frac{\partial \mu_{iH,t}}{\partial \log Z_{iH,t}(\omega)}$. Markups and their elasticities are important factors in the empirical analysis presented below, since they affect how production costs changes that result from exchange rate movements are transmitted to firm-level export and import prices.

Producers

Each H producer manufactures a unique variety ω, combining intermediate inputs and labor according to a Cobb-Douglas production function,

$$Y_t(\omega) = e^{a_t} L_t^{1-\alpha} X_t^{\alpha}, \tag{4}$$

where α is the constant share of intermediates in production and a_t is an idiosyncratic productivity shock. The intermediate input aggregator X_t takes the same form as the consumption aggregator in equation (2), and the labor input L_t is a CES aggregator of the individual varieties supplied by households.

Each firm's variety ω is sold both domestically and internationally and its output is used both for final consumption and as an intermediate input for production. Prices for the three markets, H, U and R, are chosen by the firms in a Calvo pricing environment: they can be reset infrequently with a probability $(1-\delta_p)$ in any given period. Exported goods can be priced in the dominant currency, or that of the producer, or in the local/destination currency, while domestic prices and wages w_t are set in H currency. Let $P^j_{Hi,t}(\omega)$ denote the price of variety ω produced in H, sold in country i, invoiced in currency j.

Assuming that markets are segmented, the per-period profits of the domestic firm producing variety ω are then given by

$$\Pi_t(\omega) = \sum_{i,j} \mathcal{E}_{j,t}\, P^j_{Hi,t}(\omega) Y^j_{Hi,t}(\omega) - \mathcal{MC}_t\, Y_t(\omega), \tag{5}$$

where $\mathcal{E}_{j,t}$ is the nominal exchange rate (expressed as Home currency per unit of foreign currency j); $Y^j_{Hi,t}(\omega) = C^j_{Hi,t}(\omega) + X^j_{Hi,t}(\omega)$ is the demand for ω in country i invoiced in currency j, both used for consumption and as an input in production; $Y_t(\omega) = \sum_{i,j} Y^j_{Hi,t}(\omega)$ is the total demand across markets; and $\mathcal{MC}$ is the marginal cost given (in

logs) by $mc^{j}_{H,t} = (1-\alpha)w_t + \alpha \sum_i \gamma_i \, (p_{iH,t} + e_{j,t})$. As is usual in the literature, lowercase letters denote the log of the corresponding variables.

Closing the Model

In order to evaluate the transmission of exchange rate fluctuations to prices, the model requires additional conditions on the process for setting interest rates. *H*'s monetary authority is assumed to set the domestic risk-free interest rate according to an inflation targeting Taylor rule with inertia, and the dominant currency interest rate at which *H* borrows internationally is assumed to be an increasing function of its external debt.

Given market clearing conditions for goods, labor and bond markets, the model is solved by log-linearizing around a symmetric zero-inflation steady state.

2.2. Exchange Rate Pass-Through

The DCP model delivers a number of novel predictions regarding the effects of exchange rate fluctuations on export and import prices, that is, the exchange rate pass-through (ERPT). The predictions presented in this subsection will be tested in the empirical analysis.

In the general case, firms can adjust prices with a probability of $(1-\delta_p)$. The optimal price-reset condition for domestic firms selling in country *i* and invoicing in currency *j* implies that export and import price inflation for that specific combination of origin, destination, and currency of invoicing is given by

$$\pi^{j}_{Hi,t} = \frac{\lambda_p}{1+\Gamma}\left[\left(mc^{j}_{H,t} - p^{j}_{Hi,t}\right) + \Gamma\left(p^{j}_{i,t} - p^{j}_{Hi,t}\right) + \mu\right] + \beta\mathbb{E}_t\pi^{j}_{Hi,t+1}, \tag{6}$$

and

$$\pi^{j}_{iH,t} = \frac{\lambda_p}{1+\Gamma}\left[\left(mc^{j}_{i,t} - p^{j}_{iH,t}\right) + \Gamma\left(p^{j}_{H,t} - p^{j}_{iH,t}\right) + \mu\right] + \beta\mathbb{E}_t\pi^{j}_{iH,t+1}, \tag{7}$$

respectively (see the appendix in Casas et al. (2017) for the derivation). Here, $\lambda_p = (1 - \delta_p)(1 - \beta\delta_p)/\delta_p$; $mc^{j}_{i,t}$ is the log of the nominal marginal cost of firms in country i expressed in currency j; $p^{j}_{i,t}$ is the log of the aggregate price level of country i in currency j; μ is the log of the steady state desired gross markup; and Γ is the steady-state elasticity of that markup. Although strategic complementarities (Γ) dampen their impact, the use of imported inputs in production has a direct effect on export and import prices via their effect on the marginal cost.

Note that these expressions are specific to the currency of invoicing, j. This feature has key implications for the relationship between the marginal cost of production and a firm's pricing decisions. When both exports and imports are priced in a common currency (the dominant currency), exchange rate fluctuations do not affect the terms of trade, but they do generate volatility in the relative prices of imported to domestic products. Hence, all else equal, the depreciation of a country's currency relative to the dominant currency, (1) reduces that country's demand for imports from *all* countries, and (2) directly affects the real marginal cost of firms using imported inputs regardless of their country of origin.

Equations (6) and (7) are a good starting point to motivate the empirical exercises of this paper. They show that, in general, the use of imported inputs is directly related to changes in export and import prices. However, the inner workings of the model can be better illustrated in the case of fully flexible prices. Therefore, the remainder of this section will consider the scenario in which $\delta_p = 0$ so that the model yields the closed analytical forms used to generate the predictions that are tested with the data in Section 4.[5]

Consider first the exchange rate pass-through into export prices. If domestic wages are rigid ($\Delta w_t = 0$) and productivity is unchanged ($\Delta a_t = 0$), the ERPT into export prices, expressed in H currency, is given by the following expression:

$$\begin{aligned} \Delta p_{Hi,t} &= \frac{1}{1+\Gamma}\left[\frac{\alpha\gamma_i}{1-\alpha\gamma_H}+\Gamma\right]\Delta e_{i,t} + \frac{1}{1+\Gamma}\left[\frac{\alpha\gamma_j}{1-\alpha\gamma_H}\right]\Delta e_{j,t} \\ &= \frac{1}{1+\Gamma}\left[\left(\frac{\alpha\gamma_i}{1-\alpha\gamma_H}\right)\Delta e_{i,t} + \left(\frac{\alpha\gamma_j}{1-\alpha\gamma_H}\right)\Delta e_{j,t}\right] + \frac{\Gamma}{1+\Gamma}\Delta e_{i,t}, \end{aligned} \tag{8}$$

for $i, j \in \{U, R\}^2, j \neq i$.[6]

Under these restrictions, the pass-through boils down to the role of imported intermediate inputs, that affect the firms' marginal cost, and the behavior of firms'

[5] The predictions stated below also hold in the general case when $\delta_p \in (0,1)$.

[6] If the exchange rates of H with respect to the currencies of U and R are perfectly correlated, $\Delta e_{i,t} = \Delta e_{j,t}$ and the ERPT into export prices can be simplified to $\frac{\Delta p_{Hi,t}}{\Delta e_{i,t}} = 1 - \frac{1-\alpha}{(1+\Gamma)(1-\alpha\gamma_H)}$. If, in addition, firms use only imported inputs (such that $\gamma_H = 0$), equation (8) is equivalent to the formula in Burstein and Gopinath (2014) , where the pass-through is expressed in terms of destination currency prices and the exchange rate of destination currency to home currency.

markups. If all intermediate inputs used in production are domestic ($\gamma_H = 1$) and markups are constant ($\Gamma = 0$), the exchange rate pass-through into export prices is equal to zero (equivalently, there is full pass-through into destination currency prices), as firms set their local price as a constant markup above a fixed marginal cost regardless of the exchange rate. In contrast, when $\gamma_H < 1$ and/or $\Gamma > 0$ the pass-through into export prices in home currency is positive (this is, there is an incomplete pass-through into destination currency prices).

The role of imported inputs is captured by the term $\left(\frac{\alpha\gamma_i}{1-\alpha\gamma_H}\right)\Delta e_{i,t} + \left(\frac{\alpha\gamma_j}{1-\alpha\gamma_H}\right)\Delta e_{j,t}$. When imported intermediate inputs are used in the production process, exchange rate fluctuations will have a direct impact on their cost. Therefore, a depreciation of the domestic currency will increase the marginal costs of production in H leading to an increase in local currency prices. Moreover, the effect is larger when intermediate inputs are relatively more important for production than labor. In other words, the marginal cost of production is decreasing in γ_H and increasing in α, such that the lower the home bias in intermediate inputs (the stronger the preferences for imported inputs) and the higher their share in production, the higher the ERPT into export prices. Importantly, although the presence of strategic complementarities can affect the impact of imported inputs on export prices, the positive correlation between the share of imported inputs and the ERPT into export prices holds for any given level of $\Gamma \geq 0$.

Strategic complementarities and variable markups affect the ERPT in two ways. On one hand, there is positive and direct effect on ERPT, captured by the term $\frac{\Gamma}{1+\Gamma}\Delta e_{i,t}$. Firms do not want their prices to deviate from their competitors' prices in foreign markets, so

they keep prices in the destination country relatively stable and absorb exchange rate fluctuations by adjusting their markups and their prices in local currency. On the other hand, however, complementarities *dampen* the effect of the marginal cost channel because firms may not transmit all their cost shocks into prices in order to keep them stable and close to those of competitors.

Now, consider the exchange rate pass-through into import prices. Under the same assumptions, the ERPT into import prices in H currency is given by

$$\begin{aligned} \Delta p_{iH,t} &= \frac{1}{1+\Gamma}\left[1+\Gamma\frac{\gamma_i}{1-\alpha\gamma_H}\right]\Delta e_{i,t} + \frac{\Gamma}{1+\Gamma}\left[\frac{\gamma_j}{1-\alpha\gamma_H}\right]\Delta e_{j,t} \\ &= \frac{\Gamma}{1+\Gamma}\left[\left(\frac{\gamma_i}{1-\alpha\gamma_H}\right)\Delta e_{i,t} + \left(\frac{\gamma_j}{1-\alpha\gamma_H}\right)\Delta e_{j,t}\right] + \frac{1}{1+\Gamma}\Delta e_{i,t}, \end{aligned} \tag{9}$$

for $i, j \in \{U, R\}^2, j \neq i$. In this case, strategic complementarities are crucial. From equation (9) it is clear that when markups are constant ($\Gamma = 0$), the pass-through into home currency prices is equal to one regardless of the effect that exchange rate fluctuations have on domestic producers' costs through the use of imported inputs. With foreign firms setting a constant price in foreign currency, import prices in H adjust fully to the prevailing exchange rate. In contrast, with strategic complementarities ($\Gamma > 0$), foreign firms set prices that depend on their local competitors' marginal costs, and the pass-through into import prices is incomplete.

Again, the effect of strategic complementarities and variable markups is twofold. The last term, $\frac{1}{1+\Gamma}\Delta e_{i,t}$, captures the direct, negative impact of strategic complementarities in pricing; holding competitors' prices fixed, a higher Γ reduces pass-through. But when

foreign producers take into account the production costs of domestic firms, imported inputs affect import prices through an indirect effect that works in the opposite direction. Since a home currency depreciation increases marginal costs for H firms using of imported inputs, H firms will raise prices; in turn, it leads foreign firms to also raise theirs. This effect is increasing in Γ and in the share of imported inputs in production, $(1-\gamma_H)$. In other words, in the presence of strategic complementarities ($\Gamma > 0$), the ERPT into import prices is decreasing in γ_H and increasing in α.

This discussion can be summarized in two testable predictions:

1. *Sectors that are more intensive in their use of imported intermediate inputs (those with smaller γ_H and/or larger α) will have a larger ERPT into export prices.*

2. *In the presence of strategic complementarities, sectors that are more intensive in their use of imported intermediate inputs (those with smaller $\gamma_H$and/or larger α) will have a larger ERPT into import prices.*

I test these two results empirically in Section 4.

3. Data

For my analysis, I use two firm-level data sets from Colombia: customs declarations that include information on several characteristics of firms' foreign transactions, and the national manufacturing survey that contains detailed operational information. The data used for the estimations presented in Section 4 cover the period between 2004 and 2015.

The data on firms' production and input consumption are from the Annual Manufacturing Survey, EAM (its acronym in Spanish), conducted by Colombia's department of statistics, DANE. The EAM is an unbalanced panel of Colombian factories with 10 or more employees, or sales above a certain threshold set every year.[7] For each plant, the EAM report includes values for output and for several inputs used in the production process. Crucially for this study, it includes the share of imported intermediate inputs used at each plant. The data set also provides industry classification codes (under the Central Product Classification, CPC, and the International Standard Industrial Classification, ISIC) for the plants' inputs and outputs.

The data on international trade, from Colombia's customs agency (DIAN) and DANE, include information on the universe of Colombian exporters and importers. The data include each trading firm's tax identification number; the 10-digit product code (according to the Nandina classification system, based on the Harmonized System); the FOB value (in U.S. dollars) and volume (net kilograms) of exports (imports); and the country of destination (origin), among other details.[8] The data are monthly; for the empirical exercises, I aggregate exports and imports at the annual level.

I complement these data sets with macroeconomic information from the World Bank's World Development Indicators. For the pass-through estimations, I use the annual

[7] For example, in 2016 the sales threshold was set at COP$500 million, approximately $175,000.

[8] In some cases, imported goods produced in one country arrive in Colombia from a third country (as is the case, for instance, with goods produced in China that arrive in Colombia from the United States or Panama). I exclude such observations to avoid introducing unnecessary noise in the empirical analysis, using only those observations for which the country of origin and purchase are the same.

average value of the official local currency unit per USD exchange rates (series PA_NUS_FCRF). Other controls include country-specific producer prices, measured with the wholesale price index (FP_WPI_TOTL), and real GDP, measured with the GDP at constant (2010 USD) market prices (NY_GDP_MKTP_KD). Colombian producer prices are measured with the manufacturing annual producer price index, calculated by DANE.

One important remark is that the two firm-level datasets cannot be merged; in order to keep information anonymous, the EAM identifies firms and plants with internal codes that cannot be matched to the firms' tax identification numbers. Hence, the analysis of the relationship between the use of imported inputs (observed in the EAM) and pass-through estimates (obtained with customs data) must be performed at an aggregate level. To include as many sectors as possible, results are presented at the 2-digit ISIC industry level. One advantage of this approach is that it can be used to study the relationship between ERPT and various industry characteristics, even when detailed micro data are not available.

4. Results

I used the data to test the main implications of the model, stated in Section 2. Throughout the paper, I focus on manufacturing firms producing non-commodity, tradable goods.[9] For the empirical analysis I exclude manufacturers of coke, refined petroleum products and nuclear fuel (ISIC 23), and manufacturers of basic metals (ISIC

[9] I follow the ISIC classification (Rev. 3.1) to define which goods are manufactures. See Table 1 for a list of the ISIC codes and the corresponding industries.

27), which include metals such as gold, silver, platinum, and nickel, since as commodity producers their dynamics are different from those of other manufacturing firms.[10] As a robustness check, I also limit the sample for some estimations to differentiated products, selected following the product classification proposed by Rauch (1999).[11] Results remain qualitatively similar and are shown in the Appendix.

4.1. Industry Characteristics

I begin by documenting the heterogeneity in the use of imported intermediate inputs across manufacturing sectors. Differences across industries can stem from two sources: the share of domestic and imported inputs demanded by firms, and differences in the relative importance of intermediate inputs and labor in production (i.e., the α in the production function). I take advantage of the detailed information on input use contained in the EAM to analyze these two sources separately.

On average, imported inputs account for roughly one-fourth of the total expenditure on intermediate inputs purchased by manufacturing firms that are either exporters and/or importers (Table 2).[12] Besides, this share is very stable across years. However,

[10] Results for the overall manufacturing sector do not change if these two sectors are included. See Tables A-1-A-4 in the Appendix.

[11] In the reported estimates I follow Rauch's conservative classification, but the results are virtually unchanged if I use the liberal definition instead.

[12] To calculate the average share of imported intermediate inputs used by exporting and/or importing firms by industry and year, I first calculated the share of expenditure in domestic and imported intermediate inputs purchased by each plant-year and then averaged across plants in each sector. Plants are assigned to the industry of the product that generates the largest (deflated) income over the full period included in the sample.

there is great heterogeneity across sectors. For instance, manufacturers of apparel (ISIC 18), leather products (ISIC 19), and wood products (ISIC 20) import around 10% of their inputs, while manufacturers of chemicals (ISIC 24), rubber and plastic products (ISIC 25), and different types of machinery and equipment (ISIC 30–35) rely more heavily on imported inputs. In addition, while the share of imported inputs is fairly stable across time for most industries and for the manufacturing sector as a whole, it fluctuates significantly for a few sectors (e.g., manufacturers of radio, television and communication equipment—ISIC 20 and ISIC 32).[13]

Regarding the estimated share of inputs in production, I follow the method proposed by Gandhi, Navarro and Rivers (2017) and estimate a production function of the form $Y_t = e^{a_t} X_t^{\alpha} L_t^{\beta}$ for each 2-digit industry and for the manufacturing sector as a whole.[14] I present the estimated values for the share of intermediate inputs ($\widehat{\alpha}$) and the corresponding standard errors in Table 3. On average, the relative share of intermediate inputs in manufacturing production is estimated to be 0.45. Although there is some variation in the estimates, most sectors are within a standard deviation of the average value, and all sectors are within two.

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[13] In Table 2 I include only firms that either export or import, since these are the ones that are included in the dataset used to estimate the exchange rate pass-through. If I use the full EAM sample instead, the average share of imported inputs is reduced to around 14%, but the industry averages of the two samples are very highly correlated (97%), and the ranking of industries is relatively unchanged. For instance, for firms in sectors ISIC 18–20, imported inputs account for only 5–7% of input expenditure, while the percentage for the producers of chemicals or rubber and plastic products (ISIC 24–25) is four times as large.

[14] Although I do not impose constant returns to scale for the estimation (e.g., I do not force $\beta = (1 - \alpha)$), the sum of the two coefficients is very close to 1 for most industries.

A third variable that can affect the transmission of exchange rate fluctuations into trade prices, and that can be directly measured in the data, is the currency in which transactions are made. The distribution of the invoicing currencies for all exports between 2007 and 2014 shows that the U.S. dollar is overwhelmingly dominant for all sectors (Table 4). The shown distribution is calculated using the number of transactions, but the shares by export value are very similar. Given that the dollar dominance is common across industries and there is only slight degree of variation in invoicing currencies, I will focus on the use of imported inputs.

4.2. Exchange Rate Pass-Through into Prices

Given the observed heterogeneity in the use of imported intermediate inputs across manufacturing firms, the next step in my analysis is to estimate the exchange rate pass-through into import and export prices for each individual industry, and to check whether the estimates vary with these variables.

To estimate the pass-through of exchange rates into export and import prices, I regress the log change of unit values (my proxy for prices) on the log change of the annual average exchange rate, plus additional controls. Unit values are given by the FOB value per net kilogram, and are calculated at the 10-digit product/firm/country of destination (origin) level. In all cases, I cluster standard errors by year.

For transactions with the United States and other trade partners that use the US dollar as their currency, I estimate

$$\Delta p_{ij,t}^{H} = \alpha + \beta \Delta e_{U,t} + X_t + \epsilon_t, \tag{10}$$

where $P_{ij,t}^{H}$ denote export (import) prices measured in Colombian pesos; $\mathcal{E}_{U,t}$ is the average nominal exchange rate of the Colombian peso relative to the dollar; and X_t includes price indices for Colombia and the corresponding country of destination (origin) and fixed effects by firm-industry-country.[15] This empirical approximation to the model presented in Section 2 implies that $\beta = \frac{1}{1+\Gamma}\left[\frac{\alpha\gamma_i}{1-\alpha\gamma_H} + \Gamma\right]$ for export prices, and $\beta = \frac{1}{1+\Gamma}\left[1 + \Gamma\frac{\gamma_i}{1-\alpha\gamma_H}\right]$ for import prices. In both cases the model predicts that the estimates for β should be increasing with the use of imported inputs under reasonable γ parameter values.

For other trading partners, I estimate

$$\Delta p_{ij,t}^{H} = \alpha + \beta_B \Delta e_{B,t} + \beta_U \Delta e_{U,t} + X_t + \epsilon_t, \tag{11}$$

where $\mathcal{E}_{B,t}$ is the average nominal bilateral exchange rate of the Colombian peso relative to the local currency unit, and $\mathcal{E}_{U,t}$ is the average nominal exchange rate of the

[15] Given that markup elasticity is hard to measure directly in the data, I follow Amiti, Itskhoki and Konings (2014) and assume that markups and their elasticities are increasing in a firm's market share so that the latter is a sufficient statistic for the former. The fixed effects, calculated at the 6-digit industry (HS) level, absorb the market share and control for the unobserved strategic complementarities.

Colombian peso relative to the dollar.[16] Here, $\beta_B = \frac{1}{1+\Gamma}\left[\frac{\alpha\gamma_i}{1-\alpha\gamma_H} + \Gamma\right]$ and $\beta_U = \frac{1}{1+\Gamma}\left[\frac{\alpha\gamma_j}{1-\alpha\gamma_H}\right]$ for the export price estimations, and $\beta_B = \frac{1}{1+\Gamma}\left[1 + \Gamma\frac{\gamma_i}{1-\alpha\gamma_H}\right]$ and $\beta_U = \frac{\Gamma}{1+\Gamma}\left[\frac{\gamma_j}{1-\alpha\gamma_H}\right]$ for the import price estimations. Adding an additional exchange rate to the estimations allows testing the relative importance of the local currencies and the dominant dollar in the pass-through. It also allows a check on whether the share of imported inputs and/or the variability of markups are more strongly related to one exchange rate or the other.

The estimates for the manufacturing sector as a whole and for each 2-digit industry are in Tables 5–10. As a robustness check, the estimations were also made only for differentiated products. The estimates are in Tables A5–A10 in the Appendix.

Export Prices

The estimated ERPT into export prices for dollarized destinations differs greatly across industries (Table 5). In general, sectors that use a larger proportion of imported inputs have larger ERPT estimates than those that use mostly domestic inputs. For instance, manufacturers of apparel, leather, and wood products (ISIC 18–20) use the fewest imported inputs and, accordingly, have the lowest ERPT into export prices. ERPT estimates are significantly higher for producers of chemicals (ISIC 24) and of rubber and plastic products (ISIC 25), who rely heavily on imported inputs. The correlation by

[16] The sample includes all economies except the United States, dollarized economies (mainly Panama, Puerto Rico, Ecuador, and El Salvador), economies with currencies pegged to the dollar, and Venezuela.

industry between the ERPT estimates and the cross-year average of the share of imported inputs (Table 2) is 0.42.

The relationship between the ERPT estimates and the share of inputs in the production function is less clear, perhaps because of the lack of variation in the estimated values of α (Table 3). Notably, however, the estimated ERPT for the food industry (ISIC 15) is among the highest. Firms in this sector use a smaller share of imported inputs than the average manufacturer, but intermediate inputs are more important for the productive process of this sector than for any other. These results suggest that the marginal cost channel is important in explaining pass-through differences across exporting firms.

Estimates for the ERPT into export prices for other destinations include the results of two regressions for each industry: (1) the pass-through of the corresponding bilateral exchange rate and (2) the first regression with the peso/dollar exchange rate as an additional regressor. This procedure allows me to assess the relative importance of the two exchange rates for export prices. It also allows a check on how the use of imported inputs is related to each exchange rate.

When only the bilateral exchange rate is included (Tables 6–7, odd-numbered columns), the estimated ERPT values are still correlated with the intensity of use of imported inputs, but the relationship is not as clear as in the case of the dollarized economies. Producers of chemicals (ISIC 24), electrical machinery (ISIC 31) and vehicles and transport equipment (ISIC 34-35), all heavy users of imported inputs, have the largest pass-through. But the relationship is not clear for other sectors. The ERPT estimates for the bilateral exchange rate have a correlation coefficient of 0.10 for the

average share of imported inputs, and 0.06 for the share of intermediate inputs in production.

Once the peso/dollar exchange rate is included (Tables 6–7, even-numbered columns), it greatly reduces the effect of the bilateral exchange rate and, in most cases, it eliminates its effect completely. The estimated ERPT of the peso/dollar rate is more homogeneous across sectors, but estimates are still positively correlated with the use of imported inputs. The correlation in this case is 0.32, whereas the correlation with the estimates for the bilateral rate is -0.01. The correlation between both sets of estimates and the values for α is also low.

Import Prices

The estimated coefficients for the ERPT into import prices from dollarized economies (Table 8) are very similar across sectors (with the notable exception of ISIC 18), and the value does not seem to vary much with the share of imported inputs presented in Table 2. Excluding ISIC 18 from the calculations, the correlation between ERPT estimates and the average share of imported inputs is 0.11, much lower than in the case of export prices. This makes sense because strategic complementarities dampen the effect of the marginal cost channel on import prices. As illustrated by the model, the impact of imported inputs on the price of imports is indirect, affecting them only through the sellers' incentive to keep them close to those of local competitors.

Estimates for the ERPT into import prices from non-dollarized economies consist again of two sets: bilateral exchange rates only, and bilateral plus the peso/dollar rate (Tables 9-10). When only the bilateral rates are included, the coefficients do not vary much

across industries and they do not co-move with either the share of imported inputs or the share of inputs in production. As in the case of export prices, adding the peso/dollar exchange rate results in much lower coefficients. Moreover, with the addition of the peso/dollar rate, the share of imported inputs is positively correlated with the estimated pass-through of the peso/dollar rate (the correlation is 0.46) but not with the bilateral rate (-0.09). Neither set of estimates exhibits a clear correlation with the values for α.

4.3. Exchange Rate Pass-Through into Quantities

Besides being informative about pricing behavior, the analysis of the ERPT is important to understand the extent of expenditure switching that can follow exchange rate fluctuations. These potential changes in quantities are what ultimately matter for welfare. Given the substantial heterogeneity across industries in the ERPT into prices, the question that follows naturally is whether the ERPT into traded quantities is also heterogeneous.

The DCP model described in Section 2 predicts that the ERPT into exported quantities should be fairly small (if not entirely negligible), while imported quantities should be much more responsive to exchange rate variations. After taking a first order approximation, the ERPT to quantities exported (y_{Hi}) and imported (y_{iH}) is given by

$$\frac{\Delta y_{Hi}}{\Delta e_U} = -\sigma\left(\frac{\Delta p_{Hi}}{\Delta e_U} - \frac{\Delta e_i}{\Delta e_U}\right) \quad , \tag{12}$$

and

$$\frac{\Delta y_{iH}}{\Delta e_U} = -\sigma\left(\frac{\Delta p_{iH}}{\Delta e_U} - \frac{\Delta p}{\Delta e_U}\right) + \frac{\Delta y_d}{\Delta e_U} \quad . \tag{13}$$

It follows that the ERPT into quantities exported to dollarized economies (country U) is predicted to be around zero since $\frac{\Delta e_i}{\Delta e_U} = 1$ and $\frac{\Delta p_{Hi}}{\Delta e_U}$ is close to 1.[17] In the case of the exports to the rest of the world (country R), the effect will also depend on the co-movement between the exchange rates of U and R, $\frac{\Delta e_R}{\Delta e_U}$. Intuitively, if both exchange rates are highly correlated, the change in the quantities exported to R will be mostly flat (as in the case of U); however, if the correlation is lower, a home currency depreciation relative to the dominant currency will lead to a decline in the exports to R because of its now weaker currency.

In the case of the ERPT into imported quantities, given that $\frac{\Delta p_{iH}}{\Delta e_U}$ is also close to 1, it follows that, after controlling for demand (y_d) and home competitor prices (p), the quantities are almost as sensitive as the elasticity of demand (σ).[18] Furthermore, in all cases, the only exchange rate that matters is the one with respect to the dominant currency (e_U) and not the bilateral rate (e_R).

To test the sensitivity of exported and imported quantities to changes in exchange rates, the log change of the volume of exports (imports) is regressed on the log change of the annual average exchange rate and on additional controls. Quantities are measured in

[17] This last term accounts for the ERPT into prices and is the channel through which differences in industry features can affect quantity responses.

[18] Again, differences in the ERPT into import prices can affect quantity responses.

net kilograms and, again, observations are at the 10-digit product/firm/country of destination (origin) level. As in the case of prices, I estimate the pass-through separately for dollarized and non-dollarized economies. For transactions with the United States and other trade partners that use the US dollar as their currency, I estimate

$$\Delta q_{ij,t} = \alpha + \beta \Delta e_{U,t} + X_t + \epsilon_t, \tag{14}$$

where $\mathcal{E}_{U,t}$ is the average nominal exchange rate of the Colombian peso relative to the dollar; and X_t includes price indices for Colombia and the corresponding country of destination (origin), the buyer's GDP growth to account for demand effects, and fixed effects by firm-industry-country. For other trading partners, I estimate

$$\Delta q_{ij,t} = \alpha + \beta_B \Delta e_{B,t} + \beta_U \Delta e_{U,t} + X_t + \epsilon_t, \tag{15}$$

where $\mathcal{E}_{B,t}$ is the average nominal bilateral exchange rate of the Colombian peso relative to the local currency unit, and $\mathcal{E}_{U,t}$ is the average nominal exchange rate of the Colombian peso relative to the dollar. All standard errors are clustered by year.

The estimates are presented in Tables 11-16. Each set of destinations has estimates for the manufacturing sector as a whole and for each 2-digit industry. Again, the Appendix contains results for the subset of differentiated goods (Tables A-11-A-16).

Export Quantities

As predicted by the model, the response of exported quantities to dollarized economies is generally relatively small, and roughly half of the estimated coefficients are

statistically insignificant (Table 11). Moreover, as in the case or ERPT into prices, the response of quantities to exchange rate changes differs greatly across sectors, and the variation in industry-specific estimates is consistent with the predictions of the model. Some of the industries with a relatively high share of imported inputs (e.g., ISIC 24, 32) have high ERPT into prices that also results in a relatively large decrease in quantities. Sectors that rely more on domestic inputs and therefore have a lower ERPT into prices (e.g., ISIC 18, 19) do not adjust their exported quantities significantly. The ERPT estimates have a correlation coefficient of -0.36 for the share of imported inputs and -0.27 for the share of inputs in production.

The response of quantities for non-dollarized destinations is negligible for several industries (Tables 12-13). When quantities do respond, the relevant exchange rate is the peso/dollar rate. However, the relationship between the estimates and the use of imported inputs in production is less clear in this case; among the industries with the largest ERPT estimates are the two sectors that rely mostly on domestic inputs (ISIC 18 and 19) and sectors that use a high share of imported inputs (ISIC 24 and 34+35). In fact, contrary to the prediction of the model, the correlation between the two variables is positive.

Import Quantities

All import quantities, regardless of their country of origin, respond to changes in the peso/dollar exchange rate (Tables 14-16). For the aggregated manufacturing sector and for most individual industries, a peso depreciation is associated with a decrease in imports. Although the magnitude of the response varies somewhat across industries,

no clear relationship appears between the differences in ERPT estimates and the analyzed industry characteristics.

5. Concluding Remarks

This paper evaluates whether there is any heterogeneity in the impact of exchange rate fluctuations across manufacturing industries.

The paper first examines the use of imported intermediate inputs in production, a key feature known to affect the exchange rate pass-through, and finds that there are significant variations across industries. The heterogeneity can be explained mainly by differences in the share of imported inputs in firms' total input purchases; some sectors rely much more than others on imported inputs. Industries are also heterogeneous in the relative importance of intermediate inputs in production, although the differences in terms of technology are smaller.

The paper then estimates the exchange rate pass-through (ERPT) into export and import prices for the manufacturing sector as a whole and at the 2-digit industry level. It finds that the response of prices to exchange rate fluctuations varies greatly across industries. Despite these differences, the ERPT into trade prices is generally high (close to 1) for both exports and imports, and the most relevant exchange rate is the peso/dollar rate regardless of the destination or origin of trade.

Connecting the information on input use and the ERPT estimates at the industry level provides evidence of the effect of the marginal cost channel on the ERPT. It works mainly through the changes in cost that result from using imported inputs. Industries

with a higher share of imported inputs have a higher pass-through. As expected, the effect seems to be stronger in the case of export prices, while the effect on import prices is moderated by the presence of strategic complementarities.

Finally, the paper estimates the exchange rate pass-through into exported and imported quantities. Changes in the peso/dollar exchange rate have a relatively small effect on Colombian exports, even negligible for some industries, but have a significant effect on all imports regardless of origin. Although the size of the estimated ERPT into quantities differs across industries, no clear pattern relates these estimates to the use of imported inputs.

References

Amiti, M., Itskhoki, O., and Konings, J. (2014): "Importers, Exporters, and Exchange Rate Disconnect," *American Economic Review*, *104*(7), 1942–1978.

Amiti, M., Itskhoki, O., and Konings, J. (2018): "International Shocks, Variable Markups and Domestic Prices," Forthcoming in the *Review of Economic Studies*.

Atkeson Andrew, and Burstein, A. (2008): "Trade Costs, Pricing-to-Market, and International Relative Prices," *American Economic Review*, *98*(5), 1998–2031.

Auer, R. A., and Schoenle, R. S. (2016): "Market structure and exchange rate pass-through," *Journal of International Economics*, *98*, 60–77.

Berman, N., Martin, P., and Mayer, T. (2012): "How Do Different Exporters React to Exchange Rate Changes?," *Quarterly Journal of Economics*, *127*(1), 437–492.

Burstein, A., and Gopinath, G. (2014: "International Prices and Exchange Rates," in *Handbook of International Economics*, ed. by G. Gopinath, E. Helpman, and K. Rogoff, Vol. 4, pp. 391–451. Elsevier.

Burstein, A., Neves, J., and Rebelo, S. (2003): "Distribution costs and real exchange dynamics?," *Journal of Monetary Economics*, *50*, 1189–1214.

Bussière, M., Delle Chiaie, S., and Peltonen, T. A. (2014): "Exchange Rate Pass-Through in the Global Economy: The Role of Emerging Market Economies," *IMF Economic Review*, *62*(1), 146–178.

Campa, J. M., and Goldberg, L. S. (2005): "Exchange Rate Pass-Through into Import Prices," *The Review of Economics and Statistics*, *87*(4), 679–690.

Casas, C., Díez, F., Gopinath, G., and Gourinchas, P.-O. (2017): "Dominant Currency Paradigm," IMF Working Paper No. 17/264.

Chen, N., and Juvenal, L. (2016): "Quality, trade, and exchange rate pass-through," *Journal of International Economics*, *100*, 61–80.

Fauceglia, D., Shingal, A., and Wermelinger, M. (2014): "Natural Hedging of Exchange Rate Risk: The Role of Imported Input Prices," *Swiss Journal of Economics and Statistics*, *150*(4), 261–296.

Fitzgerald, D., and Haller, S. (2014): "Pricing-to-Market: Evidence From Plant-Level Prices," *Review of Economic Studies*, *81*(2), 761–786.

Gandhi, A., Navarro, S., and Rivers, D. (2017): "On the Identification of Gross Output Production Functions," Working Paper.

Garetto, S. (2016): "Firms' heterogeneity, incomplete information, and pass-through," *Journal of International Economics*, *101*, 168–179.

Goldberg, P. K., and Hellerstein, R. (2008): "A Structural Approach to Explaining Incomplete Exchange-Rate Pass-Through and Pricing-to-Market," *American Economic Review*, *98*(2), 423–429.

Gopinath, G., Itskhoki, O., and Rigobon, R. (2010): "Currency Choice and Exchange Rate Pass-Through," *American Economic Review*, *100*(1), 304–336.

Greenaway, D., Kneller, R., and Zhang, X. (2010): "The Effect of Exchange Rates on Firm Exports: The Role of Imported Intermediate Inputs," *The World Economy*, *33*(8), 961–986.

Rincón-Castro, H., and Rodríguez-Niño, N. (2018): "Nonlinear state and shock dependence of exchange rate pass-through on prices," BIS Working Paper No. 690.

Tables

Table 1: Industry Codes (ISIC Rev. 3.1)

Code	Description
15	Manufacture of food products and beverages
16	Manufacture of tobacco products
17	Manufacture of textiles
18	Manufacture of wearing apparel; dressing and dyeing of fur
19	Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear
20	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
21	Manufacture of paper and paper products
22	Publishing, printing and reproduction of recorded media
23	Manufacture of coke, refined petroleum products and nuclear fuel
24	Manufacture of chemicals and chemical products
25	Manufacture of rubber and plastics products
26	Manufacture of other non-metallic mineral products
27	Manufacture of basic metals
28	Manufacture of fabricated metal products, except machinery and equipment
29	Manufacture of machinery and equipment n.e.c.
30	Manufacture of office, accounting and computing machinery
31	Manufacture of electrical machinery and apparatus n.e.c.
32	Manufacture of radio, television and communication equipment and apparatus
33	Manufacture of medical, precision and optical instruments, watches and clocks
34	Manufacture of motor vehicles, trailers and semi-trailers
35	Manufacture of other transport equipment
36	Manufacture of furniture; manufacturing n.e.c.

Table 2: Average Share of Imported Inputs (%)

ISIC	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
15	17,3	20,5	18,2	18,9	20,3	22,0	20,2	21,0	19,6	17,9	18,6	18,7
17	27,5	26,1	25,7	27,0	27,2	28,2	26,7	27,2	33,0	34,0	28,7	30,6
18	9,1	9,5	11,0	9,8	10,6	13,7	10,4	13,2	12,9	13,2	14,6	14,0
19	7,6	7,1	8,8	8,0	9,7	9,3	10,1	7,7	7,7	9,3	10,6	11,0
20	5,1	4,6	11,7	5,9	6,2	24,6	15,7	5,5	9,6	18,7	18,5	20,3
21-22	26,9	31,0	27,7	27,2	27,2	29,9	23,5	27,1	26,2	25,3	27,5	27,6
24	33,6	34,8	34,8	30,4	29,8	30,3	29,3	30,3	29,2	27,7	26,7	29,6
25	34,7	35,3	33,2	34,3	31,3	33,2	34,7	35,3	33,1	33,1	34,7	36,3
26	25,6	28,9	27,4	30,0	26,2	30,4	29,3	26,2	25,5	26,7	28,1	29,8
28	25,5	26,9	25,0	22,9	22,1	25,7	24,1	23,2	21,6	23,4	24,8	23,1
29	21,0	18,7	19,1	18,0	20,0	20,1	19,1	18,2	20,4	20,1	18,4	20,3
31	30,5	32,8	31,7	25,3	31,0	34,7	28,1	28,7	27,6	22,5	26,2	28,2
32	23,5	28,3	26,0	30,5	27,0	37,1	51,5	38,9	36,9	39,3	45,5	39,1
33	25,3	31,1	42,1	33,9	31,8	35,8	28,2	29,0	27,5	25,8	27,9	30,8
34-35	28,6	29,3	28,0	25,5	23,7	28,0	27,9	25,9	23,8	21,8	25,2	27,8
36	19,2	19,5	18,0	19,4	16,9	19,0	16,8	15,9	13,8	16,1	18,9	18,6
Overall	22,6	24,1	23,4	22,8	22,6	24,8	23,1	23,3	22,8	22,7	23,5	24,3

Source: Author's calculations based on data from EAM (DANE-Encuesta Anual Manufacturera, 2004-2015)

Notes: Averages calculated for the subsample of firms participating in international markets. In order to avoid disclosing confidential information, I do not report sector-specific statistics for ISIC 16 and 30; firms in these industries are included in the overall manufacturing averages. Producers of coke, refined petroleum, and nuclear fuel (ISIC 23), and basic metals (ISIC 27) are excluded.

Table 3: Estimated Share of Intermediate Inputs in Production

ISIC		S.E
15	0,54	(0,0055)
17	0,44	(0,0144)
18	0,38	(0,0104)
19	0,51	(0,0089)
20	0,52	(0,0101)
21	0,38	(0,0265)
24	0,40	(0,0078)
25	0,52	(0,0063)
26	0,46	(0,0065)
28	0,46	(0,0083)
29	0,41	(0,0093)
31	0,46	(0,0236)
32	0,38	(0,0412)
33	0,33	(0,0244)
34	0,50	(0,0137)
36	0,47	(0,0067)
Overall	0,45	(0,0041)

Source: Author's estimations based on data from EAM (Dane-Encuesta Annual Manufacturera, 2004-2015)

Notes: Parameters and standard Errors estimated for a production function of the form $Y_t = e^{a_t} X_t^{\alpha} L_t^{\beta}$ following the method proposed by Gandhi, Navarro, and Rivers (2017). All estimates are significant at the 1% level. Overall manufacturing estimates include firms in ISIC 16 and ISIC 30 and exclude those in ISIC 23 and ISIC 27.

Table 4: Currency Distribution by Industry (%), 2007-2014.

ISIC	USD	Euro	COP	VEB/VEF	GBP	MXN	Other
15	97,24	0,57	0,28	1,84	0,00	0,05	0,01
17	99,30	0,38	0,08	0,13	0,01	0,07	0,03
18	99,18	0,44	0,09	0,20	0,02	0,01	0,05
19	97,61	1,97	0,32	0,05	0,00	0,00	0,05
20	98,07	1,03	0,86	0,02	0,00	0,00	0,02
21-22	97,20	0,24	2,38	0,13	0,00	0,00	0,05
24	98,77	0,62	0,58	0,00	0,01	0,00	0,02
25	96,89	1,85	1,16	0,02	0,05	0,00	0,03
26	98,70	0,46	0,11	0,73	0,00	0,00	0,01
28	99,28	0,34	0,15	0,21	0,01	0,00	0,01
29	98,28	1,09	0,19	0,41	0,01	0,00	0,02
31	98,23	1,52	0,23	0,01	0,00	0,00	0,02
32	99,41	0,44	0,12	0,00	0,01	0,00	0,03
33	97,75	1,44	0,66	0,06	0,02	0,00	0,06
34-35	99,49	0,33	0,06	0,11	0,00	0,00	0,01
36	98,85	0,77	0,22	0,07	0,01	0,00	0,08
Overall	98,39	0,70	0,52	0,33	0,01	0,01	0,03

Source: Author's calculations based on data from DIAN/DANE

Notes: The distribution is calculated for the number of invoices in each currency. In order to avoid disclosing confidential information, I do not report sector-specific statistics for ISIC 16 and 30; firms in these industries are included in the overall manufacturing averages. Exports of coke, refined petroleum, and nuclear fuel (ISIC 23), and basic metals (ISIC 27) excluded.

Table 5: ERPT into Export Prices (Dollarized Economies)

	(1) Δp_{COP}	(2) Δp_{COP}	(3) Δp_{COP}	(4) Δp_{COP}	(5) Δp_{COP}	(6) Δp_{COP}	(7) Δp_{COP}	(8) Δp_{COP}	(9) Δp_{COP}
$\Delta_{eCOP/USD}$	0.843***	1.077***	0.710***	0.634***	0.734***	0.509	0.471**	1.083***	1.093***
	(0.0341)	(0.122)	(0.113)	(0.134)	(0.201)	(0.490)	(0.160)	(0.0412)	(0.0753)
Observations	173,248	10,398	12,900	35,402	7,756	1,534	14,441	24,725	13,251
R-squared	0.367	0.342	0.435	0.350	0.395	0.512	0.338	0.321	0.359
Industry	M	16	17	18	19	20	21-22	24	25

	(10) Δp_{COP}	(11) Δp_{COP}	(12) Δp_{COP}	(13) Δp_{COP}	(14) Δp_{COP}	(15) Δp_{COP}	(16) Δp_{COP}	(17) Δp_{COP}
$\Delta_{eCOP/USD}$	0.987***	1.114***	0.813***	0.577	0.722	1.214***	0.643**	0.977***
	(0.119)	(0.152)	(0.176)	(0.361)	(0.461)	(0.353)	(0.284)	(0.231)
Observations	5,115	10,451	11,239	5,602	1,495	3,331	5,222	9,607
R-squared	0.387	0.385	0.364	0.390	0.473	0.402	0.262	0.395
Industry	26	28	29	31	32	33	34-35	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. The sample includes all manufactured products (M) excluding petrochemicals and basic metals in column (1), and all products from each 2-digit industry in columns (2)-(17). The export destinations are the dollarized economies: USA, Panama, Puerto Rico, Ecuador, and El Salvador. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 6: ERPT into Export Prices (Non-Dollarized Economies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.534***	0.0999*	0.212*	0.0421	0.614***	0.168	0.392**	0.0743	0.707**	0.0419
	(0.128)	(0.0491)	(0.117)	(0.0597)	(0.125)	(0.117)	(0.139)	(0.165)	(0.259)	(0.244)
$\Delta e_{COP/USD}$		0.622***		0.507***		0.523***		0.521***		0.796**
		(0.0563)		(0.121)		(0.114)		(0.164)		(0.265)
Observations	148,912	148,912	14,556	14,556	12,179	12,179	34,191	34,191	6,575	6,575
R-squared	0.377	0.379	0.367	0.371	0.400	0.402	0.368	0.369	0.378	0.381
Industry	M	M	15	15	17	17	18	18	19	19

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	-1.459*	-1.825**	0.0426	-0.570*	1.134***	0.385**	0.642***	0.0908
	(0.743)	(0.810)	(0.286)	(0.299)	(0.132)	(0.127)	(0.103)	(0.162)
$\Delta e_{COP/USD}$		0.492		0.735***		0.789***		0.617***
		(0.751)		(0.137)		(0.107)		(0.129)
Observations	943	943	12,049	12,049	21,459	21,459	11,234	11,234
R-squared	0.531	0.532	0.361	0.362	0.324	0.328	0.325	0.327
Industry	20	20	21+22	21+22	24	24	25	25

Table 7: ERPT into Export Prices (Non- Dollarized Economies), continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.678***	0.115	0.794***	0.0901	0.740*	0.509	1.200***	1.094***
	(0.203)	(0.164)	(0.237)	(0.233)	(0.390)	(0.574)	(0.179)	(0.293)
$\Delta e_{COP/USD}$		0.703***		0.800***		0.264		0.117
		(0.116)		(0.164)		(0.326)		(0.164)
Observations	4,165	4,165	7,221	7,221	6,758	6,758	3,793	3,793
R-squared	0.364	0.367	0.452	0.454	0.434	0.434	0.427	0.427
Industry	26	26	28	28	29	29	31	31

	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	-1.336	-2.353*	0.496	0.244	1.143***	0.431	0.507*	0.171
	(0.825)	(1.090)	(0.509)	(0.363)	(0.310)	(0.558)	(0.236)	(0.361)
$\Delta e_{COP/USD}$		1.313		0.590**		0.896		0.433*
		(1.070)		(0.261)		(0.631)		(0.225)
Observations	1,065	1,065	2,812	2,812	1,672	1,672	7,488	7,488
R-squared	0.443	0.446	0.422	0.423	0.400	0.402	0.357	0.357
Industry	32	32	33	33	34+35	34+35	36	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. The sample includes all manufactured products (M) excluding petrochemicals and basic metals in columns (1)- (2), and all products from each 2-digit industry in columns (3)--(34). The export destinations include all countries except the dollarized economies, economies with currencies pegged to the dollar, and Venezuela. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 8: ERPT into Import Prices (Dollarized Economies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/USD}$	1.049***	0.919***	1.072***	2.211*	0.760*	1.293***	1.525***	1.078***	1.107***
	(0.0492)	(0.0914)	(0.148)	(1.016)	(0.389)	(0.299)	(0.153)	(0.0605)	(0.0546)
Observations	566,324	14,351	12,349	11,059	4,156	1,596	20,244	76,462	48,740
R-squared	0.302	0.330	0.410	0.561	0.426	0.441	0.343	0.269	0.289
Industry	M	15	17	18	19	20	21+22	24	25

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/USD}$	1.014***	1.035***	1.036***	1.018***	0.986***	0.911***	0.858***	1.021***
	(0.188)	(0.100)	(0.0790)	(0.113)	(0.133)	(0.0729)	(0.0821)	(0.226)
Observations	10,059	57,734	129,098	55,910	22,332	48,537	30,764	13,967
R-squared	0.347	0.300	0.272	0.291	0.363	0.272	0.248	0.399
Industry	26	28	29	31	32	33	34+35	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. The sample includes all manufactured products (M) excluding petrochemicals and basic metals in column (1), and all products from each 2-digit industry in columns (2)--(17). Imports originate from the dollarized economies: USA, Panama, Puerto Rico, Ecuador, and El Salvador. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 9: ERPT into Import Prices (Non-Dollarized Economies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.512***	0.280***	0.615***	0.371**	0.651***	0.262**	0.684***	0.322	0.381***	0.119
	(0.133)	(0.0883)	(0.180)	(0.125)	(0.103)	(0.0860)	(0.204)	(0.229)	(0.114)	(0.230)
$\Delta e_{COP/USD}$		0.535***		0.525***		0.618***		0.496***		0.427*
		(0.0525)		(0.0716)		(0.0904)		(0.127)		(0.228)
Observations	853,518	853,518	21,417	21,417	39,369	39,369	18,309	18,309	9,754	9,754
R-squared	0.360	0.362	0.388	0.394	0.459	0.463	0.556	0.557	0.485	0.486
Industry	M	M	15	15	17	17	18	18	19	19

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.545***	0.112	0.487	0.194	0.663***	0.389***	0.498**	0.247**
	(0.102)	(0.187)	(0.280)	(0.216)	(0.116)	(0.122)	(0.162)	(0.112)
$\Delta e_{COP/USD}$		0.657***		0.832***		0.434***		0.580***
		(0.171)		(0.152)		(0.0649)		(0.0848)
Observations	4,523	4,523	34,091	34,091	121,827	121,827	74,437	74,437
R-squared	0.504	0.506	0.395	0.396	0.289	0.291	0.365	0.367
Industry	20	20	21+22	21+22	24	24	25	25

Table 10: ERPT into Import Prices (Non-Dollarized Economies), continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.435**	0.165**	0.720***	0.487***	0.550***	0.354***	0.316*	0.151
	(0.153)	(0.0658)	(0.111)	(0.111)	(0.122)	(0.0757)	(0.170)	(0.0979)
$\Delta e_{COP/USD}$		0.708***		0.407***		0.485***		0.596***
		(0.0700)		(0.101)		(0.0427)		(0.0617)
Observations	22,375	22,375	83,029	83,029	160,207	160,207	76,679	76,679
R-squared	0.431	0.435	0.344	0.344	0.340	0.342	0.361	0.364
Industry	26	26	28	28	29	29	31	31

	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.590***	0.132	0.282	0.137	0.529***	0.320***	0.634***	0.391*
	(0.140)	(0.199)	(0.193)	(0.116)	(0.0825)	(0.0876)	(0.172)	(0.179)
$\Delta e_{COP/USD}$		0.785***		0.630***		0.497***		0.373**
		(0.160)		(0.111)		(0.0744)		(0.135)
Observations	20,584	20,584	49,442	49,442	76,985	76,985	36,043	36,043
R-squared	0.463	0.465	0.347	0.349	0.234	0.239	0.452	0.453
Industry	32	32	33	33	34+35	34+35	36	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. The sample includes all manufactured products (M) excluding petrochemicals and basic metals in columns (1)--(2), and all products from each 2-digit industry in columns (3)--(34). Imports originate from countries other than the dollarized economies, economies with currencies pegged to the dollar, and Venezuela. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 11: ERPT into Export Quantities (Dollarized Economies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/USD}$	-1.026**	-1.263***	-1.385***	-0.787	-0.893	-1.014	-0.645	-1.456***	-0.963**
	(0.356)	(0.312)	(0.419)	(0.762)	(0.697)	(0.990)	(0.367)	(0.335)	(0.410)
Observations	173,248	10,398	12,900	35,402	7,756	1,534	14,441	24,725	13,251
R-squared	0.300	0.297	0.300	0.319	0.333	0.445	0.299	0.247	0.287
Industry	M	15	17	18	19	20	21+22	24	25

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/USD}$	-0.820	-1.023**	-0.269	-0.685	-2.560***	-0.830*	-0.881	-1.348**
	(0.653)	(0.430)	(0.256)	(0.492)	(0.791)	(0.384)	(0.531)	(0.489)
Observations	5,115	10,451	11,239	5,602	1,495	3,331	5,222	9,607
R-squared	0.288	0.311	0.295	0.311	0.445	0.302	0.201	0.326
Industry	26	28	29	31	32	33	34+35	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. The sample includes all manufactured products (M) excluding petrochemicals and basic metals in column (1), and all products from each 2-digit industry in columns (2)--(17). The export destinations are the dollarized economies: USA, Panama, Puerto Rico, Ecuador, and El Salvador. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 12: ERPT into Export Quantities (Non-Dollarized Economies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-0.985***	-0.0823	-0.0888	0.187	-1.641***	-0.596	-1.446***	-0.385	-0.557	0.932
	(0.203)	(0.314)	(0.217)	(0.215)	(0.512)	(0.600)	(0.323)	(0.528)	(0.714)	(1.097)
$\Delta e_{COP/USD}$		-1.263***		-0.808**		-1.182**		-1.657**		-1.755**
		(0.289)		(0.321)		(0.506)		(0.602)		(0.677)
Observations	148,912	148,912	14,556	14,556	12,179	12,179	34,191	34,191	6,575	6,575
R-squared	0.320	0.322	0.296	0.297	0.314	0.315	0.342	0.344	0.337	0.340
Industry	M	M	15	15	17	17	18	18	19	19

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-1.097	0.210	-0.853*	0.362	-1.393***	-0.0768	-1.027**	0.266
	(1.919)	(2.092)	(0.449)	(0.604)	(0.271)	(0.540)	(0.463)	(0.844)
$\Delta e_{COP/USD}$		-1.707		-1.409**		-1.390***		-1.428**
		(2.824)		(0.476)		(0.433)		(0.526)
Observations	943	943	12,049	12,049	21,459	21,459	11,234	11,234
R-squared	0.536	0.538	0.294	0.296	0.268	0.270	0.293	0.295
Industry	20	20	21+22	21+22	24	24	25	25

Table 13: ERPT into Export Quantities (Non-Dollarized Economies), continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-1.417**	-0.904	-0.723***	-0.194	-1.008**	-0.254	-1.522**	-1.006
	(0.498)	(0.854)	(0.201)	(0.478)	(0.426)	(0.926)	(0.556)	(1.232)
$\Delta e_{COP/USD}$		-0.627		-0.591		-0.850		-0.570
		(0.532)		(0.388)		(0.893)		(0.849)
Observations	4,165	4,165	7,221	7,221	6,758	6,758	3,793	3,793
R-squared	0.296	0.296	0.347	0.347	0.354	0.355	0.372	0.372
Industry	26	26	28	28	29	29	31	31

	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	1.579	2.960	-0.678**	-0.515	-1.082	0.389	-0.873*	0.312
	(1.412)	(1.915)	(0.302)	(0.324)	(1.163)	(1.514)	(0.450)	(0.755)
$\Delta e_{COP/USD}$		-1.689		-0.395		-1.790**		-1.500*
		(1.121)		(0.521)		(0.734)		(0.705)
Observations	1,065	1,065	2,812	2,812	1,672	1,672	7,488	7,488
R-squared	0.398	0.400	0.352	0.352	0.286	0.288	0.345	0.347
Industry	32	32	33	33	34+35	34+35	36	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. The sample includes all manufactured products (M) excluding petrochemicals and basic metals in columns (1)--(2), and all products from each 2-digit industry in columns (3)--(34). The export destinations include all countries except the dollarized economies, economies with currencies pegged to the dollar, and Venezuela. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 14: ERPT into Import Quantities (Dollarized Economies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/USD}$	-1.491***	-1.693***	-1.812**	-5.524***	-1.529	-1.911*	-1.920***	-1.594***	-1.517***
	(0.325)	(0.526)	(0.710)	(1.599)	(1.982)	(0.875)	(0.422)	(0.354)	(0.409)
Observations	566,346	14,354	12,349	11,060	4,157	1,596	20,244	76,462	48,741
R-squared	0.261	0.334	0.363	0.468	0.425	0.349	0.314	0.236	0.261
Industry	M	15	17	18	19	20	21+22	24	25

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/USD}$	-1.090	-1.678***	-1.300***	-1.177***	-1.758***	-1.194***	-1.698***	-1.412**
	(0.612)	(0.369)	(0.290)	(0.319)	(0.369)	(0.266)	(0.207)	(0.533)
Observations	10,059	57,734	129,100	55,910	22,332	48,541	30,771	13,970
R-squared	0.293	0.267	0.228	0.237	0.341	0.233	0.177	0.366
Industry	26	28	29	31	32	33	34+35	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. The sample includes all manufactured products (M) excluding petrochemicals and basic metals in column (1), and all products from each 2-digit industry in columns (2)--(17). Imports originate from the dollarized economies: USA, Panama, Puerto Rico, Ecuador, and El Salvador. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 15: ERPT into Import Quantities (Non-Dollarized Economies)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-0.814***	-0.226*	-1.049**	-0.366*	-1.534***	-0.257	-2.085*	-0.546	-1.641***	-0.183
	(0.248)	(0.125)	(0.388)	(0.177)	(0.315)	(0.277)	(1.041)	(1.115)	(0.366)	(0.580)
$\Delta e_{COP/USD}$		-1.143***		-1.171***		-1.713***		-1.865**		-1.984***
		(0.248)		(0.365)		(0.547)		(0.768)		(0.578)
Observations	853,629	853,629	21,430	21,430	39,377	39,377	18,354	18,354	9,758	9,758
R-squared	0.308	0.310	0.337	0.341	0.379	0.382	0.454	0.456	0.442	0.446
Industry	M	M	15	15	17	17	18	18	19	19

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-1.125**	0.103	-0.433	0.178	-0.989***	-0.0903	-0.914***	-0.224
	(0.484)	(0.885)	(0.484)	(0.270)	(0.188)	(0.249)	(0.275)	(0.183)
$\Delta e_{COP/USD}$		-1.616		-1.490***		-1.157***		-1.325***
		(0.928)		(0.438)		(0.296)		(0.291)
Observations	4,523	4,523	34,098	34,098	121,841	121,841	74,440	74,440
R-squared	0.463	0.465	0.357	0.360	0.260	0.262	0.326	0.328
Industry	20	20	21+22	21+22	24	24	25	25

Table 16: ERPT into Import Quantities (Non-Dollarized Economies), continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-0.618***	0.132	-1.176***	-0.512***	-0.699***	-0.304**	-0.478	-0.0751
	(0.146)	(0.319)	(0.172)	(0.136)	(0.188)	(0.131)	(0.271)	(0.113)
$\Delta e_{COP/USD}$		-1.672***		-0.964**		-0.814***		-1.240***
		(0.291)		(0.346)		(0.218)		(0.266)
Observations	22,378	22,378	83,032	83,032	160,209	160,209	76,680	76,680
R-squared	0.368	0.372	0.326	0.327	0.281	0.282	0.297	0.299
Industry	26	26	28	28	29	29	31	31

	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-0.957*	0.230	-0.300	-0.0105	-1.056***	-0.640**	-1.403***	-0.510*
	(0.508)	(0.649)	(0.264)	(0.0999)	(0.260)	(0.246)	(0.418)	(0.264)
$\Delta e_{COP/USD}$		-1.781**		-1.090***		-0.795***		-1.244***
		(0.619)		(0.263)		(0.151)		(0.384)
Observations	20,585	20,585	49,443	49,443	76,985	76,985	36,049	36,049
R-squared	0.386	0.388	0.297	0.299	0.168	0.169	0.410	0.411
Industry	32	32	33	33	34+35	34+35	36	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. The sample includes all manufactured products (M) excluding petrochemicals and basic metals in columns (1)--(2), and all products from each 2-digit industry in columns (3)--(34). Imports originate from countries other than the dollarized economies, economies with currencies pegged to the dollar, and Venezuela. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Appendix

Table A-1: ERPT into Export prices, with and Without Petrochemicals and Metals

	(1)	(2)	(3)	(4)	(5)	(6)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$			0.534***	0.0999*	0.543***	0.121**
			(0.128)	(0.0491)	(0.125)	(0.0467)
$\Delta e_{COP/USD}$	0.843***	0.839***		0.622***		0.605***
	(0.0341)	(0.0348)		(0.0563)		(0.0567)
Observations	173,248	176,652	148,912	148,912	152,300	152,300
R-squared	0.367	0.368	0.377	0.379	0.377	0.378
Destination	U	U	R	R	R	R
Products	No P&M	All M	No P&M	No P&M	All M	All M

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-2: ERPT into Import Prices, with and without Petrochemicals and Metals

	(1)	(2)	(3)	(4)	(5)	(6)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$			0.512***	0.280***	0.514***	0.285***
			(0.133)	(0.0883)	(0.129)	(0.0863)
$\Delta e_{COP/USD}$	1.049***	1.049***		0.535***		0.526***
	(0.0492)	(0.0453)		(0.0525)		(0.0492)
Observations	566,324	585,204	853,518	853,518	877,926	877,926
R-squared	0.302	0.302	0.360	0.362	0.361	0.362
Origin	U	U	R	R	R	R
Products	No P&M	All M	No P&M	No P&M	All M	All M

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-3: ERPT into Export Quantities, with and without Petrochemicals and Metals

	(1)	(2)	(3)	(4)	(5)	(6)
	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$			-0.985***	-0.0823	-0.982***	-0.0702
			(0.203)	(0.314)	(0.203)	(0.310)
$\Delta e_{COP/USD}$	-1.026**	-1.029**		-1.263***		-1.276***
	(0.356)	(0.358)		(0.289)		(0.288)
Observations	173,248	176,652	148,912	148,912	152,300	152,300
R-squared	0.300	0.301	0.320	0.322	0.320	0.322
Destination	U	U	R	R	R	R
Products	No P&M	All M	No P&M	No P&M	All M	All M

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-4: ERPT into Import Quantities, with and without Petrochemicals and Metals

	(1)	(2)	(3)	(4)	(5)	(6)
	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$			-0.814***	-0.226*	-0.828***	-0.231*
			(0.248)	(0.125)	(0.248)	(0.124)
$\Delta e_{COP/USD}$	-1.491***	-1.494***		-1.143***		-1.152***
	(0.325)	(0.321)		(0.248)		(0.248)
Observations	566,346	585,226	853,629	853,629	878,038	878,038
R-squared	0.261	0.261	0.308	0.310	0.309	0.311
Origin	U	U	R	R	R	R
Products	No P&M	All M	No P&M	No P&M	All M	All M

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 5: ERPT into Export Prices (Dollarized Economies, Differentiated Products)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/USD}$	0.820***	1.208***	0.719***	0.649***	0.633**	1.161	0.251*	0.923***	1.144***
	(0.0561)	(0.204)	(0.105)	(0.130)	(0.251)	(0.655)	(0.118)	(0.137)	(0.122)
Observations	107,893	5,421	10,728	34,954	5,486	362	4,161	6,800	9,202
R-squared	0.375	0.355	0.433	0.343	0.378	0.410	0.356	0.351	0.360
Industry	D	15	17	18	19	20	21+22	24	25

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/USD}$	1.099***	1.110***	0.660***	0.606	1.151	1.718**	0.350	1.088***
	(0.153)	(0.180)	(0.195)	(0.488)	(0.742)	(0.646)	(0.560)	(0.266)
Observations	3,888	8,125	5,714	3,413	797	1,497	1,385	5,699
R-squared	0.363	0.399	0.392	0.373	0.478	0.416	0.261	0.411
Industry	26	28	29	31	32	33	34+35	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. The sample includes differentiated manufactured products (D) excluding petrochemicals and basic metals in column (1), and all products from each 2-digit industry in columns (2)--(17). The export destinations are the dollarized economies: USA, Panama, Puerto Rico, Ecuador, and El Salvador. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-6: ERPT into Export Prices (Non-Dollarized Economies, Differentiated Products)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.533***	0.0741	0.350	-0.131*	0.603***	0.158	0.395**	0.0776	0.516	-0.115
	(0.140)	(0.0749)	(0.248)	(0.0690)	(0.139)	(0.107)	(0.141)	(0.163)	(0.343)	(0.352)
$\Delta e_{COP/USD}$		0.649***		1.124***		0.529***		0.520***		0.752*
		(0.0812)		(0.175)		(0.113)		(0.161)		(0.382)
Observations	91,694	91,694	5,244	5,244	10,438	10,438	33,777	33,777	4,411	4,411
R-squared	0.387	0.389	0.358	0.368	0.399	0.400	0.367	0.369	0.374	0.377
Industry	D	D	15	15	17	17	18	18	19	19

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	-0.0887	-0.778	0.374	-0.278	1.282***	0.907***	0.695***	-0.0488
	(1.520)	(2.483)	(0.448)	(0.644)	(0.151)	(0.178)	(0.104)	(0.257)
$\Delta e_{COP/USD}$		1.084		0.752**		0.378***		0.848***
		(1.853)		(0.302)		(0.0859)		(0.185)
Observations	154	154	3,811	3,811	5,392	5,392	7,658	7,658
R-squared	0.554	0.556	0.364	0.366	0.410	0.411	0.342	0.345
Industry	20	20	21+22	21+22	24	24	25	25

Table A-7: ERPT into Export Prices (Non-Dollarized Economies, Differentiated Products), continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.715***	0.0351	0.612**	-0.0739	0.888**	0.496	1.368***	0.912
	(0.209)	(0.174)	(0.264)	(0.204)	(0.378)	(0.455)	(0.310)	(0.513)
$\Delta e_{COP/USD}$		0.767***		0.783***		0.446		0.483
		(0.136)		(0.178)		(0.403)		(0.373)
Observations	2,491	2,491	5,726	5,726	3,536	3,536	2,291	2,291
R-squared	0.344	0.347	0.463	0.465	0.420	0.420	0.420	0.420
Industry	26	26	28	28	29	29	31	31

	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	-1.455	-1.812	0.190	0.0936	1.426**	1.060	0.532	0.0601
	(0.994)	(1.289)	(0.540)	(0.417)	(0.462)	(0.995)	(0.366)	(0.432)
$\Delta e_{COP/USD}$		0.476		0.419		0.430		0.633**
		(0.989)		(0.637)		(0.909)		(0.241)
Observations	621	621	1,124	1,124	499	499	4,403	4,403
R-squared	0.436	0.437	0.426	0.426	0.477	0.477	0.395	0.397
Industry	32	32	33	33	34+35	34+35	36	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. The sample includes differentiated manufactured products (D) excluding petrochemicals and basic metals in columns (1)--(2), and all products from each 2-digit industry in columns (3)--(34). The export destinations include all countries except the dollarized economies, economies with currencies pegged to the dollar, and Venezuela. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table 8: ERPT into Import Prices (Dollarized Economies, Differentiated Products)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/USD}$	1.020***	1.110***	1.095***	2.206*	0.938**	0.920	1.397***	1.075***	1.159***
	(0.0559)	(0.192)	(0.178)	(1.014)	(0.353)	(1.397)	(0.274)	(0.0896)	(0.0799)
Observations	293,554	5,347	9,998	10,940	3,718	98	4,495	23,366	29,547
R-squared	0.312	0.321	0.403	0.559	0.442	0.306	0.378	0.297	0.290
Industry	D	15	17	18	19	20	21+22	24	25

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/USD}$	0.967***	1.006***	0.957***	0.946***	0.894***	0.845***	0.867***	1.254***
	(0.194)	(0.110)	(0.0462)	(0.105)	(0.143)	(0.0735)	(0.132)	(0.260)
Observations	7,629	45,305	58,991	35,540	11,153	22,553	12,112	8,204
R-squared	0.322	0.299	0.294	0.267	0.365	0.290	0.237	0.418
Industry	26	28	29	31	32	33	34+35	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. The sample includes differentiated manufactured products (D) excluding petrochemicals and basic metals in column (1), and all products from each 2-digit industry in columns (2)--(17). Imports originate from the dollarized economies: USA, Panama, Puerto Rico, Ecuador, and El Salvador. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-9: ERPT into Import Prices (Non-Dollarized Economies, Differentiated Products)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.535***	0.296**	0.867***	0.561***	0.670***	0.267**	0.705***	0.332	0.193*	-0.0255
	(0.150)	(0.109)	(0.0884)	(0.100)	(0.101)	(0.0893)	(0.202)	(0.226)	(0.101)	(0.226)
$\Delta e_{COP/USD}$		0.527***		0.493***		0.633***		0.511***		0.357
		(0.0657)		(0.109)		(0.0988)		(0.138)		(0.264)
Observations	440,856	440,856	8,318	8,318	28,712	28,712	17,712	17,712	7,951	7,951
R-squared	0.371	0.373	0.363	0.368	0.455	0.458	0.550	0.552	0.489	0.490
Industry	D	D	15	15	17	17	18	18	19	19

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.423	-0.0175	0.824**	0.304	0.645***	0.343***	0.452**	0.225
	(0.372)	(0.381)	(0.299)	(0.446)	(0.0753)	(0.0886)	(0.190)	(0.131)
$\Delta e_{COP/USD}$		0.750**		0.821**		0.493***		0.574***
		(0.303)		(0.355)		(0.0677)		(0.106)
Observations	401	401	7,846	7,846	32,730	32,730	46,414	46,414
R-squared	0.583	0.588	0.402	0.403	0.327	0.329	0.364	0.366
Industry	20	20	21+22	21+22	24	24	25	25

Table A-10: ERPT into Import Prices (Non-Dollarized Economies, Differentiated Products), continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.626***	0.226*	0.782***	0.540***	0.614***	0.424***	0.322*	0.160
	(0.145)	(0.113)	(0.124)	(0.119)	(0.142)	(0.105)	(0.171)	(0.106)
$\Delta e_{COP/USD}$		0.748***		0.415***		0.430***		0.579***
		(0.0723)		(0.105)		(0.0395)		(0.0735)
Observations	16,783	16,783	63,870	63,870	74,394	74,394	48,393	48,393
R-squared	0.412	0.417	0.351	0.351	0.353	0.354	0.358	0.360
Industry	26	26	28	28	29	29	31	31

	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}	Δp_{COP}
$\Delta e_{COP/LCU}$	0.683***	0.236	0.243	0.0955	0.578***	0.374***	0.726***	0.572***
	(0.142)	(0.232)	(0.222)	(0.134)	(0.0767)	(0.116)	(0.152)	(0.148)
$\Delta e_{COP/USD}$		0.804***		0.642***		0.442***		0.196
		(0.222)		(0.103)		(0.116)		(0.132)
Observations	10,613	10,613	24,350	24,350	26,321	26,321	23,841	23,841
R-squared	0.454	0.455	0.370	0.373	0.226	0.229	0.449	0.449
Industry	32	32	33	33	34+35	34+35	36	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs. Standard errors clustered at the year level. The sample includes differentiated manufactured products (D) excluding petrochemicals and basic metals in columns (1)--(2), and all products from each 2-digit industry in columns (3)--(34). Imports originate from countries other than the dollarized economies, economies with currencies pegged to the dollar, and Venezuela. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-11: ERPT into Export Quantities (Dollarized Economies, Differentiated Products)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/USD}$	-0.944*	-1.491***	-1.320**	-0.783	-0.735	-2.912	-0.359	-1.535***	-0.727
	(0.454)	(0.393)	(0.466)	(0.760)	(0.863)	(1.957)	(0.447)	(0.486)	(0.514)
Observations	107,893	5,421	10,728	34,954	5,486	362	4,161	6,800	9,202
R-squared	0.304	0.271	0.303	0.317	0.337	0.347	0.291	0.262	0.283
Industry	D	15	17	18	19	20	21+22	24	25

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/USD}$	-0.777	-0.903	-0.0245	-0.790	-1.914*	-1.458***	-0.203	-1.529***
	(0.737)	(0.509)	(0.327)	(0.615)	(0.969)	(0.446)	(0.584)	(0.470)
Observations	3,888	8,125	5,714	3,413	797	1,497	1,385	5,699
R-squared	0.265	0.314	0.305	0.300	0.435	0.304	0.210	0.333
Industry	26	28	29	31	32	33	34+35	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. The sample includes differentiated manufactured products (D) excluding petrochemicals and basic metals in column (1), and all products from each 2-digit industry in columns (2)--(17). The export destinations are the dollarized economies: USA, Panama, Puerto Rico, Ecuador, and El Salvador. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-12: ERPT into Export Quantities (Non-Dollarized Economies, Differentiated Products)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-1.258***	-0.265	-0.371	0.283	-1.649**	-0.398	-1.459***	-0.394	-0.913	0.588
	(0.244)	(0.388)	(0.418)	(0.309)	(0.541)	(0.587)	(0.325)	(0.517)	(0.896)	(1.328)
$\Delta e_{COP/USD}$		-1.365***		-1.520**		-1.436**		-1.665**		-1.755**
		(0.330)		(0.596)		(0.529)		(0.595)		(0.740)
Observations	91,694	91,694	5,244	5,244	10,438	10,438	33,777	33,777	4,411	4,411
R-squared	0.328	0.330	0.288	0.291	0.316	0.317	0.341	0.344	0.363	0.365
Industry	D	D	15	15	17	17	18	18	19	19

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-1.437	1.650	-1.042*	-0.351	-1.735***	-0.227	-1.273**	-0.137
	(4.210)	(3.902)	(0.575)	(0.915)	(0.461)	(0.879)	(0.462)	(0.885)
$\Delta e_{COP/USD}$		-4.752		-0.760		-1.541**		-1.263*
		(6.651)		(0.547)		(0.635)		(0.596)
Observations	154	154	3,811	3,811	5,392	5,392	7,658	7,658
R-squared	0.446	0.455	0.272	0.273	0.276	0.278	0.303	0.304
Industry	20	20	21+22	21+22	24	24	25	25

Table A-13: ERPT into Export Quantities (Non-Dollarized Economies, Differentiated Products), continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-1.804***	-1.486	-0.748**	-0.395	-1.767**	-0.792	-2.072*	-1.058
	(0.560)	(1.144)	(0.263)	(0.585)	(0.619)	(1.377)	(0.955)	(1.840)
$\Delta e_{COP/USD}$		-0.364		-0.396		-1.085		-1.067
		(0.750)		(0.402)		(1.240)		(1.093)
Observations	2,491	2,491	5,726	5,726	3,536	3,536	2,291	2,291
R-squared	0.282	0.282	0.341	0.341	0.363	0.364	0.396	0.397
Industry	26	26	28	28	29	29	31	31

	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	2.290	3.214	-0.638	-0.601	0.665	0.408	-1.182	0.0921
	(1.758)	(2.323)	(0.491)	(0.427)	(1.061)	(1.679)	(0.706)	(0.707)
$\Delta e_{COP/USD}$		-1.155		-0.175		0.295		-1.658**
		(1.139)		(0.857)		(1.349)		(0.627)
Observations	621	621	1,124	1,124	499	499	4,403	4,403
R-squared	0.350	0.351	0.364	0.364	0.367	0.367	0.336	0.338
Industry	32	32	33	33	34+35	34+35	36	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. The sample includes differentiated manufactured products (D) excluding petrochemicals and basic metals in columns (1)--(2), and all products from each 2-digit industry in columns (3)--(34). The export destinations include all countries except the dollarized economies, economies with currencies pegged to the dollar, and Venezuela. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-14: ERPT into Import Quantities (Dollarized Economies, Differentiated Products)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/USD}$	-1.482***	-1.657***	-1.784**	-5.620***	-1.660	-2.249	-2.246***	-1.435***	-1.398**
	(0.363)	(0.470)	(0.695)	(1.591)	(2.232)	(4.648)	(0.611)	(0.370)	(0.482)
Observations	293,563	5,347	9,998	10,941	3,719	98	4,495	23,366	29,547
R-squared	0.267	0.324	0.358	0.468	0.426	0.342	0.334	0.245	0.259
Industry	D	15	17	18	19	20	21+22	24	25

	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/USD}$	-1.137*	-1.703***	-1.205***	-1.028***	-1.795***	-1.228***	-1.825***	-1.527**
	(0.631)	(0.375)	(0.270)	(0.311)	(0.507)	(0.338)	(0.325)	(0.680)
Observations	7,629	45,305	58,993	35,540	11,153	22,554	12,114	8,206
R-squared	0.251	0.263	0.244	0.213	0.335	0.250	0.151	0.368
Industry	26	28	29	31	32	33	34+35	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. The sample includes differentiated manufactured products (D) excluding petrochemicals and basic metals in column (1), and all products from each 2-digit industry in columns (2)--(17). Imports originate from the dollarized economies: USA, Panama, Puerto Rico, Ecuador, and El Salvador. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

Table A-15: ERPT into Import Quantities (Non Dollarized Economies, Differentiated Products)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-0.863***	-0.235	-1.147***	-0.363	-1.605***	-0.240	-2.043*	-0.510	-1.481***	0.00729
	(0.265)	(0.143)	(0.302)	(0.270)	(0.308)	(0.284)	(1.043)	(1.122)	(0.437)	(0.645)
$\Delta e_{COP/USD}$		-1.177***		-0.998*		-1.819**		-1.857**		-2.055***
		(0.300)		(0.497)		(0.623)		(0.771)		(0.550)
Observations	440,927	440,927	8,320	8,320	28,719	28,719	17,755	17,755	7,953	7,953
R-squared	0.324	0.326	0.320	0.322	0.377	0.380	0.452	0.454	0.441	0.444
Industry	D	D	15	15	17	17	18	18	19	19

	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-2.403*	-2.420	-1.289*	-1.059	-1.054***	0.0307	-0.796**	-0.144
	(1.271)	(1.975)	(0.646)	(0.676)	(0.140)	(0.151)	(0.324)	(0.140)
$\Delta e_{COP/USD}$		0.0233		-0.298		-1.419***		-1.387***
		(1.874)		(0.540)		(0.327)		(0.261)
Observations	401	401	7,848	7,848	32,731	32,731	46,414	46,414
R-squared	0.433	0.433	0.336	0.336	0.286	0.289	0.335	0.338
Industry	20	20	21+22	21+22	24	24	25	25

Table A-16: ERPT into Import Quantities (Non Dollarized Economies, Differentiated Products), continued

	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-0.796***	0.434	-1.189***	-0.457***	-0.649**	-0.255	-0.491*	-0.103
	(0.216)	(0.255)	(0.170)	(0.138)	(0.217)	(0.169)	(0.264)	(0.129)
$\Delta e_{COP/USD}$		-1.863***		-1.050**		-0.744**		-1.181***
		(0.365)		(0.368)		(0.248)		(0.322)
Observations	16,786	16,786	63,873	63,873	74,395	74,395	48,394	48,394
R-squared	0.350	0.355	0.329	0.330	0.301	0.302	0.287	0.289
Industry	26	26	28	28	29	29	31	31

	(27)	(28)	(29)	(30)	(31)	(32)	(33)	(34)
	Δq	Δq	Δq	Δq	Δq	Δq	Δq	Δq
$\Delta e_{COP/LCU}$	-0.855	0.142	-0.312	-0.0137	-1.104***	-0.705*	-1.668***	-0.904***
	(0.518)	(0.684)	(0.299)	(0.112)	(0.333)	(0.369)	(0.376)	(0.213)
$\Delta e_{COP/USD}$		-1.553**		-1.112***		-0.727**		-0.891***
		(0.616)		(0.330)		(0.236)		(0.253)
Observations	10,613	10,613	24,351	24,351	26,321	26,321	23,846	23,846
R-squared	0.368	0.369	0.313	0.315	0.167	0.168	0.405	0.406
Industry	32	32	33	33	34+35	34+35	36	36

Notes: All regressions include Firm-Industry-Country fixed effects and control for domestic and trading partners' PPIs and destination's GDP. Standard errors clustered at the year level. The sample includes differentiated manufactured products (D) excluding petrochemicals and basic metals in columns (1)--(2), and all products from each 2-digit industry in columns (3)--(34). Imports originate from countries other than the dollarized economies, economies with currencies pegged to the dollar, and Venezuela. `***', `**', and `*' indicate significance at the 1, 5, and 10 percent level, respectively.

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