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# Foreign currency invoicing of domestic transactions as a hedging strategy: Evidence for Uruguay

Journal of Applied Economics

**Provided in Cooperation with:** University of CEMA, Buenos Aires

*Suggested Citation:* Licandro Ferrando, Gerardo; Mello Costa, Miguel (2019) : Foreign currency invoicing of domestic transactions as a hedging strategy: Evidence for Uruguay, Journal of Applied Economics, ISSN 1667-6726, Taylor & Francis, Abingdon, Vol. 22, Iss. 1, pp. 622-634, https://doi.org/10.1080/15140326.2019.1692581

This Version is available at: https://hdl.handle.net/10419/314076

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Journal of Applied Economics

ISSN: 1514-0326 (Print) 1667-6726 (Online) Journal homepage: www.tandfonline.com/journals/recs20

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To cite this article: Gerardo Licandro & Miguel Mello (2019) Foreign currency invoicing of domestic transactions as a hedging strategy: evidence for Uruguay, Journal of Applied Economics, 22:1, 622-634, DOI: 10.1080/15140326.2019.1692581

To link to this article: https://doi.org/10.1080/15140326.2019.1692581

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Published online: 28 Nov 2019.

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#### ARTICLE

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## Foreign currency invoicing of domestic transactions as a hedging strategy: evidence for Uruguay

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#### ABSTRACT

This study is an empirical analysis of the factors associated with the use of the US dollar for the invoicing of domestic transactions, which is a common practice of Uruguayan firms. Using a novel dataset we find that both the input and debt structure of firms are relevant for determining their currency of invoicing. Intuitively, firms will generate cash flows in US dollar if they have to make expenditures in foreign currency, either because they use imported inputs or if they cover debt services with currency risk. This practice can be seen as a hedging strategy to mitigate exchange risk in a highly dollarized economy. We empirically show that firms use their flows position to hedge currency mismatches in their stocks; domestic invoicing in US dollar is correlated with large negative financial positions, and the share of imported inputs and of exports.

#### **ARTICLE HISTORY**

Received 19 January 2018 Accepted 27 September 2019

#### **KEYWORDS**

Hedging: Exchange Rate Risk: Dollarization: Currency invoicina

#### 1. Introduction

Despite a long period of relative domestic stability and the deployment of a package of regulatory and market development initiatives starting in 2002, Uruguay continues to display unusually high and persistent levels of dollarization<sup>1</sup>. The persistence of dollarization hinges on the prospects of peso denominated market growth, and thus, has an effect on long-term financial stability in the case of a small open economy. Owing to the lack of insurance against real exchange shocks, Uruguay is particularly vulnerable.

Recent research has shown that Uruguayan firms not only have large degrees of asset and liability dollarization (Baron, Licandro, Mello, and Piccardo. (2017)), for example, stock dollarization, but also show intensive use of the US dollar for pricing and invoicing domestic transactions. This research has also shown that the majority of invoicing literature, the invoicing currency is not a dichotomous choice, most firms show invoicing shares different from zero or one.

We investigate the financial risk hedging factors associated with the practice of invoicing in foreign currency domestic transactions. We show that firms might use their flows position to hedge currency mismatches in their stocks. Domestic invoicing of transactions is more likely, as the larger the negative financial positions of firms, the bigger the share of imported inputs and the smaller the share of exports. We then

CONTACT Miguel Mello 🖾 mmello@bcu.gub.uy 🖻 Banco Central del Uruguay, Montevideo, Uruguay <sup>1</sup>See Licandro and Mello (2016).

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estimate several models to the fraction of domestic sales invoiced in foreign currency and find evidence that supports this intuition.

The rest of this paper proceeds as follows: section II briefly discusses related literature, section III presents an empirical approach to the determinants of the share of foreign currency invoicing of domestic sales, and section IV concludes.

#### 2. Literature review

The relevant literature for our analysis draws on two main sources. One is the literature on the choice of currency in which companies invoice; the other is literature about dollarization, particularly in the Uruguayan case.

The literature on *currency invoicing* has developed within the framework of international trade and finance. In this context, there is vast literature on Japan, since its large firms are mainly exporters and with subsidiaries outside Japan; therefore, several currencies come into play, the currency of the country receiving the exports, the currency of the country of production and the Japanese currency are related, since it is the relevant currency for the firm's shareholders. The literature focusing on Europe and Canada developed from theses studies.

The early literature, Baron (1976) and Donnefeld and Zilcha (1991), concentrates on the impact of invoicing choice on the pricing and volume of exports under alternative exchange rate systems. Ahtiala and Orgler (1999) show that giving the choice of invoicing to a client is equivalent to a price cut, and helps domestic firms gain market share for their exports. Friberg (1998) notes that foreign currency invoicing has a role in stabilizing export demand, very much in the spirit of pricing to market (which he calls incomplete pass-through) and shows that the decision is important in floating exchange rates because it affects the level of exports that a country generates. Other authors, such as Devereux, Engel, and Storgaard (2004) and Devereux, Dong, and Tomlin (2015), note that currency invoicing affects the short term pass-through from exchange rates to inflation, the empirical observance of the law of one price and the conduct and effectiveness of monetary policy, determining the optimal choice of exchange rate system and the micro adjustment of prices.

Chung (2016) theoretically and empirically developed a framework of how exporters' dependence on imported inputs affects their choice of invoicing currency. For this study, she used a large set of trade transactions of UK firms with non-EU countries. She concludes that exporters that depend more on foreign currency-denominated inputs are less likely to price in their home currency.

While economic literature has a long list of research on the dollarization of invoicing in international trade, very few studies examine the dollarization of prices or invoicing of domestic transactions. Gopinath, Itskhoki, and Rigobon (2010), using a database for prices and currencies for US imports, found that there is a higher exchange rate pass-through for non-dollar priced goods, which implies that the currency pricing is endogenous. Gopinath and Stein (2018a) a theoretical framework that links the invoicing decision with financial and productive aspects. The basic idea is that if a large share of a country's imports are invoiced in dollars results in the public demanding dollar-denominated saving assets. This generates higher dollarization in the banking sector, and induces a higher dollarization of firms through cheaper funding in dollars than in local currency. Gopinath and Stein (2018b) extend the framework to consider the implications for central-bank reserve holdings. They show that

highly dollarized banking system induces the central bank, as the last resort lender, to hold larger dollars reserves.

Levina and Zamulin (2006) argue that in the presence of price rigidities, and in the absence of indexation mechanisms, dollar pricing might be an optimal strategy for a firm. Recently, Drenik and Perez (2017) have shown that dollar pricing of domestic sales might be a choice for firms that seek to hedge inflation risk in the absence of other inflation-indexation mechanisms, particularly in the case of durable goods. Drenik, Perez, and Kirpalani (2018) study the relation between optimal monetary policy and the choice of currency in which domestic contracts are executed. They conclude that a higher share of contracts nominated in domestic currency is related to lower levels of policy risk, suggesting that policy could regulate currency choice in both domestic and international contracts.

Döhring (2008) discusses exchange rate exposure in terms of transaction risk in the European Union. He argues that domestic currency invoicing and hedging with exchange rate derivatives allows a fairly straightforward management of transaction risk and discusses the circumstances of its optimal use. He finds that euro area exporters have instruments to limit the adverse impact of euro appreciation, and use financial derivatives extensively.

Martin and Méjean (2012), using a survey of European export firms, conclude that large firms are more likely to use another currency. They show that for large firms, pricing in another currency is also more likely to hedge against exchange rate risk. Lyonnet, Martin, and Mejean (2016) revised the previous reference, extending the analysis in a model of currency choice and hedging that rationalizes their findings. They found that when the cost of hedging has a fixed component, large firms are more likely to hedge and to invoice in the importer's currency.

Licandro and Mello (2016) empirically analyze the determinants of financial and cultural dollarization of Uruguayan households. They define cultural dollarization as the public's perception and use of the US dollar as an accounting unit, even when their value fundamentals are in the domestic currency; for example, expressing their salary nominated in local currency in US dollars. They conclude that the pricing system and the holding of assets denominated in US dollars are majorly responsible for the high level of cultural and financial dollarization.

Mello (2016) analyzes Uruguayan firms and concludes that the high dollarization of their assets responds to the dollarization of inputs and to the tradability of their output, as to the level and of indebtedness, and the currency in which debts are nominated.

Mello (2017) formalizes the currency risk hedging strategies of Uruguayan firms by endogenously modeling the use of financial derivatives versus alternative strategies, such as foreign currency invoicing and the holding of high levels of liquidity for precautionary reasons. It concludes that strategies are substitutes but not exclusive and that large companies access sophisticated risk management tools and strategies.

#### 3. Empirical approach

#### 3.1. Data description

This study uses a unique dataset that combines several firm level surveys with a common statistical sampling frame, collected by the National Institute of Statistics (INE) for the Central Bank of Uruguay (BCU).

The dataset represents all firms that are headquartered in Uruguay with more than 50 employees, excluding the agricultural sector. It is the merging of an invoicing and financial stability survey in June 2016 of 364 companies with data for 2015 (Invoicing Survey, IS), with the 2012 Annual Economic Activity Survey (AEAS). The AEAS was made to prepare the base year of the National Accounts, covers 5,041 companies and is representative of the whole universe of companies installed in the country with more than 10 employees.<sup>2</sup>

Table 1 shows the sectorial distribution of the sample. The main sector is the manufacturing industry, which represents nearly 47% of the sample.

As Table 2 shows, most of these firms have Uruguayan owners, only 12% in the IS are property of foreign shareholders.

Approximately 46% of the companies export some of their production, while two thirds use imported inputs. Table 3 shows the geographical distribution of exports and imports. The principal destination of these exports is Mercosur, as this region is the first export destination for 40.62% of the firms. Tax Free Zones in Uruguayan territory are a relevant export destination for 9.36% of the firms in the survey. The US dollar is the principal currency in which exports are nominated, even in the case of regional trading partners, representing 84% of total exports.

Economic Sector	Percent
Industry	46.98
Retail	18.68
Transport	11.54
Real Estate	10.99
Health and Social Services	4.4
Education	3.57
Hotels and restaurants	2.47
Construction	0.82
Mining	0.27
Utilities	0.27
Total	100

 Table 1. Sectorial distribution of firms.

Table 2. C	apital	origin	distribution	of	firms.
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Country	Percent
Uruguay	87.91
Argentina	1.37
Panama	1.10
Spain	1.10
United States	1.10
Brazil	0.82
France	0.82
Switzerland	0.82
Germany	0.55
Luxembourg	0.55
Netherlands	0.55
Other Various	3.31
Total	100

<sup>2</sup>The AEAS represents the manufacturing industry, retail and services sectors, representing 82% of the Uruguayan GDP in 2015. The IS is a sub-sample of the AEAS, its firms have more than 50 employees and represent 66% of the AEAS Gross Value Added. For the descriptive statistics, we used the IS statistical weights and expanders.

Country/Region	Exports	Imports
Mercosur	40.62	35.71
Latam	53.11	40.19
USA	8.59	10.27
China	10.16	27.68
Asia	4.68	5.37
Asia & China	14.84	33.05
Free Zones	9.36	-
Europe	9.36	14.31

 Table 3. First destination for exports and first origin of imported inputs.

China is the principal provider for the surveyed firms, 27.68% principally import inputs from this country. Mercosur and the USA are important inputs providers for Uruguayan firms, Brazil and Argentina are the principal inputs sellers for 35.71% of the firms.

Table 4 presents some descriptive statistics for the firms' universe. In the sample, 12% of the firms are owned by foreign capitals; expanded to the whole population of firms with more than 50 employees, the portion of foreign capital-owned companies reduces to 7.2%. Similarly, 4.9% of all companies have at least one subsidiary firm.

In terms of inputs structure, 59% of the firms buy some domestic inputs in US dollar and 66% use some imported inputs. However, if we look at how many have a relevant weight of inputs buying in US dollars (> 10%), the proportion reduces to 55% of Uruguayan companies.

Analyzing firms' preferences towards debt, 57% declare having the power to choose the currency of their banking debts, and 53% declare having some power to set the currency for commercial debts. The portion of firms that can simultaneously choose the currency in which they will take commercial and banking debts is 40.7%. Consequently, 52% of Uruguayan companies have some debt nominated in the US dollar.

As Table 4 shows, almost one-third of the firms are exporters and practically one-half make some sales in US dollar; however, only 33.4% invoice more than 10% of total sales in the US dollar.<sup>3</sup>

	Obs.	Mean	Std. Dev.	Min	Max
Firm owns other firms	339	4.9	21.7	0.0	100.0
Foreign capital	339	7.2	25.9	0.0	100.0
Firm buys domestic inputs in USD	339	59.1	49.2	0.0	100.0
Firm uses imported inputs	339	66.6	47.2	0.0	100.0
Firm inputs in USD > 10%	339	55.2	49.8	0.0	100.0
Firm can set currency of bank debts	339	57.0	49.6	0.0	100.0
Firm can set currency of commercial debts	339	53.2	49.9	0.0	100.0
Firm can set currency of all debts	339	40.7	49.2	0.0	100.0
Firm has some debt in USD	339	52.0	50.0	0.0	100.0
Exporting firm	339	31.9	46.7	0.0	100.0
Firm domestic invoice in USD	339	49.3	50.1	0.0	100.0
Firm invoice in USD > 10%	339	33.4	47.2	0.0	100.0

	firms
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<sup>3</sup>We opted for this distinction, and we will consider dollarized invoicing those firms that sell more than 10% of their total sales in US dollars in the domestic markets. This ensures that selling in US dollars is a current practice and does not correspond to punctual business in US dollars.

		All Firm	ıs	In	voice in > 10%	USD	DO	NOT invo USD	oice in	Mean differences
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Diff
% Exports to Sales	339	11.2	26.3	137	19.4	31.5	202	7.1	22.2	12.3***
% USD invoice in domestic market	339	24.0	36.7	138	69.4	30.4	201	1.3	2.8	68.1***
% of foreign inputs	339	25.0	34.2	137	41.1	38.1	202	17.0	28.9	24.2***
% of domestic inputs in USD	339	21.8	28.6	137	38.9	34.1	202	13.3	20.8	25.6***
% of USD inputs	339	38.6	37.8	137	63.2	34.5	202	26.3	33.1	37.0***
Market power	336	38.6	27.6	141	35.7	26.1	195	40.2	28.4	-4.5*
Liquidity Share	333	9.6	12.6	140	6.8	8.0	193	11.6	14.8	-4.9***
Debt Dollarization	330	13.1	22.9	139	22.7	27.4	191	7.5	17.6	15.2***
Leverage = Liabilities/Assets	334	51.3	69.6	140	52.6	83.7	194	50.5	60.3	2.1
Efficiency	333	271.0	39.6	140	281.3	36.1	193	263.6	40.4	17.7***
Bank Debt	333	78.7	41.0	140	85.0	35.8	193	74.1	43.9	10.9**

Table 5. Firms' characteristics and differences in mean test.

\*p < 0.10, \*\*p < 0.05,\*\*\*p < 0.01

Table 5 presents descriptive statistics for the relevant variables and the difference in mean test, distinguishing if the firm does significant invoicing in US dollars. Following Döhring (2008), we introduce a measure of market power, a larger firm with market power is supposed to have more discretion in choosing a currency than smaller firms. He used firm size to approximate market power, while we prefer using the Lerner Index, as it is available in our dataset.<sup>4</sup>

The share of US dollar invoicing in domestic markets is 24% of total sales. If we focus on firms that invoice more than 10% of their sales in the US dollars, the mean dollarized invoicing is 69%. We see that the share of exports in total sales is significantly higher for firms that invoice in US dollars to domestic markets. In addition, on average these firms have higher US dollar nominated inputs.

In analyzing the financial structure of firms, we do not appreciate significant differences in leverage between US dollar sellers and Peso sellers, but the dollarization of the debt is much higher for those who sell some fraction in US dollars in domestic markets.<sup>5</sup>

Inputs and debt dollarization is significantly higher for firms that invoice in US dollars; 63% of the inputs that US dollar sellers use are nominated in US dollars, while firms that invoice less than 10% of their sales in US dollars have an input dollarization of 26%. Most of these US dollar nominated inputs are foreign, but there is a significant portion bought domestically. Debt dollarization is also higher for firms that have significant US dollar invoicing, that is, 22.7% versus 7.5%, with no significant difference in leverage.

The share of liquid assets in total assets is significantly higher on average for firms that do not invoice in US dollars in local markets. This suggests that holding higher portions of liquidity could be a hedging strategy for less sophisticated firms, as presented by Mello (2017).

Finally, we construct a variable that approximates firms efficiency, particularly in generating flow income. This variable is the interaction between sales per branch and

<sup>&</sup>lt;sup>4</sup>In Appendix we present the histograms of variables in Table 5.

<sup>&</sup>lt;sup>5</sup>Mello (2016) reported an average leverage for the EAAE of 44.3%, and 49.2% for all the firms with more than 50 employees. In this study we have an expanded sub-sample of those big firms and a leverage of 51.3%, which seems consistent with this previous study.

sales per employee. According to the difference in mean test, firms that invoice a significant portion of total sales in US dollars, are more efficient in generating income flows than firms that do not.

#### 3.2. Econometric analysis

#### 3.2.1. Models for foreign currency invoicing

The objective of this section is to estimate the determinants of the fraction of domestic sales invoiced in US dollars. Methodologically, the main challenge is to deal with the censored character of the dependent variable, particularly the accumulation of density around the zero and one values.<sup>6</sup>

To contemplate these methodological difficulties, we estimated two specifications using three different econometric techniques. First, we present a model with the expected main determinants for dollarized invoicing derived from the currency election literature. Subsequently, we present models with other firms' characteristics. We present an OLS and Tobit specification, and estimate a Zero Inflated Beta Model (*ZOIB*). This technique not only considers the character of the dependent variable censored in the interval [0,1] by using a Beta distribution function, but also allows us to model the non-symmetrical distribution, particularly the accumulation of probability in the extreme values of the distribution (zeros and ones). The ZOIB specification considers the extremes decision with a different nature from the intermediate proportions of the distribution.<sup>7</sup>

Following Gopinath and Stein (2018a), we expect the choice of invoicing in local or foreign currency to be determined by productive and financial factors. We focus on the utilization of inputs bought in US dollars and on debt dollarization.<sup>8</sup>

We estimated the following equation:

$$Y_i = \alpha_i + \beta_1 m_i + \beta_2 l_i + \rho_k X_{ik} + \varepsilon_i, \tag{1}$$

where,  $Y_i$  is the fraction of domestic sales invoiced in US dollars and  $X_{ik}$ , is a vector of k characteristics of the firm *i*;  $m_i$ , represents the share of inputs bought in US dollars and  $l_i$ , is the debt dollarization.

Table 6 shows the results for the OLS, TOBIT and ZOIB estimations. We present the ZOIB model results and the marginal effects ZOIB estimations, as the equation that explains the fraction *zero* of domestic dollarized invoicing. The fraction *one* decision equation was not significant for this specification.

Debt dollarization and US dollar nominated inputs coefficients have the expected positive sign. The firm will decide to undertake a higher portion of sales in US dollars if it has more outflows in this currency. Additionally, the probability of having zero fraction of sales invoiced in US dollars reduces if debt dollarization increases. The share of US dollar nominated inputs is also significant and positive correlated with a higher fraction of sales invoiced in foreign currency. Furthermore, an increase in the share of inputs reduces the probability of not doing dollarized invoicing.

<sup>&</sup>lt;sup>6</sup>See Figure A1 in the Appendix.

<sup>&</sup>lt;sup>7</sup>For a detailed description of this methodology, see Ospina and Ferrari (2010, 2012), and for a complete discussion about Fractional Responses Models, see Williams (2018).

<sup>&</sup>lt;sup>8</sup>These two variables should be predetermined variables, and if so, they should be instrumented. We omitted this instrumental analysis because we could not find a good instrument for these variables.

	OLS	TOBIT	ZOIB	ZOIB_MFX
Debt Dollarization	0.214***	0.434***	0.135	0.179**
	(0.080)	(0.141)	(0.379)	(0.077)
% of USD inputs	0.363***	0.668***	0.967***	0.285***
	(0.055)	(0.101)	(0.289)	(0.052)
Constant	0.079**	-0.269***	-0.946***	
	(0.034)	(0.070)	(0.195)	
Zero Equation				
Debt Dollarization			-1.708***	0.179**
			(0.594)	(0.077)
% of USD inputs			-1.584***	0.285***
			(0.354)	(0.052)
Constant			0.688***	
			(0.210)	
Ν	322	322	291	291
N_unc		169		
N_lc		122		
N_rc		31		
R2	0.166			
R2_a	0.161			

Table 6. Estimated models for domestic invoicing dollarization.

\*p < 0.10, \*\*p < 0.05,\*\*\*p < 0.01

Foreign currency nominated inputs and debt, both imply current and future liabilities in foreign currency. This result implies that Uruguayan firms are using invoicing as a hedging instrument to transfer exchange rate risk due to their structural exposure.

Table 7 presents a more precise specification, using control variables such as *Liquidity Share, Firm's Size*, a *Foreign Capital Dummy* and a *Manufacturing Industry Dummy*. Debt dollarization and US dollar nominated inputs are positively correlated with US dollar invoicing in domestic markets. In the zero equation, a higher debt dollarization and share of US dollar nominated inputs reduces the probability of invoicing only in local currency in the domestic market. The fraction one equation shows that debt dollarization is not significative in explaining the decision of only invoicing in US dollars; the only variable that explains this option is the use of higher portions of dollarized inputs. These results are in line with the theoretical framework of Gopinath and Stein (2018a).

Liquidity share in assets and the firm's size are negatively correlated with the foreign currency invoicing. These results are consistent with the idea that holding higher portions of liquid assets is a hedging strategy for non-sophisticated firms. Big companies with market power and subsidiaries of foreign companies are less likely to invoice in US dollars. A possible explanation to this result is that bigger companies are much more sophisticated; therefore, they are more likely to manage their structural exposure and hedge with financial instruments.<sup>9</sup>

#### 4. Conclusions

This study contributes to the research on dollarization and attempts to explain why Uruguayan firms sell goods and services nominated in US dollars in domestic markets. Invoicing in foreign currency is a hedging strategy for domestic firms that do not have access to sophisticated financial instruments. The portion of inflows in US dollar

Tuble 7. Estimated	models for domestic	c involcing dollariz		variables.
	OLS	TOBIT	ZOIB	ZOIB MFX
Debt Dollarization	0.252***	0.467***	0.164	0.209**
	(0.078)	(0.135)	(0.374)	(0.091)
% of USD inputs	0.402***	0.679***	1.221***	0.377***
,	(0.057)	(0.104)	(0.314)	(0.072)
Liauiditv Share	-0.475***	-1.073***	-2.260*	-0.528*
	(0.162)	(0.346)	(1.247)	(0.286)
Size	-0.021***	-0.031**	-0.069**	-0.015*
	(0.007)	(0.013)	(0.034)	(0.009)
Foreign Capital	-0.127**	-0.190*	-0.320	-0.094
5 1	(0.057)	(0.101)	(0.271)	(0.060)
D Industry	-0.151***	-0.188**	-0.584***	-0.130***
- /	(0.042)	(0.074)	(0.197)	(0.047)
Constant	0.714***	0.730**	1.171	
	(0.198)	(0.350)	(0.916)	
Zero equation	. ,	. ,	. ,	
Debt Dollarization			-1.646***	
			(0.605)	
% of USD inputs			-1.363***	
,			(0.388)	
Liquidity Share			2.783**	
, ,			(1.214)	
Size			0.050	
			(0.049)	
Foreign Capital			0.174	
5 1			(0.385)	
D_Industry			-0.160	
			(0.287)	
Constant			-0.927	
			(1.313)	
One equation				
Debt Dollarization			0.661	
			(0.724)	
% of USD inputs			1.349**	
			(0.658)	
Liquidity Share			-0.238	
			(2.569)	
Size			-0.027	
			(0.079)	
Foreign Capital			-0.559	
			(0.668)	
D_Industry			-0.862**	
			(0.432)	
Constant			-1.585	
			(2.120)	
N	322	322	322	322
N_unc		169		
N_lc		122		
N_rc	0.004	31		
K2	0.236			
R2_a	0.221			

	Table 7.	Estimated	models for	domestic	invoicing	dollarization	with control	variable
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\*p < 0.10, \*\*p < 0.05, \*\*\*p < 0.01

generated by firms is determined by actual and future US dollar outflows. The productive and financial structure of the firms defines foreign currency invoicing. These results are consistent with Gopinath and Stein (2018a), where firms invoice in US dollars because foreign trade determines that banks offer lower cost funding in US dollars to firms.

Firms with market power and subsidiaries of foreign companies are less likely to use this strategy. This is because they accede to financial hedging in the banking system or with their matrix in foreign capitals-owned companies. This could be related to the high cost of hedging with derivatives in a non-developed financial market, such as in Uruguay. The exposure to foreign trade in firms is relevant only for imports; exporters have no difference in domestic market invoicing with no tradable companies.

Hedging financial risk through invoicing in foreign currency to the domestic market does not seem to be an efficient strategy. Although it implies reducing the mismatch of currencies by generating a flow of income in foreign currency, in theory it is inefficient in at least two ways: on the one hand, it implies maintaining high levels of liquidity with its associated costs; on the other hand, it could reduce demand in the domestic market. This possible reduction in demand is because domestic consumers, whose incomes are mostly in the national currency, are not necessarily willing to have a currency mismatch, mainly if they finance consumption with debt, as in the case of durable goods.

Invoicing in US dollars seems to be an attempt by firms to transfer exchange rate risk to consumers. This attempt will be feasible depending on the elasticity of demand for domestic goods to the level and volatility of the foreign currency.

A natural extension to this study is to determine on the demand side, the elasticity and propensity of consumers to consume goods denominated in foreign currency, to quantify endogenously if invoicing in foreign currency is really optimal for firms. This seems relevant for determining the impact of this invoicing practice over the consumption of durable goods, particularly if its financed through household consumption credit.

Similarly, small firms that mostly focus on the domestic market face difficulties in accessing more efficient instruments to manage for exchange rate risk. Actually, the explanation for not using hedging financial instruments is indicative of the high costs and little diffusion of these instruments. This implies that the authorities have a role to play in the generation and promotion of a market of derivatives, which allow firms to manage the risk efficiently, thereby, benefiting domestic consumers.

#### **Disclosure statement**

No potential conflict of interest was reported by the authors.

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## Appendix



Figure A1. Share of USD invoicing in domestic market.



Figure A2. Exports to total sales.



Figure A3. Foreign inputs.



Figure A4. Domestic inputs in USD.



Figure A5. Inputs bought in USD.



Figure A6. Debt dollarization.