

## A NOTE ON THE NEW WAVE OF FOREIGN-CURRENCY DEBT FOR LAC NON-FINANCIAL FIRMS

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### ABSTRACT

This paper presents new evidence on foreign-currency debt of non-financial companies in six Latin-American countries, including years in the aftermath of the sub-prime crisis. The paper differentiates between total debt and financial debt in foreign currency. Main results indicate that some firm-specific features are key to understand foreign currency debt. Exporting firms behave differently between total foreign-currency debt and financial currency debt. Exporters hold more total foreign-currency debt than the average firm while they hold less financial foreign-currency debt. Foreign-owned firms hold less total debt in foreign currency. Macroeconomic variables only play some role when interacting with specific firm characteristics.

**Keywords:** foreign-currency debt, firm-level characteristics.

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## *En memoria de Enrique Kawamura, presente en esta edición*

Resulta difícil referirse a Enrique Kawamura en tiempo pasado. En quienes tuvieron la suerte de interactuar más o menos cercanamente con él perdurará el vívido recuerdo de alguien excepcional, por intelecto, valores y calidades personales. Conocí a Enrique hace unos cuantos años, como una figura saliente en un destacado grupo de estudiantes. Me ha quedado grabada la memoria de un aula de la UBA donde el joven Kawamura, sentado en las primeras filas a mano derecha (por algún motivo me viene en mente la clara imagen), se atareaba tomando notas y, cada tanto, sacaba los ojos del apunte con una mirada de entusiasmo cuando el tema de la conversación viraba a cosas como las restricciones intertemporales de presupuesto. Rápidamente se percibía que ahí había alguien para quien las nociones aparentemente abstractas tenían algo así como una significación personal, y era capaz de hacer del razonamiento riguroso un compromiso mantenido. No podía sorprender que se sintiera llamado a una fructífera actividad académica.

Tuve el privilegio de poder trabajar con Enrique en varios proyectos de investigación. Fueron experiencias que valoré especialmente. Colaborar con Enrique era interactuar con un colega siempre dispuesto a explorar ideas libremente, y a disfrutar de la búsqueda de argumentos, incluso cruzando fronteras entre disciplinas, mientras mantenía su apego al análisis económico claro y preciso. Diversión, búsqueda abierta y trabajo serio: todo eso formaba parte de las facetas del Enrique economista, que se manifestaron en su numerosa producción.

La rectitud de conducta, sin vueltas ni calificaciones, fue otro de sus rasgos propios. Pero eso no lo hizo ni solemne ni inabordable. Tenía barrio, y se notaba. Por algún motivo, recuerdo con especial afecto su lado futbolero: junto con una maraña de libros y papeles académicos, en su oficina destacaba un poster recordando el campeonato que ganó Huracán con el famoso equipo de 1973. Se preocupaba Enrique por el Globo y, sin perder su ánimo analítico, seguía con cuidado sus altibajos, deportivos y otros.

Se nos fue una persona entrañable, y un economista de primera. Es un eufemismo decir que lo vamos a extrañar, y mucho.

Daniel Heymann

## A NOTE ON THE NEW WAVE OF FOREIGN-CURRENCY DEBT FOR LAC NON-FINANCIAL FIRMS\*

### UNA NOTA SOBRE LA NUEVA OLA DE DEUDA EN MO- NEDA EXTRANJERA EN LAS FIRMAS NO FINANCIERAS DE LATINOAMÉRICA

*Recibido: 10 de julio de 2018. Aceptado: 10 de septiembre de 2018*

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#### ABSTRACT

This paper presents new evidence on foreign-currency debt of non-financial companies in six Latin-American countries, including years in the aftermath of the sub-prime crisis. The paper differentiates between total debt and financial debt in foreign currency. Main results indicate that some firm-specific features are key to understand foreign currency debt. Exporting firms behave differently between total foreign-currency debt and financial currency debt. Exporters hold more total foreign-currency debt than the average firm while they hold less financial foreign-currency debt. Foreign-owned firms hold less total debt in foreign currency. Macroeconomic variables only play some role when interacting with specific firm characteristics.

*Keywords: foreign-currency debt, firm-level characteristics.*

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## RESUMEN

Este artículo presenta nueva evidencia sobre determinantes de pasivos en moneda extranjera de empresas en seis países de Latinoamérica, incluyendo períodos posteriores a la crisis *sub-prime*, diferenciando entre pasivos totales y financieros en moneda extranjera. Los resultados principales indican que ciertas características específicas son claves para entender estas deudas. Firmas que exportan deciden diferentemente entre pasivos totales y financieros en moneda extranjera, manteniendo más deuda total y menos deuda financiera en moneda extranjera que la firma promedio. Empresas de propiedad extranjera mantienen menos pasivos totales en moneda extranjera. Las variables macroeconómicas sólo importan cuando se las interactúa con tipos de empresas.

*Palabras clave:* deuda en moneda extranjera, características de la empresa.

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## I. Introduction

There exists some evidence of an increase in foreign-currency borrowing (mainly through foreign-currency bond issues) by companies in Emerging-Market countries in the aftermath of the 2007-2008 sub-prime crisis due to low interest rates.<sup>1</sup> This contrast the debt de-dollarization process between 2000 and 2010, which raised new concerns especially in the policy-making discussion. The basic reason for this concern goes back to well-known problematic experiences that high debt dollarization implied in several LAC countries during the nineties.<sup>2</sup>

This work presents evidence of foreign-currency debt in public companies in Latin America during the new century, using a hand-collected database from the companion paper (García-Cicco and Kawamura, 2016, 2018). The countries included are Argentina, Brazil, Chile, Colombia, Mexico and Perú. The database includes the fraction of total foreign-currency debt and of financial foreign-currency debt. We explore possible determinants of each of these two variables as a function of firm-level as well as macroeconomic variables (and interactions among some of them). In this way, we generate new facts on which specific factors may explain the level of foreign currency debt.

The main results are as follows. Export status is a salient characteristic that affects the decision of taking debt in foreign currency. Yet, firms that export (on average) behave differently depending on the type of debt: exporters show higher total foreign currency debt, but lower financial foreign-currency debt. This suggests the role of trade debt in foreign currency for exporters.

Another specific type of firms that merits some attention is the set of foreign-owned firms. Regarding total foreign-currency debt, the average foreign-owned firm shows lower levels of that type of debt than the aver-

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<sup>1</sup> There is a growing literature presenting empirical evidence on this process. See, e.g., Gozzi et al (2015)

<sup>2</sup> See, e.g., the IDB 2014 Macroeconomic Report. Yet, another reason for such new warning messages was the increasing evidence about the destination of the receipts from those bond issues. Indeed, papers like e.g., Hattori and Shin (2009), Chung et al (2014), Shin and Zhao (2013), Caballero, Panizza and Powell (2016), Bruno and Shin (2017) and the companion paper by García-Cicco and Kawamura (2018), document that non-financial corporations used a big share of the receipts from such bond issues to increase their liquidity positions in local banks or other financial intermediaries, acting in this case as a branch of such intermediaries.

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age firm in the sample. This is a bit more puzzling result, since not all foreign-owned firms are exporters. A couple of possible explanations include either liability management directly set in headquarters or local management being averse to exchange-rate risks induced by total foreign currency debt. Of course, they need further confirmation with research that is outside the scope of this note. On the other hand, the status of foreign-owned firm per-se does not behave differently from the average firm regarding financial debt in foreign-currency. Yet, that same type of firm interacted with other features such as the level of foreign-currency assets tends to behave differently regarding financial debt in foreign currency than the average firm, depending of that specific feature.

In terms of macroeconomic variables, they also play a role in explaining both types of foreign currency debt only when interacted with firm-specific features. This reveals a certain degree of heterogeneity regarding the reaction of different types of firms to common macroeconomic shocks. Major macro variables that affects foreign-currency debt are domestic interest rate, interest-rate spreads and the level of financial depth measured as the ratio between credit and GDP.

This note is a contribution to the literature analyzing determinants of debt by currency for companies. Papers by Allayanis et al (2003), Benavente et al (2003), Gozzi et al (2010) and Mizen et al (2012) are examples of studies analyzing determinants of foreign-currency debt. Those papers consider firm characteristics different from this paper. More closely, Brown et al (2011) for transition economies and Mora et al (2013) for firms in Lebanon consider the role of export status (and the first of those papers also considers foreign-owned firms). The common result in their case is that export firms tend to show higher foreign currency debt. Yet none of those papers differentiate between total debt and financial debt in foreign currency, which is the case in this note.

The rest of the note is as follows. Section II presents the basic database characteristics, descriptive statistics and facts about the currency composition of debt (including the analysis of its possible determinants). Section III presents the main analysis on the determinants of foreign-currency debt, including a more detailed relationship with the literature. Section IV concludes.

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## II. Data sources, sample, summary statistics and facts on foreign-currency debt in the 2000's

### II.1 Data sources

As stated in the introduction, this note uses the hand-collected data in García-Cicco and Kawamura (2016, 2018) from the annual financial statements downloaded from the websites of a subset of publicly-listed companies. As explained in that paper, the process of data collection started by looking at the *Economática* database, the standard source used in other similar studies on Latin American firms given the well-recognized representativeness of the sample in that database relative to the universe of public companies in those countries. That base contains major accounting variables of 1561 major public companies from Argentina, Chile, Brazil, Colombia, Chile, United States and Venezuela, mostly for the period 2003-2013. However, such database lacks information of key disaggregated variables such as the export status (with very few exceptions), and the use of currency and interest-rate derivatives and others that are needed in García-Cicco and Kawamura (2018). *Economática* is then the baseline database to complete a first list of public firms in LAC countries for which some accounting data is available.

The data collection also uses other public sources of accounting information (such as the website of financial regulators, in the case of Colombia, given that in *Economática* there much fewer firms of that country included in that database). Thus, we compiled a dataset including a quite detailed accounting data on assets and liabilities composition, as well as some information on export status, ownership and basic corporate-governance indicators. Yet, this database also presents a high fraction of missing values for some years for some of those more disaggregated variables. Therefore, the dataset used here includes annual data for 127 companies from Argentina, Brazil, Chile, Colombia, Mexico and Peru, for a period between 1995 and 2014, although the number of observations for years before 2003 is low. It is clearly an unbalanced panel database.

The regression exercises also control for several macroeconomic variables. The major ones include several interest rates, the ratio between domestic credit and GDP and nominal exchange rates. The source for all these macro variables is the World Bank database.

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## II.2. Descriptive statistics

Table 1 below shows descriptive statistics on two sets of selected variables of interest in the analysis performed below. Panel A shows statistics for firm-level variables, while panel B shows those for selected macro variables.

**Table 1: Descriptive Statistics**

<b>A: descriptive statistics. Firm level Variables</b>	<b>Sample Size</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Min</b>	<b>Max</b>
Total foreign currency debt as a fraction of total debt	800	0.3853	0.2829	0	0.9964
Financial foreign currency debt as a fraction of total financial debt	1097	0.5935	0.3586	0	1
Profits/Losses due to FEx valuations divided by assets	1056	-0.0047	0.0350	-0.6958	0.2005
Gross Profits/Losses divided by assets	1506	0.2004	0.1377	-0.0812	1,033,004
<b>B: descriptive statistics. Macro Variables</b>	<b>Sample Size</b>	<b>Mean</b>	<b>Std Dev</b>	<b>Min</b>	<b>Max</b>
Lending Domestic Interest Rate (%)	1571	24.3114	20.21144	0	86.3633
Lending USA Interest Rate (%)	1571	5.0748	2.1015	3.25	9.2333
Variation of the exchange rate	1439	17	133	-388.46	573.61
Overnight Domestic Interest Rate (%)	1434	8.9711	6.1653	1.4005	33.3033
Overnight USA Interest Rate (%)	1369	1.5697	1.8027	0.0922	5.1586
Domestic-credit-to-GDP ratio (%)	1571	37.1352	21	9	109

*Source: García-Cicco and Kawamura (2016).*

From panel A the fraction of the total debt denominated in foreign currency seems lower than the fraction of the total financial debt denominated in foreign currency by about twenty percentage points. García-Cicco and Kawamura (2018) presents two possible interpretations. The first is related to the currency denomination of trade debt, most of which may be denominated in domestic currency. The second interpretation comes from a possible lack of detailed information on total debt in foreign currency for some firms. Also, the variation coefficient of the financial foreign-currency debt measure is higher than the total foreign-currency debt. This suggests a higher heterogeneity of currency denomi-



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nation in financial debt relative to total debt, although such difference may not be crucial.

The third and fourth variables of panel A refer to two performance variables. One is related to profits due to variations in the exchange rate, the other is linked to global profits. The third variable presents the statistics of the ratio between the profits or losses coming from exchange rate variations and total assets. On average the ratio is slightly negative, although showing a very high variability, with a very wide range of possible values in this sample. The fourth variable refers to the average of the ratio between total profits / losses over total assets. The mean is undoubtedly positive, although the minimum value is also negative but smaller than the minimum of the other performance variable.

Finally, panel B presents some statistics of major macroeconomic variables used in regression analysis. These have been selected according to the literature studying determinants and consequences of currency composition of debt referred in the introduction.

### **II.3 Summary of stylized facts on foreign-currency debt (based on García-Cicco and Kawamura (2018))**

The database allows for a time-series close view to the dynamics of foreign-currency debt for the firms in our sample. Here we provide a summary of those facts, which can be more closely viewed in the companion paper:

- Between 2000 and 2011 there is a trend towards a reduction in total foreign-currency debt, with a partial reversion in 2012. Still the values of the mean and median of this indicator are still quite high, ranging from a minimum slightly below 30%, up to maximum 37.5% on average.
  - Regarding financial currency debt, qualitatively the pattern is similar to that of total foreign currency debt, including the reversion of a declining trend since 2000 in the year 2014, although the values are higher than those of the total foreign currency debt. Indeed, the average of financial currency debt shows a minimum value of 50%.
  - When looking at both series by country (cross-firm averages), it is possible to uncover some differences across them. Regarding to-
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tal foreign-currency debt, while for four of the countries the trend is declining in the 2000's, Brazil and Colombia seem to be the exception. Yet, for those other four countries there is a reversion in the second decade of the 2000's. Regarding the cross-firm average financial foreign-currency debt, Brazilian, Chilean and Mexican firms show a declining trend in the period 2000-2010. On the other hand, the average Argentine and Peruvian firm displays a sharp decrease in this fraction between 2001 and 2002 (coinciding with the end of the peg in December 2001 in Argentina) but a partial recovery between 2002 and 2006, leading to a posterior drop between 2006 and 2011. Colombian companies show a milder and shorter reversion (only between 2011 and 2013).

### III. Foreign-currency debt: correlation with other firm-level and macro variables

This section presents the main results from OLS-based regressions applied to an equation relating the currency composition of both total and financial debt with other firm-level variables, both alone and interacted with some of the macro variables included in table 1.

#### III.1. The equation to be estimated

The existing literature on the determinants of foreign currency debt<sup>3</sup> provides an approximation through the regression equation that “explains” the fraction of foreign currency debt. The basic equation is:

$$Y_{it} = \beta \mathbf{X}_{i,t-1} + \gamma \mathbf{X}_{i,t-1} d_i + \sum_{j \in M} \alpha_j \mathbf{x}_{i,t-1} \mathbf{m}_{j,t-1} + \varepsilon_{i,t} \quad (1)$$

In equation (1) the dependent variable  $Y$  is alternatively the share of total debt in foreign currency, in a first set of regressions, and the share of total financial debt in foreign currency, in a second set of regressions. The right hand side of equation 1 includes a vector  $\mathbf{X}$  of firm-level control

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<sup>3</sup> See, e.g., Cowan et al (2005), Kamil (2009), Brown et al (2011), Gozzi et al (2012), Mizen et al (2012) and Mora et al (2013) among others.

variables, part of which comes from the literature. These control variables include the natural log of assets, total leverage, the fraction of sales exported abroad, the annual rate of growth of total sales, the fraction of short-term debt and a dummy variable stating whether the firm is foreign owned or not.

The second term measures the effect of each of the firm-level control variables in  $\mathbf{X}$  (excluding the dummy variable of foreign ownership) interacted with a dummy variable  $d$  that is alternatively one of three firm-specific dummies. The first dummy considers whether the firm is within the 50% largest firms. The second dummy considers whether the firm exports or not.<sup>4</sup> The last dummy is the foreign-ownership variable that is already included in  $\mathbf{X}$  in the first part of the right hand side. Coefficients  $\gamma$  then measures how the influence of each control variable in  $\mathbf{X}$  on the decision of borrowing in foreign currency (in the next year) depends on a firm characteristic.

The third term of the right hand side shows the effect of a subset of the vector  $\mathbf{X}$  including only the export-to-sales ratio, the log of assets and the foreign-ownership dummy. This is the vector  $\mathbf{x}$ . These three variables are interacted with a set of four macroeconomic (country-wise) variables, the four of which comprise the vector  $\mathbf{m}$ . The macro variables are the following: the domestic (lending) interest rate in domestic currency, the spread between the latter and the US interbank rate, and the ratio between total domestic credit to the private sector as a fraction of GDP. It also includes year dummies.

### III.2. Results

Tables 2 and 3 below show the results corresponding to the OLS estimates of equation 1.<sup>5</sup> Table 2 takes the share of total debt in foreign currency as the dependent variable while Table 3 considers the share of total financial debt over total financial debt as the dependent variable.

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*4 In the interactions with this latter dummy variable we also consider multiplying this export dummy with another corresponding to the status of being a commodity exporter.*

*5 Each table reports only a subset of the coefficients and standard deviation measures, corresponding mostly to statistically significant results, especially for the variables where the significance remains after adding all controls.*

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**Table 2: Determinants of the share of total debt in foreign currency**

*This table contains the OLS-based results of the benchmark regression equation (1) in section 2 for the dependent variable share of total debt issued in foreign currency. Variable A denotes the log of total assets, AHA denotes the share of foreign-owned assets over total assets, LeverageD denotes total leverage, Z denotes the export-to-sales ratio. FO is a dummy variable equal to 1 only for foreign-owned firms, SG denotes the annual growth rate of sales, S denotes the share of short-term debt. The acronym I denotes the domestic interest (lending) rate in domestic currency, SpreadIR denotes the interest rate spread between the dollar overnight rate in domestic currency and the overnight interest rate in USA, while CPS\_GDP denotes the credit-to-GDP ratio. The prefix lag refers to the first lag of the corresponding variable. Column 1 includes the regressors from the benchmark equation (1) in section 3. All regressions include year fixed effects. (Note: \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ , robust (country-level clustered) standard errors in parentheses).*

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
lagA	0.158*** (0.0206)	0.0455 (0.0348)	-0.0104 (0.0179)	0.170*** (0.0214)	0.151* (0.0693)	0.199*** (0.0234)	0.159*** (0.0252)	0.192 (0.102)
lagAHA	0.0689 (0.0965)	0.107 (0.124)	-0.0185 (0.164)	-0.423*** (0.0892)	-0.0330 (0.140)	-0.150 (0.243)	-0.453*** (0.103)	-0.111 (0.0916)
lagZ	0.444 (0.302)	0.645** (0.264)	1.303*** (0.467)	0.291 (0.358)	1.064** (0.395)	1.529** (0.480)	-1.072* (0.422)	-0.985 (0.992)
lagFO	-0.163 (0.0987)	-0.0979 (0.150)	-0.0172 (0.287)	-0.415 (0.237)	-0.421*** (0.104)	-0.272 (0.264)	0.287 (0.638)	
lagI_Z	0.00642 (0.00838)	0.0314*** (0.00863)	0.0392 (0.0406)		-0.0125 (0.00749)	-0.0477* (0.0217)	-0.0117 (0.0290)	
lagI_FO	-0.0199* (0.00792)	-0.0187* (0.0104)	-0.0477 (0.0325)	-0.00642 (0.00782)	-0.0213* (0.00846)	-0.0172 (0.0106)	-0.214 (0.147)	-0.0670 (0.0670)
lagSpreadIR_Z	-0.0410	-0.0545***	-0.102***	-0.0441	-0.0323	-0.0371	0.0546	0.000422

	(0.0230)	(0.0144)	(0.0393)	(0.0276)	(0.0178)	(0.0222)	(0.0430)	(0.0772)
lagSpreadIR_FO	0.0271***	0.0288***	0.0571**	0.0237***	0.00958	0.0200	0.174	-0.0432
	(0.00413)	(0.00535)	(0.0233)	(0.00305)	(0.00828)	(0.0109)	(0.144)	(0.109)
lagCPS_GDP_A	-0.000243	-0.000166	-0.000109	-0.000300	0.000181	-0.000539**	-0.000388*	-8.55e-07
	(0.000156)	(0.000146)	(0.000253)	(0.000173)	(0.000590)	(0.000200)	(0.000188)	(0.000714)
lagCPS_GDP_Z	-0.0104	-0.00595**	-0.0133	0.136	-0.0428**	-0.0218***	0.00883	0.635***
	(0.00561)	(0.00264)	(0.0121)	(0.242)	(0.0136)	(0.00385)	(0.00686)	(0.0405)
lagCPS_GDP_FO	0.00357	0.00152	0.000798	0.00643	0.0217***	0.00567*	0.00321	0.0255*
	(0.00190)	(0.00174)	(0.00411)	(0.00342)	(0.00196)	(0.00228)	(0.0240)	(0.0104)
ExpFirm				1.918**				1.569
				(0.536)				(1.133)
lagAHA_ExpFirm				0.477***				0.209
				(0.114)				(0.998)
lagA_ExpFirm				-0.192**				-0.142
				(0.0478)				(0.100)
lagFO_ExpFirm				0.522**				0.0672
				(0.188)				(0.116)
lagL_Z_ExpFirm				0.0480*				0.0194
				(0.0209)				(0.0329)
lagI_FO_ExpFirm				-0.0376***				0.00275
				(0.00484)				(0.0261)
lagCPS_GDP_Z_ExpFirm				-0.148				-0.646***
				(0.235)				(0.0368)

lagI_A_ExpFirm_Com	0.0728** (0.0255)	0.106 (0.0681)
lagSpreadIR_A_ExpFirm_Com	-0.0708** (0.0249)	-0.105 (0.0674)
lagCPS_GDP_A_ExpFirm_Com	-0.00102 (0.00937)	0.00802** (0.00207)
lagCPS_GDP_FO_ExpFirm_Com	0.0164 (0.156)	-0.122** (0.0403)
lagSpreadIR_Z_Top50	0.0785* (0.0321)	0.143 (0.0891)
lagCPS_GDP_Z_Top50	0.0396** (0.0148)	0.0187 (0.0269)
lagCPS_GDP_FO_Top50	-0.0158*** (0.00237)	-0.0205*** (0.00228)
Top50bycountry	0.594* (0.276)	
lagA_Top50bycountry	-0.0561* (0.0262)	
lagLeverageD_Top50bycountry	0.00879** (0.00271)	-0.210* (0.103)
lagZ_Top50bycountry	-1.536** (0.432)	-0.00987 (0.245)
lagI_Z_Top50bycountry	0.0690**	



In the case of the share of total debt in foreign currency, the size effect (measured by the coefficient of lagged total assets) is clearly significant in almost all specifications. Another variable correlated with foreign-currency total debt is the fraction of sales abroad, which shows a positive correlation in most of the specifications except for that controlling for foreign ownership.

Firms that inform to export a fraction of their sales (although do not necessarily report the fraction of those exported sales in all cases) seem also to show particular features regarding foreign-currency financial debt behavior. On average, those firms borrow more in foreign currency than the average, even more the higher is the stock of assets held abroad, or else if the firm is also foreign owned, but less the bigger their assets are.

An important characteristic that correlates to the debt-in-foreign-currency share is the foreign ownership dummy. The latter, both alone (lagged) and interacted with several other variables, appears to be statistically significant. The basic main result is that the average foreign-owned firm presents less total debt in foreign currency than the average firm. This result merits some careful interpretation. Given that not all foreign-owned firms export, then the trade-debt argument that applies to exporters may not be valid here. The most straightforward interpretation is that the financial strategy by foreign-owned firms are determined overseas (at headquarters of the major shareholder) but the latter would merit confirmation by further research that may include surveys to CFOs.

Another interpretation may have to do with lowering exchange-rate risk for foreign shareholders. Indeed, being a foreign-owned firm in Latin America, higher foreign-currency debt exposes that firm to higher risk in profitability. Thus, the financial management of the firm may have strong incentives to reduce such risk. Foreign-owned firms seem to react more to variations in the interest rate spread than other types of firms.<sup>6</sup> This seems consistent with the trend observed during the first decade of the XXI century about both interest rate spreads and foreign currency debt decreas-

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<sup>6</sup> This seems the case by looking at the positive coefficient of the interaction variable *lagSpreadIR\_FO*, for example

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ing. Yet, this effect may be mitigated by the effects of domestic interest rates (whose coefficient is positive in several specifications).

Macroeconomic variables seem to matter only when interacting them with firm-level characteristics such as foreign-ownership or export status. For example, interest rate spread movements become relevant for foreign-owned firms. This result makes sense whenever the management of such firms need to follow certain policies coming from the foreign headquarters. Of course, this depends on the degree of autonomy of the local management, a feature that is absent from our database. For commodity exporters a higher spread seems to decrease total foreign currency debt. This result seems a bit odd, although we may attribute it to a sample-size issue.

Regarding factors correlated with the share of financial debt in foreign currency, Table 3 below shows the results of the OLS regression referred to equation (1).

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**Table 3. Determinants of the share of financial debt in foreign currency**

This table contains the OLS-based results for the benchmark regression equation (1) in section 2. The dependent variable is the share of financial debt issued in foreign currency. Variable **A** denotes the log of total assets, **AHA** denotes the share of foreign-owned assets over total assets, **LeverageFD** denotes leverage in foreign currency, **Z** denotes the export-to-sales ratio, **FO** is a dummy variable equal to 1 only for foreign-owned firms, **SG** denotes the annual growth rate of sales, **S** denotes the share of short term debt. The acronym **I** denotes the domestic interest (lending) rate in domestic currency, **SpreadIR** denotes the interest rate spread between the overnight rate in domestic markets and the US overnight interest rate, while **CPS\_GDP** denotes the credit-to-GDP ratio. The term **lag** refers to the first lag of the corresponding variable. All regressions include year fixed effects. (Robust standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ )

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
lagA	0.0944*** (0.0181)	0.0444 (0.0306)	-0.0218** (0.00981)	0.0721** (0.0266)	0.0766* (0.0304)	0.0518* (0.0255)	0.102*** (0.0245)	0.0741* (0.0331)
lagAHA	0.398 (0.223)	0.275* (0.164)	0.319** (0.148)	-0.120* (0.0522)	0.532** (0.206)	0.232* (0.111)	-0.0942 (0.116)	-0.233 (0.204)
lagLeverageFD	0.0110** (0.00418)	0.00943*** (0.00157)	-0.00585 (0.0110)	0.0112*** (0.000809)	0.0150*** (0.00358)	0.00523** (0.00192)	0.0127*** (0.00209)	0.0156*** (0.00301)
lagZ	0.217 (0.183)	0.317 (0.227)	0.822*** (0.240)	0.0413 (0.322)	0.227 (0.548)	0.0620 (0.497)	1.020** (0.350)	
lagFO	0.0342 (0.0385)	0.00774 (0.0304)	0.262*** (0.0387)	0.0692 (0.0471)	-0.549 (0.307)	0.126 (0.0633)	0.181 (0.394)	5.188 (2.643)
lagS	-0.149*** (0.0325)	-0.146*** (0.0163)	0.0193 (0.0510)	-0.179** (0.0685)	-0.178*** (0.0240)	-0.234* (0.107)	-0.133 (0.0714)	-0.199 (0.141)
lagLFO	-0.0333** (0.00887)	-0.0312*** (0.0106)	-0.0532*** (0.0129)	-0.0229** (0.00835)	-0.0180 (0.0103)	-0.0216** (0.00787)	-0.0538 (0.0604)	-0.417* (0.198)

lagSpreadIR_Z	-0.0176	-0.0155	-0.0161	-0.0293	-0.0318***	-0.0317**	-0.0452	-0.0789**
	(0.0167)	(0.0205)	(0.0286)	(0.0217)	(0.00400)	(0.0101)	(0.0257)	(0.0280)
lagSpreadIR_FO	0.0305**	0.0280***	0.0415***	0.0209*	0.0236	0.0239**	0.0139	-0.151
	(0.00972)	(0.0108)	(0.0114)	(0.00935)	(0.0159)	(0.00855)	(0.0334)	(0.102)
lagCPS_GDP_A	9.61e-06	4.72e-05	-0.000178***	7.14e-05	-0.00142*	0.000536*	-0.000116	-0.00127*
	(0.000132)	(0.000110)	(6.59e-05)	(0.000222)	(0.000659)	(0.000253)	(0.000197)	(0.000598)
lagCPS_GDP_Z	-0.00552	-0.00198	-0.00334	-0.977	-0.00245	-0.00386	-0.0163*	-0.339
	(0.00548)	(0.00387)	(0.00668)	(0.919)	(0.0147)	(0.00945)	(0.00791)	(1.063)
lagCPS_GDP_FO	0.00328***	0.00333***	0.00110	0.00265***	0.0290	-0.00297	0.00522	-0.0849
	(0.000684)	(0.000586)	(0.00150)	(0.000617)	(0.0148)	(0.00189)	(0.00873)	(0.0489)
ExpFirm				-1.417***				-1.475***
				(0.283)				(0.176)
lagAHA_ExpFirm				0.547**				0.972***
				(0.169)				(0.114)
lagA_ExpFirm				0.0821				0.107**
				(0.0522)				(0.0377)
lagI_FO_ExpFirm				-0.0558***				-0.00611
				(0.0132)				(0.0348)
lagSpreadIR_FO_ExpFirm				0.0407**				0.00863
				(0.0136)				(0.0376)
lagSG_ExpFirm_Com				0.276				0.853*
				(0.144)				(0.373)
lagI_A_ExpFirm_Com				-0.267***				0.514

	(0.0615)	(0.533)
lagl_FO_ExpFirm_Com	5.017***	-9.276
	(1.149)	(9.806)
lagSpreadIR_A_ExpFirm_Com	0.254***	-0.630
	(0.0625)	(0.595)
lagSpreadIR_FO_ExpFirm_Com	-4.816***	11.07
	(1.164)	(10.75)
Top50	-1.279	-1.225*
	(0.711)	(0.545)
lagAHA_Top50	-0.366	-0.805**
	(0.194)	(0.250)
lagFO_Top50	0.509	1.799***
	(0.329)	(0.328)
lagS_Top50	0.215***	0.227*
	(0.0423)	(0.0902)
lagl_Z_Top50	0.0630**	0.121**
	(0.0173)	(0.0420)
lagl_FO_Top50	-0.0116	-0.0889***
	(0.0153)	(0.0187)
lagCPS_GDP_A_Top50	0.00135*	0.00114*
	(0.000654)	(0.000535)
lagCPS_GDP_FO_Top50	-0.0245	-0.0324**
	(0.0145)	(0.0110)

lagLeverageD_Top50bycountry	0.0212*** (0.00210)
lagL_A_Top50bycountry	0.00174* (0.000721)
lagL_Z_Top50bycountry	-0.0520** (0.0190)
lagSpreadIR_A_Top50bycountry	-0.00279*** (0.000328)
lagCPS_GDP_A_Top50bycountry	-0.000686* (0.000268)
lagCPS_GDP_FO_Top50bycountry	0.0109*** (0.00169)
lagAHA_Foreignownership	0.619** 0.0138 (0.160) (0.256)
lagA_FO	-0.0560* -0.178*** (0.0273) (0.0208)
lagZ_FO	-0.839** 0.990 (0.236) (0.814)
lagSG_FO	0.0122 -0.140** (0.0480) (0.0512)
lagL_A_FO	0.00501 0.00696** (0.00531) (0.00219)
lagSpreadIR_Z_FO	0.0346* 0.0433

lagCPS_GDP_A_FO									(0.0162)	(0.0473)
									0.000820**	0.00220***
									(0.000245)	(0.000314)
Constant	-0.933**	0.164	0.622***	-0.428	-0.287	-0.494**	-1.011***	-1.190		
	(0.272)	(0.367)	(0.131)	(0.547)	(0.519)	(0.149)	(0.240)	(0.788)		
Country fixed-effects	NO	YES	NO	NO	NO	NO	NO	NO	NO	NO
Firm fixed-effects	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO
Observations	493	493	493	484	493	493	493	484	493	484
R-squared	0.350			0.444	0.414	0.422	0.371	0.525		
Number of Firm	70	70	70	66	70	70	70	66	70	66

*Source: authors's calculations based on database*

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As in the case of total debt in foreign currency, table 3 shows that size measured by the log of assets is still a key variable correlated to the dependent variable here. Unlike in the case of total debt in foreign currency, the first lag of financial leverage is strongly correlated to the financial debt in foreign currency share. This may be read as a mechanical result. Yet, the same variable was not correlated to total debt in foreign currency. This suggests that a firm with higher levels of financial debt may need to refinance part of such debt in foreign currency, hence generating the positive correlation.

For firms exporting, the fraction of sales exported abroad in this case appears to be significant when interacted with the share of short term debt of last period. Yet, the coefficient on the export status is negative, suggesting that the average exporting firm takes less financial debt in foreign currency than the non-exporting ones. This suggests that the exporting firms tend to take trade-debt in foreign-currency rather than financial debt. This also suggests that the exporters in our sample presents enough reputation with trade-partners to avoid financing those trades with financial debt. Yet, this effect is ameliorated when exporting firms have high levels of assets in foreign currency. Probably, the availability of foreign-currency assets may imply that such exporters may find less risky to finance part of their trade (or maybe, expenditures that are applied, for example, to search for new markets) with financial debt. This hypothesis would need further confirmation in future research.

Foreign-ownership status per se does not imply a difference in the financial foreign-currency debt holdings relative to the average. Yet, when considering those foreign-owned firms with high assets in foreign currency they seem to be propense to take financial debt in foreign-currency. One possible interpretation is that these firms may be involved in international financial trading (being intrinsically non-financial firms) so they may take debt in foreign-currency to just to accumulate foreign-currency assets for future trading. Yet, there may be other motives for this result. Again, with more information this and other hypotheses may be tested more accurately. Notice also that foreign-owned firms with large amount of total assets and those with higher exports tend to take less financial debt

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in foreign-currency. The second of these two results resembles the fact that exporters on average take less financial debt in foreign-currency.

Finally, regarding the role played by macroeconomic variables, as in the case of the total foreign-currency debt case, they seem to matter only for specific types of companies. A higher interest rate spread increases the foreign-currency financial debt in foreign-owned firms. This again may be part of a financial strategy coming from headquarters. For exporting, foreign-owned firms, the effect is even higher, although not so for foreign-owned commodity exporters. Relative to the domestic interest rate, for foreign-owned companies that export with high amount of assets, an increase of such variable reduces the financial debt in foreign-currency. Yet, for foreign-owned commodity exporters the result is the reverse. This result seems a bit puzzling, since it is not obvious why exporting commodities changes those incentives to increase or decrease the holdings of financial debt in foreign currency. This is clearly left for future research.

### **III.3. Relationship with the literature**

Comparing these findings with part of the literature, Allayanis et al (2003) analyze determinants of different types of debt currency-denomination for Asian companies in the 90's. That paper shows that several macroeconomic variables influence the decision of having more debt in foreign currency. Among firm-specific variables, market-to-book ratio, and foreign cash implies higher incentives to borrow in foreign-currency. In this regard, this paper obtains some comparable results when looking at the foreign-owned assets in some of our regressions, but only for certain firms (i.e, those exporting abroad). In that paper, a macro variable that increases the debt in foreign currency is the interest rate differential. In that regard this paper obtains comparable results but again only for specific types of firms.

Benavente et al (2003) also analyzes determinants of foreign-currency debt in the case of Chilean companies. The main firm-level regressor is the size of the firm. There is no differentiation across different types of firms, as it is the case in this paper. Regarding macro variables, financial depth measured as total credit over M2 has an effect on foreign-currency debt, although the sign of the corresponding coefficient is not the same whether

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OLS methods are used vis-à-vis other GMM is used (in the first case the coefficient is negative, in the other cases the coefficient is positive). It has already been mentioned that our measure of financial depth does have an influence but for specific types of firms.

Gozzi et al (2010) analyzes the patterns of fund-raising by companies in developed and developing countries, both in domestic markets and international markets. A major difference with that paper is that Gozzi et al (2010) use very few firms characteristics such as size (total assets), annual growth, capital expenditures, capital structure and profitability.

Brown et al (2011) analyze the determinants of foreign-currency debt for small firms in transition economies. That paper also finds (as well as this paper) that being an exporter firm increases the incentives to borrow in foreign-currency. The same occurs with foreign-owned firms. Yet, that paper does not differentiate between financial foreign-currency debt and total foreign-currency debt. This differentiation seems relevant in this paper, especially concerning the behavior of exporting firms.

Mizen et al (2012) analyze the determinants of onshore versus offshore debt issues by Asian companies for the period 1995-2007, that is, previous to the sub-prime crisis (but including the South-Asian crisis in 1997). In that period, the onshore issues increased relative to the offshore market issues. Yet, that paper uses somewhat different controls than in this paper, except for leverage and a measure of size. That paper does not look at foreign-ownership or export status, for example. Their main result is that domestic market depth is a major influence on the decision of issuing debt domestically rather than abroad. In this paper, domestic market depth is proxied by the domestic-credit-to-GDP ratio. This last variable in our regressions do not seem to be relevant per-se, but only for certain firms. For example, in the case of total financial-debt decisions, this variable is significant only when for firms involved in export activities or else the largest firms. More closely, results regarding determinants of financial foreign-currency debt such variable seems only be relevant for foreign-owned firms and large firms. Again, the size of the database imposes an important limitation when comparing results between papers.

Finally, Mora et al (2013) presents results on foreign-currency borrow-

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ing for Lebanese companies. That paper does consider the export status explicitly. That paper finds that being an exporter increases the probability of having debt in foreign-currency. As stated above, this paper finds somewhat a slightly more subtle result: the behavior of the average export firm is not the same when considering total debt in foreign currency than in the case of financial foreign-currency debt. The rest of the control in Mora et al (2013) are different from those used in this paper, so the main comparability criterion is the behavior exporters regarding foreign currency debt.

## **II. Concluding remarks**

This note presented new evidence on the incentives to borrow in foreign currency by non-financial public companies in six major Latin American countries. Results indicate differencing between total and financial debt in foreign currency may be important, especially for economies with exporting or foreign-owned companies. The effects of different variables on each of those two types of foreign-currency liabilities may be very different (even the opposite) across them. This means that other types of liabilities such as trade debt may play important roles in understanding the behavior of firms regarding foreign-currency debt.

There is clearly room for future research in different directions. First, the size of the database is clearly an issue. There is a need of widening the scope of firms, although the latter is clearly limited to information availability. Provided such additional information could be found, there are firm-level variables that are not considered in this paper that could be used as regressors in future papers. For example, specific firm-level, corporate-governance indicators such as one share-one vote may be used to understand their possible role in issuing debt in foreign currency.

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