NFCs' offshore debt issuances and within-company loans

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Abstract

This paper presents a comprehensive analysis of the co-movement of offshore debt issuance and within-company loans and conducts an in-depth study on what aspects of the economic environment stimulate this co-movement using the bilateral offshore issuance dataset by Aldasoro, Hardy, and Tarashev (2021) and direct investment positions dataset from the Coordinated Direct Investment Survey (CDIS). Within-company loans that are financed through the offshore issuance of debt securities can be viewed as portfolio flows masked as FDI and raises questions about the traditional view that FDI is a stable or good form of capital flow. The literature has studied the growth of non-financial corporates' (NFCs') offshore debt issuance through overseas affiliates and its relation with financial instability by using nationality as a proxy for the ultimate obligator. However, the risk profile of offshore debt is likely to be very different depending on whether the issuing affiliate uses proceeds for operations in the country of residence or channels funds to the parent company. Therefore, the key questions of this paper are: How do NFCs use the proceeds of issuance? What aspects of the economic environment stimulate the re-lending business in NFCs' offshore subsidiaries abroad? Why are debt securities issued via offshore affiliates?

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Summary

In the aftermath of the global financial crisis, financing through debt securities grew faster than bank flows. At the same time, the size of external borrowing of non-financial corporations (NFCs) through overseas affiliates, i.e., offshore issuance, is continuously increasing, especially for emerging markets. Therefore, offshore issuance of NFCs has become central for assessing the risk profile of debt issuance and its link with the economic environment. In this study, I analyze if affiliates of NFCs re-route the proceeds of offshore issuance to their ultimate parents for the years 2009-2020. I study what aspects of the economic environment stimulate this re-routing activity. In addition, I investigate the drivers of offshore issuance share in total issuance by using the period 2000-2020.

We can use an example to illustrate the concept of NFCs' offshore issuance. Let's take an energy company in China and its subsidiary in the British Virgin Islands. When this subsidiary issues bonds in the British Virgin Islands, it can use the proceeds either by acquiring foreign assets or transferring them to the parent company in China as within-company loans. The latter case can be defined as re-routed external debt, and viewed as portfolio flows masked as FDI. While FDI is generally viewed as a stable and good form of capital, this belief may be misleading for the within-company loans arising from offshore issuance. Therefore, an increase in the re-routed debt to parent companies by their affiliates might increase the systemic risk and financial instability of countries where parent companies are domiciliated.

Related research has documented the effect of offshore debt issuances on financial instability via the transmission of global liquidity and US financial conditions. This paper is the first to empirically analyze the link between the offshore issuance of bonds by NFCs and within-company loans by affiliates back to their parent companies. I show that re-routed external debt in advanced, emerging, and developing countries is a non-trivial phenomena. These results highlight the importance of monitoring the sources of, and question the stability of, FDI. This study also emphasizes the importance of institutional features and regulations, financial integration, and carry trade motivation in re-routing activities. I then investigate the drivers of offshore issuance by NFCs. I find that the quality of the legal environment, the deepness of the investor base, and capital controls on international lending, amongst others, are key factors in explaining the share of offshore in total issuance.

The prevalence of re-routed external debt might be a double-edged sword. On the one hand, it could promote the growth of the domestic market where the parent company is located by reallocating financial resources to parent companies. On the other hand, it may increase systemic risk and financial instability. My findings provide key policy implications. For countries where parent companies are domiciliated, policymakers may want to trace the within-company borrowing behaviors of NFCs. In the meantime, they might want to enhance the legal environment for international investors and reconsider the capital control policies to cool down re-routing activities by NFCs. As international financial integration continues, governments need to recognize the importance of this phenomena when designing policies for capital flow.

1 Introduction

Post Global Financial Crisis (GFC), the issuance of international bonds grew faster than bank lending, and its relationship with global financial conditions strengthened (Shin, 20014; Avdjiev, Gambacorta, Goldberg, and Schiaffi, 2020). Non-financial firms have increased their external borrowing significantly through the issuance of debt securities, with a significant part of the issuance taking place offshore through overseas affiliates of corporates. Foreign affiliates of NFCs could use those offshore funds for either acquiring foreign assets or transferring them to the parent's nationality country as within-company loans (re-routing external debt). The latter could be viewed as portfolio flows masked as FDI and raises questions about the traditional view that FDI is a stable or "good" form of capital flow (CGFS, 2009). Although these re-routed proceeds of issuance may contribute to growth in the economy of the parent's residence, an increase in the indebtedness and the misperception about its stability might increase the systemic risk and financial instability.

How do NFCs use the proceeds of issuance? Are funds raised by offshore affiliates on-lent to the parent company? What aspects of the economic environment stimulate the re-lending business in NFCs' offshore subsidiaries abroad? Why are debt securities issued via offshore affiliates? These are key questions at the centre of this study.

There is a substantial body of literature showing that external corporate borrowing through international financial centres can be a source of broader financial instability because of the exposures to global financial conditions and vulnerability to exchange rate movements (Kim and Shin, 2021; Aldasoro et al., 2021). However, the risk profile of offshore debt is likely to be very different regarding whether the foreign affiliates of NFCs act as a surrogate intermediary by channeling funds to their parents (Gruić, Upper, and Villar, 2014; Gruic, Wooldridge, et al., 2015). Therefore, I focus on the link between offshore issuances and within-company loans and conduct an in-depth study on what aspects of the economic environment stimulate the development of this link.

Another part of the literature focuses on bilateral portfolio investment based on nationality versus residency (Coppola, Maggiori, Neiman, and Schreger, 2021; Pellegrino, Spolaore, and Wacziarg, 2021; Galstyan, Maqui, and McQuade, 2021). Most international financial statistics are reported on a residency basis. On the one hand, residency-based statistics associate securities with the location of their immediate issuer. On the other hand, nationality-based statistics associate securities with the country of the issuer's ultimate parent. It means the residence-based issuance measure does not capture the issuance when offshore affiliates issue bonds in international financial centers. In this case, it offers a highly distorted financial linkage across countries. Despite the prevalence of a vastly different picture of global capital allocation between nationality-based and residency-based data, there is a gap in the literature for investigating the drivers of this difference, i.e., offshore issuance. Therefore, this paper also aims to fill this gap using empirical analysis.

Empirical analyses show the prevalence of re-routing external debt by foreign affiliates to their NFCs. This pattern is present in advanced, emerging, and developing countries. The measures of institutional development, access to the international capital market and

carry trade motivation shape the striking heterogeneity across the country pairs. Better legal environments and institutions, higher corporate bond issuance volume, international financial integration, and capital account openness of the countries where the parent resides relative to countries where their affiliates reside cool down the re-routing activities of NFCs. In addition, because of the financial return motivation, higher borrowing costs in the residence of the parent relative to the location of the affiliate amplify the re-routing activities of NFCs.

Analyses for drivers of the weight of offshore issuance relative to onshore issuance, which refers to the debt issued from the country of headquarters, reveal the crucial role of institutional quality and security of the legal environment, the deepness of the investor base, capital controls on international lending and financial integration, and risk level of countries. Higher institutional and financial development and better international financial integration in a country where headquarters reside relative to the country where the offshore affiliate resides are negatively associated with the offshore share for all country groups. Better hedging market development in the parent residence relative to the offshore affiliate location is negatively linked with the offshore issuance weight for emerging and developing countries. However, greater values of capital flow management control and volatility in the inflation rate in the nationality country of affiliates relative to their residence country are positively associated with the offshore issuance weight for all county groups. A negative link between volatility in exchange rate change and offshore issuance share is apparent only for advanced and emerging countries.

This paper is structured as follows. Section 2 introduces the conceptual framework of NFCs' offshore debt issuance, how it can be used, and potential emerging risks. Section 3 provides the analytical framework of the international capital market and explores the drivers of the re-routed external debt from the affiliates. Section 4 specifies the methodology and describes the data. Section 5 presents empirical results, followed by a discussion and conclusion.

2 NFCs' debt issuance through offshore affiliates

To understand the concept of NFC's offshore debt issuance via their subsidiaries in foreign countries, I draw an example from Coppola et al. (2021). China's energy company, China Petroleum & Chemical Corporation, established a financing subsidiary in the British Virgin Islands called Sinopec Group Overseas Dev. 2015 Ltd. In 2017, foreign investors bought 8.4 billion USD of bonds this company issued. While it is recorded as a corporate bond investment in the British Virgin Islands according to residency-based statistics, according to nationality-based statistics, it is recorded as a corporate bond investment in China.

Figure 1a illustrates an increasing trend of NFCs' debt securities issuance through their offshore affiliates for both advanced economies (AE) and emerging and developing economies (EME). While offshore issuance of advanced economies' NFCs starts to increase in the early period, I observe the drastic increase in offshore issuance of EME' NFCs after the GFC as a foreshadowing of the second phase of global liquidity. Shin (2014) divides global liquidity into two phases. Although global banking and acceleration of banking sector capital flow are at the core of the first phase, roughly between 2003 and 2008, the bond market, especially the one

for emerging market debt securities at the centre of the second phase of global liquidity.

When I divide EMEs in terms of their geography, it is possible to observe that the NFC of Asian EMEs constitutes a large amount of offshore issuance. Since there is a big gap between the amount issued by Asian EME NFCs and other EME NFCs, Figure 1b is beneficial to zoom in on patterns in other EMEs, and it is possible to observe a post-GFC increasing trend in those groups as well. Figure 2 shows the offshore issuance shares of countries in their groups. Germany and US stand out among the advanced economies with their offshore issuance share in their group. Among the emerging developing economies, China, Brazil, Russia, and South Africa are the countries that have the largest share in their geographies, Asia Pacific, Latin America, Europe, and Africa, respectively.

On the other hand, Figure 3 represents shares of countries hosting offshore issuance of different country groups' NFC. While the Netherlands, Luxembourg, Cayman Island, United Kingdom, and the US are the most popular offshore locations for advanced economies, Cayman Island, British Virgin Island, the Netherlands, Hong Kong, and Luxembourg are prominent locations for emerging and developing economies. Under the same figure, shares of countries that are hosting the offshore issuance of different geographical groups of EME are also available.

2.1 Use of proceeds

Foreign affiliates of NFCs could use funds that are obtained by issuing bonds offshore in two alternative ways. They can either use them to acquire foreign assets, which means money stays outside, or transfer the proceeds to the country where their parents reside. Figure 4 illustrates the three possible channels foreign affiliates might exploit to re-lend the bond issuance proceeds to its parent country. It could lend directly to its headquarters (within-company flows), extend credit to unrelated companies (between-company flows), or make a cross-border deposit in a bank (corporate deposit flows) (Gruic et al., 2015; Avdjiev, Chui, and Shin, 2014).

This paper focuses on the within-company loan channel for transferring the proceed from a foreign subsidiary to its parent. International debt securities issued by foreign affiliates and repatriated by the parent are recorded as debt liabilities of the parent to their affiliates under FDI (TFFS, 2013) and raise questions about the traditional view of FDI. FDI is mainly known as a stable form of investment. Although this general belief might reflect the truth for the case of greenfield investment and foreign acquisitions, it might not be the case for within-company loans, which could turn out to be hot money and withdrawn at short notice (Avdjiev et al., 2014; CGFS, 2009)

2.2 Potential risks

When firms straddle borders and access international capital markets by using their offshore issuance, they can mimic the behavior of financial institutions by re-lending funds to other non-financial firms, banks, or non-bank financial intermediaries in the headquarter country.

Figure 5 illustrates the case where corporate that have issued debt offshore in foreign currency and accumulated liquid financial assets in domestic currency in the form of claims on domestic banks. In this case, even though it doesn't appear in the official external debt statis-

tics, the company faces a currency mismatch and is affected by currency fluctuations. Even if there is no currency mismatch, since the indebtedness and the claims of the firms are associated with global financial conditions, the domestic market is potentially affected by the transmission of global liquidity (Chung, Lee, Loukoianova, Park, and Shin, 2015).

An increase in debt issuance offshore might raise the leverage on corporate balance sheets. In the event of slowing growth and tightening profit margins, corporates might be challenged by the management of debt levels. Apart from an increase in the size of indebtedness, the compositions of assets and liabilities also change. If there is low volatility, corporates could have carry trade incentives and take advantage of interest rate differentials adjusted for exchange rate volatility by borrowing overseas and depositing the proceeds in the local market. An increase in bond market financing, especially in foreign currencies, makes companies' balance sheets more pro-cyclical. In the case of shifts in risk appetite, firms might face difficulties in rolling over their outstanding debt. Because of the corporate deposits in banks and other financial institutions, local institutions' liabilities may also be subject to sudden withdrawals by corporates. From the currency perspective, escalated levels of foreign currency borrowing could deteriorate debt sustainability. If the foreign currency liabilities are not financially hedged or matched by foreign currency receivables, depreciation in the local currency inflates the local currency value of foreign currency liabilities relative to domestic currency assets (Chui, Fender, and Sushko, 2014; Turner, 2014)

Some studies investigate offshore debt issuance as a source of wider financial instability. On the one hand, Kim and Shin (2021) study whether debt issued offshore is the channel transmitting US financial conditions to emerging market economies. They find that offshore bond issuance has a strong positive response to impulse in the US aggregate credit variable after 2010. In addition, offshore bond issuance has become more important than onshore bond issuance as a transmission channel of global liquidity during the post-crisis period. Aldasoro et al. (2021) investigate the link between offshore debt issuance by NFCs and global financial conditions. They find that for emerging market economies, offshore issuance has a strong positive link with the global financial cycle and a strong negative link with the US dollar nominal effective exchange rate. Furthermore, these links are more pronounced for offshore issuance denominated in US dollars.

3 Rerouted external debt from the affiliates

Drivers of offshore debt issuance via the foreign subsidiaries by NFC and channeled proceeds via the within-company loan, i.e., rerouted external debt from the affiliates, should be highly related to the determinants of capital structure.

3.1 Capital structure theories

In this section, I summarize the central capital structure hypothesis in the literature[1] that is important to understand the model.

Static trade-off theory – Debt issuance increases or decreases depending on its benefits or cost, which are determined by tax rates, asset types, business risk, profitability, and bankruptcy code. This theory is also highly related to the currency denomination of debt. The direct cost of borrowing differs across markets because of the different levels of interest rates between the local and foreign borrowing markets. Interest rate differentials should be positively related to the use of foreign currency debt.

Agency cost theory – This type of cost originated from asymmetric information. Managers and investors have different sets of information, and the latter must take costly monitoring activities. Conflict of interest between inside and outside investors determines the optimal capital structure.

When the purpose of the manager is the investment for growth, the aim of shareholders and management coincide, and equity is valuable for investment opportunities. However, without strong investment purposes, agency costs emerge because of managerial discretion. Although debt limits the costs of managerial discretion, if the firm is highly debt-financed, it might create costs of forgone opportunities and contractual provisions.

Peking order theory – One of the most accepted explanations for firm financing behavior is pecking order which suggests that firms prefer to use internally obtained funds first, then external debt, and finally, external equity (Myers, 1984; Myers and Majluf, 1984). Asymmetric information, transaction costs, and interest rates make external funds more expensive than internal funds. Therefore, to finance their operations, non-financial firms normally use internal sources first, and when they are inadequate, they look for outside funds.

Market depth hypothesis – If the local (currency) market is not deep and sufficient enough for the demands of borrowers, then firms that have access to foreign (currency) markets would reach out to foreign (currency) lending.

Risk management theory – Corporates might be incentivized to adjust their capital structure according to their earnings to hedge foreign currency exposure. On the one hand, if the corporate has high foreign earnings, then borrowing in foreign currency is a buffer against exchange rate fluctuation. In other words, foreign-denominated debt can be a natural hedge of foreign revenues. On the other hand, if a corporation does not have foreign earnings, it is likely to hedge the currency exposure by using currency derivatives. Many foreign currency bond issuers simultaneously enter into currency swaps when they undertake foreign currency borrowing. In this way, while they can pay the domestic currency swap rate, they can receive the foreign currency swap rate. In other words, a foreign currency bond issuer creates a synthetic domestic currency bond (Munro and Wooldridge, 2010; Habib and Joy, 2010).

[1] Booth, Aivazian, Demirguc-Kunt, and Maksimovic, 2001; Allayannis, Brown, and Klapper, 2003; Mizen, Packer, Remolona, and Tsoukas, 2012

3.2 The model

I set up an analytical framework for the functioning of the internal capital market following Goldbach, Møen, Schindler, Schjelderup, and Wamser (2021) that analysis the borrowings of multinationals' affiliates from their parents by setting up a model. A novelty of my framework is that I look at the borrowing of parent from its affiliates and include the rerouted external debt from subsidiaries into the model.

Non-financial parent corporate is in country i, and its affiliate is in country j. I assume that there is only one parent and one affiliate. The parent company owns technology $\theta \in [\underline{\theta}, \bar{\theta}]$ that increases productivity. It has fixed assets K_i which is financed by equity E_i, external debt from third party D_i^E, debt from the affiliates $D_{i,j}^I$, rerouted external debt from the affiliates $D_{i,j}^{RE}$ The balance sheet of the company i is $K_i = E_i + D_i^E + D_{i,j}^I + D_{i,j}^{RE}$.

Using external and internal debt entails different types of costs and benefits. Internal debt should be considered as tax-favored equity. On the one hand, as it is discussed in the previous subsection, while external debt decreases the information asymmetries between the managers and shareholders, too much debt financing increases bankruptcy risk or creates a debt-overhang situation. On the other hand, internal debt affects neither information asymmetries nor bankruptcy costs. Unlike external debt, there is no outside enforcement in the case of failure to pay back internal loans. However, internal debt also carries costs that are related to various tax-engineering expenses, such as the cost of audits, lawyers, and accountants to avoid regulations like thin capitalization rules and/or controlled foreign company rules. (Schindler and Schjelderup,2016; Gertner, Scharfstein, and Stein, 1994).

In line with the optimal capital structure literature, I assume that the cost functions for internal and external debt are separate and they are convex in debt to asset ratios.[2] The cost of internal debt is

$$C^I(b_{i,j}^I) = \frac{\eta}{2}(b_{i,j}^I)^2 K_i(\theta) \tag{1}$$

where $b_{i,j}^I = \frac{D_{i,j}^I}{K_i(\theta)}$ indicates the internal debt from affiliate j to asset ratio in parent i, and η is a positive constant.

Apart from profit shifting to the parent company, subsidiaries can issue bonds in the country they reside in and reroute funds to the parent company. Both external debt from third parties and rerouted external debt from the related affiliates together constitute the total external debt. I assume a cost function for total external debt (external debt and rerouted external subsidiary debt)

$$C^E(b_i^E, b_{i,j}^{RE}) = [\frac{\mu}{2}(b_i^E + b_{i,j}^{RE})^2 + \frac{\delta_i^E}{2}(b_i^E)^2 + \frac{\delta_j^{RE}}{2}(b_{i,j}^{RE})^2]K_i(\theta) \tag{2}$$

where $b_i^E = \frac{D_i^E}{K_i(\theta)}$ and $b_{i,j}^{RE} = \frac{D_{i,j}^{RE}}{K_i(\theta)}$ represent the external and rerouted external debt to asset ratios in parent i, respectively and μ is a positive constant. The first term in the function

[2]See, e.g., Fuest and Hemmelgarn (2005), Huizinga, Laeven, and Nicodeme (2008), Schindler and Schjelderup (2016), and Goldbach et al. (2021) for similar assumptions

represents the agency costs. Additionally, the parent and the affiliates may face different transaction costs of accessing the external capital market, which are represented by δ_i^E and δ_j^{RE}, respectively. Such costs depend negatively on the quality of the legal and institutional environment, development of the domestic capital market, and accessibility to the international capital market in the countries where the parent and affiliate are located.

Economic and taxable profit in parent i, π_i^e and π_i^t, respectively are as the following

$$\pi_i^e = f(\theta K_i(\theta)) - r_i.K_i(\theta) - \tilde{r}_{i,j}.b_{i,j}^{RE}.K_i(\theta) - C^I(b_{i,j}^I) - C^E(b_i^E, b_{i,j}^{RE})$$

$$\pi_i^t = f(\theta K_i(\theta)) - r_i.(D_{i,j}^I + D_i^E + D_{i,j}^{RE}) - \tilde{r}_{i,j}.D_{i,j}^{RE}$$

where r_i is the market interest rate of the country where the parent resides and $\tilde{r}_{i,j}$ is the interest rate differential between the country where the affiliate resides and the country where the parent resides. Parent i's profit after corporate taxation in country i is

$$\pi_i = \pi_i^e - t_i.\pi_i^t \tag{3}$$

$$= (1-t_i).f(\theta K_i(\theta)) - r_i.K_i(\theta) - \tilde{r}_{i,j}.b_{i,j}^{RE}.K_i(\theta) + t_i.r.(D_{i,j}^I + D_i^E + D_{i,j}^{RE}) + t_i.\tilde{r}_{i,j}.D_{i,j}^{RE}$$

$$-C^I(b_{i,j}^I) - C^E(b_i^E, b_{i,j}^{RE})$$

After examining the first-order condition for rerouted external debt in the appendix A, I derive the optimal debt-to-asset ratio for rerouted external debt $b_{i,j}^{RE}$ as

$$b_{i,j}^{RE} = [t_i.r_i - \frac{(\delta_i^E + \mu)}{\delta_i^E}.(1-t_i).\tilde{r}_{i,j}].\frac{1}{[\mu(1 + \frac{\delta_j^{RE}}{\delta_i^E} + \delta_j^{RE}]} \tag{4}$$

it is also possible to write the relation between rerouted external debt and external debt: $b_{i,j}^{RE} = \frac{\delta_i^E}{\delta_j^{RE}}.b_i^E - \frac{(1-t_i).\tilde{r}_{i,j}}{\delta_j^{RE}}$. The higher the costs to access the capital market and receive third-party debt in the parent country (δ_i^E), relative to the equivalent costs in the subsidiary's residing country (δ_j^{RE}), the larger is the rerouted subsidiary debt-to-asset ratio. The higher the market interest rate, the direct cost of borrowing, in the subsidiary's residing country relative to the interest rate in the parent country ($\tilde{r}_{i,j}$), the smaller the rerouted debt-to-asset ratio.

3.3 Rerouted external debt vs. external debt

Parent companies are exposed to different institutional quality, different levels of financial development, access to the international financial market, taxation and risk by depending on using rerouted funds by their subsidiaries or borrowing from third parties in the domestic market.

Institutional Development – A country's institutional environment may be an important determinant of capital market frictions. Issuers who do not have access to solid investor protection, corporate governance rules, and a secure legal environment might then use within-

company loans provided by their subsidiaries via bond issuance in offshore locations to offset the negative influence. Worse institutional quality and legal environment make management less accountable to outside investors and increase the moral hazard problem. This deteriorates access to the local and external capital market and augments the reliance on internal funds (Forbes, 2010; Egger, Keuschnigg, Merlo, and Wamser, 2014; Aldasoro et al.,2021). Possible indicators that can be used are world governance indicators.

Domestic financial market development – The maturity level of the financial market affects the loan rate and the cost of capital across locations of parent companies and their subsidiaries. Parent companies in countries with less developed financial markets might take advantage of a deeper investor base, particularly for foreign currency borrowing, in the foreign subsidiaries' locations by borrowing the funds internally and hence reduce borrowing costs (Bertaut, Bressler, and Curcuru, 2019; Aldasoro et al., 2021). Financial development, stock market capitalization, and financial intermediary size, the quantity of funds channeled through the banking system to investors in the private sector are the possible variables.

Furthermore, companies located in countries with relatively small bond markets issue bonds in offshore locations where the depth and liquidity of bond markets are high to improve pricing, access to foreign investors, and issue more significant, lower-rated, or longer-maturity bonds (Black and Munro, 2010; Serena and Moreno, 2016). Corporate bond issuance volume and average maturity are additional variables that might be used.

Access to international capital market– Companies in countries that are highly integrated with the international capital market have the ability to issue larger, lower-rated, or longer-maturity bonds, and they have less incentive to borrow internally via their affiliates in other countries (Bertaut et al., 2019). The total aggregate foreign assets and liabilities ratio to GDP can measure international financial integration.

The extent to which domestic capital markets are open to foreign investment is another critical factor in the offshore bond issuance decision. (Caballero, Panizza, and Powell, 2016; Burger, Warnock, and Warnock, 2012; Coppola et al., 2020). Bonds issued by affiliated entities in foreign countries may be less likely to be affected by capital controls than domestic securities. Parent companies may face less restrictive capital controls on inter-company lending, which is classified as direct investment in the balance of payments (BOP) relative to other cross-border flows (McCauley, Upper, and Villar, 2013; Aldasoro et al., 2021). Kim and Shin (2021) find that the circumvention of capital controls may be one of the factors explaining the stronger role of offshore issuance during the post-crisis period.

Taxation– High-tax countries incentivize companies to finance investments with debt because interest payments are tax-deductible, while the costs associated with equity financing are often not. Some multinational corporations take advantage of the tax benefits associated with debt financing by lending money internally from subsidiary entities in low-tax countries to entities in high-tax countries. Tax savings in high-tax countries typically exceed the increased tax paid in low-tax countries, decreasing worldwide tax liability. Only the affiliate facing the lowest tax rate should lend, and all others borrow internally to exploit the tax advantage of interest deductions. However, differences in local institutional quality and financial institutions

may amplify or offset differences in profit tax rates so that internal capital can flow in any direction. (Egger et al., 2014)

Risk Level– Parent and host country market factors like exchange rate risk, inflation, and interest rates are essential factors in the choice between the rerouted external debt of affiliates and the external debt of the parent. Exchange rate and inflation uncertainty increase the corporate's business risk, making external borrowing more costly for firms (Aggarwal and Kyaw, 2008; Huizinga et al., 2008).

Since most bonds issued offshore are in foreign currency (US dollar), the differentiation in USD borrowing cost of the parent and its subsidiaries might bring different motives to NFCs. One motive for taking on such a carry trade position may be to hedge U.S. dollar receivables. Alternatively, the carry trade position may be motivated by the prospect of financial gain if the domestic currency is expected to strengthen against the dollar.Bruno and Shin (2017) find that foreign bond issuances are driven by carry trade activities in emerging market countries but not in advanced economies. Whatever the motivation, the corporate treasurer who takes the consolidated balance sheet into account will care about fluctuations in the exchange rate as well as the U.S. dollar borrowing costs. (Shin and Zhao, 2013, Shin, 2014)

Furthermore, hedging market development makes access to swaps and derivatives easier. Swap and derivatives make it possible to hedge interest payments on foreign currency obligations for borrowers and foreign currency returns for investors and strengthen the issuance in both foreign and domestic currency bond markets (Mizen, Packer, Remolona, and Tsoukas, 2021). In the case of an immature derivative market, corporate might face foreign exchange risk. Therefore, differences between the hedging market development in a country where parents reside and in countries where its subsidiaries reside might be another factor in choosing the location for external borrowing.

Take, for instance, the transition economies like China and Russia. These countries embody most of the unfavorable environments I mentioned above and be a special case regarding the actions of foreign affiliates of a non-financial corporation as a surrogate intermediary by repatriating funds. There are studies verifying the existence of widespread shadow banking (re-lending) activities of non-financial firms in these countries, in which firms borrow in order to lend. This includes papers like Shin and Zhao (2013), Du, Li, and Wang (2017), and Huang, Panizza, and Portes (2018).

Financial repression is the natural outcome of countries changing from a centrally planned economy to a market economy. While state-owned and/or large enterprises have privileged access to formal finance with favorable terms, small privately-owned enterprises face serious obstacles to accessing formal finance. Because of the ownership-identity-based credit market discrimination, NFCs with good access to financial markets issue bonds to raise funds and then re-lend other non-financial firms rather than finance their own investments.

4 Methodology and data

4.1 Methodology

Suppose the foreign subsidiaries issue debt to re-route it to their parents. In that case, it should be reflected in the international investment position of the country where the parent resides as foreign direct investment debt liabilities. Therefore, co-movement between foreign affiliates' lending to resident parents and offshore debt issuance by foreign affiliates can be a proxy of re-routed external debt by foreign affiliates to their parents.

I conduct regressions of within-company loans on offshore issuance to employ this strategy. To address the endogeneity, I include country-time fixed effects, which allow me to control for time-variant factors that are jointly correlated with within-company loans and offshore issuance. In addition, I use distance as a time-invariant country pair control variable. My focus is the sign and statistical significance of the estimated coefficient of offshore issuance. If it is significant and positive, then it suggests the prevalence of re-lending funds to the parent by their affiliates.

I run a log-linearized OLS regression of the form

$$ln(IOWDL_{ij,t}) = \alpha_{it} + \alpha_{jt} + \beta_1 ln(OFFSHORE_{ij,t}) + \beta_2 ln(DIST_{ij}) + \epsilon_{ij,t}$$

where the dependent variable is the logarithm of outward debt instruments liabilities position of NFC parent country i in offshore location j at the end of year t. $OFFSHORE_{ij,t}$: amounts outstanding offshore issuance by the country of NFC parent i in offshore location j in the year t.[3] α_{it} and α_{jt} are NFC parent country time fixed effects and offshore location country time fixed effects, respectively. $DIST_{ij}$ is the geographic distance between the country of NFC parent i and offshore location j to control for variables that variate across country pairs. Standard errors are clustered by country pairs.

To incorporate country pairs with zero investment and cope with possible heteroskedasticity, I convert the log-linear specification into a Poisson pseudo maximum likelihood regression (PPML) as (Tenreyro and Silva, 2006; Silva and Tenreyro, 2011; Correia, Guimarães, and Zylkin, 2020)

$$IOWDL_{ij,t} = exp[\alpha_{it} + \alpha_{jt} + \beta_1 ln(OFFSHORE_{ij,t}) + \beta_2 ln(DIST_{ij}) + \epsilon_{ij,t}]$$

To explore the factors shaping heterogeneous re-routing of external debt by foreign subsidiaries across parents' countries, I examine the difference between the national factors in the residence countries of parents and residence countries of the parent's foreign subsidiaries with respect to institutional quality, domestic financial market development, access to the international capital market, taxation and the risk factors.

I divide countries into sub-samples based on the value of variables of interest to examine whether the correlation between within-company loans and offshore issuance would change across sub-samples. Variables of interest are the first principle component of the world gover-

[3] Both IOWDL and OFFSHORE are stock variable.

nance indicator (WGI) for institutional development block, financial development index (FD), stock market capitalization (STOCK), domestic credit to the private sector (CREDIT), corporate bond issuance volume (BOND), and corporate bond average maturity (MATURITY) for domestic financial market development block, international financial integration (IFI), Chin-Ito capital openness index (KAOPEN), and capital flow management controls index (KACONTROL) for access to the international capital market block, corporate income tax (CORPTAX) for taxation block and finally Sharpe ratio (SHARPE), and the size of foreign exchange swaps, derivatives and options market (DERIV) for the risk block. In addition, I include interaction terms between offshore issuance and the key independent variables in PPML regression separately and investigate whether these variables strengthen or weaken the re-routing activities. All the key independent variables I used for five blocks; institutional quality, domestic financial market development, access to the international capital market, and the risk factors are the differences between the values of the residence countries of parents and residence countries of their affiliates.

On the one hand, co-movement between foreign affiliates' lending to parent and offshore debt issuance by foreign affiliates is expected to diminish as the difference between institutional quality, financial market development, and access to the international capital market in NFC parent's residence country and offshore affiliate's location country increases. In other words, if these variable blocks are better in the parent's country relative to the affiliate's country, the incentive for the issuance of debt by offshore affiliates to channel the funds to the parent should reduce.

On the other hand, I expect the co-movement to strengthen as the difference between the corporate income tax of the parent's residence country and its affiliate's residence country increases and the interest rate difference adjusted by the exchange rate volatility of the parent's residence country rises.

To explore the factors determining the relative weight of offshore issuance, I also formulate a model of debt structure as

$$\frac{OFFSHORE_{ij,t}}{(OFFSHORE + ONSHORE)_{i,t}} = \alpha_i + \tau_t + ln(DIST_{ij})\beta + I_{ij,t}\eta + F_{ij,t}\gamma + A_{ij,t}\delta + T_{ij,t}\mu + R_{ij,t}\theta + \epsilon_{ij,t}$$

where the dependent variable is the ratio of amounts outstanding offshore issued by the country of NFC parent i in offshore location j in the year t to the sum of offshore and onshore issuance by the country of NFC parent i in the year t. $I_{ij,t}$ is the institutional development block including WGI. $F_{ij,t}$ is the domestic financial market development block, including FD, STOCK, CREDIT, BOND, and MATURITY. $A_{ij,t}$ is access to the international capital market block, including IFI and KACONTROL. $T_{ij,t}$ is the taxation block, including CORPTAX. $R_{ij,t}$ is the risk block matrix, including the volatility of inflation (vol(π)), volatility of exchange rate change (vol(ERC)), and the size of foreign exchange swaps, derivatives and options market (DERIV). α_i and τ_t are NFC parent country fixed and time-fixed effects, respectively.

4.2 Data and variables

NFC's offshore amount outstanding debt issued by affiliates located outside the country of headquarters is provided by Aldasoro et al. (2021). This dataset includes information on 85 NFC nationalities and 90 offshore locations.[4] The sample period is 1980Q1 -2021Q1.

For within-company loans, I use Outward Debt Instruments Liabilities Positions (IOWDL) from CDIS. This data shows the lending of the resident affiliates in an offshore location to parents in NFCs nationality and provide information on outward direct investment positions cross-classified by the economy of immediate investment. The sample period is 2009 -2020. Appendix B provides more details about the data.

I obtained geographic distance from CEPII's GeoDist dataset (Mayer and Zignago, 2011), and it measures the geodesic distance between any two countries based on a population-weighted average of the distances between individual cities. For the institutional quality, I use the first principle component of control of corruption, government effectiveness, political stability, regulatory quality, the rule of law, and voice and accountability from World Bank World Governance Indicators. For the domestic financial market development, I use the financial development index (FD) from Svirydzenka (2016), stock market capitalization (% of GDP) as the stock market size, domestic credit to the private sector (% of GDP) as a proxy of financial intermediary size, corporate bond issuance volume (% of GDP), and corporate bond average maturity (years) from World Bank Global Financial Development (GFD).

International financial integration, total external assets, and liabilities excluding financial derivatives (% of GDP) (Lane and Milesi-Ferretti, 2018) and Chin-Ito capital account openness index (Chinn and Ito, 2006) are the key variables for international capital market access. Alternatively, I also use the index of capital flow management controls (restrictions) for all asset categories from Fernández, Klein, Rebucci, Schindler, and Uribe (2016).

I use statutory corporate income tax rates from OECD Statistics for the taxation block. Finally, for the risk factors, I take the exchange rate and consumer price index for inflation calculation from IMF International Financial Statistics (IFS). For the calculation of relative borrowing cost, I draw short-term interest from IMF and OECD. Furthermore, for the size of foreign exchange swaps, derivatives, and options markets, I sum up currency swaps, FX swaps, options, outright forwards, and other derivatives based on the daily average turnover in April, by location of the counterparty, currency, and reporting country from the BIS Triennial Survey.[5]

5 Empirical results

5.1 Baseline results

In this section, I estimated the parameter β_1, the effect of offshore issuance on outward debt instrument liabilities. Table 1 presents results of both OLS and PPML regressions of within-company loans on offshore debt issuance. In this specification, I include country of nationality

[4]The number of countries in different country groups, EME, AE, and OFC are 47, 26, and 12, respectively.
[5]I interpolate the intervening years using a semi-annual survey conducted by the BIS.

time fixed effect and location country time fixed effect to control time-variant variables that might be correlated with both within company loans and offshore issuance. I also add control for geographic distance. The focus is the sign of the estimated coefficient of offshore issuance.

While Columns (1)-(3) report the results of OLS regression of the log of outward debt instrument liabilities, Columns (4)-(6) report the results of PPML regressions of outward debt instrument liabilities. Column (1) and (4) reports the regression results of all country sample, and the slope coefficients of offshore issuance are positive and statistically significant at the 99% confidence level. Positive co-movement between offshore debt issuance by foreign affiliates and foreign affiliates' lending to resident parents suggests an incentive to channel the funds to their parents by foreign affiliates.

While Columns (2) and (5) report the OLS regression result and PPML regression result, respectively, for the advanced country sample, Columns (3) and (6) report the OLS regression result and PPML regression result, respectively, for the emerging and developing country sample. There is a positive link between within-company loans and offshore issuance for both advanced, and emerging and developing countries. The magnitude of the coefficient is higher for the emerging developing country sub-sample relative to the advanced country sub-sample. However, the number of observations for the former is lower than for the latter because of the data gap in CDIS for emerging and developing countries. The magnitudes of Poisson estimates are generally larger than the corresponding OLS estimates.

5.2 Country characteristics and re-routed external debt

This section analyzes the heterogeneous re-routed external debt activities. I explore the cross-country variations from five perspectives; institutional development, domestic financial market development, access to the international capital market, taxation, and risk factors.

Column (1) in Table 2 presents the estimated coefficient of log offshore issuance and the interaction term of offshore issuance with the difference between the first principle component of world governance indicators of the affiliates' nationality country and residence country in the full sample. I observe that although the link between within-company loans and offshore issuance statistically insignificant in the country pairs with above median scores, it remains significantly positive in the country pairs with below median scores, which suggests that better legal environment and institutions in the issuer's nationality country relative to the location country hinder NFCs from participating in re-routing external debt back to parent companies. Furthermore, the negative and statistically significant estimated interaction term coefficient supports that finding.

To explore whether re-routing behavior is affected by domestic financial market development, I select five different measures, i.e., the financial development index, stock market capitalization, domestic credit to the private sector, corporate bond issuance volume, and corporate bond average maturity, and report the results in Columns (2)-(6) respectively. All the estimated coefficients of offshore issuance in the above and below sub-sample are positive and statistically significant. However, apart from the financial development index, the magnitudes of the estimated coefficients are higher in the below-median sub-sample relative to

above-median sub-sample, which suggests that lower domestic financial market development in parents' countries relative to their affiliates' countries strengthens the incentive to channel the funds to the parent. Although I observe that pattern in all four measures, only the finding for corporate bond issuance volume is supported by the estimated coefficient of the interaction term, which is negative and statistically significant.

Considering better access to financial resources in the market where the parent resides should relax the financial constraint of companies, I use measures of financial integration and openness, i.e., international financial integration, Chinn-Ito index, and Schindler's KA index. Column (1) in Table 3 shows that the estimated coefficient of the interaction term between offshore issuance and international financial integration is significantly negative. In addition, while the estimated coefficient of the offshore issuance is significantly negative for the above sub-samples, it is significantly positive for the below sub-sample. All these findings suggest that greater international financial integration reduces the intensity of engagement in re-routing external debt activities.

In Columns (2) and (3) in Table 3, the Chin-Ito index, where a higher score means greater financial openness, and Schindler's KA index, where a higher value suggests greater restrictions, are used, respectively. Column (2) presents that if the difference between the Chin-Ito index of affiliate's nationality and residence countries is above the median, the estimated coefficient of offshore issuance is insignificant and negative. If it is below the median, the estimated coefficient is significantly positive. Furthermore, the coefficient of the interaction term between offshore issuance and the Chin-Ito index difference is significantly negative. Column (3) shows that the estimated coefficients of Schindler's KA index difference are significantly positive for both the above and below median sample. Still, the magnitude of the above median sub-sample is relatively higher. The significantly positive coefficient of the interaction term also supports this finding. Two patterns emerge from Columns (2)-(3), suggesting that higher openness in country of parent relative to country of subsidiary decreases the prevalence of re-routing external debt activities.

Column (4) in Table 3 reports that the estimated coefficients of offshore issuance are significantly positive both in above and below the median of the difference between statutory corporate income tax rates of the national and offshore country; the magnitude of the above median sub-sample is relatively higher. However, the estimated coefficient of the interaction term between offshore issuance and corporate income taxes is insignificant. Considering the possible carry trade motivation of NFCs, I use the Sharpe ratio, interest rate differences adjusted for exchange rate volatility in Column (5). Both the coefficients of above and below median sub-samples are significantly positive, but the magnitude of the former is higher than the latter. The estimated coefficient of the interaction term between offshore issuance and the Sharpe ratio is significantly positive. These results suggest that higher interest rates adjusted for exchange rate volatility (search for yield) in a nationality country relative to the location country strengthen the incentive to channel the funds to the parent. In Column (5), I use the difference between the hedging market development of the affiliates' nationality country and residence country. Both the estimated coefficients of offshore issuance in the above and below

median sub-sample are significantly positive, and there is no substantial difference between the magnitudes. In addition, the estimated coefficient of the interaction term is statistically insignificant.

5.3 Debt structure

In this section, I address the debt structure with reference to the ratio of offshore issuance to the total external debt by nationality of issuers, i.e., the sum of offshore and onshore issuance. Table 4 - 7 report estimated OLS regression results using data for all countries, advanced counties, emerging and developing countries, and emerging countries samples, respectively.

Overall, in all specifications, as a proxy of information asymmetry, the geographic distance between the country where the parent resides and the location country where their affiliates reside (DIST) has a significantly negative coefficient. Furthermore, coefficients of difference between the corporate income tax of the issuer's national and location country (CORPTAX) are also significantly negative. It is also economically significant because interest payments are tax-deductible, and it is expected to have a positive link between external debt issuance and the countries' corporate income tax.

Because of the high correlation of world governance indicators (WGI) with the measures for domestic financial market development and measures for financial integration and openness, in Column (1) in Tables 4-7, I include only WGI, corporate income tax (CORPTAX), and risk block. An increase in WGI reduces the ratio of offshore issuance to total external issuance for the entire sample and sub-samples, which is consistent with the theory.

Again because of the high correlations across the measures of domestic financial market development and international financial integration (IFI), each of the measures is included in separate regressions alongside the corporate bond average maturity (MATURITY), capital flow management controls (KACONTROL), corporate income tax, and risk block. Column (2) in Table 4-7 reports significantly negative estimated coefficients of the financial development index difference between country of parent and country of affiliate (FD), which suggest that better financial development in the market where parents reside than in the market where affiliates reside has a negative influence on the ratio of offshore. On the one hand, when I replace FD with the domestic credit to the private sector (CREDIT) and the corporate bond issuance volume (BOND) in Column (3) and (5) respectively, the results do not change. On the other hand, when I replace FD with the stock market capitalization in Column (4), except for the advanced country sample, although the coefficient is negative, it is not significant.

Considering the high correlation of international financial integration with WGI, FD, and CREDIT, IFI is included in Columns (4) and (5) for entire sample and sub-samples. Overall, higher financial integration of the nationality country relative to the location country negatively links with the offshore ratio. In addition, because of the high correlation between WGI and KACONTROL, apart from Column (1), KACONTROL is included in all specifications. The coefficient of KACONTROL is positive and significant in Columns (2)-(4) for all countries, (2) and (3) for advanced countries, and (2)-(4) for emerging and developing countries. These findings suggest a higher capital control in the affiliate's national country relative to the

residence country positively associated with the offshore issuance ratio.

For the risk block, the estimated coefficient of the inflation volatility (volπ) in Columns (3) and (5) in Table 4 and 5 are significantly positive, which means a higher difference between the volatility in the affiliate's nationality and residence countries is positively associated with the offshore issuance ratio for entire sample and advance countries. In Table 6 and 7 for emerging and developing countries, I observe the same result only for the specification in Column (5). Table 5 and 7 show the importance of volatility in exchange rate change (vol(ERC)) in the weight of offshore issuance for advanced countries and emerging countries, respectively. Positive and significant coefficients confirm that the higher volatility in exchange rate change in a national country relative to the location country increases the offshore issuance weight. Furthermore, the importance of hedging market development is apparent for emerging and developing countries in Tables 6 and 7. Better hedging market development in offshore locations relative to the national country (DERIV) increases the offshore issuance ratio.

6 Conclusions

This paper provides several contributions by studying how NFCs use the proceeds of offshore debt issuance. More specifically, I focus on the channel where foreign affiliates re-route the bond issuance proceeds to their parent NFC. I study the factors shaping the heterogeneity of re-routed external debt activities. Furthermore, I also conduct an in-depth study on factors driving the weight of offshore issuance relative to onshore issuance.

Gravity-type regression results show there is an incentive to channel the funds to the parent for advanced as well as emerging and developing countries with positive co-movement between offshore debt issuance by foreign affiliates and foreign affiliates' lending to resident parents. I document factors linked with heterogeneous re-routing external debt activities across country pairs using five blocks: institutional development, domestic financial market development, access to the international capital market, taxation, and risk level. While better legal environment and institutions, higher corporate bond issuance volume, international financial integration, and capital account openness in nationality country relative to the residence country of foreign affiliates weakens the incentive to channel the funds to the parent, a higher Sharpe ratio as a proxy of carry trade motivation strengthens the incentive.

Furthermore, I assess OLS regressions for the weight of offshore issuance in total international debt issuance by nationality of NFC parent. On the one hand, the higher difference between the values of national and residence countries of affiliates for world governance indicators, financial development index, credit to the private sector, corporate bond issuance volume, international financial integration for all county groups, and hedging market development for emerging and developing countries are negatively linked with the offshore issuance share. On the other hand, greater values of nationality country relative to residence countries of foreign affiliates for capital flow management control, volatility in the inflation rate for all country groups, and volatility in exchange rate change for advanced and emerging countries are positively linked with the offshore issuance share.

While related research has documented the effect of offshore debt issuances on financial instability via the transmission of global liquidity and US financial conditions, this paper is the first to empirically analyze the link between the offshore issuance of NFCs and their within-company loans considered as portfolio flows masked as FDI. The results of this study highlight the importance of questioning the general view of FDI regarding its stability and monitoring its sources. This study also emphasizes the importance of institutional features and regulations, financial integration, and carry trade motivation in re-routing proceeds of external debts by offshore affiliates to their parent NFCs. Moreover, this in-debt study on the factors determining the relative weight of offshore relative to onshore issuance highlights institutional quality and security of the legal environment, the deepness of the investor base, capital controls on international lending and financial integration, and risk level of countries at the core of the global financial system on the relative incidence of offshore financing. In light of the continuously increasing size of external borrowing of NFCs through overseas affiliates, such studies have become central for assessing the risk profile of debt issuance and its link with the economic environment.

The prevalence of the re-routed external debt might be a double-edged sword. On the one hand, it could promote the growth of the domestic market where the parent company is located by reallocating financial resources to parent companies. On the other hand, it may increase systemic risk and financial instability. My findings provide some policy implications. The government can support the movement to a more mature financial system, integration into the global financial system, and legal institution-building to cool down the re-routed external borrowing by NFCs.

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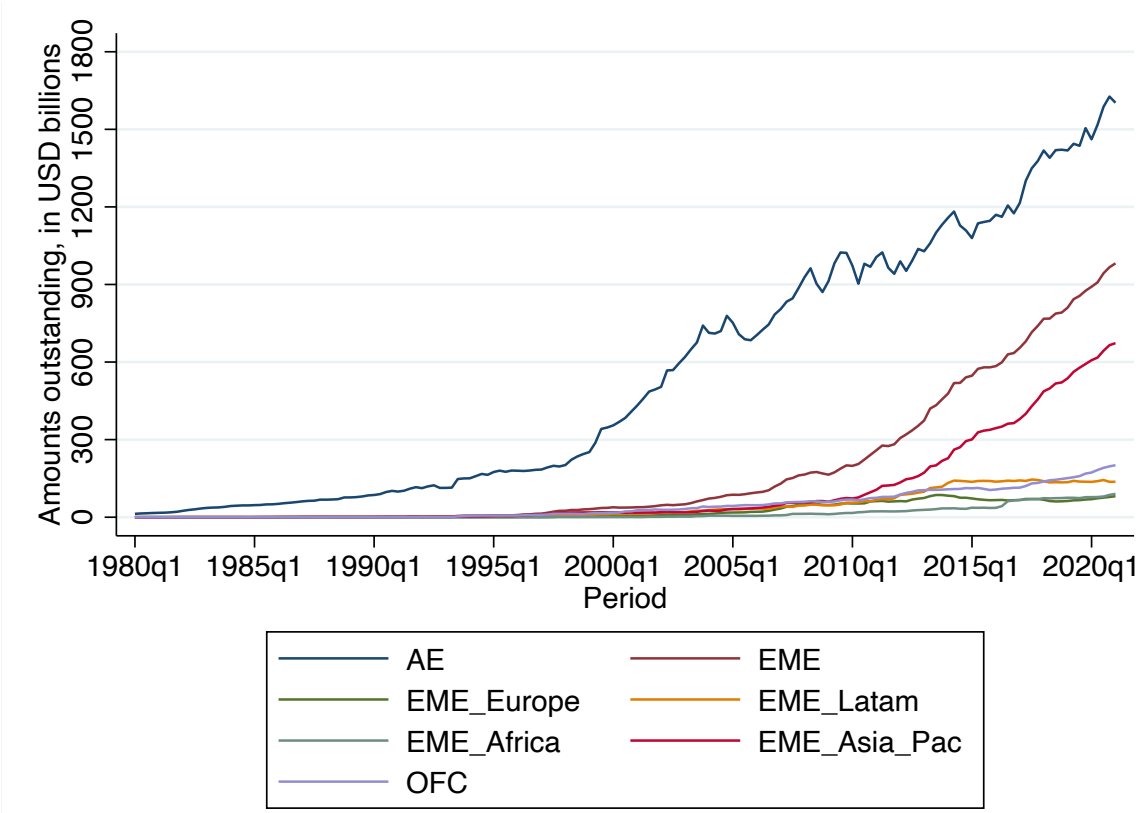
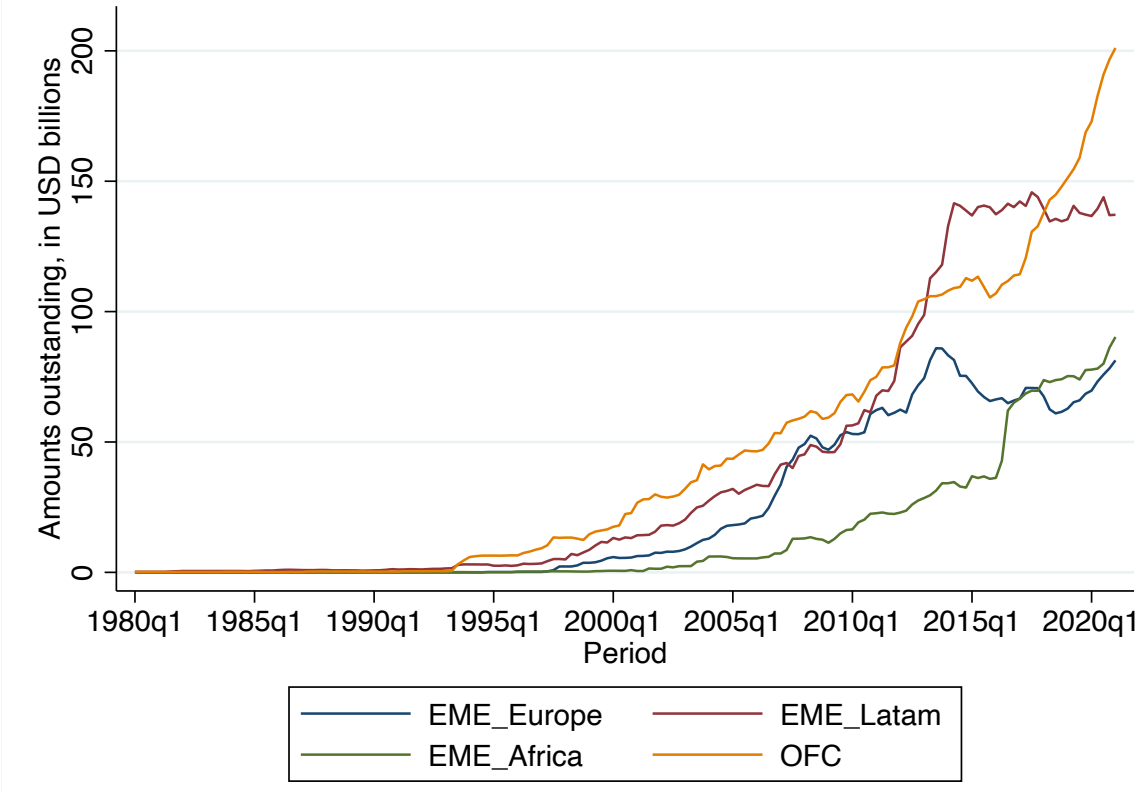
Figure 1: Offshore Issuance

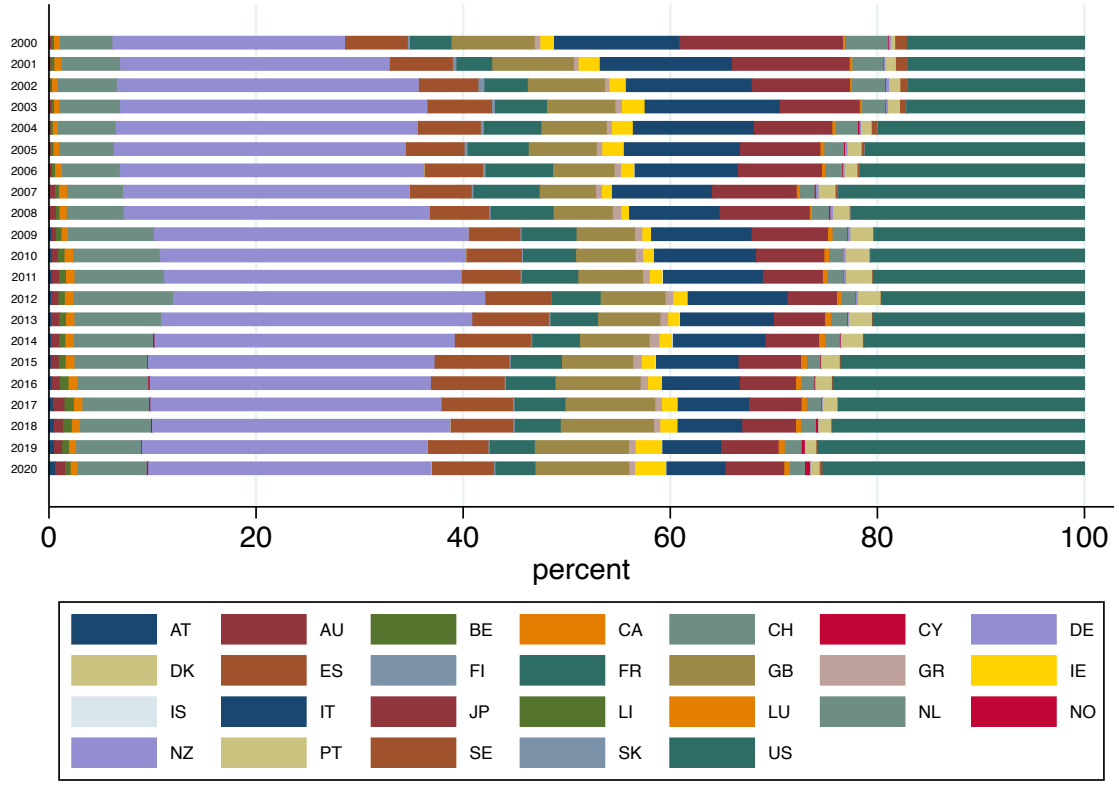


(a)

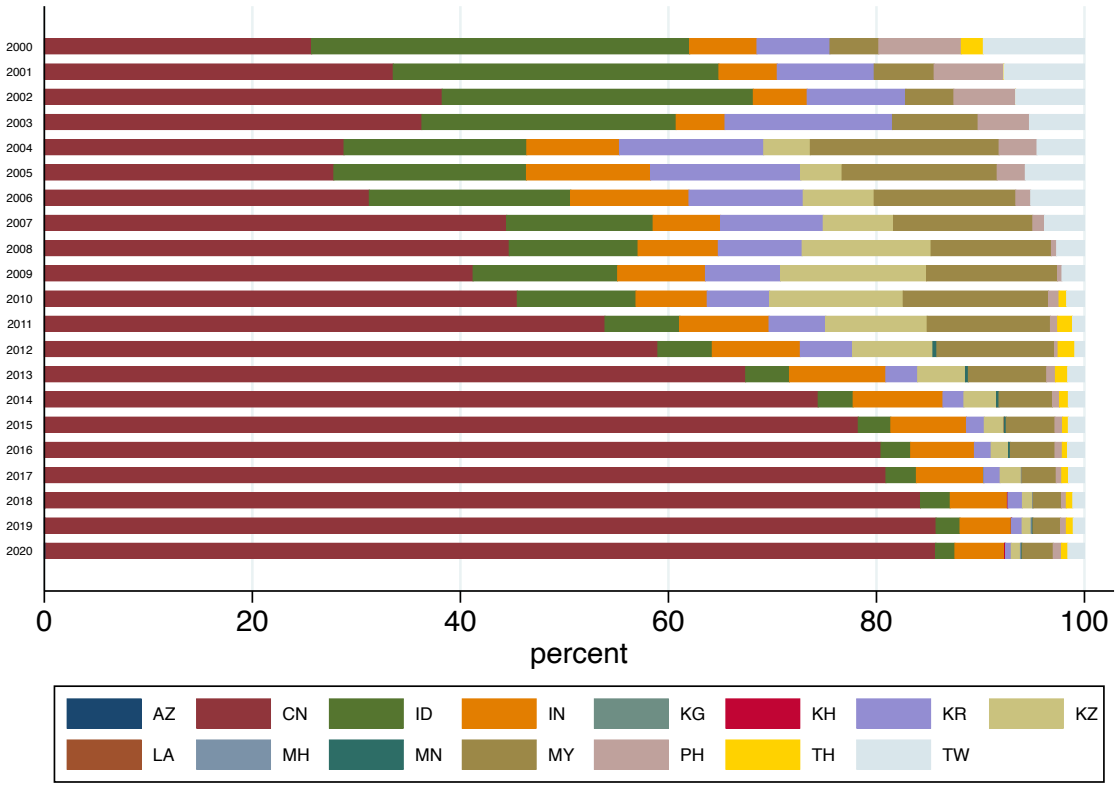


(b)

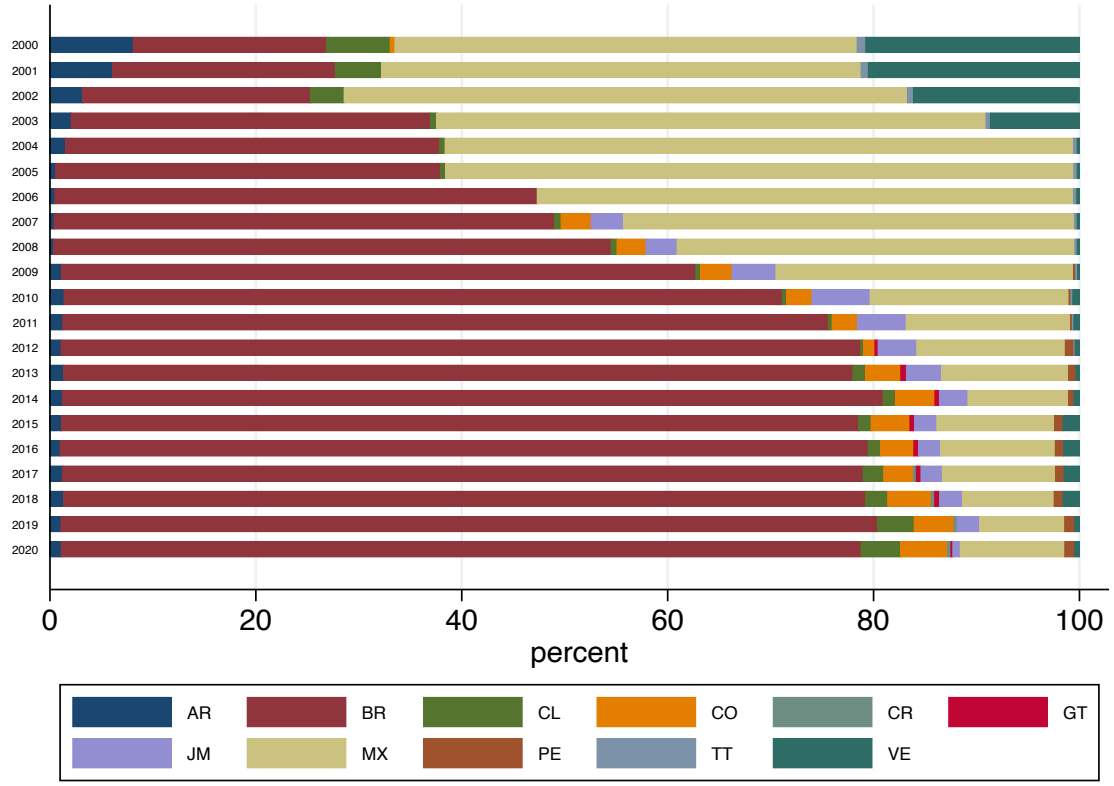
Figure 2: Country shares



(a) Advanced economies



(b) Emerging Asia/Pacific



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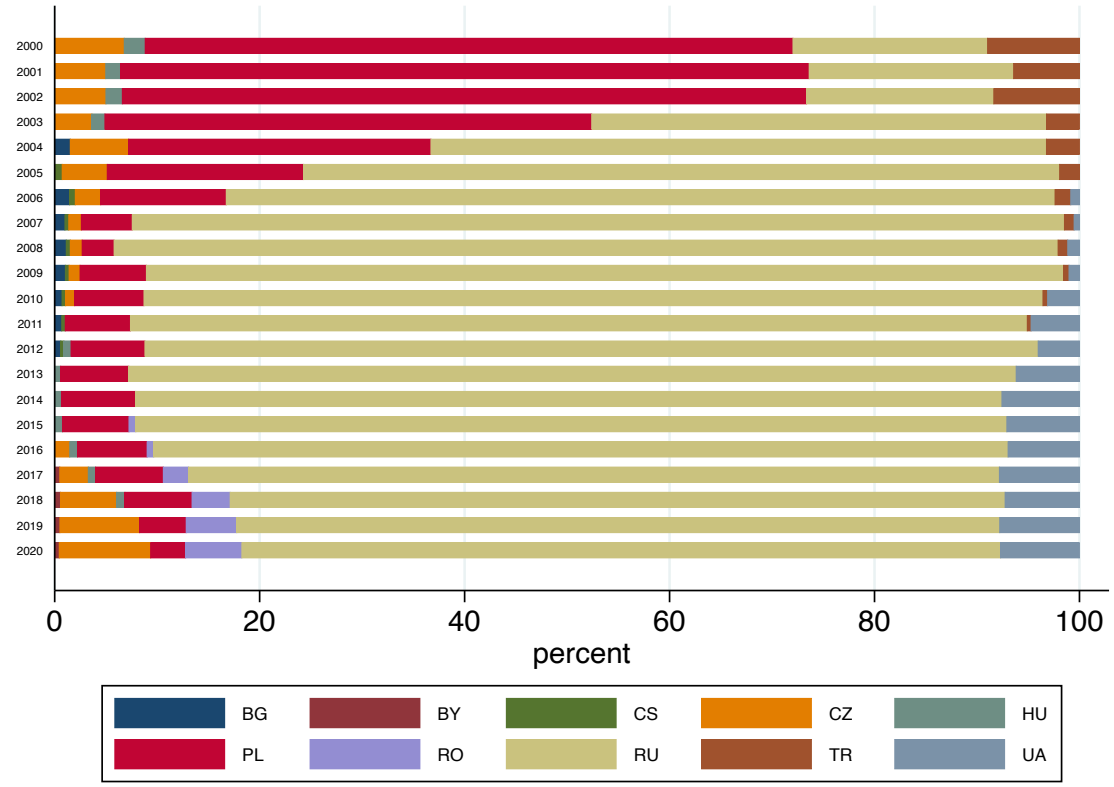
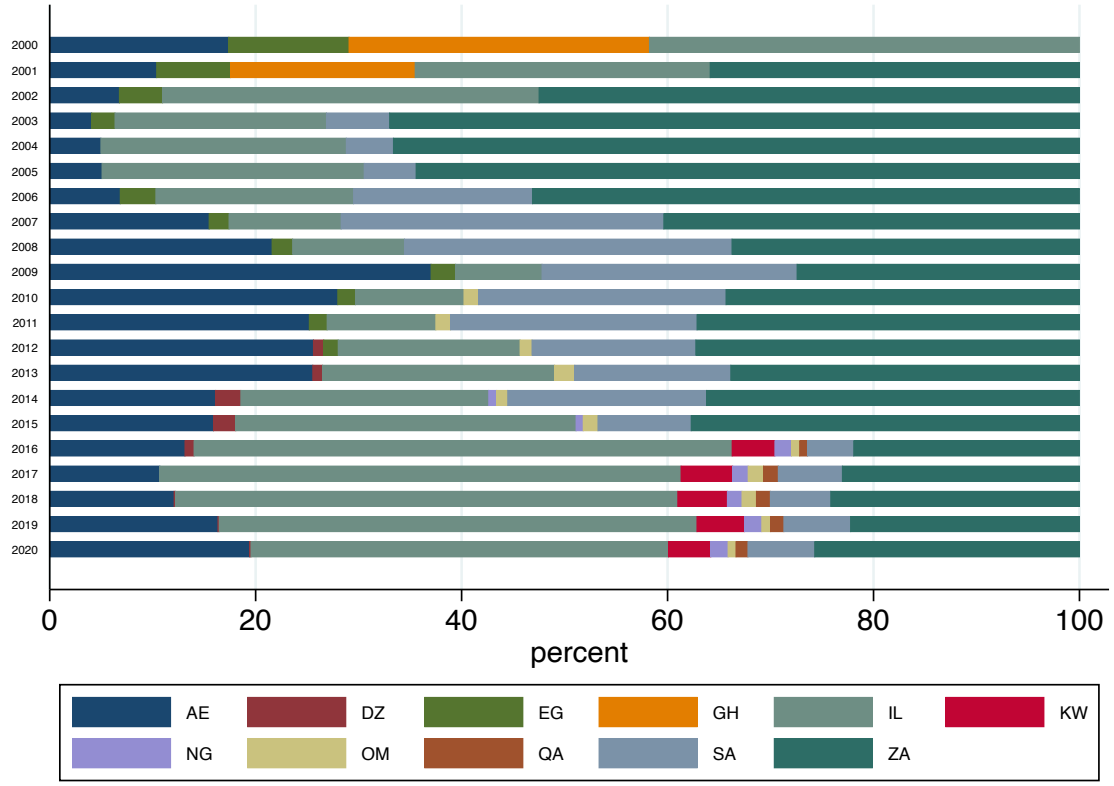
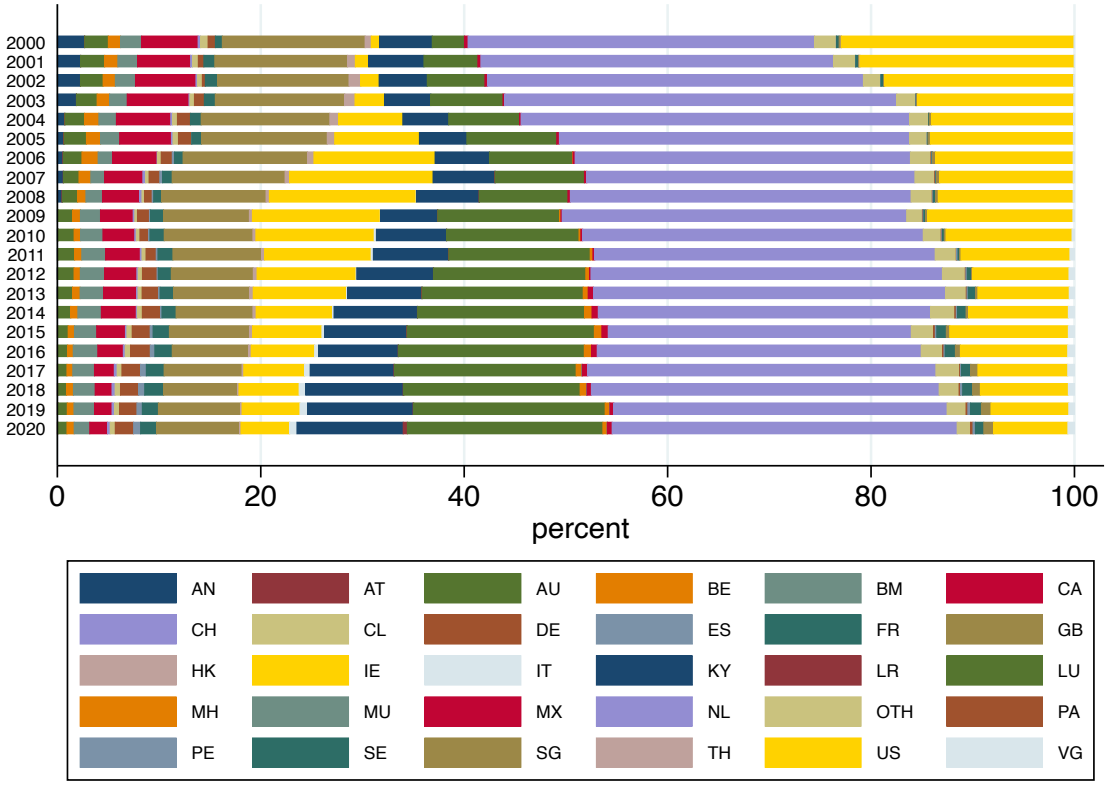


(d) Emerging Europe

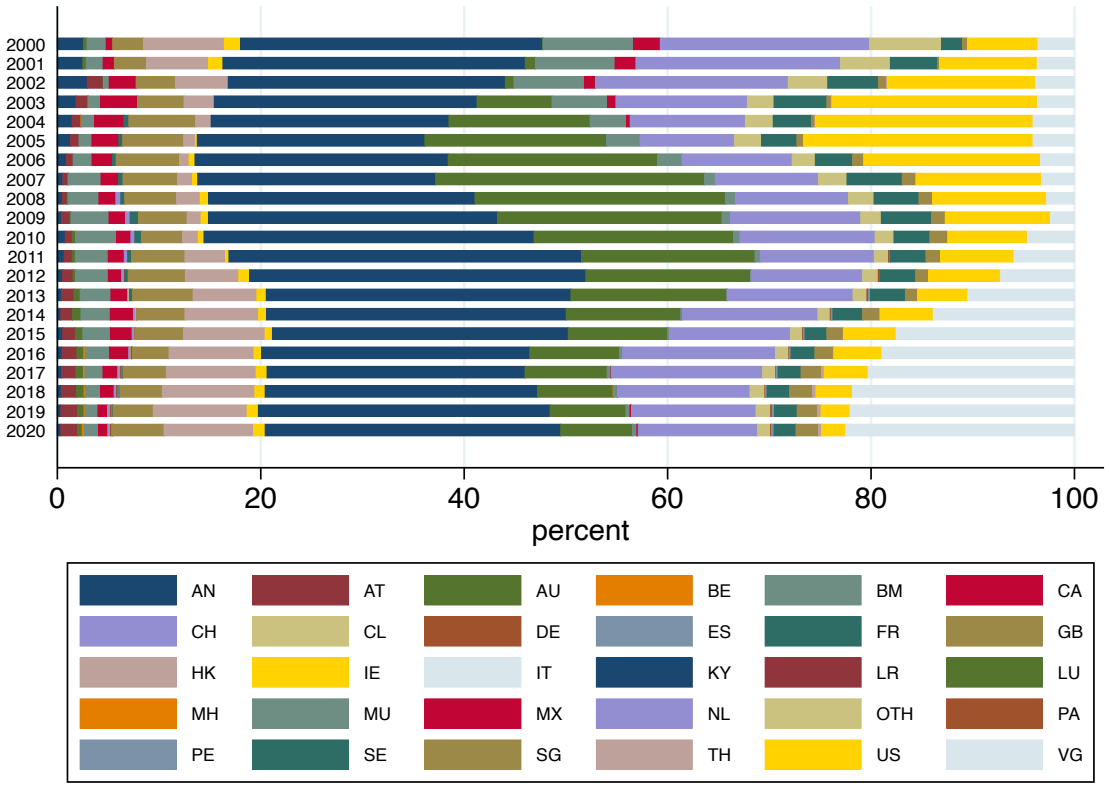


(e) Emerging Africa

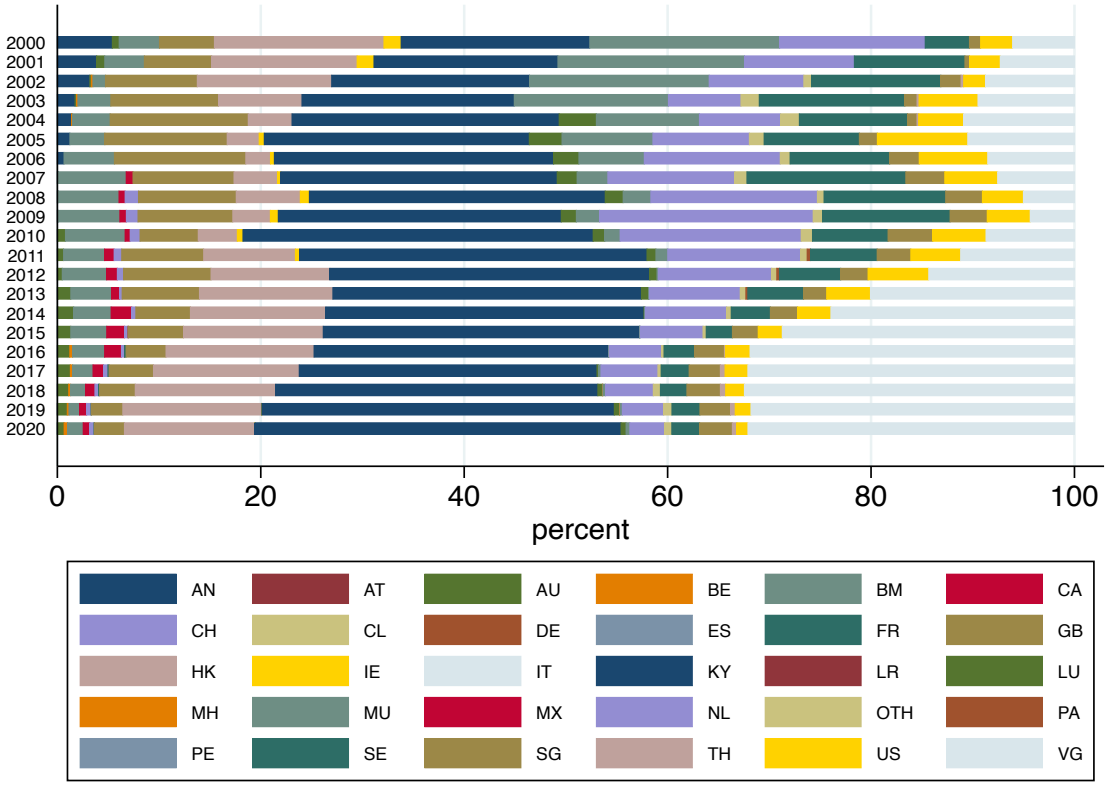
Figure 3: Offshore locations' share



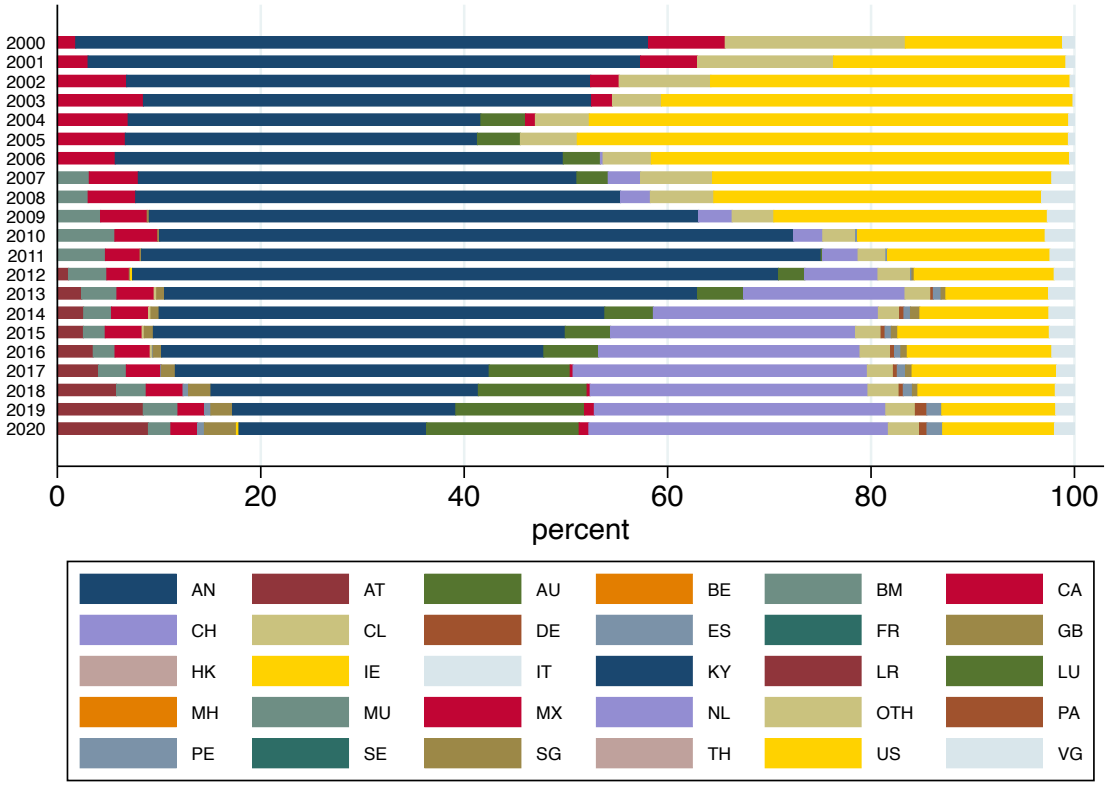
(a) Advanced economies



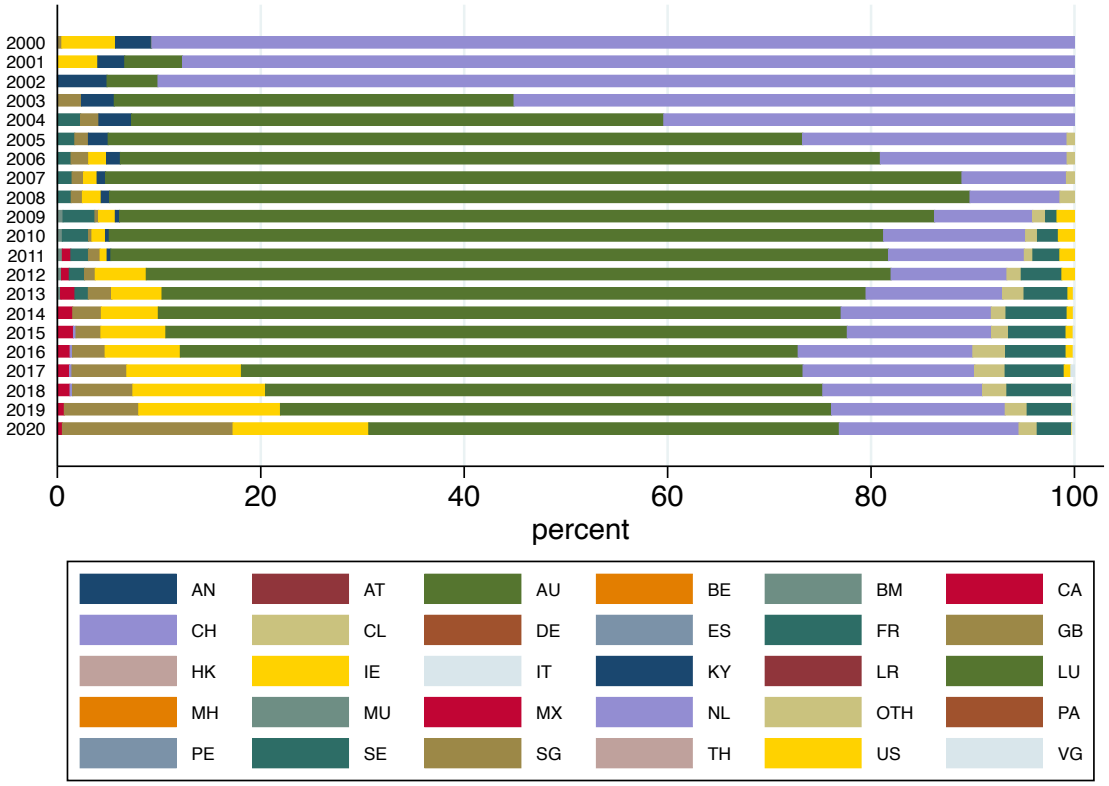
(b) Emerging market and developing economies



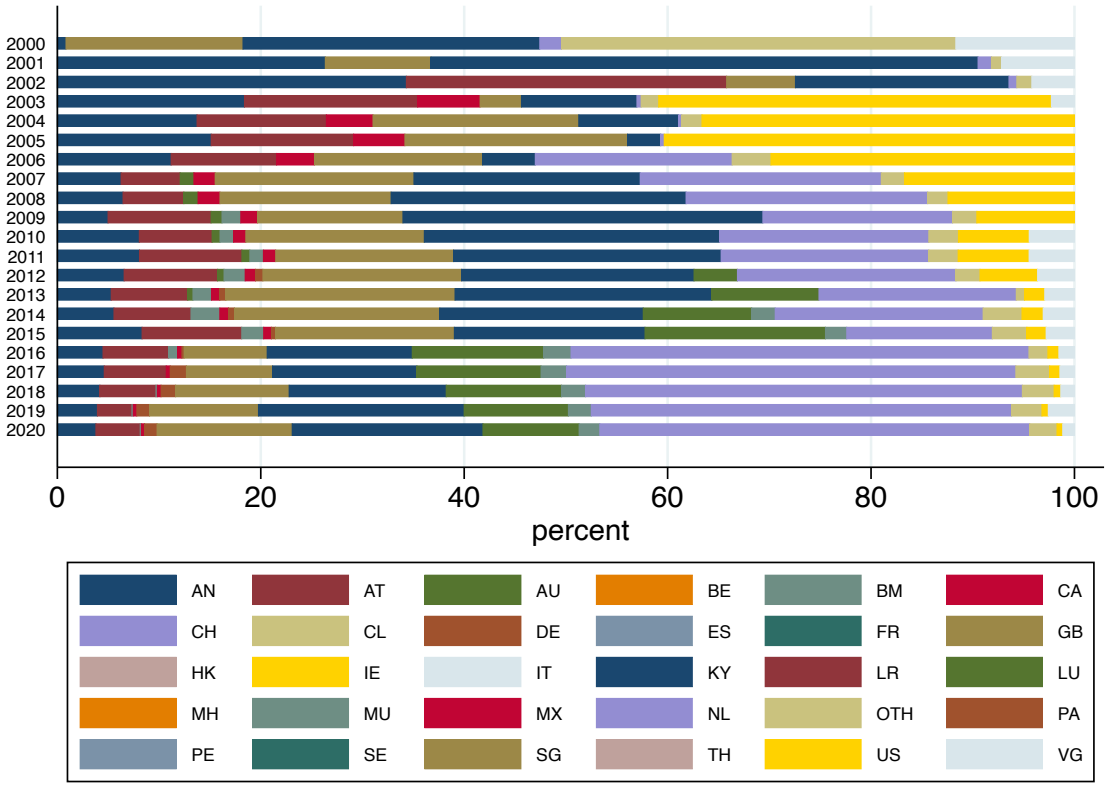
(c) Emerging Asia and Pacific



(d) Emerging Latin America

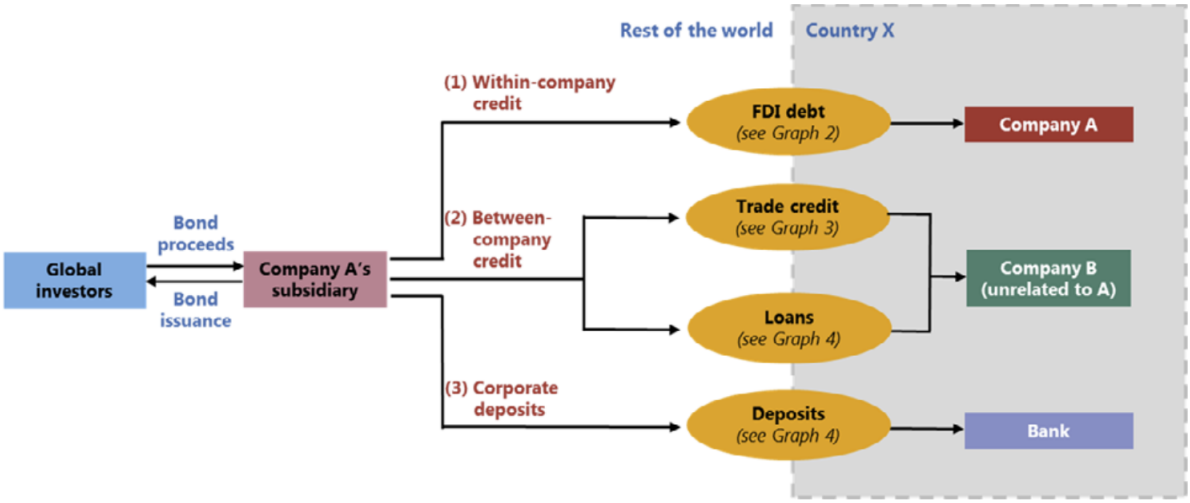


(e) Emerging Europe



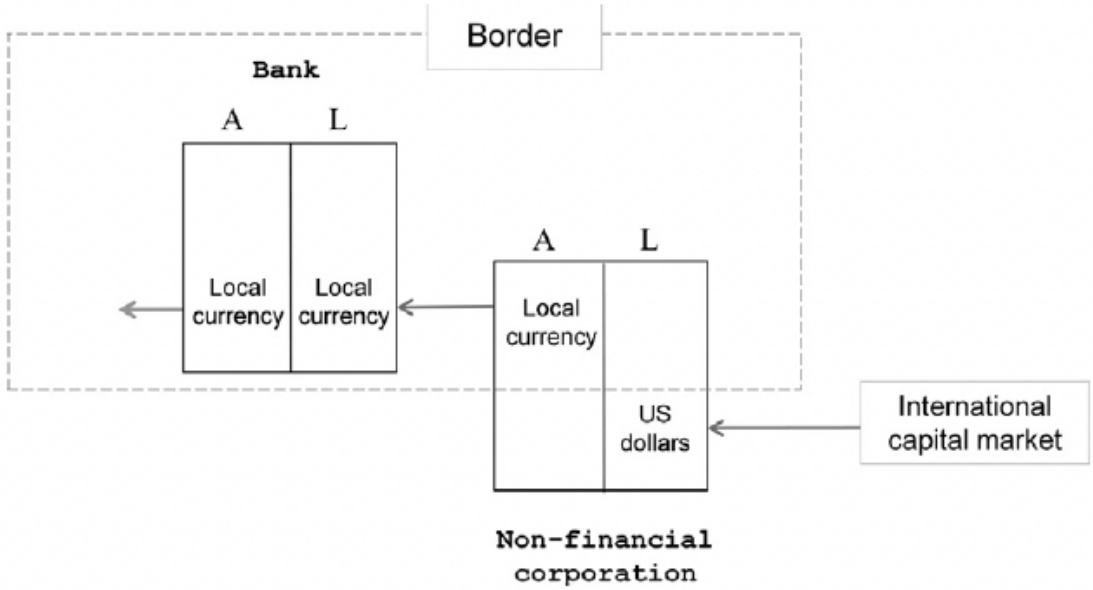
(f) Emerging Africa

Figure 4: Non-financial corporations and capital flows



Source: Avdjiev et al. (2014).

Figure 5: Transmission of Global Liquidity through Offshore Debt Issuance



Source: Chung et al. (2015)).

Table 1: The correlation between within company loans and offshore issuance

IOWDL	OLS			PPML		
	All	Advanced	EmeDev	All	Advanced	EmeDev
	(1)	(2)	(3)	(4)	(5)	(6)
Offshore	0.431***	0.261***	0.474**	0.451***	0.358***	0.956***
	(0.067)	(0.057)	(0.177)	(0.056)	(0.067)	(0.066)
Nationality × Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Location× Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Countrol Variables	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,021	1,540	248	2,328	1,685	361
R-squared	0.746	0.822	0.807	0.7139	0.7239	0.8525

Note: This table reports the coefficient of key variable in the OLS and PPML regressions. The dependent variable is the log of the outward debt instruments liabilities (IOWDL) in Column (1)-(3) and IOWDL in Column (3)-(6). The key independent variable is the log of amounts outstanding offshore issuance (OFFSHORE). Columns (1) and (4) represent the estimated coefficients of OFFSHORE for all country sample. Columns (2) and (5) represent the estimated coefficients of OFFSHORE for the advanced country sample. Columns (3) and (6) represent the estimated coefficients of OFFSHORE for emerging and developing country sample. Country of nationally time fixed effect and location country fixed effects are included in all regressions. ***, **, and * denote, respectively p<0.01, p<0.05, p<0.1.

Table 2: The effects of national factors on re-routing activities.

	WGI	FD	STOCK	CREDIT	BOND	MATURITY
	(1)	(2)	(3)	(4)	(5)	(6)
Above median	0.115	0.394***	0.307***	0.306***	0.190***	0.380***
subsample	(0.076)	(0.080)	(0.090)	(0.080)	(0.066)	(0.058)
Below median	0.627***	0.359***	0.574***	0.433***	0.532***	0.448***
subsample	(0.068)	(0.085)	(0.081)	(0.077)	(0.077)	(0.053)
Full sample	0.389***	0.416***	0.490***	0.411***	0.404***	0.437***
	(0.067)	(0.068)	(0.064)	(0.065)	(0.066)	(0.067)
Full sample	-0.089***	-0.092	-0.029	-0.042	-0.159***	-0.002
interaction term	(0.024)	(0.291)	(0.044)	(0.079)	(0.046)	(0.002)

Note: This table reports the coefficient of key variable in the PPML regressions. The dependent variable is the outward debt instruments liabilities (IOWDL). The key independent variable is the log of amounts outstanding offshore issuance (OFFSHORE). Rows 1–3 present the estimated coefficients of OFFSHORE in the corresponding samples, and row 4 presents the estimated coefficients of the interaction terms of each factor with OFFSHORE. Rows 1 and 2 in Columns (1)–(6) all represent the above-median sub-samples and the below-median sub-samples based on the value of each determinant. Country of nationally time fixed effect and location country fixed effects are included in all regressions. ***, **, and * denote, respectively p<0.01, p<0.05, p<0.1.

Table 3: The effects of national factors on re-routing activities.

	IFI	KAOPEN	KACONTROL	CORPTAX	SHARPE	DERIV
	(1)	(2)	(3)	(4)	(5)	(6)
Above median	-0.156**	-0.070	0.512***	0.525***	0.551***	0.413***
subsample	(0.065)	(0.092)	(0.071)	(0.079)	(0.075)	(0.085)
Below median	0.633***	0.980***	0.221**	0.391***	0.177**	0.334***
subsample	(0.067)	(0.071)	(0.113)	(0.079)	(0.080)	(0.072)
Full sample	0.328***	0.452***	0.310***	0.480***	0.385***	0.413***
	(0.064)	(0.069)	(0.069)	(0.062)	(0.068)	(0.067)
Full sample	-0.087***	-0.210***	0.846***	0.002	0.067***	0.000
interaction term	(0.026)	(0.044)	(0.235)	(0.004)	(0.021)	(0.019)

Note: This table reports the coefficient of key variable in the PPML regressions. The dependent variable is the outward debt instruments liabilities (IOWDL). The key independent variable is the log of amounts outstanding offshore issuance (OFFSHORE). Rows 1–3 present the estimated coefficients of OFFSHORE in the corresponding samples, and row 4 presents the estimated coefficients of the interaction terms of each factor with OFFSHORE. Rows 1 and 2 in Columns (1)–(6) all represent the above-median sub-samples and the below-median sub-samples based on the value of each determinant. Country of nationally time fixed effect and location country fixed effects are included in all regressions. ***, **, and * denote, respectively $p<0.01$, $p<0.05$, $p<0.1$.

Table 4: Debt structure

$OFFSHORE_{SH}$	(1)	(2)	(3)	(4)	(5)
DIST	-0.352***	-0.312***	-0.366***	-0.312***	-0.283***
	(0.086)	(0.097)	(0.101)	(0.103)	(0.105)
WGI	-0.239***				
	(0.041)				
FD		-1.387***			
		(0.270)			
STOCK				-0.068	
				(0.049)	
CREDIT			-0.228***		
			(0.063)		
BOND			-0.185***		-0.065**
			(0.036)		(0.032)
MATURITY	-0.003	-0.004**	-0.003*	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
IFI				-0.536***	-0.564***
				(0.142)	(0.169)
KACONTROL		0.746***	0.824***	0.237**	0.164
		(0.155)	(0.165)	(0.099)	(0.107)
CORPTAX	-0.021***	-0.013***	-0.013***	-0.031***	-0.034***
	(0.006)	(0.005)	(0.005)	(0.009)	(0.010)
vol(π)	0.001	0.002*	0.002**	-0.004	0.003**
	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
vol(ERC)	0.000	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DERIV					-0.107*
					(0.059)
Constant	3.461***	3.097***	3.551***	3.089***	2.885***
	(0.771)	(0.872)	(0.915)	(0.926)	(0.936)
Observations	27,783	22,910	21,519	16,858	18,376
R-squared	0.038	0.039	0.041	0.050	0.058

Note: This table reports the OLS regressions based on data for all country sample. The dependent variable is the ratio of amounts outstanding offshore issuance (OFFSHORE) to the sum of offshore and onshore issuance. DIST is the log of distance. WGI is the first principle component of World Governance Indicators. FD is the financial development index. STOCK is the log of stock market capitalization to GDP. CREDIT is the log of domestic credit to the private sector to GDP. BOND is the log of corporate bond issuance volume to GDP. MATURITY is corporate bond average maturity. IFI is international financial integration, the total external assets and liabilities ratio to GDP at the log level. KACONTROL is capital flow management controls. CORPTAX is the corporate income tax. vol(π) is the standard deviation to the mean of month-to-month inflation. vol(ERC) is the standard deviation to the mean of the month-to-month exchange rate change. All measures of volatilities are computed considering the non-overlapping window. DERIV is the size of foreign exchange swaps, derivatives, and options markets. All time-varying independent variables are the differences between issuer nationality and offshore location. Country of national fixed effects and time-fixed effects are included in all regressions. ***, **, and * denote, respectively $p<0.01$, $p<0.05$, $p<0.1$.

Table 5: Debt structure, Advanced countries

$OFFSHORE_{SH}$	(1)	(2)	(3)	(4)	(5)
DIST	-0.383***	-0.299**	-0.361***	-0.291*	-0.209*
	(0.114)	(0.133)	(0.139)	(0.158)	(0.118)
WGI	-0.203***				
	(0.058)				
FD		-1.256***			
		(0.434)			
STOCK				0.000	
				(0.086)	
CREDIT			-0.229**		
			(0.106)		
BOND			-0.179***		-0.028
			(0.057)		(0.031)
MATURITY	-0.002	-0.003*	-0.003	-0.004	-0.002
	(0.002)	(0.002)	(0.002)	(0.003)	(0.002)
IFI				-0.734**	-0.670**
				(0.311)	(0.303)
KACONTROL		0.675***	0.734***	0.074	0.022
		(0.232)	(0.253)	(0.149)	(0.136)
CORPTAX	-0.023***	-0.016**	-0.017**	-0.044**	-0.040**
	(0.009)	(0.008)	(0.008)	(0.019)	(0.017)
vol(π)	0.001	0.001	0.002**	-0.004	0.002*
	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)
vol(ERC)	0.000**	0.000***	0.000**	0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DERIV					-0.073
					(0.097)
Constant	3.886***	3.156***	3.645***	3.436**	2.650**
	(1.048)	(1.216)	(1.286)	(1.486)	(1.104)
Observations	13,170	10,222	9,343	6,278	8,532
R-squared	0.045	0.042	0.045	0.065	0.065

Note: This table reports the OLS regressions based on data for the advanced country sample. The dependent variable is the ratio of amounts outstanding offshore issuance (OFFSHORE) to the sum of offshore and onshore issuance. DIST is the log of distance. WGI is the first principle component of World Governance Indicators. FD is the financial development index. STOCK is the log of stock market capitalization to GDP. CREDIT is the log of domestic credit to the private sector to GDP. BOND is the log of corporate bond issuance volume to GDP. MATURITY is corporate bond average maturity. IFI is international financial integration, the total external assets and liabilities ratio to GDP at the log level. KACONTROL is capital flow management controls. CORPTAX is the corporate income tax. vol(π) is the standard deviation to the mean of month-to-month inflation. vol(ERC) is the standard deviation to the mean of the month-to-month exchange rate change. All measures of volatilities are computed considering the non-overlapping window. DERIV is the size of foreign exchange swaps, derivatives, and options markets. All time-varying independent variables are the differences between issuer nationality and offshore location. Country of national fixed effects and time-fixed effects are included in all regressions. ***, **, and * denote, respectively $p<0.01$, $p<0.05$, $p<0.1$.

Table 6: Debt structure, Emerging and developing countries

$OFFSHORE_{SH}$	(1)	(2)	(3)	(4)	(5)
DIST	-0.349***	-0.359**	-0.397***	-0.277***	-0.396**
	(0.122)	(0.140)	(0.145)	(0.105)	(0.178)
WGI	-0.279***				
	(0.062)				
FD		-1.602***			
		(0.384)			
STOCK				-0.094	
				(0.068)	
CREDIT			-0.262***		
			(0.090)		
BOND			-0.195***		-0.089
			(0.051)		(0.057)
MATURITY	-0.004	-0.004	-0.003	-0.001	-0.000
	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)
IFI				-0.463***	-0.530***
				(0.148)	(0.198)
KACONTROL		0.836***	0.928***	0.333**	0.330*
		(0.213)	(0.224)	(0.141)	(0.185)
CORPTAX	-0.020***	-0.012*	-0.012*	-0.026***	-0.032***
	(0.007)	(0.007)	(0.006)	(0.010)	(0.012)
vol(π)	0.003	0.003	0.003	-0.003	0.007*
	(0.002)	(0.002)	(0.002)	(0.004)	(0.004)
vol(ERC)	0.000	0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DERIV					-0.148*
					(0.080)
Constant	3.136***	3.275***	3.651***	2.468***	3.382**
	(1.073)	(1.253)	(1.302)	(0.928)	(1.586)
Observations	13,653	11,812	11,325	9,829	9,070
R-squared	0.034	0.037	0.039	0.041	0.055

Note: This table reports the OLS regressions based on data for emerging and developing country sample. The dependent variable is the ratio of amounts outstanding offshore issuance (OFFSHORE) to the sum of offshore and onshore issuance. DIST is the log of distance. WGI is the first principle component of World Governance Indicators. FD is the financial development index. STOCK is the log of stock market capitalization to GDP. CREDIT is the log of domestic credit to the private sector to GDP. BOND is the log of corporate bond issuance volume to GDP. MATURITY is corporate bond average maturity. IFI is international financial integration, the total external assets and liabilities ratio to GDP at the log level. KACONTROL is capital flow management controls. CORPTAX is the corporate income tax. vol(π) is the standard deviation to the mean of month-to-month inflation. vol(ERC) is the standard deviation to the mean of the month-to-month exchange rate change. All measures of volatilities are computed considering the non-overlapping window. DERIV is the size of foreign exchange swaps, derivatives, and options markets. All time-varying independent variables are the differences between issuer nationality and offshore location. Country of national fixed effects and time-fixed effects are included in all regressions. ***, **, and * denote, respectively $p<0.01$, $p<0.05$, $p<0.1$.

Table 7: Debt structure, Emerging countries

	(1)	(2)	(3)	(4)	(5)
DIST	-0.419**	-0.445**	-0.489**	-0.344**	-0.500**
	(0.164)	(0.190)	(0.197)	(0.142)	(0.225)
WGI	-0.330***				
	(0.080)				
FD		-2.074***			
		(0.513)			
STOCK				-0.125	
				(0.091)	
CREDIT			-0.311***		
			(0.118)		
BOND			-0.254***		-0.111
			(0.070)		(0.068)
MATURITY	-0.002	-0.001	-0.000	-0.002	0.001
	(0.003)	(0.003)	(0.003)	(0.002)	(0.003)
IFI				-0.533***	-0.532**
				(0.192)	(0.224)
KACONTROL		0.967***	1.090***	0.473**	0.399*
		(0.262)	(0.278)	(0.193)	(0.219)
CORPTAX	-0.022**	-0.013	-0.013*	-0.030**	-0.033**
	(0.009)	(0.009)	(0.008)	(0.013)	(0.014)
vol(π)	0.005	0.006	0.006	-0.007	0.008*
	(0.004)	(0.004)	(0.004)	(0.008)	(0.005)
vol(ERC)	0.000**	0.000***	0.000***	0.000***	0.000**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
DERIV					-0.183*
					(0.093)
Constant	3.690**	4.008**	4.431**	3.066**	4.276**
	(1.439)	(1.695)	(1.759)	(1.260)	(2.002)
Observations	10,062	8,679	8,289	7,197	7,648
R-squared	0.037	0.041	0.043	0.045	0.058

Note: This table reports the OLS regressions based on data for the emerging country sample. The dependent variable is the ratio of amounts outstanding offshore issuance (OFFSHORE) to the sum of offshore and onshore issuance. DIST is the log of distance. WGI is the first principle component of World Governance Indicators. FD is the financial development index. STOCK is the log of stock market capitalization to GDP. CREDIT is the log of domestic credit to the private sector to GDP. BOND is the log of corporate bond issuance volume to GDP. MATURITY is corporate bond average maturity. IFI is international financial integration, the ratio of total external assets and liabilities to GDP at the log level. KACONTROL is capital flow management controls. CORPTAX is the corporate income tax. vol(π) is the standard deviation to the mean of month-to-month inflation. vol(ERC) is the standard deviation to the mean of the month-to-month exchange rate change. All measures of volatilities are computed considering the non-overlapping window. DERIV is the size of foreign exchange swaps, derivatives, and options markets. All time-varying independent variables are the differences between issuer nationality and offshore location. Country of national fixed effects and time fixed effects are included in all regressions. ***, **, and * denote, respectively $p<0.01$, $p<0.05$, $p<0.1$.

A Deriving the optimal rerouted external debt

To derive the optimal capital structure, the parent corporate maximizes its after-tax profits.

$$\begin{aligned} max_{D_i^E, D_{i,j}^{RE}, D_{i,j}^I} \Pi_i = (1-t_i).f(\theta K_i(\theta)) - r_i.K_i(\theta) - \tilde{r}_{i,j}.b_{i,j}^{RE}.K_i(\theta) \\ +t_i.r_i.(D_{i,j}^I + D_i^E + D_{i,j}^{RE}) + t_i.\tilde{r}_{i,j}.D_{i,j}^{RE} \\ -\frac{\eta}{2}.(b_{i,j}^I)^2.K_i(\theta) \\ -[\frac{\mu}{2}.(b_i^E + b_{i,j}^{RE})^2 + \frac{\delta_i^E}{2}.(b_i^E)^2 + \frac{\delta_j^{RE}}{2}.(b_{i,j}^{RE})^2].K_i(\theta) \end{aligned} \tag{A.1}$$

where I used Eqs. (1) and (2) in Eq. (3).

The resulting first-order conditions are

$$D_i^E : t_i.r - \mu(b_i^E + b_{i,j}^{RE}) - \delta_i^E b_i^E = 0 \tag{A.2}$$

$$D_{i,j}^{RE} : -\tilde{r}_{i,j} + t_i.r_i + t_i.\tilde{r}_{i,j} - \mu(b_i^E + b_{i,j}^{RE}) - \delta_j^{RE}.b_{i,j}^{RE} = 0 \tag{A.3}$$

$$D_{i,j}^I : t_i.r - \eta b_{i,j}^I = 0 \tag{A.4}$$

FOC (A.4) can be rewritten as

$$b_{i,j}^I = \frac{t_i.r}{\eta} \tag{A.5}$$

Turning to the optimal external and rerouted external debt-to-asset ratios, we subtract FOC (A.3) from FOC (A.2) to establish the relationship

$$\tilde{r}_{i,j} - t_i.\tilde{r}_{i,j} - \delta_i^E b_i^E + \delta_j^{RE} b_{i,j}^{RE} = 0 \Rightarrow b_i^E = \frac{\delta_j^{RE}}{\delta_i^E}.b_{i,j}^{RE} + \frac{(1-t_i).\tilde{r}_{i,j}}{\delta_i^E} \tag{A.6}$$

When I use Eq. (A.6) to replace b_i^E in Eq. (A.3), I obtain

$$b_{i,j}^{RE} = [t_i.r_i - \frac{(\delta_i^E + \mu)}{\delta_i^E}.(1-t_i).\tilde{r}_{i,j}].\frac{1}{[\mu(1 + \frac{\delta_j^{RE}}{\delta_i^E} + \delta_j^{RE}]} \tag{A.7}$$

B CDIS vs. BOP

CDIS bilateral data of direct investment with the issuer and holder information (geography) in IMF's Coordinated Direct. It provides detailed data on "inward" and "outward" direct investment positions. Unlike the Balance of Payments (BOP) and International Investment Position (IIP) datasets, both presented according to the asset/liability principle, Investment Survey is presented according to the directional principle (OECD,2014; Mesias, 2015; IMF, 2009).

On the one hand, according to the asset/liability principle, both the asset and liability sides include all assets and liabilities of both resident parent companies and of resident affiliates. It includes investment by a direct investor in its direct investment enterprise, reverse investment

by a direct investment enterprise in its own immediate or indirect direct investor and investment between resident and nonresident fellow enterprises.

On the other hand, according to the directional principle, to derive the amount of total outward or inward investment of the reporting country, reverse investment (arises when a direct investment enterprise lends funds to its immediate or indirect direct investor) is subtracted. While inward debt instruments liabilities positions show foreign parents' lending to resident affiliates, inward debt instruments assets positions represent resident affiliates' lending to foreign parents, and the difference between them is inward debt instruments positions. While outward debt instruments liabilities positions show foreign affiliates' lending to resident parents, outward debt instruments assets positions show resident parents' lending to foreign affiliates, and the difference between them is outward debt instruments positions.

Therefore, direct investment debt instruments liabilities are equivalent to the sum of inward debt instruments liabilities and outward debt instruments liabilities positions. Direct investment instruments assets are equivalent to the sum of inward debt Instruments assets and outward debt instruments assets.

In the case of the data gap for country pairs, I employ a "mirror data" approach. For the country pairs that have no data for outward debt instruments liabilities positions throughout the all-time period, I use inward debt instruments asset position if it is available.