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Dollar dominance in Cross-border Bank Loans and Its Response to Uncertainties*

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Abstract

This paper examines whether, and if so, to what extent uncertainty increases the degree of the use of U.S. dollars in cross-country loans. To this end, we investigate what factors affect the choice of currency for denomination of cross-border syndicated loans. Among them, we focus on whether external shocks and global uncertainties, such as uncertainty stemming from U.S. monetary, fiscal, and trade policies, financial instability (measured by VIX), and infectious disease risk affect the choice of international loans. The analysis uses micro firm-level data on syndicated loans agreed between borrowers located in 25 emerging market economies (EMEs) and lenders from 59, from the 1995 to 2019 period. We find that uncertainties driven by U.S. trade policy led to a higher USD share in total international loans from the borrowers' perspective, indicating the borrowers' inclination to avert the exchange rate risk or volatility that may arise due to the uncertainty of U.S. trade policy. A rise in the general level of U.S. economic policy and the intensity of financial instability both have a negative impact on the USD share, likely reflecting dollar shortages at the time of increasing economic policy uncertainty and financial instability. The estimation on the currency shares from the lenders' perspective also confirms these impacts on U.S. economic uncertainties and financial instability. We also test the correlation between currency choice for international loans and the borrowers' revenue volatility, and find that syndicated loans in the local currency are associated with less revenue volatility compared to USD-denominated loans.

Keywords: Dollar dominance; globalization; financial spillover

JEL Classification Nos. G3, F3, F6, F41

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1. Introduction

The recent trend of dollar appreciation, that started in March 2020 with the breakout of the new corona virus (COVID-19) pandemic, reminded many that the U.S. dollar (USD) is the most trusted safe haven currency. Both the COVID-19 crisis and the Russian invasion of Ukraine were followed by dollar appreciation. The strong dollar at the time of an economic or military crisis is not unprecedented. The USD appreciated in the immediate aftermath of the Global Financial Crisis (GFC) of 2008. Economic, geopolitical, or political uncertainties drive investors to demand USD-denominated assets in pursuit of safety (Fratzscher, 2009; McCauley and McGuire, 2009), or liquidity (Rose and Spiegel, 2012), or both.

In such a dollar-dominant world, shocks emanating from the U.S. could have repercussions in the rest of the world while non-major economies could be vulnerable to the "global financial cycle" (Rey, 2013). Many papers have shown that spillovers occur from the center economy (i.e., the U.S.) to the peripheral economies through the channels of asset markets, bank lending, and output movements.[1]

The dollar dominance may sustain itself through a self-fulfilling process. Investors preferring to hold reliable, convenient, and liquid USD-denominated assets means that debt issuers or borrowers rely on the USD as the currency of denomination, making the USD a preferred currency for many countries for the store of value on the liability side as well. As the famous "original sin" argument (Eichengreen, Hausmann and Panizza, 2007) spells out, developing and emerging market economies (EMEs) tend to be highly reliant on the USD for debt issuance and therefore vulnerable and subject to shocks arising from the U.S. or global uncertainties.

Given this background, we investigate whether and how external shocks and global

[1] Refer to Bruno and Shin (2015a,b), Habib and Venditti (2018), Miranda-Agrippino and Rey (2020), Passari and Rey (2015), and Xu and La (2015, 2017) among many others.

uncertainties affect the choice of currency denomination for cross-border syndicated loans, using the individual loan-level data.

Following Xu and La (2015, 2007)[2], we use Thomas Reuters' Loan Pricing Corporation (LPC) Dealscan that comprises the detailed data on individual loan deals made between the borrowers located in 25 EMEs and the lenders from 59 advanced and emerging market economies during the 1995 – 2019 period. Using the merit of this database that contains detailed information on both borrowers and lenders, we estimate the determinants of the currency of denomination for cross-border syndicated loans from both borrowers' and lenders' perspectives. To our knowledge, this is the first in the literature to look at micro-level currency choice of loans from both sides.

Among the candidate determinants of currency choice in cross-border syndicated loans, we focus on whether and how external shocks and global uncertainties, such as U.S. monetary, fiscal, and trade policies, financial instability, and infectious disease risks, can affect the decisions of currency choice in cross-border loans.

U.S. monetary expansion would lower the cost of borrowing in USD and raise the value of currencies for the EME borrowers, so that the USD share in cross-border loans would rise. Also, if there is a rise in the perceived level of economic uncertainties, more cross-border loans could be denominated in the USD. However, if there is an acute financial instability, dollar shortage may occur so that both lenders and borrowers may find it difficult to agree on USD-denominated loans. Hence, it is an empirical question worth investigating.

The degree of dollar exposure can affect both borrowers and lenders. Conceptually, in a *perfect* world where the financial markets are fully developed, complete, and open, the currency

[2] Xu and La (2017) have shown that U.S. unconventional monetary policy has spillover effects on cross-border syndicated loans. Xu and La (2015) have also found that it is the currency of denomination, not bank ownership (i.e., domestic vs. foreign), that affects the degree of shock transmission of GFC shocks to the Asian credit market.

composition of loans must not affect the volatility of revenue or income because the risks from borrowing should be fully diversified.[3] However, many EMEs are often not equipped with fully developed and open financial markets (which applies to most of the economies where our sample borrowers are located, i.e., EMEs). Hence, we could suspect the risk from borrowing overseas may be greater if borrowers hold liabilities denominated in a particular currency such as the USD. Based on the above discussion, we examine whether greater dollar exposure leads to higher levels of revenue volatility, or whether borrowing in local currency leads to lower levels of revenue volatility.[4]

Thus, in the paper, we will explore the following questions:

- What is the trend of the shares of major currencies in cross-border syndicated loans in the last two decades?
- What are the micro- or macro-level determinants of currency denomination in cross-border loans from both borrowers' and lenders' perspectives?
- Do the shares of major currencies in cross-border loans respond to external shocks or global uncertainties? If so, how?
- Is the revenue volatility of borrowers correlated positively with the USD share and negatively with the share of local currency in cross-border loans?

These are all important questions to understand the current and future state of international monetary system. This study will certainly contribute to the debates on different roles of the U.S. dollar, the euro, and other major international currencies.

[3] For example, in the world with complete and open financial markets, the exchange rate risks should be fully covered, i.e., no deviations from the covered interest parity.

[4] Currency exposure may also influence the economic performance of lenders. However, as we mention later, our dataset does not allow us to conduct meaningful estimation exercises on the impact of currency choice on the lenders' revenue volatility.

In what follows, we will present the stylized facts and summary statistics of the international loan market while focusing on the share of currency of denomination. In Section 3, we conduct regression exercises to estimate the determinants of the currency choice for cross-border loans. In Section 4, we investigate the impacts of the currency compositions of loans on borrowers' revenue volatility and briefly on lender risk perception. We make concluding remarks in Section 5.

2. Snapshots of the international loan market: stylized facts and summary statistics

We first present stylized facts and summary statistics of cross-border syndicated loans. For the loan data, we use the Dealscan database. It provides detailed information on the deals of medium to large international loans, the company data of the syndicated lenders and the borrowers, and, importantly, the currency of denomination. The data source represents a substantial share (20%-30%) of international banking activities (Cerutti, Hale, and Minoiu 2014).

Using these data, we present the summary statistics and stylized facts of 35,260 international syndicated loans borrowed by 17,571 firms in 25 EMEs over the period of January 1995 through December 2019. The lenders participating in the syndicated loans are located in 59 advanced and emerging market economies.[5]

The dataset contains information on individual deals as of the dates of the announcements of the deals (not the dates when the loans are actually delivered). The dataset presents the ebb and flow of cross-border loans and captures the market dynamics. However, although the loan data involves time dimensions, it is rare for one borrower to appear in more than two loans. That is, the international loan data we employ here is not much of panel data, but of a cross-sectional one.

Some aggregation of the data across individual or groups of economies allows us to have

[5] Refer to appendix 1 for the lists of borrower and lending economies.

some overviews of the international syndicated loan market.

In Figure 1, which shows the total monthly loans provided by syndicated lenders to the firms in 25 EMEs, we can discern two sets of booms and busts.[6] One represents the Asian Financial Crisis that started in July 1997, and the other the Global Financial Crisis that peaked September 2008. The figure also reveals there is a structural break around the mid-2000s. Before then, the total monthly loan amount averaged around US$15 billion, but rose to US$30 billion in the run-up to the GFC. Since then, the size of the market has remained roughly around the same level.

Most of the international syndicated loans borrowed by EME firms are in foreign currencies and mostly in USD (Figure 2). While the amounts of euro loans and local currency loans have been rising over time, they are overshadowed by the dominance of the dollar-denominated loans. Nevertheless, since 2005, the share of euro loans has increased, so has that of local currency loans increased notably since 2012 (Figure 3).

Among the EME borrowers, the Asian borrowers are the major players with more financing activities than other regions (Figure 4), though Central and East European (CEEs) become active in the late 2000s. Across the regions, USD loans dwarf loans in other currencies (Figure 5), but the increasing importance of local currency in international loans is noticeable among Asian and African borrowers. In addition, CEE economies have demonstrated a significantly changing pattern of currency denomination with the share of euro loans surpassing that of USD in recent years.

Table 1 confirms that USD-denominated loans are by far sizeable compared to those denominated in other currencies. The average amount of USD loans in a facility (loan) is US$160 million, much higher than the second highest euro-denominated loans of US$23 million. In terms

[6] The two red vertical lines represent the two financial crises. The data series are smoothed with 12-month moving average. That also applies to Figures 2 and 3.

of the term structure, more than 80% of the loans in the sample are long-term (>= 1 year) loans. According to Figure 6, the USD share in loans is higher for long-term loans than short-term ones (81% vs. 70%) while the EUR share is much larger for short-term loans (27% vs. 10%). The proportion of local currency loans is higher for long-term loans than short-term ones. In terms of the purposes of loans (Table 1), loans for physical investment (in acquisition and upgrading of physical assets) are more issued than those for financial investment (debt repayment and investment in financial assets). Regardless of the purposes of loans, the currency composition is similar (Figure 6).

Figure 7 lays out the currency composition for a range of borrower characteristics (institution type, regions, ownership, and size).

The USD share is high and similar across three different types of borrowers: banks, corporations, and non-bank financial institutions, ranging 75-80%. However, the EUR share is higher for banks, 25%, compared to corporations and non-bank financial institutions (11% and 8%, respectively). The share of local currency loans is about 5-10% for corporations and non-bank financial institutions, but it is non-existent for banks.

Among different regions of borrowers, Latin America and the Middle-East are the most reliant on USD loans with the share of about 90%. Considering both regions export commodities and natural resources, it makes sense for the borrowers in these regions borrow mostly in USD. Asian borrowers also tend to borrow in USD with the share of more than 80%. Ito and Kawai (2021) show that the economies in the Asian region are heavily reliant on the USD for not just cross-border loans but also trade invoicing, international debt securities, and foreign exchange reserves. Unsurprisingly, the USD share is noticeable smaller for Central or Eastern Europe (CEE), 50%, and euro-denominated loans account for nearly 40% of total cross-border loans. It reflects

that CEE countries belong to the eurozone as Ito and McCauley (2019) and many others show. Outside the CEE region, the euro does not play a significant role as the currency of loan denomination. The share of local currency loan is high for Asia, accounting for around 13% while the share is less than 4% in other regions.

Privately and publicly owned borrowers do not show much difference in terms of currency choice for their loans, though privately-owned borrowers tend to have a larger portion of local currency loans than publicly-owned borrowers.

Finally, for both medium-sized and large-sized loan sizes, the USD share is around 80%.[7] While the currency compositions are quite similar between the two groups of loans, interestingly, 87% of small loans (< US$5 million) are denominated in local currency. This is common among all the 25 countries in our sample and is an interesting stylized fact – small loans tend to be borrowed in local currencies.

Our dataset allows us to observe the characteristics of the lenders as well.

Figure 8 illustrates the currency compositions by lenders' characteristics including the average number of lenders in a syndicated loan, institution type, and the location of the main lender. Syndicated loans often involve multiple lenders, which is a key feature of the international loan market, and offer mutual benefits to both lenders and borrowers. Syndication helps lenders overcome balance sheet constraints and diversify risks by limiting exposure to individual borrowers. Borrowers can get access to a large group of lenders and accordingly reduce funding risks. Thus, the number of lenders provides an indication of both the size of loans and the level of risk diversification.

According to our data, there is no regularity between the number of participating banks and

[7] "Small-sized" loans refer to the loans whose average amount is less than US$5 million. "medium-sized" loans are the ones between US$5 million and US$1 billion, whereas "large-sized" loans more than US$1 billion on average.

the currency composition in international loans. A group of three lenders or more and single lenders have high USD shares (80%) in their loans while double-lenders tend to have a lower USD share of 62%. Double-lenders tend to mobilize more local currency loans (about 20%) than the other groups of lenders, though there is no clear explanation for it.

The lender institution type being either corporations, banks, or nonbank financial institutions does not seem to matter in terms of currency choice for loans. However, corporations tend to overwhelmingly choose USD for the currency of loan denomination (about 95%).[8]

The location of lenders seems to matter. African lenders stand out from the others by having a low USD share, only 40%, in their loans while lenders in the other regions have 85% or more of their loans denominated in the USD, except for CEE lenders which unsurprisingly have a higher euro share in their syndicated loans. Interestingly, Asian and African lenders mobilize a higher proportion of loans in local currencies compared to the lenders of the other regions.

3. Estimation of the currency choice for cross-border syndicated loans

We now examine how the characteristics of both borrowers and lenders can explain the choice of currency for cross-border syndicated loans. A key advantage of our dataset is that it allows us to model the impacts of the characteristics of both borrowers and lenders. In cross-border syndicated loans, terms of a loan deal, including the currency of denomination, are based on a joint decision made and agreed by both parties of the deal. Hence, for the estimation method, the ideal approach is to include both parties - the borrower and lender - in one equation or use a system of simultaneous equations (e.g., seemingly unrelated regression). However, each syndicated loan

[8] Corporations only account for around 2% of the total observations, banks around 78%, and nonbank financial institutions 20%.

involves multiple lenders and that makes any joint estimation challenging. Instead, we separately estimate the determinants of the probability of choosing a currency of denomination for cross-border loans from both borrowers' and lenders' perspectives.

While the past literature has investigated the choice of currency for cross-border loans or the decision to issue foreign-currency debt such as Niepmann and Schmidt-Eisenlohr (2019), Brown and De Haas (2012), Kedia and Mozumdar (2003), and Keloharju, M. and M. Niskanen (2001) among others, our approach is more nuanced in that we examine the determinants of currency choice for international loans from both lenders' and borrowers' perspectives.

3.1 Conceptual framework – choice of the currency of denomination by the borrowers and the lenders

Past studies have investigated the impacts of firm- or bank-specific factors by testing the variables related to firms' or banks' balance sheets. Others have also examined the effects of the characteristics of industries or macroeconomic conditions or policies such as the exchange rate regime and capital controls on the behaviors of borrowers or lenders.

Our exercise of investigating the impacts of U.S. and global shocks and uncertainties, we believe, should make an important additional contribution to the literature.

Why does investigating the choice of currency for loan denomination matter? If the financial markets are fully developed, complete, and open, the choice of currency for denomination of cross-border loans (or any international financial transactions) would not matter. In such a situation, any risk or expectation would be fully covered and incorporated in the forward exchange rate, making the issue of choosing preferred currency irrelevant.

However, as we observed at the time of the Great Financial Crisis and the COVID financial

crisis, the CIP can get violated (See McCauley and McGuire, 2009), making a particular currency for denomination more preferable to others. A borrower of a cross-border loan would denominate the loan in the USD, for example, if and only if the USD borrowing cost (adjusted for risk and exchange rate movements) is lower than the domestic currency (i.e., $i \geq i^* + \frac{F-E}{E} + \rho$ where F is the forward exchange rate whereas i and i^* are domestic and foreign interest rates, respectively, and ρ represents risks).

Emerging market and developing economies find it hard to borrow in their home currency abroad and end up with borrowing in hard currencies (the "original sin" by Eichengreen et al. (2007)). This reality reflects that many of the fundamental assumptions for the CIP are violated among emerging market and developing economies.

Free capital flow across borders may not always be warranted for these economies, not to mention, the borrowers of the syndicated banks loans in our sample all of which are EMEs. That means that in our context, the degree of overall financial openness in the borrower country can affect the choice of a currency.

Transaction costs, or conversely, the level of market or institutional efficiency, can differ across different economies as well as across different borrowers. Hence, borrower-specific characteristics that represent the level of efficiency and the level of financial market development of the economies where borrowers are located should affect the choice of denomination currency.

The risk-free arbitrage condition can be violated if some risks arise. Those risks can include economic or noneconomic shocks emanating from the U.S. and global economic and political or geopolitical uncertainties.

Hofmann, et al. (2020) argue that the "original sin" seems to have been mitigated among EMEs in recent years, but that such a view only looks at the issue of the original sin from the

perspectives of borrowers. They argue that while borrowers have become more willing to issue debt in their local currencies, the lenders, i.e., advanced economies, tend to be concerned about the risks involved with lending to EMEs (i.e., the exchange risks, liquidity risk, currency mismatch) so that lenders would prefer providing funding in the hard currency, especially the USD ("original sin redux").[9] Considering that borrowers and lenders inevitably face information asymmetry, it is possible to face separate utility functions..

While borrowers and lenders may have different utility functions, they are both facing incomplete, imperfect, and not completely open financial markets and trying to maximize their own utilities through careful and thorough negotiations to agree on the terms of the contract. Regression exercise will allow us to see there is symmetry or asymmetry between borrowers and lenders in terms of identified determinants of currency choice for cross-border syndicated loans.

We have three types of potential determinants for currency choice for borrowers and lenders. That is, 1) borrower- or lender-specific factors, 2) economy-level, macroeconomic factors, and 3) global shocks and market uncertainties.

Borrower- or ledner-specific factors:

The size of loans should matter. Large borrowers tend to borrow more in foreign currencies than local currencies because the spreads and the commissions to exchange foreign to local currencies are usually small for them. In addition, those who borrow large-size funds are more likely to engage derivative contracts to manage exchange rate risks. Smaller transaction costs and lower exchange rate risks often make the borrowing cost in foreign currencies lower than that in local currencies.

Similar size effects can be expected for lenders. Like borrowers, the larger the size of the

[9] Also see Bertaut et al. (2021).

syndicated loan of concern is, the less of commissions or other transaction costs the lenders would be subject to. Also, larger lenders can hedge, pool, or diversify exchange rate risks through derivatives contracts.[10]

As for lenders' characteristics, global banks can have greater capacity to mobilize global funds and have easier access to USD and EUR credits compared to corporations or non-bank financial institutions.

Financial institutions may borrow more in USD than corporations since the former is well positioned to readily employ derivative markets and instruments to hedge their exposure to exchange rate risks.

Publicly owned firms may be more likely to borrow more in USD and less in local currencies due to information asymmetry. Private firms are less transparent compared to public owned firms because they are not obligated to publish company information on a regular basis as is in the case of publicly owned firms. Loans for private firms entail higher transaction costs and information asymmetry, which makes loans to publicly owned borrowers more appealing to foreign lenders.

Economy-level, macro factors for the borrowers

Borrowers from oil exporting countries have a higher share of USD loans. The USD is the predominant currency in the international trade of commodities and natural resources, especially oil. The revenue from the sales of oil and oil-related products could function as collaterals, which can mitigate the potential borrowers' USD funding constraints. Hence, an economy with large oil exporting capabilities can be presumed to have more dollar-oriented financial markets, that should make it easy for firms and financial institutions to borrow in USD. Such an oil effect on currency

[10] Ito, et al. (2010) explain why the share of USD in trade invoicing is high for Japan. They show that keiretsu firms use USD as the intra-group major currency and thereby pool exchange risks as a group.

composition of loans is not predicted for lenders.

The exchange rate may affect the choice of a denomination currency. Local currency appreciation could make it easier for both borrowers and lenders to obtain funds in hard currency such as USD. Local currency appreciation help mitigate debt burden for borrowers as well. Borrowers with their home currency appreciating persistently may be able to borrow in their own home currency (e.g. Chinese RMB before 2013). Bruno and Shin (2017) find that non-financial corporations in EMEs are less likely to issue debt in the U.S. dollars (outside the U.S.) when their home currencies appreciate against the dollar. However, local currency appreciation would also make dollar- or euro-denominated loans relatively inexpensive. In the 2010s when lax monetary policy contributed to dollar depreciation, many firms in EMEs borrowed in USD.

For lenders, if local currency appreciates, USD or EUR funds would become less expensive, so lenders may try to make hard currency as the currency of denomination.

Overall, a currency's changing values may lead to rebalancing of portfolio, that makes the sign of the correlation between the exchange rate and the choice of a certain currency ambiguous.

If the economy where the borrower is located tried to stabilize its local currency against the USD, the borrower in such an economy would try to borrow more in the USD so that the exchange rate risk can be avoided. In other words, the higher degree to which a borrower's economy belongs to the dollar zone, it is more likely for the borrower to borrow in USD. One easy example is that borrowers in an economy whose currency is pegged to the USD are very much likely to borrow in USD so that debt burden would be time invariant. The same prediction can be made for lenders as well. In an economy with fully-pegged or stabilized local currency against USD, transaction costs of providing USD-denominated cross-border loans would be lower.

The level of efficiency of the financial market where the borrower or the lender is located

can affect the choice of currency to denominate cross-border loans. Highly efficient financial markets should allow financial transactions cost to be low and could provide more effective derivatives and other hedging methods, all of which can make it easier to borrow or lend in USD or other foreign currencies. At the same time, higher level of efficiency for financial transactions should involve higher level of overall financial development. A more efficient financial market can give a potential borrower to have greater bargaining power, which may lead the potential borrower to insist signing in her home currency as the currency of denomination to avoid exchange risk.[11] Thus, the level of market efficiency should be positively correlated with the share of the borrower's local currency and negatively with foreign currencies such as USD and EUR. The same argument can be made for the lenders.

In more open financial markets, a potential borrower should face lower transaction costs for dealing with foreign currencies simply because foreign currency-denominated financial products are easily available. The share of a foreign currency such as USD and EUR in cross-border loans should be higher while that of the local currency should be lower. Lenders from more open financial markets tend to denominate their loans in foreign currencies.

Lastly, borrowers from the economies that tend to rely on a specific currency for export invoicing, the share of that currency in cross-border loans tends to be high. A country that tends to invoice exports in USD can expect to receive more USD as revenues from exporting goods and services, that would make it easier for the borrower to repay the loans. For lenders, a higher USD or EUR share in exports can help maintain easier accessibilities those currencies.

The impacts of global market uncertainties

Many have argued that developing and EMEs are exposed to the global financial cycle (Rey,

[11] Ito and Chinn (2015) and Ito and Kawai (2016) find that an economy with more developed or open financial markets tends to invoice its international trade less in hard currencies and more in its own local currency.

2013), and therefore that their economic conditions can be easily affected by a policy change by the center economy, i.e., the U.S. A faster growth in U.S. money supply might increase the share of USD loans in total loans because a lower U.S. interest rate would lead to EME borrowers' currency to appreciate, which would lower the cost of borrowing in USD loans.

Economic, political, and geopolitical uncertainties may increase the share of USD in total loans. For example, in 2018-19, the Trump administration engaged trade war against China. The tit-for-tat tariff increases between the two countries made it very difficult to predict the future of global trade. Such trade uncertainty could lead investors to cling more on USD as the medium for financial transactions including cross-border loans because the USD is the most creditworthy and liquid currency in the world, and that increases the demand for USD. Such flight to safety can be triggered not just by trade uncertainties, but also by global uncertainties such as geopolitical situations, global financial instability, and pandemics as we have seen in the past few years. In general, we could expect greater uncertainty could increase demand for the use of the U.S. dollar as a denomination currency.

The behavior of lenders might also be affected by economic or noneconomic uncertainties. Uncertainties arising from U.S. policy change or a mere mention of it by government officials, or global shocks may increase the reliance of lenders on USD as the denomination currency. However, if the shock is too fierce, the supply of USD-denominated loans may decline because of shortage of the currency, or because the price of dollar-denominated loans rises too high. In this case, when the extent of uncertainties rises, the share of USD in cross-border loans may decline.

3.2 Methodology

The estimation for the share of major currency C (USD, euro, or local currency) in total

international syndicated loans of borrower i in month t ($s_{it}{}^{C}$) is modelled as below:

$$s_{it}{}^{C} = \delta + B'_{it}\Theta + X'_{t}\Lambda + G'_{t}K + \varepsilon_{it}, \qquad (1)$$

where B_i is a vector of borrower characteristics including the size of borrower i ($SIZE_B$: proxied by the average size of loans borrowed by borrower i); *CORPORATE* that takes the value of one when borrower i's institution type is corporation; *BANK*, a dummy for borrower i's institution type being bank; *PUBLIC* that takes the value of one when borrower i is publicly owned.

Vector X_t includes the economy-level or macroeconomic characteristics. The (growth rate of) real effective exchange rate of the U.S. (*REER_US*) is included in the USD share estimation, *REER_EURO* in the EUR share estimation, and borrower i's economy's REER in the estimation for the share of local currency loans of borrower i'.[12] *OIL* is a dummy variable for the borrower's economy being an oil exporter. We control for financial openness by using the Chinn-Ito (2006, 2008) index (*KAOPEN*). *EFFC* represents financial market and institutional efficiency. The International Monetary Fund (IMF) publishes "financial development index."[13] The subindexes include *FIE* (financial institution efficiency) and *FME* (financial market efficiency). The variable *EFFC* is the first principal component of the two.

WGT_US(EU) is also included to represent the extent to which borrower i's economy belongs to the dollar (euro) zone. This variable is based on the estimation model popularized by Frankel and Wei (1996). When *WGT_US* = 100 for borrower i in year t, that means that borrower i's local economy stabilizes its home currency fully against the USD, i.e., pegs to the USD (e.g., Hong Kong, Bulgaria), whereas *WGT_US* = 0 means borrower i's economy allows its currency to fluctuate fully flexibly against the USD. For more details, refer to Ito and McCauley (2019).

[12] A rise in REER means appreciation of the currency of concern.
[13] For more details, refer to https://data.imf.org/?sk=F8032E80-B36C-43B1-AC26-493C5B1CD33B .

EXP_USD, EXP_EUR, and *EXP_HOME* are included to control for the shares of USD, EUR, and local currency in export invoicing. The data are extracted from Boz, et al. (2020).

Vector G_t contains U.S. or global factors that may affect currency choice for cross-border loans. It includes the following variables:

- U.S. economic uncertainty (*USEPU*): It measures the general level of uncertainties arising from U.S. economic policies in general. The index is based on the frequency of articles in American newspaper that discuss policy-related economic uncertainty (Baker, Bloom and Davis 2016).
- U.S. monetary policy uncertainty (*USMPU*): It measures the frequency of articles in American newspaper that discuss policy-related economic uncertainty and also contain one or more references to U.S. monetary policy (Baker, Bloom and Davis 2016).
- U.S. fiscal policy uncertainty (*USFPU*): It measures the frequency of articles in American newspaper that discuss policy-related economic uncertainty and also contain one or more references to U.S. fiscal policy (Baker, Bloom and Davis 2016).
- U.S. trade policy uncertainty (*USTRU*): It measures the frequency of articles in American newspaper that discuss policy-related economic uncertainty and also contain one or more references to U.S. trade policies (Baker, Bloom and Davis 2016).
- Geopolitical risk index (*GPR*): It is based on the counts of the occurrence of words related to geopolitical tensions in 11 leading international newspapers (details see Caldara and Lacoviello, 2017).
- Chicago Board Options Exchange Volatility Index (*VIX*) as a measure of financial instability. It measures the implied volatility of S&P 500 index options.[14]

[14] It is available in http://www.cboe.com/micro/VIX/vixintro.aspx.

- Infectious disease risk index (*Infect*): It measures the frequency of articles in American newspaper that discussed infectious diseases related equity market volatility (details see Baker, et al. 2020).[15]

Similarly to the estimation model for borrowers, we model the lender equation as follows:

$$s_{jt}{}^{C} = \delta + L'_{jt}\Theta + X'_t\Lambda + G'_tK + \varepsilon_{it}, \qquad (2)$$

where $s_{jt}{}^{C}$ is the share of loans denominated in currency *C* (USD, euro, or local currency[16]) in total loans extended by lender j in month t. L_{jt} is a vector of lender-specific characteristics. We again have three institution types: *BANK* = 1, *CORPORATE*=1, or nonbank financial institutions. Lenders from industrialized countries tend to provide syndicated loans in foreign currencies, so we include a dummy for industrialized countries (IDC).[17] $SIZE_L$ represents the size of a lender, proxied by the average size of loans lent by lender j.

X_t comprises the same economy-level variables: *EFFC*, *KAOPEN*, *REER_US*(*EURO*) or *REER*, and *WGT_US(EU)*. G_t contains the same external and global factors as in the above borrower equation.

It must be noted that the distribution of the share of currency *C* ($s_{it}{}^{C}$), i.e., the dependent variable, is almost binary for both borrowers and lenders. The observations of zero or one account for more than 95% of the total observations for the USD. The other currencies are also distributed similarly. The nonzero values are predominately 1's because the borrowing by a borrower tends to be of the same currency in their monthly borrowings in the market.[18]

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[15] See Appendix 2 for the development of these uncertainty indexes over the sample period.
[16] "Local currency" means the official currency of the country where borrower *i* of an individual loan resides.
[17] "Industrialized countries" refer to the countries whose IMF country codes are less than 186 plus Australia and New Zealand.
[18] If one borrows in a certain currency, it is highly likely to borrow again in the same currency for the rest of the one month period. Therefore, at the firm level in monthly frequency, the share of a currency almost certainly takes the value of either 0's or 1's.

Given these characteristics of the data distribution of the dependent variable, we believe that a population-averaged logit model is appropriate for the estimation. Hence, the estimation models for borrowers and lenders should be, respectively, as follows:

$$logit(s_{it}{}^{C}) = \delta + B'_{it}\Theta + X'_t\Lambda + G'_tK + \varepsilon_{it} \quad (3)$$

$$logit(s_{jt}{}^{C}) = \delta + L'_{jt}\Theta + X'_t\Lambda + G'_tK + \varepsilon_{it}. \quad (4)^{19}$$

3.3 The findings

3.3.1 Findings from the borrower estimation

Table 2 reports the results of the borrower estimation and suggests that borrowers' characteristics help predict the probability of a currency choice in international loans. Larger borrowers are more likely to borrow in USD or EUR, whereas smaller borrowers tend to borrow in local currency. These findings suggest that larger borrowers can tolerate exchange rate risks while smaller ones cannot.

Compared to nonbank financial institutions, banks or corporate borrowers tend to borrow more in USD or EUR and less in local currency. Given the comparison of the estimates' magnitudes, banks are more likely to borrow in USD or EUR compared to corporate borrowers. In terms of ownership, publicly-listed firms tend to borrow a higher proportion of syndicated loans in USD or EUR while privately-owned firms borrow more in local currency.

Borrowers in an oil exporting economy tend to borrow in USD as we expect. When the value of USD is rising, the USD share in cross-border loans falls, suggesting that the debt burden

[19] We also include the variable *TIME* to capture the trend that the USD share has been declining while the EUR and local currency share have been rising the sample period. This is not the fixed effects. As previously mentioned, we are not dealing with a panel dataset. The data for the empirical analysis is cross-sectional.

would be greater for borrowers. Unsurprisingly, borrowers in an economy where the value of its local currency is stabilized against the USD (or EUR) tend to sign off loans denominated in the USD (or EUR).

The borrowers from an economy with more efficient financial markets tend to borrow *less* in USD, but more in EUR or its local currency. That indicates that more efficient financial markets are capable of offering a wider variety of denomination currencies, that makes borrowers less reliant on USD and more able to choose loans denominated in non-USD currencies such as EUR and their home currency.

The variable for financial openness enters significantly with positive estimates in the USD or EUR estimation while the estimate is negative in the local currency share estimation. Apparently, more open financial markets give borrowers more access to foreign currency loans.

In models (4) through (6), we also include the variable for the share of USD, EUR, or local currency in export invoicing. Because the data availability of the invoicing share data is limited, we estimate and report the results separately.

As expected, a borrower from the economy where a particular currency is more used for export invoicing is more likely to agree on a loan denominated in that currency. For example, borrowers from the economy where the USD is more used for export invoicing tend to prefer signing on USD-denominated loan contracts.

Tables 3 (a) through (c) report the results of the estimations that examines the impact of external shocks or uncertainties on currency denomination. Including the uncertainty variables does not affect much of the estimates on the baseline explanatory variables.

The uncertainty indexes related to U.S. policy all have significantly negative estimates. However, *US_EPU*, *US_MPU*, and *US_FPU* are conceptually redundant (see Appendix 2). The

correlation between US_MPU and US_FPU is especially high (approx. 70%). Hence, in Model 8, we include all the uncertainty-related indexes and in Model (9), we include all but US_MPU, and US_FPU. In Model 8, all of *US_EPU*, *US_MPU*, and *US_FPU,* whereas in Model 9, *US_EPU* becomes significantly negative again. At least, we can conclude that a greater level of uncertainty arising from U.S. economic policy in general leads to a fall in the USD share in cross-border syndicated loans.

This finding is not consistent with the story of USD as a safe haven. Additionally, the significantly negative estimate on VIX implies when financial instability arises, the share of USD in total syndicated loans *falls* instead of rises. We also tested using the EMV (Equity Market Volatility) index (Baker, et. al, 2016, 2020) instead of VIX and still get the significantly negative estimate on the EMV index. This finding may indicate that when financial instability breaks out, that would cause severe dollar shortage and consequential dollar appreciation, that might lead borrowers to shy away from dollar-denominated loans. The GFC started with the frozen money market, but it also caused severe dollar shortage (McCauley and McGuire, 2009). Not just money market, severe dollar shortage constrained other financial transactions such as the issuance of letters of trade credit, contributing to the shrinkage of international trade in the immediate aftermath of the GFC (Amiti and Weinstein, 2011).

Uncertainty driven by U.S. trade policy would lead borrowers to sign off more loans denominated in USD. Borrowers may avert exchange rate risk or volatility that may arise due to uncertainty of trade policy.

The degree of uncertainties in U.S. trade policy increases, borrowers would prefer borrowing in USD. Unlike in the case of VIX, a rise in the level of U.S. trade uncertainties does not necessarily involve dollar shortage, which explains the positive coefficient on the U.S. trade

uncertainty index. A mere increase in the reliance on the dollar occurs, not involving acute dollar shortage. This may be because a rise in the level of uncertainty as a result of trade policy changes does not involve actual financial transactions, thereby not causing actual dollar shortage.

The estimates on the uncertainty indexes may not be stable over time. The impacts of the uncertainty indexes may change depending on the time period, or, the significant estimates we have found may only reflect particular periods or events.

Table 4 reports the estimates of external shock and uncertainty indexes (while omitting the other estimates to conserve space) for the estimations using different sample periods: the full sample period (1995M1 – 2019M12), pre-GFC (1995M1 – 2008M8), post-GFC (2010M1 – 2019M12), the full sample excluding the GFC period (1995M1 – 2008M8, 2010-M1 – 2019M12), the Trump administration period (2017M1 – 2019M12), and post-GFC and pre-Trump (2017M1 – 2019M12).

Interestingly, the estimate on VIX is consistently significant with a negative sign for all the different sample periods. Even before the GFC (column (2)) or when the GFC period is removed (4), a rise in the level of financial instability contributes to lower USD shares in total syndicated loans.

The impact of U.S. trade policy uncertainty is detected in the post-GFC, but not in the pre-GFC period. Considering how the U.S. trade uncertainty index developed much later in the sample period (Appendix 2), the impact of U.S. trade uncertainty we detect for the full sample and the post-GFC period must be reflecting the impact of the uncertainties caused by the Trump administration's trade policy.[20]

[20] The impact of U.S. trade uncertainty is not detected when the sample is restricted to the Trump administration period (column (5)) or the pre-Trump, post-GFC period (column 6). However, the *change* in the level of U.S. trade uncertainty between the pre-Trump, post-GFC period and the Trump administration period must be leading to the significant coefficient in the post-GFC period (column 3).

We have seen that the size of borrowers matters for the USD or EUR share in cross-border syndicated loans while the currency share can also be affected by external shocks or global uncertainty. This suggests that the response of borrowers to external shocks and global uncertainty may differ depending on the size of the borrower. If larger borrowers borrow more in hard currencies in the face of external shocks or global uncertainty, they may be better able to cope with shocks and uncertainty because their size reduces their foreign exchange risk.

To formally test this, we include in the estimation an interaction term between external shock or global uncertainty and the *SIZE* variable. More specifically, we create a dummy for larger borrowers, which we define as borrowers whose *SIZE* is greater than the sample median (*SIZE_D*). With this interaction term included, the estimated coefficient on *UNC,* the variable for external shocks or global uncertainty, will represent the response of small borrowers to external shock or global uncertainty, and the estimated coefficient on the interaction term, *UNC*×*SIZE_D*, represents the response of large borrowers.

Table 5 reports the estimation results with interaction terms between the size dummy and external shock or uncertainty variables. The other explanatory variables, i.e., size, corporate, bank, public, financial efficiency, financial openness, oil exporters, and *YEAR,* are included in the baseline models, but their estimates are omitted from presentation. The table for the borrowers' euro share is reported in Appendix 3, and that of the home currency share is available from authors upon request.

Among the different models reported in Table 5, the magnitude of the estimated coefficients of the shock variables and the interaction terms are about the same in absolute values. That means that while small borrowers tend to have lower USD shares when they are exposed to U.S. economic shocks, the marginal effect for the large borrowers is essentially zero.

That is, the impact of the uncertainties or shocks stemming from U.S. economic policy, its trade policy, or financial instability, is especially present only for smaller borrowers. Larger borrowers are not affected by such uncertainties. This suggests that large borrowers can hedge, pool, or diversify their foreign exchange risk through financial instruments such as derivatives.

3.3.2 Findings from the lender estimation

Table 6 reports the results of the lender equation. Unlike the borrower equation, lender characteristics do not explain much of a currency choice. The size of the loan continues to be a contributor to currency denomination. Larger lenders are more likely to provide cross-border loans in USD or EUR, whereas smaller lenders provide local currency-loans. However, whether the lender is a bank or corporation does not matter. Lenders from industrialized countries tend to lend more USD- denominated loans and less local currency loans. The finding that larger lenders and those from industrialized economies in USD is consistent with the original sin redux argument by Hofmann, Shim, and Shin (2020).

Another finding consistent with Hofmann, et al. is that lenders from the economies with less efficient financial markets tend to lend in USD. Lenders from an economy that can provide more derivatives and other hedging can afford to provide loans in other currencies than USD, including borrowers' domestic currencies.

Lenders from more financial open economies find it easier to provide foreign currency denominated loans.

Unlike the case of the borrowers, whether and to what extent lenders' economies try to stabilize their home currencies against the USD does not matter for whether or not to provide loans in USD, although, for the choice of EUR, the euro weight still matters. This finding reflects the

fact that those economies that are not dollar-oriented economies (e.g., Japan, the U.K., Australia) still provide syndicated loans, though those lenders that provide EUR-denominated loans are usually from the euro or EU area. In other words, from cross-border loans also, we can see that the USD is a global currency whereas the euro is more of a regional currency.

As was in the case of the borrower estimation, U.S. trade policy uncertainty positively contributes to a higher USD share in total cross-border loans, and financial instability, represented by the VIX index, leads to a lower USD share (Table 7 (a)). In Table 8, we can see that the impact of *VIX* is robust across different subsample periods, confirming from the lenders' perspective that dollar shortage that happens with financial instability makes it more difficult for potential lenders to provide cross-border loans in USD. In contrast, uncertainty arising from U.S. trade policy does not involve dollar shortage, but lenders still take a precaution by providing loans in USD.

As we have seen in the case of borrowers, we are interested in seeing if the impact of external shocks or uncertainties can be affected by the size of lenders. According to Table 9, when we focus on the estimation results in which interaction terms are included individually (columns 1 through 7), the sign for smaller lenders is mostly negative (except for U.S. trade policy uncertainty), and the sign for larger lenders is positive though the net impact is still negative for larger lenders because the absolute magnitude of the estimate for the interaction terms is not large enough to cancel the impact on smaller lenders. This suggests that external shocks or uncertainties negatively affect the USD shares in cross-border loans, but that the impact is greater for smaller lenders than larger ones. Again, a larger size of the lenders can alleviate the impact of external shocks or uncertainties.

4. Impacts of currency compositions of loans on firm performance - borrower revenue

volatility and lender risk perception

4.1 Borrower revenue volatility

This section examines how currency denomination of loans may affect borrower's performance especially in terms of revenue volatility. Eichengreen, Hausmann and Panizza (2007) argue that developing countries often face the pain of the 'original sin' associated with international borrowing. Because they tend to borrow in hard currencies, currency mismatches on their national balance sheet would expose countries with net foreign debt to output volatility and other vulnerabilities.

In this section, we anticipate the pain of the original sin exists at the firm level and that firms or financial institutions with higher USD shares in syndicated loans are more likely to experience high levels of revenue volatility. As posited in Eichengreen et al. (2007), exchange rate volatility creates uncertainty over the cost of dollar-denominated debt and debt repayment plans, thereby increasing the level of revenue uncertainty. Also, while local currency-denominated currency loans are often underpinned by long-time relationships with lenders, that mitigates information asymmetry between borrowers and lenders, foreign capital tends to be more of fickle nature and volatile – lenders can be quick in retreating or stopping refinancing whenever uncertainty arises on either lender or borrower side. Such volatile nature of international lending can function as a catalyst of spillovers of global monetary and financial shocks, posing funding risks and causing financial distress, all of which contribute to higher revenue volatility (Bernanke and Gertler 1995). Xu and La (2015; 2017) find evidence of dollar credit playing a significant role in international monetary shock transmission. They also show that contraction of dollar credit for borrowing firms in the downsides of the global financial cycles had a 'real' impact on firm performance.

We test the impact of currency denomination of loans on revenue volatility of borrowers

using the following specification.

$$\sigma_{it} = \beta_0 + \beta_1 size_{it} + \beta_2 liq_{it} + \beta_3 ROA_{it} + \beta_4 DER_{it} + \beta_5 currencyshare_{it} + \beta_6 Period_t + u_t + v_i + \varepsilon_{it} \quad (5)$$

σ_{it} denotes revenue volatility which we measure with the standard deviations of (the logarithm of) three types of revenues: pre-tax income, earnings, and profits calculated in each of the five-year panels in the 2000-2019 period. The explanatory variables include *size*, the liquidity ratio (*liquidity*), the return-to-asset ratio (*ROA*), and the debt-equity ratio (*DER*), all of which are calculated as the five-year averages.[21] We also include the fixed effects for the five-year panels to capture global effects. u_t captures time specific effects and v_i time invariant firm specific effects. Because we need the balance sheet data of borrowers, we merge the syndicated loan data from *Dealscan* with the borrowing firms' financial data from Compustat, which leads to a significant reduction in the sample size compared to the previous analysis.

The key variable of our interest is the average shares of loans borrowed in USD, EUR, and local currency ($currencyshare_{it}$). We expect $\hat{\beta}_5$ to be positive when we include $currencyshare_{it}^{USD}$ or $currencyshare_{it}^{EUR}$ in the estimation, and negative when we include $currencyshare_{it}^{local}$.

The estimation results are consistent with our prior. A one percent increase in the USD share of total loans borrowed in the syndicated markets is associated with a 2.4 percent increase in the standard deviation of firms' pre-tax income on average (Column 1 of Table 10 (a)). In contrast, a higher share of local currency-denominated loans is associated with a lower income volatility. A one percent increase in the local currency share of total loans is associated with a 2.8 percent

[21] These variables are all converted to natural logs before the five-year averages are calculated. The liquidity ratio is measured by the current ratio.

*de*crease in the standard deviation of borrowers' pre-tax income.

In Table 10 (b), where we use earnings as the measure of revenue volatility, the estimates on the USD and local currency share variables continue to be significant with the signs consistent with our priors. In the model where we estimate profit volatility (Table 10 (c)), while the estimate of the local currency share variable continues to be significant, the effect of the USD share is no longer significant. Overall, we can conclude that when a borrower signs off a syndicated cross-border loan denominated in her local currency, she can expect smaller revenue volatility compared to when the loan is denominated in a hard currency. We have some evidence that borrowing USD-denominated syndicated loans would lead the borrower to face greater revenue volatility.

4.2 Lender risk perception

What about the impact of the currency composition of syndicated loans on the lenders? On the one hand, lenders may view certain currencies (e.g., the USD) less risky than others (as far as major international currencies are concerned). That means the more syndicated loans are provided in the USD, the less revenue volatility the lenders might expect. On the other hand, the participating lenders in syndicated loans should be able to diversify away exchange rate risks on a global scale so that the lenders' performance is not subject to small idiosyncratic shocks. If that is the case, the currency composition of cross-border loans would not affect the revenue volatility of the lenders.

One way to test this is to see the impact of the currency composition of international loans on a certain risk measure of the syndicating banks. One risk measure that can be used is loan loss provisions. The more risks a banker perceives arise, the more loan loss provisions the banker would hold. We could regress the amount of loan loss provisions on the share of USD or local currency in the syndicated cross-border loans. If the estimated coefficient of the share of USD or local

currency is statistically significant, that would mean a certain currency composition influences the level of risks perceived by the lenders.

However, we cannot conduct such an analysis with the dataset we have. As we previously mentioned, merging two databases (Dealscan and Compustat) significantly reduces the sample size, and furthermore, the data on loan loss provisions further limits the total number of observations we could have down to mere 18.

With the small sample, nonetheless, we still regress loan loss provisions on the share of USD and local currency along with a set of risk factors, including total asset, debt-equity ratio and foreign exchange income. We find the share of USD or local currency in total syndicated loans does not affect risk perception (results not reported). That may suggest that the currency composition of syndicated loans does not matter for the level of lenders' perceived risk. Unlike the borrowers, the lenders are able to diversify away the potential currency risk.

However, we must admit that the results are far from robust given a very small sample size and compromises made in constructing the sample. We regard this research analysis as one of the future research topics.

5. Concluding remarks

The U.S. dollar's position as the world's dominant currency remains unassailable. When the world experiences economic, political, or geopolitical shocks, the demand for the USD-denominated assets rises as investors seek safe havens. When the shock is strong, the global markets can experience dollar shortage as has happened at the onset of the GFC in 2008 or the COVID-19 crisis in 2020. Such strong demand could affect the currency composition of international financial transactions.

This paper investigates what factors determine the choice of currency denomination for

cross-border syndicated loans. Among the determinants of currency choice, we focus on whether and how external shocks and global uncertainty, such as U.S. money growth, financial instability (VIX), uncertainties of U.S. trade policy, global economic policy, geopolitical risks, and infectious disease risks, affect the currency choice of international loans.

The analysis uses detailed data on individual syndicated loan deals made between the borrowers located in 25 EMEs and the lenders from 59 advanced and emerging market economies during the period of 1995 through 2019. Using the rich dataset, we separately estimate the probability of borrowers and lenders choosing either USD, EUR, or home currency as the currency of denomination in the international loans.

We find that uncertainty stemming from U.S. trade policy increases the USD share in total international loans from the borrowers' perspective, indicating that borrowers try to avert exchange rate risk or volatility that may arise due to uncertainty of trade policy.

We also find that financial instability reduces the share of U.S. dollars in international loans. The difference from the case of U.S. trade uncertainty can be explained by dollar shortage that arises during financial instability or the expectation that such an event might happen. The impact of VIX is found to be persistent throughout the sample period, but the impact of U.S. trade uncertainty is more pronounced in the aftermath of the GFC, especially when the Trump administration implemented strenuous trade policies.

The estimation on the currency shares from the lenders' perspective also confirms these impacts on U.S. trade uncertainty and VIX.

We also test the correlation between currency choice for international loans and the borrowers' revenue volatility, and find that borrowing syndicated loans in local currency would lead the borrower to face less revenue volatility while USD-denominated loans would involve

greater revenue volatility.

Appendix 1: Country list

Borrower Economies

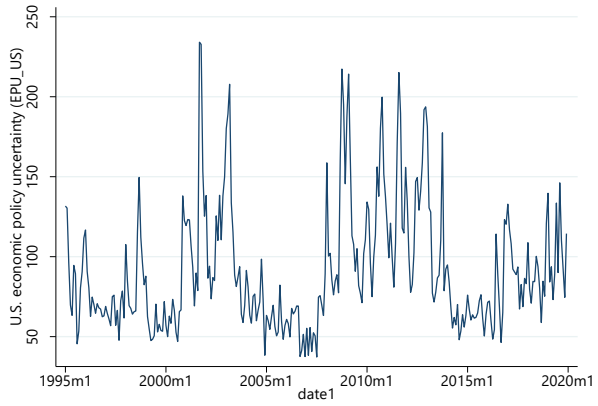
1 Argentina
2 Brazil
3 Chile
4 China
5 Colombia
6 Czech Republic
7 Egypt
8 Hungary
9 India
10 Indonesia
11 Korea (South)
12 Malaysia
13 Mexico
14 Pakistan
15 Peru
16 Philippines
17 Poland
18 Qatar
19 Russia
20 South Africa
21 Taiwan
22 Thailand
23 Turkey
24 United Arab Emirates
25 Vietnam

Lender Economies

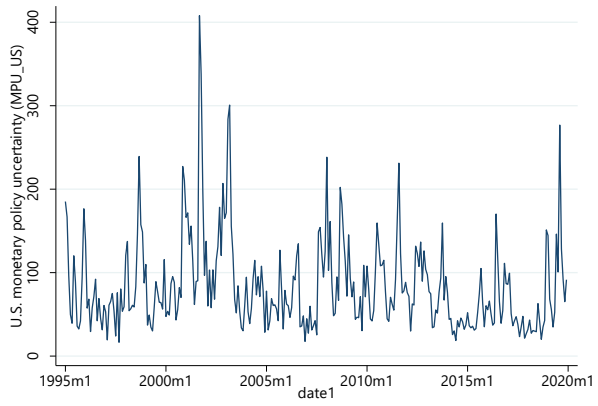
1 Argentina
2 Australia
3 Austria
4 Bahrain
5 Bangladesh
6 Belgium
7 Brazil
8 Canada
9 Cayman Islands
10 Chile
11 China
12 Colombia
13 Cyprus
14 Czech Republic
15 Egypt
16 Finland
17 France
18 Germany
19 Greece
20 Hong Kong
21 Hungary
22 India
23 Indonesia
24 Ireland
25 Israel
26 Italy
27 Japan
28 Jordan
29 Kazakhstan
30 Korea (South)
31 Kuwait
32 Luxembourg
33 Malaysia
34 Mauritius
35 Mexico
36 Netherlands
37 Norway
38 Pakistan
39 Panama
40 Philippines
41 Poland
42 Portugal
43 Qatar
44 Russia
45 Saudi Arabia
46 Singapore
47 Slovakia
48 South Africa
49 Spain
50 Sweden
51 Switzerland
52 Taiwan
53 Thailand
54 Turkey
55 USA
56 United Arab Emirates
57 United Kingdom
58 Venezuela
59 Vietnam

Appendix 2: Indexes for external shock and uncertainties

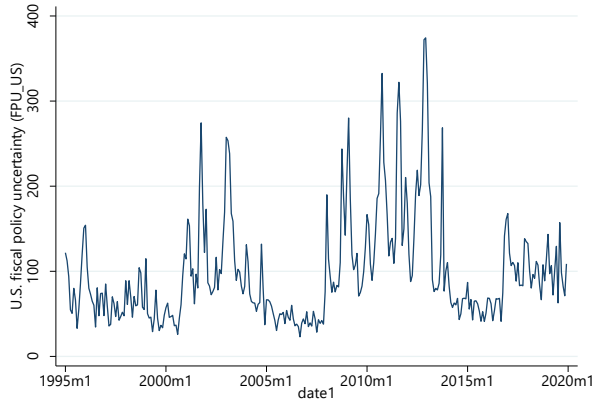
(a) US Economic Policy Uncertainty Index (epu_us)



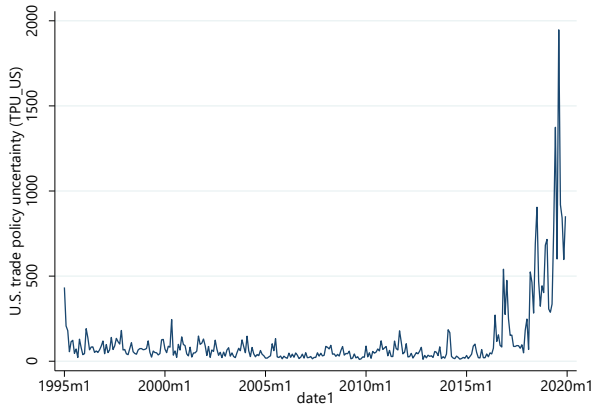
(b) U.S. Monetary Policy Uncertainty Index (mpu)



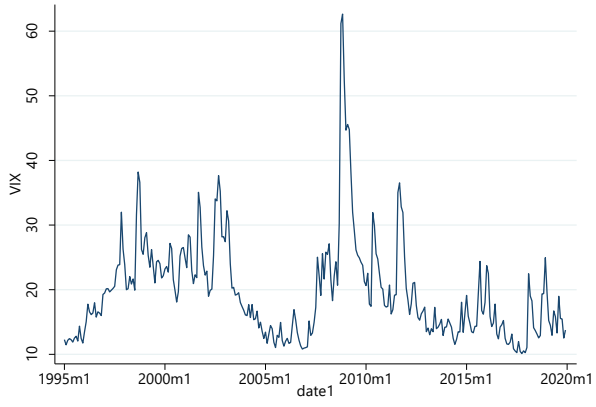
(c) U.S. Fiscal Policy Uncertainty Index (fpu)



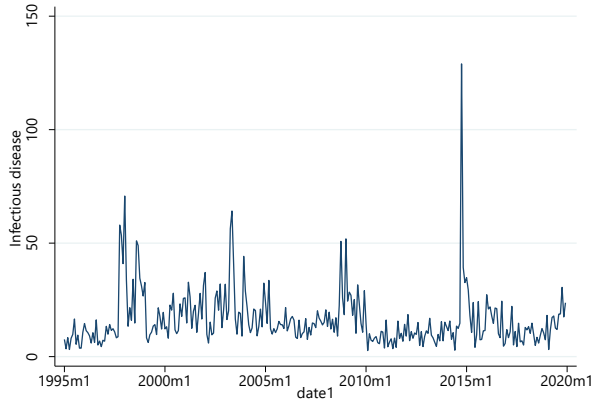
(d) US Trade Policy Uncertainty Index (tpu_us)



(e) VIX (vix)



(f) Disease Risk Index (*infect*):



Appendix 3:
AP-Table 1: US and Global Shocks to Euro Share, Borrowers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
US Econ. policy uncertainty	-0.001							-0.029	-0.003
	(0.004)							(0.031)	(0.009)
US Econ. policy uncertainty x SIZE_D	0.012***							0.034	0.011
	(0.001)							(0.032)	(0.009)
US Monetary policy uncertainty		-0.005*						0.009	
		(0.003)						(0.009)	
US Monetary policy uncertainty x SIZE_D		0.013***						-0.010	
		(0.002)						(0.010)	
US Fiscal policy uncertainty			-0.004					0.014	
			(0.003)					(0.019)	
US Fiscal policy uncertainty x SIZE_D			0.012***					-0.013	
			(0.001)					(0.020)	
US Trade policy uncertainty				-0.006***				-0.000	-0.001
				(0.002)				(0.003)	(0.003)
US Trade policy uncertainty x size				0.011***				0.002	0.002
				(0.001)				(0.003)	(0.003)
VIX					-0.005			0.010	0.009
					(0.006)			(0.014)	(0.013)
VIX x SIZE_D					0.019***			-0.005	-0.004
					(0.002)			(0.015)	(0.013)
Infectious Disease						-0.013***		-0.002	-0.003
						(0.003)		(0.005)	(0.004)
Infectious Disease x SIZE_D						0.020***		0.005	0.006
						(0.002)		(0.005)	(0.005)
WUI (individual countries)							-0.099**	0.116***	0.114***
							(0.048)	(0.038)	(0.038)
WUI (individual) x SIZE_D							0.202***	-0.109**	-0.106**
							(0.049)	(0.045)	(0.045)
N	18315	18315	18315	18315	18315	18315	18315	18315	18315

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space. The estimates for size, corporate, bank, public, financial efficiency, financial openness, oil, and year are included in the estimations, but are not reported.

AP-Table 1: US and Global Shocks to EURO Share, Lenders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
US Econ. policy uncertainty	0.015*							-0.094*	0.002
	(0.008)							(0.055)	(0.017)
US Econ. policy uncertainty x SIZE_D	0.002							0.102*	0.013
	(0.002)							(0.058)	(0.018)
US Monetary policy uncertainty		-0.004						-0.015	
		(0.006)						(0.015)	
US Monetary policy uncertainty x SIZE_D		0.002						0.001	
		(0.003)						(0.017)	
US Fiscal policy uncertainty			0.014**					0.084**	
			(0.006)					(0.035)	
US Fiscal policy uncertainty x SIZE_D			0.002					-0.071*	
			(0.002)					(0.038)	
US Trade policy uncertainty				-0.006				0.004	-0.001
				(0.005)				(0.007)	(0.006)
US Trade policy uncertainty x size				0.001				-0.011	-0.008
				(0.002)				(0.008)	(0.008)
VIX					0.023**			0.045	0.023
					(0.012)			(0.030)	(0.028)
VIX x SIZE_D					0.003			-0.021	-0.002
					(0.004)			(0.032)	(0.030)
Infectious Disease						-0.002		0.008	0.001
						(0.006)		(0.013)	(0.014)
Infectious Disease x SIZE_D						0.002		-0.011	-0.006
						(0.004)		(0.014)	(0.015)
WUI (individual countries)							-0.094	-0.084	-0.094
							(0.092)	(0.101)	(0.099)
WUI (individual) x SIZE_D							0.095	0.104	0.109
							(0.107)	(0.128)	(0.124)
N	4241	4241	4241	4241	4241	4241	4223	4223	4223

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space. The estimates for size, corporate, bank, public, financial efficiency, financial openness, oil, and year are included in the estimations, but are not reported. The table for the borrowers' euro share is reported in Appendix 3, and that of the home currency share is available from authors upon request.

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Table 1: Summary Statistics of Loan Variables, Monthly

(unit: USD million)

Variable	Obs	Mean	Std. Dev.	Min	Max
Currency of denomination					
Total	35,260	200.17	737.68	0	50,000
USD loans	35,260	160.05	663.43	0	50,000
Euro loans	35,260	23.14	275.17	0	18,092
Other currency loans	35,260	5.57	120.84	0	16,894
RMB loans	35,260	6.11	118.42	0	20,717
local currency loans	35,260	11.4	130.3	0	20,717
Term of loans					
Short-term loans	35,260	27.5	244.67	0	17,932
Long-term loans	35,260	172.67	692.79	0	50,000
Type of loans					
Loans for physical investment	35,260	154.78	690.16	0	50,000
Loans for financial investment	35,260	45.39	257.11	0	14,700

Table 2: Borrower Equation - Baseline

	(1) USD	(2) Euro	(3) Local currency	(4) USD share	(5) Euro share	(3) Local currency share
Size	0.427***	0.023***	-0.978***	0.315**	0.037***	-0.940***
	(0.062)	(0.005)	(0.081)	(0.130)	(0.007)	(0.159)
Corporate borrower	0.026***	0.017***	-0.020**	0.045***	0.004	0.011
	(0.009)	(0.005)	(0.009)	(0.016)	(0.010)	(0.015)
Bank	0.202***	0.050***	-0.368***	0.262***	0.047***	-0.134***
	(0.021)	(0.010)	(0.033)	(0.027)	(0.012)	(0.047)
Public	0.119***	0.006	-0.102***	0.073***	0.021**	-0.013
	(0.012)	(0.005)	(0.013)	(0.019)	(0.009)	(0.022)
Fin. mkt. efficiency	-0.105***	0.009***	0.053***	-0.065***	0.012*	0.016*
	(0.005)	(0.002)	(0.005)	(0.010)	(0.006)	(0.009)
Financial openness	0.131***	0.079***	-0.246***	0.104***	0.050***	-0.240***
	(0.020)	(0.006)	(0.022)	(0.031)	(0.016)	(0.036)
Oil	0.094***	-0.047***	-0.014	0.091***	0.003	0.260***
	(0.010)	(0.005)	(0.011)	(0.018)	(0.012)	(0.029)
Year	-0.014***	0.003***	0.011***	-0.010***	0.006***	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Δ(US REER)	-0.033*			-0.016		
	(0.019)			(0.033)		
Dollar weight	0.028**		0.015	0.187***		-0.143***
	(0.013)		(0.013)	(0.027)		(0.021)
Δ(EURO REER)		0.001			-0.001	
		(0.008)			(0.017)	
Euro weight		0.066***			-0.016	
		(0.008)			(0.014)	
Δ(REER$_i$)			-0.008			-0.019
			(0.012)			(0.018)
USD invoicing				0.412***		
				(0.044)		
EUR invoicing					0.370***	
					(0.017)	
Home currency inv.						0.626***
						(0.183)
N	18315	18315	15473	7658	7355	3151

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 3 (a): US and Global Shocks to USD Share, Borrowers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Size	0.426***	0.427***	0.426***	0.426***	0.427***	0.427***	0.426***	0.425***	0.425***
	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)	(0.062)
Corporate borrower	0.026***	0.028***	0.026***	0.024***	0.029***	0.027***	0.026***	0.027***	0.026***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Bank	0.199***	0.202***	0.198***	0.200***	0.201***	0.202***	0.200***	0.197***	0.196***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)	(0.022)
Public	0.119***	0.119***	0.119***	0.119***	0.119***	0.119***	0.119***	0.119***	0.119***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Fin. mkt. efficiency	-0.105***	-0.105***	-0.105***	-0.103***	-0.104***	-0.105***	-0.105***	-0.101***	-0.101***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Financial openness	0.132***	0.133***	0.132***	0.135***	0.134***	0.132***	0.132***	0.139***	0.139***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Oil	0.094***	0.094***	0.094***	0.094***	0.094***	0.094***	0.094***	0.095***	0.095***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Year	-0.014***	-0.014***	-0.014***	-0.015***	-0.015***	-0.014***	-0.014***	-0.016***	-0.016***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Δ(US REER)	-0.036*	-0.037*	-0.036*	-0.034*	-0.014	-0.032*	-0.034*	-0.022	-0.021
	(0.020)	(0.019)	(0.020)	(0.019)	(0.019)	(0.019)	(0.019)	(0.020)	(0.020)
Dollar weight	0.025**	0.027**	0.025**	0.026**	0.024**	0.029**	0.033***	0.023*	0.023*
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
US Econ. policy uncertainty	-0.026***							-0.017	-0.018**
	(0.008)							(0.032)	(0.009)
US Monetary policy uncertainty		-0.016***						-0.004	
		(0.005)						(0.009)	
US Fiscal policy uncertainty			-0.016***					0.002	
			(0.006)					(0.017)	
US Trade policy uncertainty				0.009***				0.012***	0.012***
				(0.003)				(0.003)	(0.003)
VIX					-0.051***			-0.041***	-0.042***
					(0.012)			(0.013)	(0.013)
Infectious Disease						-0.007		-0.002	-0.002
						(0.005)		(0.005)	(0.005)
WUI (indiv.)							0.077	0.041	0.040
							(0.058)	(0.058)	(0.058)
N	18315	18315	18315	18315	18315	18315	18315	18315	18315

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 3 (b): US and Global Shocks to Euro Share, Borrowers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Size	0.023***	0.023***	0.023***	0.023***	0.023***	0.023***	0.023***	0.023***	0.023***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Corporate borrower	0.017***	0.017***	0.017***	0.017***	0.017***	0.017***	0.017***	0.016***	0.016***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Bank	0.050***	0.050***	0.051***	0.050***	0.050***	0.050***	0.049***	0.049***	0.049***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Public	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006	0.006
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Fin. mkt. efficiency	0.008***	0.009***	0.008***	0.009***	0.008***	0.009***	0.009***	0.009***	0.009***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Financial openness	0.078***	0.078***	0.078***	0.079***	0.078***	0.079***	0.081***	0.081***	0.081***
	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)
Oil	-0.047***	-0.047***	-0.047***	-0.047***	-0.047***	-0.047***	-0.046***	-0.046***	-0.046***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Year	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Δ(EURO REER)	-0.000	-0.000	0.000	0.001	0.000	0.001	0.000	-0.001	-0.001
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Euro weight	0.066***	0.066***	0.066***	0.067***	0.066***	0.066***	0.063***	0.063***	0.063***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)
US Econ. policy uncertainty	0.009**							0.001	0.006
	(0.004)							(0.017)	(0.005)
US Monetary policy uncertainty		0.005**						0.001	
		(0.002)						(0.005)	
US Fiscal policy uncertainty			0.005**					0.003	
			(0.003)					(0.009)	
US Trade policy uncertainty				0.002				0.001	0.001
				(0.001)				(0.002)	(0.002)
VIX					0.011**			0.007	0.007
					(0.006)			(0.006)	(0.006)
Infectious Disease						0.002		0.002	0.002
						(0.002)		(0.002)	(0.002)
WUI (indiv.)							0.053**	0.055**	0.055**
							(0.024)	(0.025)	(0.025)
N	18315	18315	18315	18315	18315	18315	18315	18315	18315

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 3 (c): US and Global Shocks to Home Currency Share, Borrowers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Size	-0.978***	-0.978***	-0.977***	-0.975***	-0.977***	-0.979***	-0.976***	-0.971***	-0.972***
	(0.081)	(0.081)	(0.081)	(0.081)	(0.081)	(0.081)	(0.082)	(0.082)	(0.082)
Corporate borrower	-0.021**	-0.020**	-0.020**	-0.018**	-0.022***	-0.021**	-0.020**	-0.019**	-0.020**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Bank	-0.367***	-0.368***	-0.367***	-0.364***	-0.367***	-0.368***	-0.368***	-0.359***	-0.361***
	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)	(0.033)
Public	-0.102***	-0.102***	-0.102***	-0.101***	-0.102***	-0.102***	-0.102***	-0.101***	-0.101***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Fin. mkt. efficiency	0.053***	0.053***	0.053***	0.051***	0.052***	0.053***	0.053***	0.049***	0.049***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Financial openness	-0.245***	-0.246***	-0.245***	-0.248***	-0.247***	-0.246***	-0.246***	-0.250***	-0.250***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Oil	-0.014	-0.014	-0.014	-0.014	-0.014	-0.014	-0.013	-0.013	-0.013
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Year	0.011***	0.011***	0.011***	0.012***	0.012***	0.011***	0.011***	0.013***	0.013***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Δ(US REER)	-0.008	-0.008	-0.008	-0.011	-0.005	-0.009	-0.008	-0.008	-0.008
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Dollar weight	0.016	0.014	0.016	0.016	0.017	0.015	0.009	0.016	0.017
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
US Econ. policy uncertainty	0.010							0.042	0.012
	(0.008)							(0.033)	(0.009)
US Monetary policy uncertainty		-0.002						-0.021**	
		(0.005)						(0.009)	
US Fiscal policy uncertainty			0.009*					-0.005	
			(0.006)					(0.018)	
US Trade policy uncertainty				-0.012***				-0.013***	-0.014***
				(0.003)				(0.003)	(0.003)
VIX					0.036***			0.035***	0.031***
					(0.011)			(0.012)	(0.012)
Infectious Disease						0.011**		0.011**	0.008*
						(0.005)		(0.005)	(0.005)
WUI (indiv.)							-0.073	-0.031	-0.031
							(0.057)	(0.056)	(0.056)
N	15473	15473	15473	15473	15473	15473	15473	15473	15473

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 4: US and Global Shocks to USD Share, Borrowers, Different Sample Periods

	Full sample	**Pre-GFC**	**Post-GFC**	**Ex-GFC**	**Trump years**	**Post-GFC, pre-Trump**
	1995M1 – 2019M12	1995M1 – 2008M8	2010M1 – 2019M12	1995M1 – 2008M8 2010-M1 – 2019M12	2017M1 – 2019M12	2010M1 – 2016M12
	(1)	(2)	(3)	(4)	(5)	(6)
US Econ. policy uncertainty	-0.018**	-0.044***	0.002	-0.018*	-0.097***	0.004
	(0.009)	(0.017)	(0.011)	(0.009)	(0.034)	(0.016)
US Trade policy uncertainty	0.012***	0.010	0.009**	0.013***	0.026**	-0.003
	(0.003)	(0.010)	(0.004)	(0.003)	(0.013)	(0.006)
VIX	-0.042***	-0.084***	-0.016	-0.053***	-0.076**	-0.023
	(0.013)	(0.026)	(0.016)	(0.013)	(0.033)	(0.023)
Infectious Disease	-0.002	0.001	0.005	-0.003	-0.015	0.007
	(0.005)	(0.010)	(0.006)	(0.005)	(0.014)	(0.007)
WUI (indiv.)	0.040	0.128	0.042	0.017	-0.037	-0.044
	(0.058)	(0.119)	(0.060)	(0.058)	(0.100)	(0.108)
N	18315	5635	12140	17775	3914	7006

Notes: Standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The estimation model is the same as the one in column 9 of Table 3 (a). To conserve space, we only report the estimates on the external shock and uncertainty indexes. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 5: Interactions between US and Global Shocks and the Size of Borrowers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
US Econ. policy uncertainty	-0.064***							-0.104***	-0.040***
	(0.008)							(0.039)	(0.011)
US Econ. policy uncertainty x SIZE_D	0.065***							0.196***	0.036***
	(0.002)							(0.049)	(0.014)
US Monetary policy uncertainty		-0.056***						0.032***	
		(0.005)						(0.012)	
US Monetary policy uncertainty x SIZE_D		0.067***						-0.077***	
		(0.003)						(0.016)	
US Fiscal policy uncertainty			-0.052***					0.033	
			(0.006)					(0.022)	
US Fiscal policy uncertainty x SIZE_D			0.063***					-0.077***	
			(0.002)					(0.031)	
US Trade policy uncertainty				-0.026***				-0.001	-0.004
				(0.003)				(0.004)	(0.004)
US Trade policy uncertainty x SIZE_D				0.063***				0.022***	0.027***
				(0.002)				(0.005)	(0.005)
VIX					-0.109***			-0.032**	-0.038**
					(0.012)			(0.016)	(0.016)
VIX x SIZE_D					0.102***			-0.015	-0.005
					(0.003)			(0.024)	(0.022)
Infectious Disease						-0.062***		-0.007	-0.007
						(0.006)		(0.006)	(0.006)
Infectious Disease x SIZE_D						0.103***		0.013	0.013
						(0.005)		(0.009)	(0.009)
WUI (indiv.)							-0.929***	0.035	0.025
							(0.124)	(0.068)	(0.068)
WUI (indiv.) x SIZE_D							1.737***	-0.107	-0.093
							(0.171)	(0.103)	(0.104)
N	18315	18315	18315	18315	18315	18315	18315	18315	18315

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space. The estimates for size, corporate, bank, public, financial efficiency, financial openness, oil, and year are included in the estimations, but are not reported. The table for the borrowers' euro share is reported in Appendix 3, and that of the home currency share is available from authors upon request.

Table 6: Lender Equation, Baseline

	(1) USD share	(2) Euro share	(3) Local currency share	(4) USD share	(5) Euro share	Local currency share
Size	0.543***	0.009*	-0.708***	0.209	0.045*	-0.964***
	(0.170)	(0.005)	(0.151)	(0.314)	(0.026)	(0.181)
Bank	0.008	0.018	-0.034	0.051	0.014	0.002
	(0.026)	(0.019)	(0.023)	(0.041)	(0.044)	(0.038)
Corporate	-0.038	0.010	0.027	0.020	-0.001	-0.016
	(0.056)	(0.032)	(0.044)	(0.100)	(0.067)	(0.074)
IDC	0.071**	0.001	-0.121***	0.343***	-0.044	-0.197***
	(0.036)	(0.017)	(0.029)	(0.071)	(0.035)	(0.052)
Fin. mkt. efficiency	-0.033***	0.001	0.029***	0.007	-0.024	-0.004
	(0.012)	(0.007)	(0.010)	(0.020)	(0.015)	(0.018)
Financial openness	0.301***	0.094***	-0.234***	0.185**	0.097*	-0.057
	(0.040)	(0.020)	(0.030)	(0.087)	(0.055)	(0.074)
Year	-0.015***	0.004***	0.011***	-0.013***	0.009***	0.005***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Δ(US REER)	-0.034			0.011		
	(0.044)			(0.076)		
Dollar weight	0.025		0.044*	-0.012		-0.047
	(0.033)		(0.026)	(0.067)		(0.056)
Δ(EURO REER)		0.038**			0.013	
		(0.019)			(0.043)	
Euro weight		0.109***			-0.107*	
		(0.016)			(0.063)	
$\Delta(REER_i)$			0.009			-0.014
			(0.027)			(0.042)
USD invoicing				0.342***		
				(0.085)		
EUR invoicing					0.378***	
					(0.073)	
Home currency inv.						0.181
						(0.113)
N	4317	4241	4295	1796	1514	1112

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 7 (a): US and Global Shocks to USD share, Lenders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Size	0.545***	0.544***	0.545***	0.551***	0.545***	0.541***	0.533***	0.543***	0.545***
	(0.170)	(0.170)	(0.170)	(0.170)	(0.167)	(0.169)	(0.169)	(0.166)	(0.166)
Bank	0.009	0.009	0.009	0.013	0.017	0.012	0.011	0.024	0.026
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
Corporate	-0.037	-0.038	-0.037	-0.034	-0.032	-0.038	-0.033	-0.021	-0.022
	(0.056)	(0.056)	(0.056)	(0.055)	(0.057)	(0.056)	(0.056)	(0.057)	(0.057)
IDC	0.067*	0.069**	0.068*	0.067*	0.058*	0.070**	0.069**	0.053	0.050
	(0.036)	(0.036)	(0.036)	(0.036)	(0.035)	(0.036)	(0.036)	(0.036)	(0.036)
Fin. mkt. efficiency	-0.031***	-0.032***	-0.032***	-0.030**	-0.027**	-0.033***	-0.030**	-0.022*	-0.021*
	(0.012)	(0.013)	(0.012)	(0.013)	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)
Financial openness	0.302***	0.303***	0.301***	0.302***	0.302***	0.304***	0.311***	0.310***	0.312***
	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)	(0.040)
Year	-0.014***	-0.015***	-0.014***	-0.015***	-0.017***	-0.015***	-0.014***	-0.016***	-0.017***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Δ(US REER)	-0.042	-0.037	-0.043	-0.036	0.005	-0.026	-0.029	0.011	0.007
	(0.044)	(0.044)	(0.044)	(0.044)	(0.046)	(0.045)	(0.044)	(0.047)	(0.047)
Dollar weight	0.020	0.023	0.021	0.022	0.013	0.024	0.022	0.006	0.004
	(0.033)	(0.033)	(0.033)	(0.033)	(0.032)	(0.033)	(0.033)	(0.032)	(0.032)
US Econ. policy uncertainty	-0.044***							-0.016	-0.009
	(0.017)							(0.063)	(0.019)
US Monetary policy uncertainty		-0.012						0.027	
		(0.011)						(0.019)	
US Fiscal policy uncertainty			-0.030***					-0.016	
			(0.012)					(0.033)	
US Trade policy uncertainty				0.014**				0.015**	0.017**
				(0.007)				(0.007)	(0.007)
VIX					-0.116***			-0.114***	-0.110***
					(0.020)			(0.024)	(0.024)
Infectious Disease						-0.023**		-0.009	-0.004
						(0.010)		(0.010)	(0.010)
WUI (indiv.)							-0.198	-0.212	-0.217
							(0.169)	(0.158)	(0.160)
N	4317	4317	4317	4317	4317	4317	4299	4299	4299

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 7 (b): US and Global Shocks to EUR Share, Lenders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Size	0.009*	0.009*	0.009*	0.008*	0.008*	0.009*	0.009*	0.008	0.008
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Bank	0.017	0.018	0.016	0.015	0.015	0.018	0.017	0.012	0.010
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Corporate	0.011	0.010	0.011	0.006	0.008	0.010	0.010	0.002	0.002
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
IDC	0.003	0.000	0.003	0.003	0.007	0.001	0.001	0.006	0.009
	(0.017)	(0.017)	(0.017)	(0.017)	(0.018)	(0.017)	(0.018)	(0.019)	(0.019)
Fin. mkt. efficiency	-0.002	0.001	-0.003	0.001	-0.002	0.001	0.001	-0.005	-0.004
	(0.008)	(0.007)	(0.008)	(0.007)	(0.008)	(0.007)	(0.007)	(0.008)	(0.008)
Financial openness	0.094***	0.094***	0.093***	0.093***	0.091***	0.094***	0.095***	0.088***	0.090***
	(0.021)	(0.020)	(0.021)	(0.020)	(0.021)	(0.020)	(0.021)	(0.021)	(0.021)
Year	0.004***	0.004***	0.004***	0.005***	0.005***	0.004***	0.004***	0.005***	0.005***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Δ(EUR REER)	0.035*	0.038**	0.034*	0.041**	0.033*	0.038**	0.038**	0.036*	0.036*
	(0.019)	(0.020)	(0.019)	(0.020)	(0.019)	(0.020)	(0.020)	(0.019)	(0.019)
EUR weight	0.109***	0.109***	0.111***	0.107***	0.106***	0.109***	0.110***	0.107***	0.105***
	(0.015)	(0.016)	(0.015)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
US Econ. policy uncertainty	0.016**							-0.010	0.012
	(0.008)							(0.035)	(0.010)
US Monetary policy uncertainty		-0.002						-0.014	
		(0.005)						(0.010)	
US Fiscal policy uncertainty			0.016***					0.025	
			(0.006)					(0.020)	
US Trade policy uncertainty				-0.005				-0.005	-0.007
				(0.004)				(0.005)	(0.005)
VIX					0.025**			0.028**	0.021
					(0.011)			(0.012)	(0.013)
Infectious Disease						-0.000		-0.001	-0.003
						(0.005)		(0.005)	(0.005)
WUI (indiv.)							-0.019	-0.010	-0.011
							(0.071)	(0.065)	(0.064)
N	4241	4241	4241	4241	4241	4241	4223	4223	4223

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 7 (c): US and Global Shocks to Home Currency Share, Lenders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Size	-0.708***	-0.708***	-0.708***	-0.708***	-0.701***	-0.707***	-0.701***	-0.695***	-0.696***
	(0.151)	(0.152)	(0.151)	(0.151)	(0.149)	(0.151)	(0.151)	(0.148)	(0.149)
Bank	-0.036	-0.035	-0.036	-0.038*	-0.039*	-0.035	-0.038*	-0.049**	-0.050**
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)	(0.022)	(0.023)	(0.023)
Corporate	0.026	0.028	0.026	0.024	0.024	0.028	0.020	0.012	0.013
	(0.045)	(0.044)	(0.045)	(0.043)	(0.045)	(0.044)	(0.044)	(0.045)	(0.045)
IDC	-0.118***	-0.119***	-0.119***	-0.118***	-0.113***	-0.121***	-0.127***	-0.116***	-0.114***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)	(0.030)	(0.029)	(0.029)
Fin. mkt. efficiency	0.029***	0.029***	0.029***	0.028***	0.027***	0.029***	0.028***	0.024***	0.024**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Financial openness	-0.234***	-0.235***	-0.233***	-0.235***	-0.236***	-0.235***	-0.237***	-0.235***	-0.236***
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
Year	0.011***	0.012***	0.011***	0.012***	0.013***	0.011***	0.011***	0.012***	0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Δ(US REER)	0.009	0.009	0.008	0.004	0.011	0.008	0.010	0.004	0.003
	(0.027)	(0.027)	(0.027)	(0.028)	(0.027)	(0.027)	(0.027)	(0.027)	(0.027)
Dollar weight	0.049*	0.046*	0.048*	0.047*	0.051**	0.044*	0.046*	0.060**	0.062**
	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
US Econ. policy uncertainty	0.036***							0.063	0.027*
	(0.015)							(0.056)	(0.017)
US Monetary policy uncertainty		0.010						-0.022	
		(0.010)						(0.017)	
US Fiscal policy uncertainty			0.025***					-0.008	
			(0.010)					(0.029)	
US Trade policy uncertainty				-0.011**				-0.015***	-0.015***
				(0.005)				(0.006)	(0.005)
VIX					0.065***			0.052***	0.052***
					(0.017)			(0.021)	(0.020)
Infectious Disease						0.009		0.003	0.000
						(0.008)		(0.008)	(0.008)
WUI (indiv.)							0.200	0.247**	0.247**
							(0.124)	(0.121)	(0.121)
N	4295	4295	4295	4295	4295	4295	4277	4277	4277

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 8: US and Global shocks to USD Share, Lenders, Different Sample Periods

	Full sample	**Pre-GFC**	**Post-GFC**	**Ex-GFC**	**Trump years**	**Post-GFC, pre-Trump**
	1995M1 – 2019M12	1995M1 – 2008M8	2010M1 – 2019M12	1995M1 – 2008M8 2010-M1 – 2019M12	2017M1 – 2019M12	2010M1 – 2016M12
	(1)	(2)	(3)	(4)	(5)	(6)
US Econ. policy uncertainty	-0.009	0.022	-0.018	-0.016	-0.016	0.015
	(0.019)	(0.038)	(0.028)	(0.020)	(0.020)	(0.035)
US Trade policy uncertainty	0.017**	-0.007	0.012	0.016**	0.016**	-0.004
	(0.007)	(0.019)	(0.011)	(0.008)	(0.008)	(0.016)
VIX	-0.110***	-0.132***	-0.004	-0.089***	-0.089***	-0.041
	(0.024)	(0.045)	(0.039)	(0.027)	(0.027)	(0.051)
Infectious Disease	-0.004	-0.037*	0.006	-0.005	-0.005	0.012
	(0.010)	(0.021)	(0.013)	(0.011)	(0.011)	(0.016)
WUI (indiv.)	-0.217	-0.211	-0.058	-0.175	-0.175	-0.220
	(0.160)	(0.316)	(0.190)	(0.167)	(0.167)	(0.287)
N	4299	1682	2437	4119	4119	1452

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The estimation model is the same as the one in column 9 of Table 7 (a). To conserve space, we only report the estimates on the external shock and uncertainty indexes. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space.

Table 9: Interactions between US and Global Shocks and the Size of Lenders

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
US Econ. policy uncertainty	-0.064***							-0.008	-0.018
	(0.018)							(0.077)	(0.024)
US Econ. policy uncertainty x SIZE_D	0.033***							-0.012	0.013
	(0.008)							(0.097)	(0.027)
US Monetary policy uncertainty		-0.029**						0.037	
		(0.013)						(0.025)	
US Monetary policy uncertainty x SIZE_D		0.032***						-0.021	
		(0.008)						(0.035)	
US Fiscal policy uncertainty			-0.049***					-0.036	
			(0.013)					(0.042)	
US Fiscal policy uncertainty x SIZE_D			0.032***					0.035	
			(0.008)					(0.057)	
US Trade policy uncertainty				-0.011				-0.011	-0.009
				(0.008)				(0.010)	(0.009)
US Trade policy uncertainty x sizw				0.036***				0.038***	0.037***
				(0.008)				(0.014)	(0.013)
VIX					-0.139***			-0.091***	-0.081***
					(0.022)			(0.034)	(0.032)
VIX x SIZE_D					0.046***			-0.027	-0.037
					(0.012)			(0.042)	(0.039)
Infectious Disease						-0.045***		-0.016	-0.009
						(0.012)		(0.013)	(0.013)
Infectious Disease x SIZE_D						0.046***		0.019	0.014
						(0.013)		(0.019)	(0.019)
WUI (indiv.)							-0.841**	-0.308	-0.323
							(0.346)	(0.257)	(0.265)
WUI (indiv.) x SIZE_D							0.978***	0.152	0.171
							(0.374)	(0.324)	(0.330)
N	4317	4317	4317	4317	4317	4317	4299	4299	4299

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The marginal effects are reported. The constant term is included in the estimation, but omitted from presentation to conserve space. The estimates for size, corporate, bank, public, financial efficiency, financial openness, oil, and year are included in the estimations, but are not reported. The table for the borrowers' euro share is reported in Appendix 3, and that of the home currency share is available from authors upon request.

Table 10: Impacts of Currency Share

(a) on pre-tax income volatility

	(1) Dollar share	(2) Euro share	(3) Local currency share
Size	0.953***	0.734***	0.810***
	(0.105)	(0.204)	(0.136)
Liquidity	0.017	-0.059	0.045
	(0.127)	(0.196)	(0.126)
ROA	1.180	4.658	4.273
	(6.284)	(8.320)	(7.167)
Debt/equity ratio	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)
USD share	2.408***		
	(0.783)		
Euro share		0.336	
		(1.159)	
Local currency share			-2.845***
			(0.596)
Time fixed effects	Yes	Yes	Yes
Borrower fixed effects	Yes	Yes	Yes
N	155	155	155
adj. R^2	0.628	0.525	0.637

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The constant term is included, but its estimates are not reported.

(b) earnings volatility

	(1) dollar share	(2) euro share	(3) local currency share
Size	0.854***	0.671***	0.735***
	(0.184)	(0.183)	(0.144)
Liquidity	0.411***	0.346	0.434***
	(0.141)	(0.222)	(0.139)
ROA	11.501	14.261	14.077
	(12.580)	(11.895)	(11.541)
Debt/equity ratio	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)
USD share	2.005*		
	(1.176)		
Euro share		-0.035	
		(1.197)	
Local currency share			-2.375*
			(1.285)
Time fixed effects	Yes	Yes	Yes
Borrower fixed effects	Yes	Yes	Yes
N	155	155	155
adj. R^2	0.581	0.533	0.585

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The constant term is included, but its estimates are not reported.

Table 10: Continued
(c) on profit volatility

	(1) dollar share	(2) euro share	(3) local currency share
Size	0.641***	0.630***	0.658***
	(0.205)	(0.175)	(0.173)
Liquidity	-0.035	-0.029	-0.002
	(0.083)	(0.082)	(0.076)
ROA	6.492	7.425	6.534
	(5.531)	(5.184)	(5.588)
Debt/equity ratio	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)
USD share	0.088		
	(0.523)		
Euro share		1.873***	
		(0.606)	
Local currency share			-0.949**
			(0.473)
Time fixed effects	Yes	Yes	Yes
Borrower fixed effects	Yes	Yes	Yes
N	155	155	155
adj. R^2	0.565	0.593	0.581

Notes: Robust standard errors in parentheses. * p<.105, ** p<.055, *** p<.015. The constant term is included, but its estimates are not reported.

Figure 1: Total cross-border loans, monthly

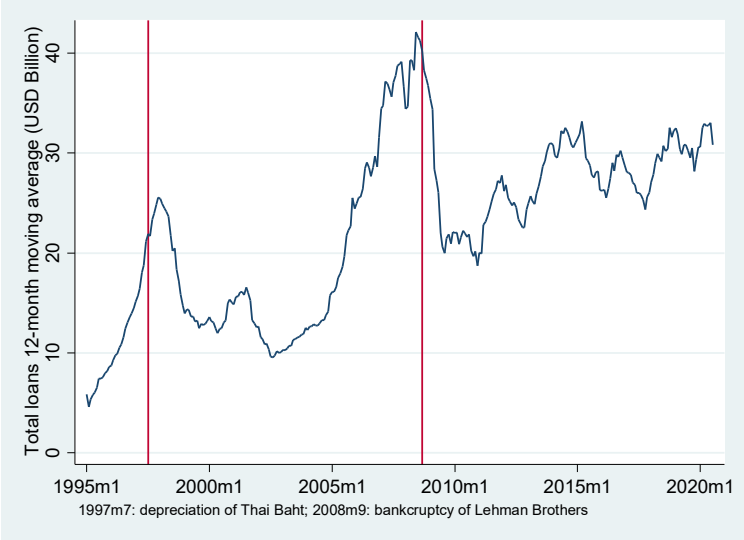

Figure 2. Currency denomination, monthly

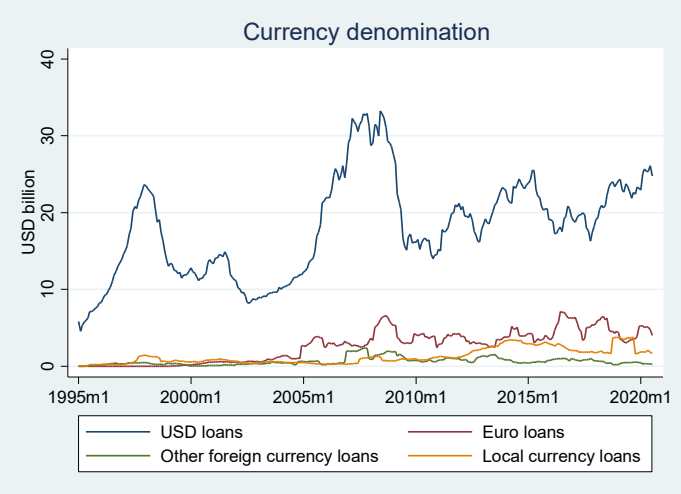

Figure 3. Currency shares, monthly (% of total)

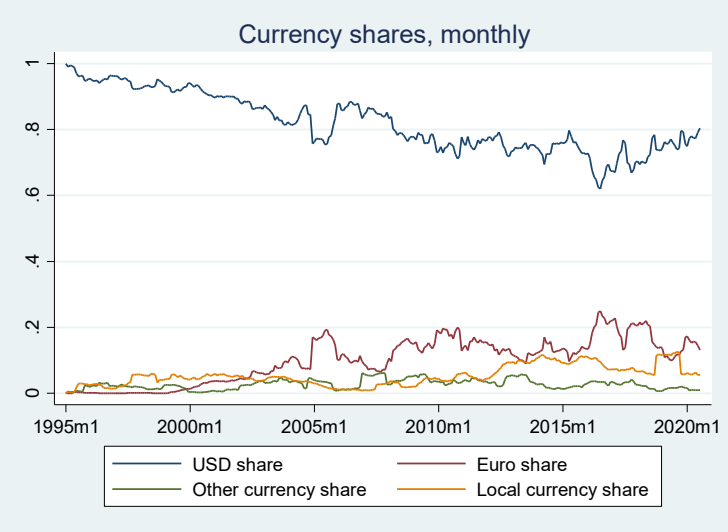

Figure 4: Regional allocation, monthly

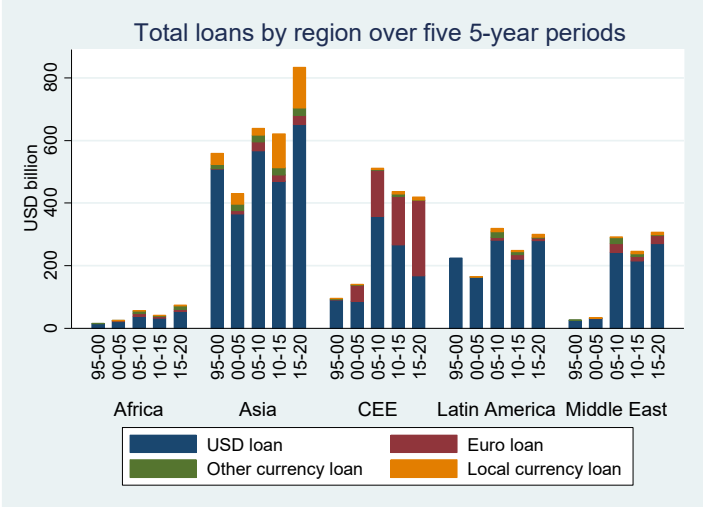

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Figure 5: Currency share by region, monthly

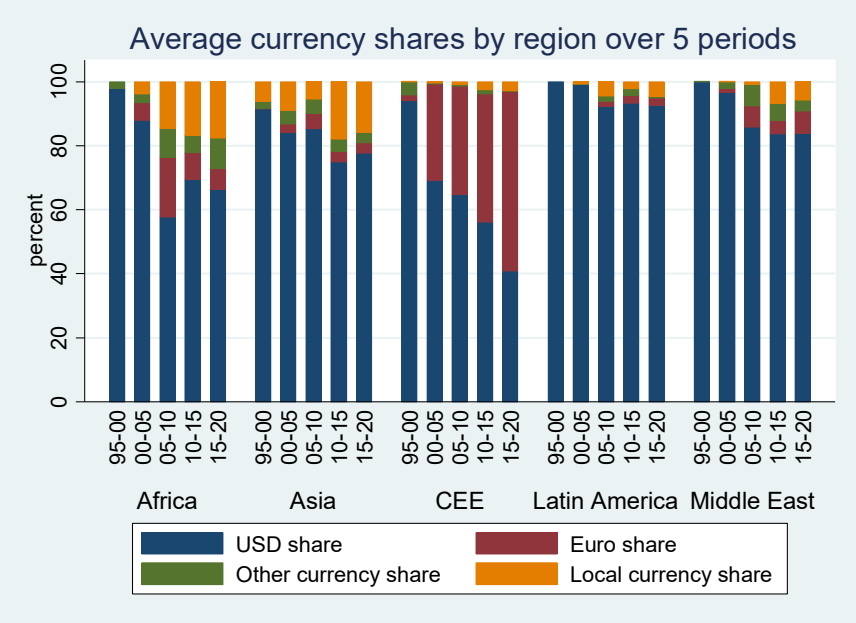

Figure 6: Currency share by loan characteristics

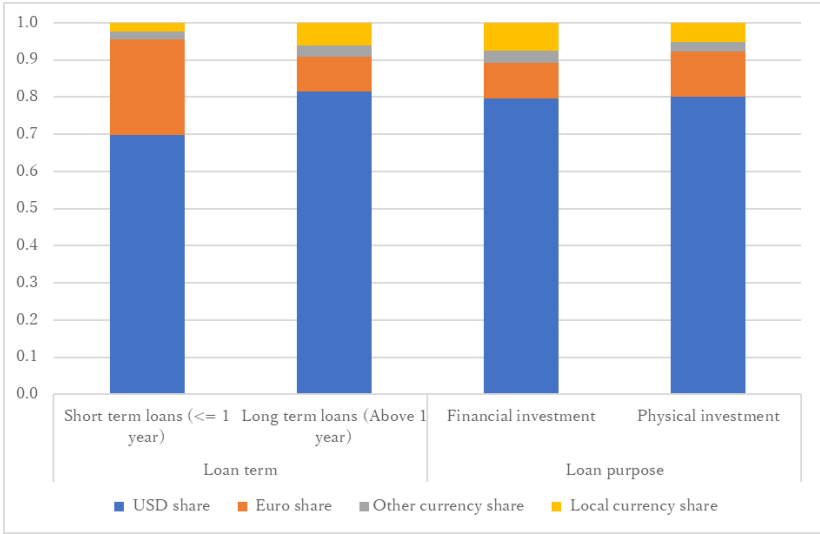

Figure 7: Currency share by borrower characteristics

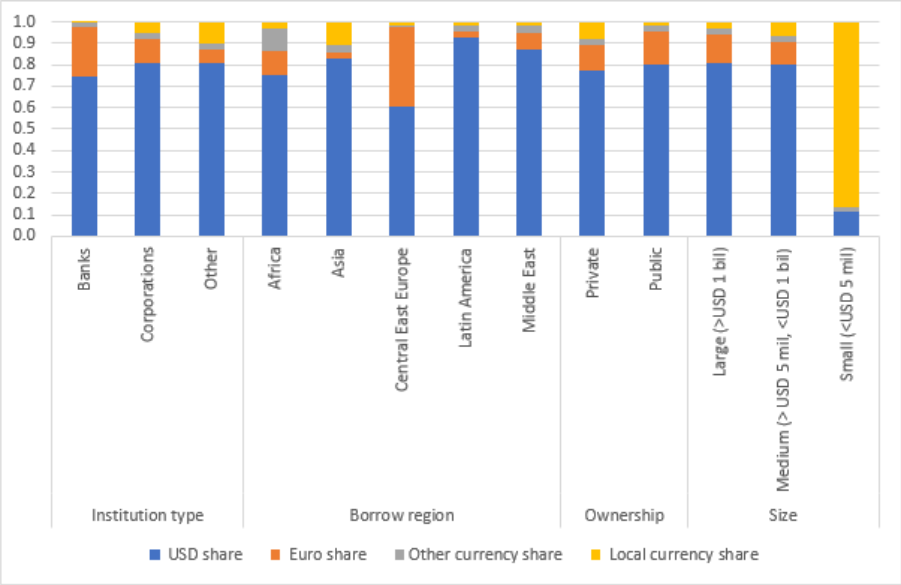

Figure 8: Currency share by lender characteristics