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**Non-Resident Holdings of Domestic Debt in Nigeria:
Internal or External Driven?**

by Amr Hosny

I N T E R N A T I O N A L M O N E T A R Y F U N D

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Non-Resident Holdings of Domestic Debt in Nigeria: Internal or External Driven?

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Abstract

Foreign holdings of domestic debt instruments in Nigeria have been increasing. Using data over 2007M1-2019M1, we show that, on average, global factors (global interest rates, oil prices) seem to carry more weight than domestic factors (treasury bills rate and domestic risk) in foreign portfolio investors' decisions in Nigeria. Specifically, we show that foreign participation is, in the long run, positively correlated with oil prices and profitable rates of return on local-currency instruments, but negatively correlated with exchange rate depreciation pressures. In the short run, oil prices, opportunity cost of funds and perception of Nigeria-specific risks also play a role. These results highlight the volatile short-term nature of such flows and call for a package of policy reforms to attract longer term direct investments.

JEL Classification Numbers: F30; G11; G15; O16.

Keywords: foreign holdings, local currency debt, portfolio flows, Nigeria

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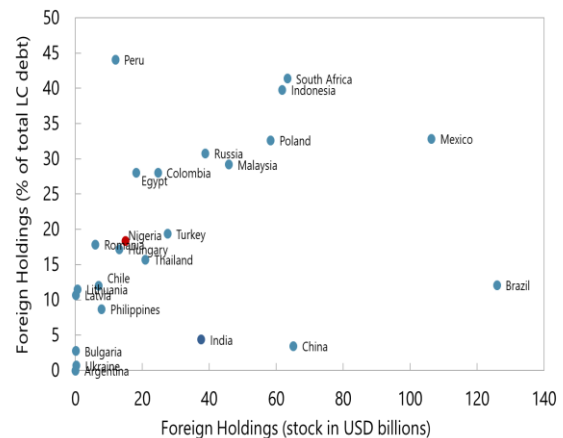
I. INTRODUCTION AND CONTRIBUTION TO THE LITERATURE

The financing landscape facing developing countries has been gradually changing. Over the past decade, there has been a noticeable change in the mix of creditors away from traditional multilateral sources towards more non-Paris Club official bilateral creditors, and from concessional to market debt from both domestic and external commercial sources. Contingent liabilities are also large and growing, and debt management capacities are improving albeit at a slow pace.

This change has been most visible in frontier low-income countries (LICs), where debt ratios have increased, albeit from a low level, mainly on the back of rising domestic debt and greater access to international capital markets. In frontier LICs, domestic debt financing increased from 14 to 19 percent of GDP from 2007 to 2014, respectively. More and more LICs are issuing international sovereign bonds, with each issue providing average financing equivalent to 3.2 percent of GDP (IMF 2015).

As globalization progressed, a handful of frontier economies witnessed an increasing participation of non-resident investors in their domestic debt markets. As domestic financial markets deepen and the search for yields continues, foreign portfolio investors (FPIs) are becoming increasingly active in several frontier economies. In Senegal and Ghana, for example, foreign holdings average about one-third of domestic debt while in other countries, their share has been increasing albeit from a lower base (IMF 2015; IMF 2020). In Nigeria, as of end-2018, foreign investors held a little below 20 percent of all outstanding domestic debt instruments, approaching levels observed in several emerging markets (EMs) (text figure), and with increasingly attractive domestic yields, FPIs' interest is expected to continue to grow.

Foreign Holdings of LC Government Securities
(at end 2017)



Sources: Staff calculations based on Arslanalp and Tsuda (2014, updated)

Foreign participation in local debt markets can be useful. FPIs can be especially helpful in countries where domestic commercial banks are the largest holders of government debt and/or there is limited participation from other institutional investors such as mutual funds, pension funds, or insurance companies. Asonuma et (2015) find that this “home bias” or increased domestic banks’ holdings of domestic sovereign debt maybe associated with less responsive fiscal policy and/or higher borrowing costs during crisis periods. Foreign investors can improve price discovery, increase demand for longer-maturity instruments and provide liquidity (Bae 2012; and Arslanalp and Tsuda 2014). More generally, local currency issuances

can reduce currency mismatches and exchange rate risk compared to external borrowing (IMF, WB, EBRD, OECD 2013).

The literature on foreign holdings of local debt instruments is limited, focuses mostly on EMs and their impact on yields rather than their determinants. While several studies have examined drivers of capital flows to EMs in general (see Koepke 2018 for a survey of the empirical literature), focus on foreign portfolio inflows into local currency debt markets has been limited. Specifically, available studies on EMs show that greater foreign participation reduces long-term government bond yields, without necessarily increasing yield volatility (Peiris 2010; Sánchez 2018; and Lu and Yakovlev 2017), although others found evidence of increased yield volatility (Ebeke and Lu 2015; and Ebeke and Kyobe 2015). Agur et al (2018) show that EM local-currency sovereign bond yields co-move with international interest rates. In Malaysia, Lu and Yakovlev (2018) show that an efficient FX derivatives market could help attract a wider range of FPIs, while Grigorian (2019) studies the relationship between portfolio flows and exchange rate volatility. Kemoe and Zhan (2018), in a sample of 33 EMDCs, present evidence that higher fiscal transparency can reduce sovereign interest rate spreads and increase foreign holdings of sovereign debt.

There is generally little evidence on the drivers of foreign fixed income investments in domestic markets in the empirical literature. Only a few studies examine these determinants, and when available they typically focus on the role of external factors only. IMF (2015) notes that non-resident participation in domestic debt markets in frontier LICs can depend on global financial conditions and confidence in host markets but provides no empirical examination. Focusing on the general development of local currency bond markets (LCBMs) in SSA, but with no reference to foreign holdings, Essers et al (2016) report the importance of fiscal balance, inflation and institutional quality. Arslanalp and Tsuda (2015) argue that the steady increase in EM portfolio inflows post the global financial crisis, and the associated large degree of synchronicity, suggests that foreign investor interest is shaped by external (or push) factors which allocates funds independently of individual internal country fundamentals (or pull) factors. Arslanalp and Tsuda (2012) argue that changes in sovereign credit ratings may have triggered portfolio outflows in some euro-area countries. In the U.S., Bae (2012) shows that U.S. investors tend to invest in bonds in advanced countries with strong fiscal balances, high institutional quality, and are more open to capital flows, while Burger and Warnock (2007) shows that U.S. investors avoid local currency bonds that have returns with historically high variance and negative skewness – features that are predominant in EMs.

This paper contributes to the literature on determinants of foreign holdings in three ways. This paper examines the domestic vs global factors driving foreign participation in the domestic market in Nigeria over 2007M1-2019M1. As such, first, we focus on the drivers of foreign holdings, whereas the literature has mostly focused on their impacts on yields or volatility.

Second, this study is the first to conduct an econometric analysis of the drivers of foreign holdings of domestic debt in a low-income developing country, whereas the literature has mostly focused on emerging economies. Third, we study the role of both internal and external factors, whereas the literature has mostly focused on external factors only.

We find that foreign participation in Nigeria is driven by both external and internal factors, although external factors seem to carry more weight. Results suggest that, on average in all model specifications, global factors (global interest rates, oil prices) seem to carry more weight in FPIs' decisions than domestic factors (NTB rate and domestic risk). Specifically, using an autoregressive distributed lag (ARDL) model, we show that foreign holdings are, in the long run, positively correlated with oil prices and profitable rates of return on local-currency instruments, but negatively correlated with exchange rate depreciation pressures. In the short run, oil prices, opportunity cost of funds and perception of Nigeria-specific risks also play a role. Results are largely robust to changing specifications.

While foreign participation can be associated with financial deepening, it can also be a source of vulnerability. Increased foreign holdings can help reduce borrowing costs, broaden the investor base and be seen as a natural and encouraging development as domestic financial markets deepen. However, they can also increase risks to capital reversals as these flows are more volatile and short term in nature (see BIS 2007 and IMF 2015 for an overview of the pros and cons). Supportive monetary and financial policies and strong institutions are needed to anchor investor confidence.

This paper is structured as follows. Section II analyzes the data. Section III presents the econometric model, methodology and results. Finally, Section IV concludes and provides some policy implications.

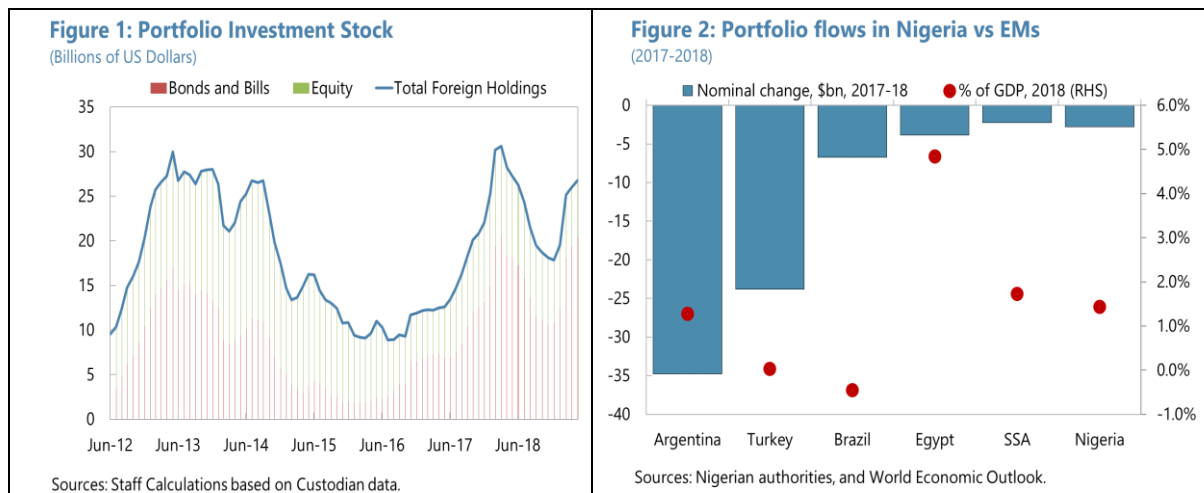
II. AN INITIAL LOOK AT THE DATA

Non-resident holdings of locally-issued local-currency debt in Nigeria have been rising since early 2017. Total non-resident holdings, of both fixed income securities and equity, have picked up significantly since 2017, following a downward trend observed since end-2014. After reaching a peak of around \$30bn in March 2018, foreign participation in domestic debt and equity markets declined in 2018H2 before picking up in 2019H1 (Figure 1). A sell-off during the EM turmoil—which coincided with dividend repatriation—along with investors' concerns about FX repatriation following the fine imposed on MTN (South African telecom company) in September 2018 and some pre-election jitters resulted in outflows of about \$9 billion during April-November 2018. As of end-2018, foreign investors held a little below 20 percent of all outstanding domestic debt instruments, in short-term Nigerian Treasury Bills (NTBs) and Central Bank of Nigeria (CBN) Open Market Operations (OMOs) Bills and in

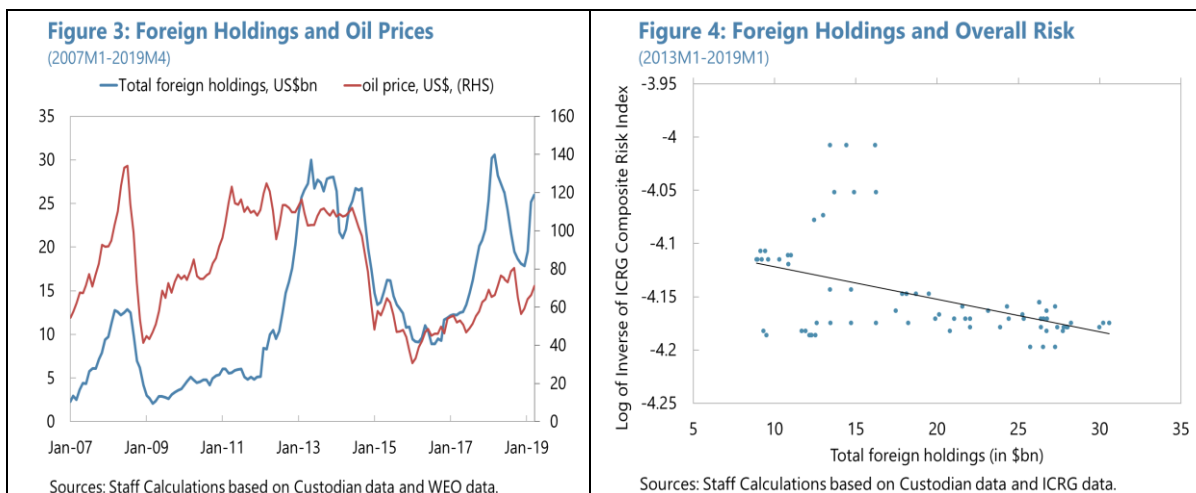
long-term Federal Government of Nigeria (FGN) Bonds. During 2018, a similar reversal of portfolio flows has been observed in peer countries, albeit with different intensities (Figure 2).

What drives foreign holdings of domestic debt? Foreign participation in domestic debt markets typically reflects both global (or push) and domestic (or pull) conditions. See Koepke (2018) for an overview. Specifically:

- External factors: Global financial conditions, driven by VIX and monetary conditions in major financial centers are important determinants of capital flows (Rey 2015). Movements in oil prices are an important factor as well for commodity exporters such as Nigeria. Figure 3 shows that oil prices and total foreign holdings tend to move together.
- Internal factors: The rise of total non-resident holdings observed since early 2017 has roughly coincided with the introduction of the Investor and Exporter (I&E) window in April 2017, an FX window for willing suppliers and buyers of FX, where foreigners can freely go in and out, at a flexible naira rate largely in line with market expectations. This has also been a period of attractive rates of return on debt securities issued both by the government (NTBs and FGN bonds) and the Central Bank (CBN bills), at least in comparison to peer countries. The downward trend in non-resident holdings observed in 2018H2 could be associated with rising domestic risks or investors wait-and-see attitude ahead of elections. Figure 4 shows that higher foreign holdings are associated with lower overall risk (proxied by the ICRG index)².



² The International Country Risk Guide (ICRG) index comprises 22 variables in 3 subcategories of risk: political, financial, and economic. Similar correlations, as in Figure 4, are found between the ICRG 3 subcategories and foreign holdings. The ICRG is available at <https://epub.prsgroup.com/products/icrg>, and updated monthly for 140 countries. In the chart and regressions, we use the inverse of the ICRG index, so that higher values represent more risk, so coefficients attached to this risk index would have the same interpretation as the VIX global index.



Global factors tend to carry a large weight in index-funds and decisions to invest in local currency debt in EMs. Several studies argue that portfolio flows to EMs tend to be correlated, driven by the so-called “benchmark effect” (see Sánchez 2018; Arslanalp and Tsuda 2015; BIS 2007). These benchmark-driven investors³, as of end-2014, held more than one third of total foreign holdings in EM local currency government bond markets, and are typically more sensitive to global than country-specific factors. Rey (2015) argues that capital flows are mainly driven by the global financial cycle, which co-moves with the VIX and monetary conditions in main financial centers. Raddatz et al (2017) find that benchmarks explain, on average, between 40-70 percent of equity and bond mutual fund portfolio allocations after controlling for country-specific effects. Sienaert (2012) highlights the importance of benchmark index inclusion, (or the risk of exclusion, if already included) in affecting investment decisions of institutional investors⁷.

III. THE MODEL, METHOD AND RESULTS

We model foreign holdings as a function of domestic and global factors. Using monthly data over 2007M1-2019M1, we specify the following equation:

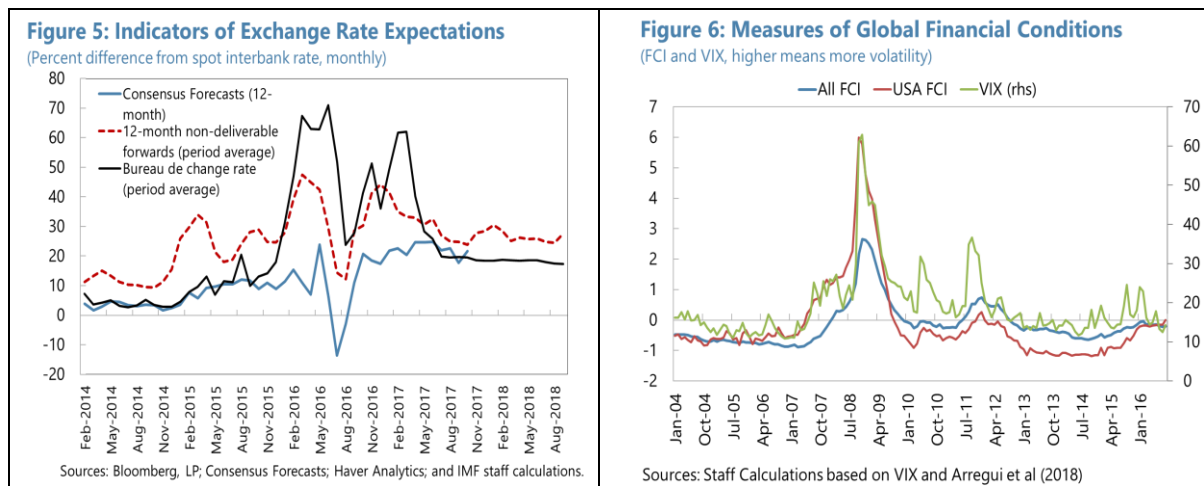
$$\text{foreignholdings} = f(\text{domestic}, \text{global}) \quad (1)$$

Where the dependent variable represents foreign holdings of debt and/or equity, regressed on domestic and global variables. Similar independent variables, especially global factors, have

³ Benchmark-driven investors as those who invest in countries through a fund that either tracks or closely follows a flagship benchmark index, like the J.P. Morgan Government Bond Index-Emerging Markets (GBI-EM) which tracks local currency bonds issued by EMs. Nigeria became the second African country after South Africa to be listed in this index in 2012M10, but was removed in 2015M10. It had a weight of 1.8 percent in the index, ahead of countries like Colombia, Philippines and Chile.

been used in the literature (Grigorian 2019; Koepke 2018; Konopczak 2015; Rey 2015; Bae 2012; and Baldacci et al 2008).

- Domestic factors include the rate of return on NTBs, Nigeria country specific risk (measured by ICRG risk index), measure of exchange rate pressure (12 months NDF and spread between Bureau de Change (BDC)-official exchange rate) and a dummy representing the introduction of the I&E window. Figure 5 shows different indicators of exchange rate expectations. The 12 months non-deliverable forward (NDF) is what is typically used by foreign investors to hedge their FX risk as they enter the market. Since the introduction of the I&E window, the NDF spread above the BDC and I&E rates has hovered around 10 percent, close to the underlying interest rate differentials.
- Global factors include the oil price, measure of global financial volatility (VIX⁴ and FCI⁵), as well as the London Interbank Offered Rate (LIBOR) to account for the opportunity cost of investing in Nigeria. Figure 6 shows the close correlation between the Financial Conditions Index (FCI) and VIX.



To distinguish long-run from short-run effects, we run an autoregressive distributed lag (ARDL) model. Using the ARDL co-integration approach of Pesaran et al (2001), we distinguish between a long-run equation in levels and a short-run error correction equation in

⁴ The VIX volatility index, created by the Chicago Board Options Exchange (CBOE), is a real-time market index derived from the price inputs of the S&P 500 index options, it provides a measure of market risk and investors' sentiments. It is available at <http://www.cboe.com/vix>.

⁵ We use the Financial Conditions Index (FCI), discussed in Arregui et al (2018) and several GFSR issues. The FCIs are estimated for 1990–2016 at monthly frequency for 43 advanced and emerging market economies. They are based on 10 underlying financial indicators. The FCI we use here is a simple average of the individual country FCIs in Arregui et al (2018), which may be a more appropriate measure of global financial volatility compared to VIX which focuses on American companies listed in S&P 500 only. That said, simple correlation with VIX is 0.83 for our sample period.

first differences, both simultaneously estimated. Variables are expressed in logs and the ARDL methodology takes into account the time-series properties of the variables as explained below.

The long-run reduced form model is estimated in steps as shown in equation (2), following the same specification above. Theoretically, we would expect coefficients on NTB and oil prices to be positive, while those of NGA-specific risk (ICRG), measure of exchange rate (BDC-official spread or 12m NDF), global volatility (VIX or FCI) and opportunity cost of funds (LIBOR) to be negative.

$$\begin{aligned} \text{foreignholdings}_t = & \beta_0 + \beta_1 \text{NTB}_t + \beta_2 \text{Risk}_t^{\text{ICRG}} + \beta_3 \text{exrate}_t + \\ & \beta_4 \text{Oilprice}_t + \beta_5 \text{Volatility}_t^{\text{VIX}} + \beta_6 \text{LIBOR}_t + \varepsilon_t \quad (2) \end{aligned}$$

The short-run ARDL error correction specification is shown in (3) and (4), where (ECT_{it-1}) is the lagged error correction term, representing the linear combination of lagged level variables. Short-run coefficients (attached to first-differenced variables) and the long-run coefficients (attached to lagged level variables) are simultaneously estimated by OLS. Long-run coefficients are produced by normalizing ($\hat{\theta}_{k+1}$) by ($\hat{\theta}_1$) as explained in Pesaran and Pesaran (1997). To establish cointegration, Pesaran et al (2001) propose the standard F -test for the joint significance of lagged level variables.

$$\begin{aligned} \Delta \text{foreignholdings}_t = & \alpha + \sum_{k=1}^{n1} \omega_k \Delta \text{foreignholdings}_{t-k} + \sum_{k=0}^{n2} \eta_k \Delta (\text{NTB}_{t-k}) \\ & + \sum_{k=0}^{n3} \phi_k \Delta (\text{Risk}_{t-k}^{\text{ICRG}}) + \sum_{k=0}^{n4} \phi_k \Delta (\text{exrate}_{t-k}) + \sum_{k=0}^{n5} \beta_k \Delta (\text{Oilprice}_{t-k}) \\ & + \sum_{k=0}^{n6} \gamma_k \text{Volatility}_t^{\text{VIX}} + \sum_{k=0}^{n7} \mu_k \text{LIBOR}_t + \delta \text{ECT}_{t-1} + u_t \quad (3) \end{aligned}$$

$$\begin{aligned} \text{where } \text{ECT}_{it-1} = & \theta_1 \text{foreignholdings}_{t-1} + \theta_2 \text{NTB}_{t-1} + \theta_3 \text{Risk}_{t-1}^{\text{ICRG}} + \theta_4 \text{exrate}_{t-1} \\ & + \theta_5 \text{Oilprice}_{t-1} + \theta_6 \text{Volatility}_{t-1}^{\text{VIX}} + \theta_7 \text{LIBOR}_{t-1} \quad (4) \end{aligned}$$

Model specifics. An advantage of this procedure is that it is applied irrespective of whether the underlying regressors are purely $I(1)$ or purely $I(0)$ or mutually cointegrated, so there is no need for the usual pre-unit-root testing associated with standard cointegration approaches such as Johansen and Juselius (1990).⁶ Specifically, Pesaran et al (2001) bounds testing approach reports two sets of critical values; an upper bound critical value assuming all variables are $I(1)$, and a lower bound assuming all are $I(0)$. If the calculated F -statistic is above the upper bound, then variables are jointly significant indicating long-run cointegration. In estimating the

⁶ That said, ADF unit root tests are conducted to ensure none of the variables are $I(2)$.

(continued...)

models, we use information criteria to select the optimum lag number, as explained in Bahmani-Oskooee and Tanku (2008).⁷

In the long-run, higher NTB rate and oil prices, and less depreciation pressures, are correlated with higher FPIs (Table 1). Models 1 and 2 use foreign holdings in debt instruments as the LHS dependent variable, while models 3-5 use total (debt and equity) holdings. NTB rate and oil prices are statistically significant with the correct sign in almost all models. High pressure on the exchange rate (i.e. expectation of depreciation, proxied by the BDC-official spread) is associated with lower FPIs. Coefficients on I&E window, Nigeria-specific risk and global financial volatility are significant in certain specifications only. Specifically:

- Internal factors: The coefficient on the NTB yield is positive and significant, whether at 3-month (models 2,3,5) or 6-months maturity (model 4). For example, in model 5, results imply that a percentage change in the NTB rate is associated with a 1.1 percentage change in foreign holdings, on average and ceteris paribus at the 1 percent significance level. The coefficient on the monetary policy rate (MPR) is not statistically different from zero (model 1), suggesting it is not representative of true monetary policy stance given its relative stability over time. Hosny et al (2018) find a similar result. A percentage increase in the spread between BDC-official exchange rate discourages foreign holdings by around 0.4 percent, on average and ceteris paribus (model 5), as FPIs would lose if they bring their FX in at a certain rate and go out at maturity at a more depreciated rate. The ICRG coefficient is negative and significant (model 2), where a percentage change in the (inverse of) ICRG risk index is associated with more than 7 percent decline in foreign holdings, on average and ceteris paribus. The I&E dummy is statistically significant where the sample coverage is shorter and as such has more weight (model 1).⁸
- External factors: As expected in a commodity exporter, higher oil prices measured as WEO (model 1) or Brent price (model 4) are correlated with higher foreign holdings of debt and/or equity. In model 1 for example, a percentage increase in international oil prices is associated with a 1.3 percent increase in foreign holdings of fixed income instruments, on average and holding all else constant. The negative coefficient on VIX or FCI highlights the hot money nature of these portfolio flows and their susceptibility to exogenous factors (models 3-5). This result is in line with Grigorian (2019) for Malaysia and Arslanalp and Tsuda (2015) who suggest that benchmark-driven investors, who constitute a larger share

⁷ Panopoulou and Pittis (2004) provide evidence that ARDL generally performs better than alternative methods such as the dynamic OLS of Stock and Watson (1993) or the fully modified OLS of Phillips and Hansen (1990), both in terms of estimation precision and reliability of statistical inferences.

⁸ Monthly data on the breakdown between debt and equity foreign holdings is only available starting 2012M6 as opposed to the available series on aggregate foreign holdings which starts in 2007M1.

of global portfolio flow decisions, are mostly sensitive to global shocks and less so to country-specific factors.

In the short-run, oil prices and investor risk appetite are also important (Table 2). Lagged difference coefficients on oil prices are positive and significant in all models, while the short-run coefficients on ICRG and LIBOR are negative and significant in model 4. There also appears to be a persistent effect as lagged dependent variables are significant. Only statistically significant coefficients are reported.

- Internal factors: The negative coefficient on ICRG (model 4) might explain the decline in aggregate non-resident holdings in 2018H2, where foreigners have been less interested in rolling over their holdings or even selling and casing-out ahead of maturity. MPR and NTB rates show both positive and negative short-run coefficients.
- External factors: Coefficients on oil prices are statistically significant at multiple lags (models 1-5). Higher LIBOR, a proxy for the opportunity cost of funds or investors risk aversion, seem to induce less foreign interest in Nigerian debt and equity in the short-run (model 4).

Table 1: ARDL Long-Run Results 2007M1-2019M1

Dep variable:	(1) Debt	(2) Debt	(3) Total	(4) Total	(5) Total
Domestic factors					
NTB rate 3m		1.689*** (0.619)	1.077*** (0.260)		1.091*** (0.375)
NTB rate 6m				0.771** (0.331)	
MPR	2.155 (2.740)				
ICRG risk		-7.679*** (4.440)		0.674 (3.358)	
NDF	-0.475 (0.867)				
Spread BDC-official					-0.410** (0.201)
I&E	0.901*** (0.321)			-0.380 (0.447)	0.173 (0.364)
Global factors					
Oil price WEO	1.678*** (0.441)		0.493 (0.386)		-0.713 (0.740)
Oil price Brent		0.96 (0.635)		0.867* (0.488)	
VIX	-0.691	-0.688		-1.919***	-1.872***

	(1)	(2)	(3)	(4)	(5)
Dep variable:	Debt	Debt	Total	Total	Total
	(0.653)	(0.985)		(0.481)	(0.504)
FCI			-0.761*** (0.187)		
LIBOR				0.209 (0.172)	
Observations	63	76	113	140	141

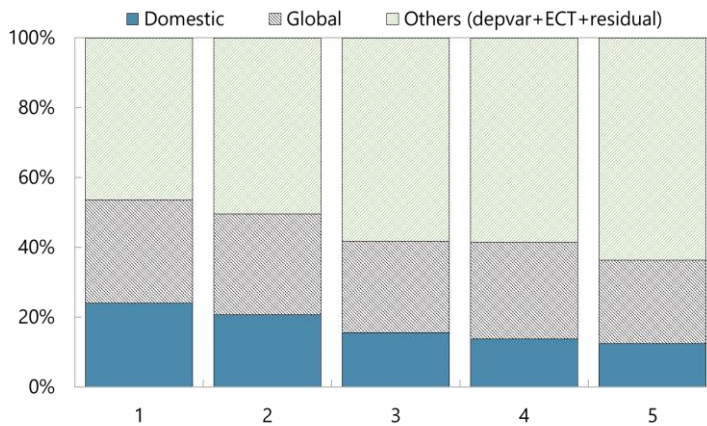
Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Model diagnostics. Model diagnostics show good overall fit (R-squared). Information criteria (AIC and BIC) are reported, although they are only comparable when sample is held constant. The Peseran et al (2001) bound test rejects the null hypothesis of no long-term level relationship (significant F -test). The negative and significant lagged error correction term ($ECT_{(t-1)}$), the speed of adjustment coefficient which links the long-run equilibrium implied by the cointegration relationship with the short-run adjustment process, also indicates long-run cointegration. The validity of the bounds test relies on normally distributed error terms that are homoskedastic and serially uncorrelated, no omitted variables and stable coefficients over time. Results reveal that models are mostly free from heteroskedasticity (White (1980) test fails to reject null hypothesis of constant variance), autocorrelation (Breusch-Godfrey LM test fails to reject null of no serial correlation), misspecification (Ramsey (1969) RESET test fails to reject null of no omitted variables) and instability (cumulative sun CUSUM test of recursive residuals fails to reject null of no structural break).⁹

On average, global push factors seem to carry slightly more weight in FPIs' decisions. We average the contribution of global vs domestic factors, in each of the above model specifications, by multiplying the lagged explanatory variables with their corresponding statistically significant estimated coefficients. On average, global factors (oil price and LIBOR) seem to have more weight than domestic factors (NTB rate and ICRG) in all models. On average in the 5 models, other factors (lagged

Drivers of Non-Resident Holdings of LC Debt and Equity

(average contribution, by factor, ARDL short-run model, 2007M1-2019M1)



Sources: Staff Estimations

⁹ The CUSUMSQ test of Brown, Durbin, and Evans (1975) also shows parameter stability.

dependent variable, error correction term and residuals) explain slightly above half the variation in the dependent variable. This result is in line with those documented in the recent literature on the importance of global push factors in attracting foreign portfolio flows (Rey 2015 and Arslanalp and Tsuda 2015).

Results highlight the vulnerable nature of foreign portfolio flows in Nigeria. While results suggest that attractive rates of return on NTBs, relative to peers, may have succeeded in attracting FPIs looking for quick profit-making opportunities, this also highlights the vulnerability given the underlying volatility of such hot money, especially if combined with an environment of lower oil prices and/or increased domestic risks.

Table 2: ARDL Short-Run Results 2007M1-2019M1

	(1)	(2)	(3)	(4)	(5)		(1)	(2)	(3)	(4)	(5)
Dependent variable						Global factors					
Δ debt foreign (t-1)	0.634*** (0.190)	0.385*** (0.112)				Δ Oil price WEO (t-1)	-0.658* (0.372)		0.366*** (0.123)		0.276*** (0.105)
Δ debt foreign (t-3)	0.554*** (0.186)					Δ Oil price WEO (t-3)	1.546*** (0.386)		0.226* (0.118)		0.210** (0.102)
Δ debt foreign (t-5)	0.530** (0.198)					Δ Oil price Brent (t-1)		0.736*** (0.204)		0.387*** (0.110)	
Δ total foreign (t-1)				-0.076*** (0.019)		Δ VIX (t)	-0.158 (0.150)	-0.047 (0.138)			
Domestic factors						Δ VIX (t-1)	0.301* (0.131)				
Δ MPR (t-1)	-3.734** (1.547)					Δ LIBOR (t-1)				-0.360*** (0.103)	
Δ MPR (t-2)	-2.934** (1.309)					Δ LIBOR (t-2)				0.243** (0.106)	
Δ NTB 3m (t-1)		-0.185** (0.085)	-0.095** (0.044)			ECT (t-1)	-0.389** (0.154)	-0.126*** (0.037)	-0.081*** (0.020)	-0.076*** (0.019)	-0.069*** (0.019)
Δ NTB 3m (t-3)		-0.217** (0.088)	-0.118** (0.045)		-0.111*** (0.042)	Observations	63	76	113	140	141
Δ NTB 6m (t-2)				-0.113** (0.051)		F-test	2.423**	3.232**	6.364***	4.796***	6.760***
Δ ICRG (t-4)				-0.954** (0.433)		AIC	-95.569	-101.088	-209.6133	-267.708	-274.948
Δ NDF (t-1)	2.28** (1.310)					ARDL	6,6,6,6,6,4	2,4,3,4,4	1,4,4,0	1,4,5,0,2,0,2	1,4,0,0,4,0
Constant	1.352 (3.796)	-2.983 (1.823)	0.243 (0.177)	0.756 (0.922)	1.005*** (0.225)	White test	74.00	78.00	99.94	140.00	121.13
						LM test	3.445*	0.675	0.011	0.768	0.791
						RESET F-test	1.75	0.22	0.91	0.71	0.75
						CUSUM	0.1776	0.6256	0.1505	0.1706	0.1490
						R-squared	0.834	0.590	0.526	0.525	0.506

Standard errors in parentheses. Only statistically significant coefficients reported.

*** p<0.01, ** p<0.05, * p<0.1

IV. CONCLUSION AND POLICY IMPLICATIONS

This paper finds that both push and pull factors drive non-resident holdings of domestic debt in Nigeria, albeit with more weight to global push factors. Using time-series econometrics on Nigerian data over 2007M1-2018M9, we find that foreign participation in the long-run is positively correlated with rates of return on Nigerian debt instruments and oil prices, but negatively correlated with exchange rate depreciation pressures. While in the short-run, oil prices, opportunity cost of funds and perception of Nigeria-specific risks also play a role. By multiplying the lagged explanatory variables with their corresponding statistically significant estimated coefficients, we show that, on average, global push factors have been slightly more important than domestic pull factors in explaining foreign holdings.

Results highlight the volatile nature of foreign portfolio flows. Foreign hot money, by definition, is of a volatile and short-term nature. On the domestic front, NTB rates of return have indeed been attractive recently, contributing to increased foreign inflows, but such high rates cannot be sustained especially as inflation drops towards its target range. As the overall macro improves, NTB rates are bound to decrease, and FPIs could potentially seek other destinations as the risk-return payoff changes. Indeed, the recent decline in NTB rates over the course of 2018 has been associated with less foreign holdings. That said, strong domestic fundamentals (proxied here by the Nigeria-specific risk index) can continue to support foreign portfolio inflows, notwithstanding the role of the NTB rate. A unified exchange rate would eliminate the official-BDC spread, which is shown to be an important factor in our empirical results. More generally, it is important to pursue prudent macro policies to reduce vulnerabilities and build buffers, as well as accelerate structural reforms to improve the business climate and support diversification. Global financial conditions tend to be volatile and can suddenly tighten leading to a wave of portfolio outflows as has been seen in several EMs. Short-run model results also highlight the vulnerability of foreign participation to oil prices, an exogenous and volatile factor. The opportunity cost of funds, proxied by LIBOR, can also change given expected normalization in major central banks worldwide.

Foreign participation in domestic debt markets is generally associated with financial deepening and can diversify the investor base. General increases in domestic debt as a share of GDP have been associated with deeper financial markets. Increased foreign participation can help with liquidity management, diversify the investor base, create greater demand for local debt securities, and even temporarily support reserves or the exchange rate. Increased foreign inflows can also be an important source of financing, creating space for productive investments and increased lending. There is empirical evidence that financial inclusion and development are associated with increased capital flows (Soumaré and Tchana 2015; Qamruzzaman and Wei 2019). In this context, complementary policies to foster inclusive financial services are

important; and recent initiatives in the government's financial inclusion strategy to increase financial access and utilization – including by different demographic groups – are welcome.

But it also increases debt vulnerabilities. Foreign patriation in local debt markets can increase the transmission of global shocks (Essers et al 2016; Ebeke and Kyobe 2015), raise external funding risks (Arslanalp and Tsuda (2014), raise exchange rate volatility (Grigorian 2019), and increase yield volatility (Ebeke and Lu 2015). They can also increase risks of capital reversals, especially if inflows are driven by global factors and/or appropriate domestic policies are not put in place to limit potential outflows. Foreign investors' perception of risk-return trade off can change quickly for any given global or domestic factor. The combination of portfolio outflows and high global interest rates may increase refinancing risks, especially in countries with weak fundamentals (IMF and World Bank 2018). Rising foreign participation can raise external funding risks related to global investors sentiments and financial conditions; what Arslanalp and Tsuda (2014) call the “demand-side “risk which relates to who holds the debt rather than how it is issued.

If external factors can encourage non-resident inflows, strong domestic policies in “good times” can discourage outflows. Gosh et al (2016) using data from 53 EMs argue that policies in good times (when capital is flowing in) can shape the outcome in bad times (when capital reverses). Even if inflows are mostly driven by external factors, they find that countries that allow the buildup of macroeconomic imbalances are more likely to experience a banking or currency crisis after a surge of inflows. Strong domestic fundamentals, such as fiscal transparency (Kemoe and Zhan 2018) and institutional quality (Bae 2012) are thus important in supporting foreign holdings of domestic debt.

Systematic monitoring and periodic assessments of these risks are important for formulating appropriate policy responses. As domestic debt and foreign participation increases, safeguarding debt sustainability will require stronger institutions, especially in the context of an integrated and rapidly global financial environment. The IMF diagnostic framework for LCBMs provides a comprehensive approach to bond market development, also focusing on encouraging foreign participation (IMF, WB, EBRD, OECD 2013). Strengthening legal frameworks, institutional capacity and public debt transparency is also important in this context (see IMF and World Bank (2020) for best practices). Efforts led by the Debt Management Office are welcome in this regard, including on the compilation, reporting, and dissemination of public sector debt data as well as on bonds issuance calendar and bonds auction results. It would be beneficial to regularly publish data on non-resident holdings of local currency debt across the different instruments.

Encouraging more stable longer-term direct investments is key. Broner et al (2013) in a sample of European countries argue that foreign investors, despite diversifying the investor base, may

be less willing to rollover their holdings, especially in times of stress. Stronger underlying macro policies along with bold structural reforms would help attract more stable flows, linked to the real economy, in the form of FDI. Such flows would not only be more stable and long-lasting but should also have stronger employment and growth effects than short-term portfolio flows. In this context, implementation of the government's Economic Recovery and Growth Plan (ERGP) is key, including on recent efforts on doing business, governance and financial inclusion.

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