The metamorphosis of external vulnerability from 'original sin' to 'original sin redux': Currency hierarchy and financial globalization in emerging economies[*][†]

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Abstract

How has financial globalization changed the nature of external vulnerability of emerging economies? To answer this question, we first present an overview of the changes in international capital flows and cross-border stocks involving emerging economies from the 1970s to the COVID-19 crisis and then identify relevant recent shifts in financial globalization. We adapt the concept of currency hierarchy to the most recent features of financial globalization. We deploy a stylized balance sheet analysis to better understand the metamorphosis of these economies' vulnerabilities. We find the occurrence of the phenomenon of 'original sin' during financial internationalization. In contrast, in more recent times of financial globalization, the diversification of financial flows and investors and the increase of securities denominated in domestic currency have created additional channels of vulnerability, labeled as 'original sin redux'. We find that the private sector in Southern economies is mostly exposed to these new vulnerabilities. At first sight, it is good news because it preserves the fiscal space of Southern States in the case of capital outflows. However, it might create new contingent liabilities for the public sector. We call for capital account regulation in a broad sense to target these new complex vulnerabilities.

Keywords: external vulnerability; currency hierarchy; subordinated financial integration; financial globalization; emerging markets economies; COVID-19

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1. Introduction

The economic and financial COVID-19 crisis brought exceptional hardship to most emerging market economies (EMEs)[††]. As it happened at the global level, they suffered from local lockdown measures and the interruption of global value chains while they were hit by capital outflows never seen before (UNCTAD, 2020).

This unprecedented pro-cyclical response of global financial investors certainly relates to the new level and form of integration into financial globalization. Here, we are confronted with a complex picture: on the one hand, we observe a wave of external debt accumulation during the 2010s (World Bank, 2020), while at the same time, most EMEs have accumulated high levels of foreign exchange (FX) reserves, and – to different degrees – the share of those investors' assets denominated in EMEs domestic currency has increased. This new wave of instability has placed the new configurations of external vulnerability under the spotlight.

Financial globalization is subject to fierce debate. Here, we draw on strands of critical discussion that emphasize the inherent instability of capital flows (i.e., Stiglitz & Ocampo, 2008). Especially relevant for the case of EMEs are concepts that consider the asymmetric nature of monetary and financial relations and the center-periphery configuration of the international monetary system, such as the concept of currency hierarchy (Paula et al., 2017; Fritz et al., 2018; see also Andrade and Prates, 2014; Kaltenbrunner, 2015).

Departing from this view of an asymmetric and hierarchical organization of monetary relations and the subsequent patterns of global financial integration, we ask how we can understand and systematically depict the new patterns of external vulnerability of EMEs and its implications regarding risks? What is the metamorphosis of this vulnerability along the different phases of financial globalization? Our central hypothesis is that vulnerability has not necessarily decreased; instead, it has changed its nature and the channels through which it affects EMEs.

The novelty of the paper lies in combining the different periods of financial internationalization with the concept of the so-called 'original sin' (Eichengreen et al., 2002), and the period of financial globalization with the idea of 'original sin redux' (Carsten & Shin, 2019; Hofmann et al., 2020; Bertaut et al., 2023). The former is a well-established concept, describing the phenomenon of the inability of countries in the Global South to borrow abroad

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[††] Here we define EMEs as peripheral or developing countries that have engaged in financial globalization in the 1990s. We will use EMEs and emerging economies as synonyms.

in their own currency and its negative consequences for Southern debtors in the US dollar, especially when their currency suffers a devaluation. The latter phenomenon of original sin redux is more recent and has caught far less attention[‡‡]. It seeks to explain the consequences of the new pattern of international capital flows, as described above, where global financial actors invest in domestic currencies in local financial markets of EME.

At first look, this seems to revert the distribution of losses, as global investors instead of EMEs' debtors must bear the costs of EMEs' currency devaluations. Yet, as Shin and his co-authors (Bertaut et al., 2023) argue, the reaction of these global investors by selling their assets in EMEs' currencies to prevent further losses leads to second-round-effects such as stronger EME's currency devaluation and a plunge of EMEs' asset prices as global investors sell these off.

However, the original sin redux' authors mostly focus on the behavior of global investors, differentiated by various types such as investment funds and pension funds. In this paper, we take a deeper and systematic look at the consequences for the most relevant actors in the Global South. This analysis allows us to identify, within the much-increased complexity of financial contracts and actors involved in financial globalization, the main channels through which the original sin redux affects the external vulnerability of EMEs countries and to distinguish them, among others, between the public and the private sector and between residents and nonresidents.

The paper is divided in five sections. Section 2 provides an overview of the changes in financial flows to EMEs, together with a periodization of the regimes of financial internationalization and globalization from the 1970s to today. Section 3 adapts the concept of currency hierarchy to the most recent features of financial globalization, and links it to the concept of 'original sin redux'. Section 4 provides a synthetic balance sheet analysis for these different regimes to systematically assess the metamorphosis of external vulnerability that EMEs have been going through since then. Finally, Section 5 concludes the paper.

[‡‡] One exception is Kaltenbrunner and Painceira (2015), that following a Minskyan analysis, showed the changing nature of Brazil's external vulnerability, in which the surging share of foreign investors in Brazilian assets shift the currency mismatch from domestic economic units to international financial investors, increasing the link between exchange rate movements to international market and funding conditions.

2. New patterns of capital flows and cross-border stocks involving EMEs

2.1 Overall picture: Ever greater volumes, diversified channels, and actors

Since the mid-1990s, cross-border global capital flows and, consequently, cross-border stocks, have expanded remarkably and steadily. EMEs still account for a small, albeit growing share of these stocks (Figure 1). However, despite the residual nature of capital flows directed to these economies, their potentially destabilizing effects on their financial markets and exchange rates are significant, since the volume allocated by global investors is not marginal in relation to the size of these markets. This financial asymmetry stems from the fact that international financial integration takes place between 'unequal partners' (Studart, 2006).

Figure 1 here

The value of EMEs' gross foreign assets and liabilities has significantly increased in absolute terms, and to a lesser extent as a proportion of GDP, being accompanied by significant changes in the structure of external balance sheets (Figure 2). The unprecedented growth in FX reserves – as a form of self-insurance to prevent a sudden reversal of speculative capital flows in EMEs – was the largest change on the asset side (more than 50% of total assets on average in 2004-2020, according to our calculations using data from Milesi-Ferretti, 2022). Foreign exchange reserve accumulation mostly originates from capital inflows. Only in a few countries it results from cumulative current account surpluses. At the same time, foreign direct investment (FDI) increased from 2.2% of GDP in 1997 to 15-17% in 2017-2020, thanks to the emergence of transnational firms in major EMEs, such as Brazil, China, India, and Turkey. On the liability side, where the composition has been more diversified, the share of both FDI and equity portfolio has grown at the expense of other investments (where private external debt grew faster than public external debt), reducing their share on GDP from 7.3% in 1995 to less than 14% in 2016-2020. FDI increased from 8.2% of GDP in 1995 to more than 24% of the total liabilities since 2009[§§].

[§§] We make use of Milesi-Ferretti (2022) database, that update data of Lane & Milesi-Ferretti (2018) consolidating data extracted from IMF.

Figure 2 here

Figure 3 shows the net financial assets (total external assets less total external liabilities) of EMEs without China (other EMEs) and of China from 1995 to 2020. The composition of the net position of other EMEs was more or less like the one of gross net assets. Both have a predominance of FX reserves and FDI, but net FDI was still negative despite its growing participation in external assets. In China, a declined trend started in 2015 due to the increase in foreign investments abroad. Only China was a net creditor in the period because of enormous foreign reserve accumulation (declining since 2011 due to the increase of GDP), enabled by the combination of a currency account surplus and large FDI, while other EMEs have been net debtors (Figure 3). Another difference between China and other EMEs was the performance of net other investments: positive to China since 2015 due to a huge increase in loans and financing abroad, while in other EMEs the net balance remained negative because of foreign indebtedness. Indeed, China growing external integration increasingly shaped the cross-border balance-sheets of EMEs in the analyzed period.

Figure 3 here

Another new trend in the composition of several EMEs' external liability in the 2000s was the increasing proportion of public debt, denominated in domestic currency, held by non-residents, although the role of foreign investors in local currency government debt varies significantly across countries. According to Akyüz (2017, p. 117), this share accounts for more than 25% of the total in most EMEs in 2013 (Indonesia, Malaysia, Philippines, Mexico, Peru, Russia, South Africa, and Turkey). In December 2021, this share was above 25% in many countries, reaching 43 % in Peru, 27% in Colombia and 23% in Malaysia (IMF, 2022). The greater reliance on local-currency-denominated public debt mitigates the currency mismatch in the balance sheet of the EMEs' governments, reducing the vulnerability to exchange rate volatility, but frequently creates maturity mismatches (given the shorter maturity of domestic treasury bonds) and shifts the currency mismatch to the foreign investor's balance sheets who have assets in EMEs' currency but obligations in their currency (see section .3).

The structural changes in the composition of cross-border holdings have amplified the susceptibility of gross external assets and liabilities and net foreign asset positions to variations in asset prices and exchange rates, entailing large transfers of wealth between EMEs and

advanced economies (AEs). According to UNCTAD's (2019) estimates, in the 2000-2018 period the resource transfer from 16 major EMEs amounted on average to roughly US$ 440 billion per year or 2.2% of these countries' GDP, as a result of return differentials between safe external assets held to insure against risky external liabilities. Table 1 shows that the total returns of AEs were positive over 2000-2016 due to both the yield on gross assets and gross liabilities and the capital gains from changes in asset prices and exchange rates, while both were negative for EMEs. Hence, the EMEs' negative returns on net international investment stem from not only the greater external liabilities than external assets for most countries but also the lower returns of their foreign assets compared with their foreign liabilities (see also Mayer, 2019).

Table 1 here

2.2 Financial internationalization and globalization: A periodization of capital flow cycles to EMEs

The increasing volume of capital flows to EMEs and the resulting changes in the dimension and composition of their external liabilities and assets, described above – together with the diversification of financial instruments and investors – have led to a growing internationalization of finance in EMEs. This, in turn, is part of a broader global regime shift.

Regulationist economists (i.e. Guttman, 2016) define this new regime as "*finance-led capitalism*". Its most important feature is the process of financialization, broadly understood as a "pattern of accumulation in which profit-making occurs increasingly through financial channels rather than through trade and commodity production" (Krippner, 2005, p. 173; see also Fontana et al., 2019). Financial globalization – defined as the interpenetration of national financial markets, as well as their integration in the international financial market (Chesnais, 1996, pp. 10-11) – is seen as one of the main drivers of 'finance-led capitalism' and financialization.

Part of the mainstream literature sustains that this new era of financial globalization promises more stability to the world economy due to a greater share of less volatile FDI and equity flows, even if volatile capital flows bring the risk of financial contagion (McKinsey, 2017). Against this, we argue that these structural changes have created new transmission channels of financial shocks through international capital flows and new sources of external vulnerability to EMEs (see sections 3 and 4).

We can divide the boom-bust cycles of capital flows to EMEs into two main phases of financial internationalization (1970s and 1980s) and financial globalization (1990s to present). In all of them, global push factors (mainly, lower interest rates in advanced economies) were the main driver of capital inflows during the boom phase, but pull factors also played a role, such as increasing financial openness and deepening of domestic capital markets (Akyüz, 2017). As Hannan (2018, p.13-14) stressed: "The more recent work shows that while the incidence of capital flow surges depends on external factors, whether a particular emerging market economy receives that surge depends on domestic factors, including the extent of financial market liberalization and global financial market integration."

Financial internationalization began in the 1970s with the increase in international banking lending (mainly from "Eurodollar" markets) - driven by a rapid expansion of international liquidity associated with oil surpluses and growing US external deficits - and ended with an external debt crisis in Latin America in the 1980s[***]. The second period, financial globalization, was triggered in the early-1990s by the rapid increase in international liquidity and the huge decline in interest rates in the US and Japan, followed by a sovereign debt restructuring in Latin America and the liberalization of capital flows in many peripheral countries that have become EMEs.

Taking a closer look at the unfolding of financial globalization and its impact on EMEs, we can identify three main sub-periods. The first started at the beginning of the 1990s and ended with a sequence of financial crises in Latin America, East Asia, and Russia at the end of that decade. The second wave began with the new millennium, coming to an abrupt halt in 2008 with the GFC. Triggered by aggressive policies of quantitative easing by AEs central banks, the third cycle of financial globalization started, with ever greater and diversified capital flows to EMEs[†††]. The inherent volatility of these flows reached its peak in the aftermath of the COVID-19 shock.[‡‡‡]

[***] The contraction of world trade in 1981 caused the prices of primary resources (Latin America's largest export) to fall. Considering the balance of payments of indebted countries due the effect of interest rate shocks on the stock of external debt, a handful of countries eventually became – using Minsky's (1986) taxonomy – Ponzi, namely they had to borrow to pay the debt service, in a situation that causes debt to escalate.

[†††] For a detailed analysis of capital flows to EMEs from a historical perspective, see Akyüz (2011). On the boom phase of the third cycle of financial globalization, see World Bank (2020) and López and Stracca (2021).

[‡‡‡] This sequencing obviously entails regional and country-specific variation, which we cannot detail due to space constraints. The group of so-called 'frontier markets economies' of Sub-Saharan Africa and other poorer countries in terms of per capita income (IMF, 2019) certainly

While debt operations (mainly bank loans) predominated during the cycle of financial internationalization, the first cycle of financial globalization began with some change in the composition of capital inflows, with a gradual increase in FDI. However, major changes occurred in the second and third capital flows' waves of financial globalization. Besides the much larger total flows, their composition became more diversified, favored – among others – by carry-trade operations to explore interest differentials, the internationalization of global value chains, the enormous push of FDI to and from China, and the liberalization of local capital markets to foreign investors (see Figure 4; for an overview over the different periods see also Table A1)[§§§].

Figure 4 here

2.3 Capital flows in the beginning of the COVID-19-pandemic

The COVID-19 pandemic led to the burst of the third boom of capital flows under financial globalization. The high uncertainty related to the spread of the pandemic hugely increased fears about the future, triggering record portfolio outflows from EMEs, first reaching equity markets and in the sequence, bond markets. This resulted in deflation in equity prices, a sharp increase in bond spreads and abrupt currency depreciations. Net outflows amounted US$ 104.8 billion during the first three months of the COVID-19 crisis, more than three times the US$ 33 billion recorded in the GFC (Figure 5).

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represents one of the major variations. Most of them entered into financial globalization during the third cycle (i.e., after the GFC) and to date they demonstrate a lower and less complex degree of global financial integration. For an analysis of the causes and consequences of the financial integration of frontier markets, see Prates et al (2023).

[§§§] Another new feature of the third cycle of financial globalization is the increasing role of China as a creditor for peripheral countries. According to the World Bank (2023), Chinese loans to low- and middle income-countries (LMIC) increased from 2012 and 2016 but have fallen sharply to an all-time low of US$5,4 billion in 2022. At the end of 2022, China accounted for 26.6% of the total external debt stock of LMICs. However, most of Chinese loans went to frontier-markets and other poorer developing economies not integrated in the global financial market. Therefore, although this is a key issue to understand the current debt challenges these economies are facing, it is beyond the scope of this paper that focuses on EMEs. On China's expanding role in global finance, see Horn et al. (2019).

Figure 5 here

The COVID-shock also brought to light global investors' new strategy to invest in EMEs, which contributed to the record capital outflows. After GFC, these investors have relied increasingly on benchmark-driven funds that follow a flagship benchmark index with a predefined list of countries and securities with specific weights (e.g., JP Morgan Emerging Market Bond Index Global (EMBIG) for sovereign bonds). As El-Erian (2023) stresses, besides charging lower fees relative to active portfolio management, passive portfolio management is particularly attractive in a global context where the combination of very low interest rates and massive injections of central bank liquidity - which predominate after the GFC - boosted virtually all assets and increased the correlations across asset classes.

Benchmark-driven financial funds have reinforced the role of push factors in the dynamics of capital flows to EMEs since they rely on highly correlated benchmark indices based on similar methodologies and focus on developments affecting EMEs as a group rather than on country-specific features. Consequently, the common movement of portfolio flows across EMEs has increased, and these economies have become even more exposed to unexpected changes in global financial conditions. Moreover, the influence of benchmark-driven strategies is not limited to passive fund management since active funds search to outperform passive investment strategies. By some estimates, around 70 per cent of country allocations of investment funds is influenced by benchmark indices (Raddatz et al., 2017)[****].

The combination of the COVID-19 crisis and the steep decline in oil prices led to sharp currency depreciations in EMEs between the end of February and mid/late-March 2020, in a trend that continued in April in some countries like Brazil, South Africa and Turkey more than in others (Figure 4). The greater presence of foreign investors in local capital markets has increased the transmission of global financial shocks to these markets, as surges in the entry and exit of non-residents affect not only asset prices but also exchange rates. Indeed, huge currency depreciations have a strong impact on EMEs. First, as most EMEs accumulated corporate external debt before the COVID-19 crisis, driven by historically low borrowing costs and various incentives favoring debt over equity, free-falling exchange rates along with a sharp rise in spreads increased the costs to borrowers paying foreign currency debt (OECD, 2020). Second,

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[****] On the impact of benchmark-driven funds on sovereign debt markets, see Cormier and Naqvi (2023).

the reduction of financial assets' values in foreign investors' home currency terms eventually triggered the sale of financial assets by non-residents, which resulted in further capital outflows (Hofmann et al., 2020). This latter event is related to the emergence of a new source of external vulnerability – the so-called 'original sin redux' – that the COVID-19 crisis laid bare and is analyzed in the next section.

3. Currency hierarchy and the original sin redux

3.1 Currency hierarchy

Critical discussion regarding the effects of financial globalization on EMEs – in particular related to the more recent boom-bust cycles – comes from diverse strands. Especially relevant are the concepts of center-periphery and currency hierarchy.

In prior work (Paula et al., 2017; Fritz et al., 2018; see also Andrade & Prates, 2014), we have applied the structuralist concept of an asymmetric global economy divided into two poles – center and periphery – to the analysis of the international monetary system. This approach states that currencies are hierarchically positioned according to their degree of liquidity, whereby the key currency (currently the US fiduciary dollar) is placed at the top of the hierarchy because it has the highest degree of liquidity. The currencies issued by the other center (or advanced) countries/regions (such as the euro and yen) are in intermediate positions and they are also liquid currencies. At the opposite end are the currencies issued by peripheral economies, which are non-liquid currencies as they are incapable of performing the basic functions of money (medium of exchange, denomination of contracts and international reserve currency) at the international level.

Indeed, with its formalization of the liquidity premium in relation to other valuation attributes of assets, the concept of currency hierarchy enables a more precise grasping of the effects of financial globalization in EMEs, especially in the recent cycles.

To compensate the differences in liquidity premia between center and periphery assets, less liquid currencies need to offer higher total returns to be attractive to global investors, such as higher interest rates and/or higher capital gains (through asset price and/or exchange rate appreciation) when compared with AEs' currencies. Expressed formally, in the face of the lower liquidity premium (l), to make a global investor hold their assets, EMEs have to offer higher monetary returns ($a + q$) – where a is the expected appreciation/depreciation of the currency

and q is the yield of the securities (measured by the interest rate) – and/or reduce the carrying cost by reducing capital flows' regulation (c). In equilibrium, we have:

$$a_N + q_N - c_N + l_N = a_S + q_S - c_S + l_S \qquad (1)$$

where S denotes Southern or EMEs, and N denotes Northern or AEs.

As $l_S < l_N$, this difference has to be compensated by higher returns, so that:

$$(a_S + q_S - c_S) > (a_N + q_N - c_N) \qquad (2)$$

Taking account of the recent changes in the composition of capital flows with the increasing share of portfolio debt and equity in external liabilities, we additionally consider the valuation variation generated by changes not only in exchange rates but also in asset prices (equities, bonds).

Therefore, we extend the formal concept of currency hierarchy (formula (1)) by incorporating the yield differentials and assets' capital gains/losses, so that:

$$l_S < l_N => (a_{c;S} + a_{a;S} + q_{r;S} + q_{y,S} - c_S) > (a_{c;N} + a_{a;N} + q_{r;N} + q_{y,N} - c_N) \qquad (3)$$

where a_c is currency appreciation/depreciation, a_a is asset price appreciation/depreciation, q_r is the monetary returns derived from loans' interest rates and $q_{y;}$ is the yield derived from fixed-income securities (portfolio debt).

To better understand how the different liquidity premia shape foreign investors' portfolio decisions along boom-bust cycles, we bring in Minsky's (1986) financial fragility hypothesis. He emphasizes the inherent tendency of economic units to move from the state of robustness to financial fragility over time, "due to shift in expectations that occurs over the course of a business cycle, and the way this shift is transmitted through the financial system" (Dymski & Pollin, 1992, p. 40). This behavior results in increasingly smaller safety margins, giving rise to a growing financial fragility in the economy. To cite Minsky's (1982, p. 101) most well-known aphorism: "*Stability* – or tranquility – in a world with a cyclical past and capitalist financial institutions *is destabilizing*" [italics added].

During *booms* of capital inflows – i.e. stability and tranquility – in the international financial markets (most of them geared initially by an expansionary monetary policy in the United States), global investors' preference for liquidity decreases, leading to a fall in the weight given to the liquidity premium differential and a rise in global investors' demand for EMEs securities, associated with the favorable interest rate differential (bonds) or expectation of

capital gains (equity) in local markets (see formula 3 above)[††††]. This 'search for yields' results in an appreciation of the EMEs currency, leading to an expectation of further appreciation (rise in $a_{c;S}$), which further increases the expected return differential, thus further stimulating capital inflows and reinforcing the currency appreciation[‡‡‡‡].

Two features of EMEs underlie these self-feeding interactions that increase the financial fragility over the boom and can lead to destabilizing dynamics in the bust phase. First, these investors are more likely to be drawn to exchange rate returns that are greater for EMEs' currencies due to their higher volatility, stemming from their subordinated position in the currency hierarchy. Consequently, they tend to respond more quickly to a first exchange rate appreciation. Second, the demand from a few money managers is sufficient to trigger self-feeding interactions due to the already-mentioned financial asymmetry.

Over the boom phase, investors' low liquidity preference leads to a sustained and gradual increase in the demand for EMEs' assets and, hence, a gradual currency appreciation path. Conversely, over the bust phases, by virtue of changes in the monetary policy in the AEs and/or an increase in the international liquidity preference, sudden capital outflows trigger deflation of EMEs' financial assets and an abrupt depreciation of EMEs' currencies, which are the main victims of global investors 'flight to quality' (Ramos, 2019; see also Paula et al., 2017).

3.2. Original sin and original sin redux

The phenomenon known as 'original sin' is well documented in the literature, and is related to the fact that EMEs have traditionally been unable to borrow abroad in their own domestic currency. Due to the dependence of these economies on foreign currency borrowing, especially that denominated in US dollars, they are subject to problems of currency mismatch (Eichengreen & Hausmann, 1999; Eichengreen et al., 2002). According to Eichengreen et al. (2022, p.3), the "inability to issue external debt in the country's own currency is correlated with fear of floating, with the need to hold additional FX reserves, with higher volatility of output and capital flows, and with lower credit ratings."

[††††] For a formalization of the relationship between liquidity preference and liquidity premium, see Ramos (2019).
[‡‡‡‡] Most empirical studies confirm this spiraling dynamic between interest rate differential and currency appreciation, which violates the uncovered interest rate parity. This resulted in the emergence of one more puzzle in the mainstream literature on the determination of nominal exchange rates, the so-called *forward premium puzzle* (Brunnermeier et al., 2008), and the development of new models to explain it (De Grauwe & Grimaldi, 2006).

However, since the EMEs' currency crises of the 1990s and the global liquidity that resulted from the implementation of expansionary monetary policies in the AEs after the 2008 financial crisis, domestic financial markets have deepened, and the share of government debt in foreign currency has reduced significantly while global portfolio investors have increased their participation on the local currency-denominated sovereign bonds. At the same time, the ongoing difficulty of the corporate sector of borrowing abroad in domestic currency remains. As middle-income EMEs have been able to place domestic currency debt (mainly public debt) with non-resident investors, overcoming 'original sin' has allowed the reduction of vulnerabilities associated with currency mismatches on sovereign debt that exposed EMEs governments to the negative effects of currency depreciation[§§§§].

'Original sin redux' is the term coined by economists of the Bank for International Settlement (BIS) (Carsten & Shin, 2019; Hofmann et al., 2020) to grasp the new type of vulnerability of EMEs that resulted from the shift in currency mismatch risks from borrowers' balance sheet to investors' balance sheet, that has created an endogenous link between local currency yields and exchange rate fluctuations. The authors stress that when foreign investors have assets in EMEs' currencies and obligations to beneficiaries in their own currency an EMEs' currency depreciation might trigger sales of EMEs' bonds and equity.

> "The exchange rate plays an important amplifying role in the portfolio adjustment of global investors [lending in EMEs currencies] (…). In this context, a generalized EME currency depreciation further lowers the value of assets in the foreign investor's home currency terms, tightening their risk constraints more than otherwise. When risk capacity is limited, EME currency depreciation may trigger sales or ex post hedging, pushing up EME bond spreads due to the exit of foreign investors" (Hofmann et al., 2020, p. 2).

Thus, even if Northern investors have to bear the direct costs of an a_{cS} decrease, their reaction will trigger self-feeding interactions in the opposite direction to that observed in the boom phase (see section 3.1), i.e. further capital outflows to cover prior losses, reinforcing a_{cS} depreciation (see formula 3 above). Thus, the reaction to the 'original sin redux' will increase the balance sheet effects on Southern debtors in $N linked to the 'original sin'.

[§§§§] Eichengreen et al. (2023) point out, however, that the original sin persists in low-income countries as they have more difficulty in issuing domestic currency debt.

This amplified herding behavior of investors who invested in different currencies and assets and reacted to shocks in the same direction augments the volatility of capital flows and EMEs' exchange rates and financial asset prices, therefore influencing the transfers of wealth between EMEs and AEs. While for specific agents the net costs will depend on a series of variables - such as the ratio of debt held in \$S to that in \$N and the net effects of asset price changes on his/her asset and liability sides -, for the EME economy as a whole the result is augmented capital flows and exchange rate volatility, with all of its damaging effects for growth, employment and productive investment. CGFS (2012, p. 35) resumes the complex effects of the 'original sin redux' on EMEs' external vulnerability:

> While issuing in local currency reduces EME borrowers' currency mismatch, it results in foreign holders of the local currency debt carrying such mismatches, which can amplify their reaction to shocks that affect exchange rates. As a result, the reduced vulnerability for domestic issuers comes at the cost of greater transmission of foreign shocks via the balance sheets of foreign creditors.

Therefore, original sin redux can reinforce boom-bust movements of capital flows and their effects on EMEs, as described above. During tranquil periods associated with the abundance of capital inflows, bonds' yields tend to fall while \$S appreciate, increasing \$N return due to the valuation effect; alternatively, during periods of financial stress, capital flight goes hand-to-hand with rising yields and currency depreciation, hitting the \$N return of global investors (Bertaut et al., 2023). The combination of currency depreciation and higher spreads can amplify the effects of capital outflows as global investors sell even more \$S bonds, weakening bond market sentiment. Therefore, these investors 'lose twice' as they must convert the local currency back to \$N currency at a lower rate, while dealing with the fall in the bond price (Shin, 2023).

Bertaut et al. (2023) point out that the duration risk can interact with currency risk to amplify even more portfolio flows, considering that the longer the maturity, the more sensitive the bond price is to shifts in the yield. Lengthening maturities may increase the sensitivity of the domestic yield curve to global financial conditions. According to Bertaut et al. (2023, p. 3):

> "Emerging market sovereigns have joined the trend of borrowing at longer maturities taking advantage of yield chasing behavior set off during the low-for-long period of monetary policy. While issuing longer maturity bonds mitigates rollover risk for the borrowers, longer maturity bonds come with greater duration

risk for the investor whereby a given yield change is associated with a larger percentage price change. Fluctuations in market values due to duration risk, rather than traditional vulnerabilities due to currency mismatch or maturity mismatch, have taken center stage in market condition dynamics".

At the same time, investors become more sensitive to exchange rate fluctuations in countries where they hold a larger proportion of locally denominated securities, which can amplify financial instability in those countries. Duration risk faced by global investors with investments in $S financial assets is another channel of transmission of global financial conditions to the domestic economy, even when the EMEs' borrower has overcome original sin[*****]. As for the discussion of the currency hierarchy in section 3.1, we should consider that valuation variation generated by changes not only in exchange rates but also in asset prices (equities, bonds) can still be higher when we consider the duration risk associated with a greater share of locally denominated securities with higher duration in the global investors' portfolio. Such factors, combined with the lower liquidity premium of $S compared to $N may obligate EMEs to offer even higher monetary returns to make global investors hold their assets[†††††]. As for policy effects in EMEs, the fluctuations in portfolio flows and nominal yields that follow the ups and downs of the exchange rate can pose difficulties to the macroeconomic management of these economies[‡‡‡‡‡].

All these new trends in domestic and international financial systems make the mapping of EMEs' external vulnerabilities much more complex as analyzed in the next section by using a balance sheet analysis.

[*****] According to Bertaut et al. (2023, p. 49), investors do not pre-hedge the currency risk when entering the local currency bond market as they aim to benefit from a stronger local currency even as the yields fall.

[†††††] In this connection, Shin (2023, p. 337) concludes that "those countries whose bonds are more sensitive to the fluctuations of the broad dollar index tend to pay higher nominal yields".

[‡‡‡‡‡] We briefly explore this point in the conclusion, but it is beyond the scope of this paper to go into this issue in depth. For more on this issue, see Paula et al. (2017).

4. The metamorphosis of external vulnerabilities: A balance sheet analysis

This section applies the balance sheet analysis to assess how EMEs' vulnerability to external financial shocks has changed over the periods of financial internationalization and financial globalization.

Drawing on multiple ancestries – comprising scholars such as Stützel (1978) and especially Minsky (1986) - scholarship on balance sheet methodology has developed in parallel, mostly outside the mainstream, in multiple academic fields – for instance, Post Keynesianism (Godley & Lavoie, 2007)[§§§§], historical central banking research (Bindseil 2004), the Money View (Mehrling 2020), International Political Economy (IPE) under the label of critical macro-finance (Gabor, 2020; Dutta et al., 2020; Murau, 2020), development economics (Nitsch, 1999), and within the BIS (Aldasoro et al., 2020).

Such methodology allows for a monetary analysis in which the disposition over liquidity, being for precautionary or for speculative purposes, is at the center. It is, thus, highly suitable to model a Keynesian view of financial processes resulting from a series of transactions among bank-like institutions which make and take payments from one another. For instance, Post-Keynesian Stock Flow Consistent models provide a simplified representation of real-world institutional configurations and feed them with statistical data to analyze and predict variables such as prices, quantities, or interest rates.

Our application of balance sheet methodology does not have as primary goal to be calibrated with quantitative data. It aims to provide an analytical framework for conceptualizing the hierarchical interdependencies of the global monetary and financial system, which can be applied for future empirical research on specific periods and/or country cases (see section 5).

Inspired by Minsky's approach on agents' portfolio decisions, our framework allows consists of balance sheets of stylized agents - such as central banks, commercial banks, investors, firms and the treasury - in a Northern and a Southern country, interlocked through the financial contracts they hold as assets and liabilities in Northern and Southern currencies. This adds up to a fully self-referential system in which each asset is another agent's liability. Given the difference in the liquidity premium between Northern and Southern currencies, the interconnectedness of positions makes explicit how: (i) changes in the yields and/or in the expected value of both

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[§§§§] For instance, Post-Keynesian Stock Flow Consistent models provide a simplified representation of real-world institutional configurations and feed them with statistical data to analyse and predict variables such as prices, quantities, or interest rates.

currencies and assets impacts agents' positions (for instance, through exposure to currency mismatches); (ii) portfolio reallocations by northern agent's spill over on Southern agents' balance sheets.

4.1 Traditional vulnerability under financial internationalization: Balance sheet effects from original sin

During the capital flow boom of financial internationalization (1970s-1980s), the developing countries that would become EMEs in the mid-1980s[******] adopted significant controls on capital flows, except for FDI[††††††] and external loans. External debt had mainly the form of syndicated loans of Northern universal banks operating in the Euromarket, with floating interest rates, long maturities and denominated in Northern currency ($N, i.e., USD) (see arrow 1 in Figure 6 below). This phenomenon of foreign currency-denominated debt has been labelled as '*original sin*' (Eichengreen et al., 2002), reflecting the inability of a country to borrow abroad in its currency (see section 3.2).

As in Southern economies c_S was high and constant in this period due to the lower degree of financial openness, and a_S was stable due to the predominance of fixed exchange rate regimes, international creditors' motivation concentrated on the yield differential ($q_S - q_N$), which had to compensate the liquidity premium differential ($l_N - l_S$) The weight given to this differential in their portfolio decisions decreased during the boom due to the lower liquidity preference.

Although the first post-war capital flow boom was losing speed with mounting debt levels in developing countries, especially in Latin America, the death knell came with the interest rate shock by the Fed in 1979 that led to an increase in q_n. The subsequent rise in the liquidity preference of international creditors triggered a credit crunch in the syndicated loan markets. Sovereigns, domestic banks, state-owned and private firms came under liquidity stress because of maturity mismatch from the shortening of international lending terms, interest rate increases in Southern currencies ($S), and currency devaluations as a result of massive capital outflows.

[******] The term "emerging market" was coined by an economist from the International Financial Corporation (IFC) – a member of the World Bank Group - in 1986 (Chancellor, 1999).
[††††††] For the sake of simplification, we only assess financial flows and do not consider FDI. Against the neoclassical concept of households, here we distinguish between private households as wage earners without net financial wealth and investors who are net wealth owners.

The economic literature started to grasp the nature and explosive implications of original sin-related balance mismatches at some degree after the debt crises especially in Latin America in the 1980s and more systematically after the financial crises in EMEs in Asia and Latin America in the 1990s (i.e. Calvo et al., 2004; Allen et al., 2002).

The main balance sheet effect of original sin is the so-called currency mismatch. Currency mismatch is defined as the mismatch between the currency composition of liabilities and assets where the assets are denominated in domestic currency but liabilities in foreign currency (Goldstein & Turner, 2004). This means for a Southern debtor in N$ that in the case of currency depreciation, the value of debt in $N measured in $S increases while the asset side remains unchanged. It is exactly this mismatch between the two sides of the balance sheet that stemmed from an exchange rate change that stands in the center of the effects of original sin.

In the following, we translate this literature into a balance sheet analysis for the different actors in the Southern economy, along with the stylized balance sheets in Figure 6. The scenario of original sin-caused balance sheet effects is like the one experienced at the end of the 1970s when fixed exchange rate regimes predominated in peripheral countries and external debt was primarily in the form of syndicated loans. When there is an interest rate hike in the $N, with effects on both external debt service and on inter-bank loans (making it more expensive for domestic banks to borrow funds abroad), the Southern central bank has frequently to depreciate S$ to increase net exports, which is the main source of N$ revenues for Southern countries.

In the following, we will go through the effects in the balance sheets related to original sin for each of the relevant Southern actors.

Southern firm:

To finance its production, the Southern firm takes on debt in $S (arrow 1) and $N at lower borrowing costs due to the higher l_N, from the Southern bank (arrow 2), or even directly from the Northern Bank (arrow 3). We assume its income is in $S, i. e. the firm sells its products domestically. The main original sin effect is the currency mismatch, i.e., the jump in the $S value of its $N debt due to the currency depreciation, whereas its income and assets in $S remain unchanged. Moreover, the Southern firm also faces a maturity mismatch effect that captures the impact of an interest rate shock in a specific currency on both short-term financial contracts (which will incur higher debt service costs when roll-over) and contracts with floating interest

rates. In the case of the Southern firm, syndicate loans predominate, and the impact on the debt service cost is immediate due to the floating interest rate and long maturity.[‡‡‡‡‡‡]

Southern bank:

The Southern bank borrows abroad in $N (arrow 4) and lends to a Southern firm at a longer term than the $N debt in $N or $S. If it has lent in $S, it will suffer the negative consequences of currency mismatch. Moreover, it will be affected directly by a maturity mismatch in the case of syndicated loans and also if it has short-term loans in $N that are not rolled over (such as trade credit). If the borrowing Southern firm has problems in serving its $N debt, this may also affect the Southern bank and the quality of its lending portfolio.

Southern State sector:

The Treasury also gets syndicate loans from Northern banks in $N. Thus, like the private actors, the State suffers the consequences of currency mismatch and maturity mismatch.

Southern central bank

The critical vulnerability to a global financial shock for countries tainted with 'original sin' is the limited capacity of the Southern central bank to act as a Lender of Last Resort (LLR) for solvent domestic banks indebted in $N. While the central bank can act as an LLR for domestic financial institutions in its currency – as pointed out by Bagehot's (1873) seminal work (arrow 6) – the central bank's LLR capacity in $N is limited to its FX reserves. This inability to handle $N-related liquidity problems triggers a shift from liquidity to solvency problems in the domestic financial and productive sectors.

Additionally, during the 1980s, Latin American States saw themselves pressured to socialize the costs of external debt through either the treasury or the central bank. This resulted from Northern creditor banks' requirements for obtaining state guarantees when lending to Southern private actors and from government decisions to socialize private losses (Frenkel, 1992, p. 28)[§§§§§§].

[‡‡‡‡‡‡] This effect was particularly important during the debt crisis on developing countries in the 1980s as most syndicate loans had floating interest rates (Libor).

[§§§§§§] Calvo and Frenkel, key authors in analyzing the effects of the Latin American debt crisis, with special reference to Argentina, to describe the balance sheet effects of debt socialization in clear words, more than a decade before the concept of balance sheet effects entered the mainstream economic models: 'Delinking the fortunes of debtor and creditor enterprises through debt socialization transforms the nature of debt and alters its

Figure 6 here

4.2 Increased interconnectedness and new vulnerabilities under financial globalization: 'Original sin redux'

Most EMEs entered the 1990s increasing their financial openness ($c_s\downarrow$) for inflows and outflows, in a process that would continue over the next two decades. This was followed by a shift to flexible exchange rates in the 2000s, the second sub-period of financial globalization. All three capital flow cycles of financial globalization were driven by periods of low global interest rates. However, especially the third sub-period of quantitative easing during the 2010s launched an intensified global 'search for yield'.

The interconnectedness with international financial markets has become much more intensive, diverse and complex compared to the financial internationalization period. The share of cross-border activities increased with the emergence of new agents and the growing use of complex financial instruments, such as derivatives, especially from the 2000s onwards.[*******] All kinds of wealth owners (i.e., institutional investors or money managers, from pension funds to

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risk characteristics without changing its magnitude. In socializing the debt, the government engages in debt-for-debt swaps in which government obligations (like treasury bills) are swapped for the claims that creditor firms and banks hold against [external] enterprises (…) to recapitalize creditor firms and banks. At the same time, the liabilities of debtor firms to other enterprises and banks are transformed into liabilities to the government' (Calvo & Frenkel, 1991, p. 142). In the Argentinean context, Fanelli et al. (1987) outline a scenario where a significant devaluation in 1981 was implemented to address capital outflows and acute external liquidity challenges. This move resulted in substantial balance sheet strain for Argentinean private firms and banks. Consequently, in 1982, a fiscal bailout was initiated, transferring the burden of foreign currency debt to the Argentinean State. This action triggered a profound fiscal crisis, compelling the Argentinean government to enter into an agreement with the IMF.

[*******] For the emergence of new actors, such as financial investors in manyfold forms, see French and Leyshon (2004). The balance sheet analysis in this section supposes an emerging economy with full financial openness and permission for domestic financial transactions in (or denominated in) $N. For the sake of simplicity, it only includes transactions in spot markets, thus excluding financial derivatives.

hedge funds) emerged in Northern as well as Southern countries, with Southern treasuries entering the field as borrowers with cross-border links with these investors.

While busts of capital flows to EMEs are often associated with a $q_{rN}\uparrow$, the GFC and the COVID-19 shock were triggered by a radical increase in uncertainty, resulting in a sharp rise in the liquidity preference of Northern agents and the weight given to the liquidity premium differential ($l_N - l_S$).

For cross-border debt in \$N, we essentially detect the same kind of negative balance sheet effects due to 'original sin' and the limited capacity of the Southern central bank to act as an LLR as in the period of financial internationalization (see section 4.1). Again, Southern debtors in \$N suffer from the problem of currency mismatch that results in debt revaluation expressed in \$S due to currency depreciation, which eventually leads to a situation of insolvency.

Figure 7a displays the effects of original sin redux associated with financial contracts in \$S. Figure 7b considers the effects of both original sin and original sin redux to illustrate the much more complex pattern of balance sheet effects under the conditions of financial globalization, as the COVID-19 shock brought to light.

Figure 7a and 7b here

The increased investment of global investors in securities in \$S appears to be very good news, as it shifts the balance sheet effects of a currency depreciation from Southern borrowers to Northern creditors (arrows 1 and 2 in Figure 7a). Consequently, EMEs' exposure to this kind of external vulnerability declines.

As stressed in section 3.2, the authors of the original sin redux concept (Carstens & Shin, 2019; Hofmann et al., 2020; Bertaut et al., 2023; Shin, 2023) give key insights into the balance sheet effects global investors suffer from when they have invested in assets denominated in EMEs' currencies and the US dollar exchange rate changes. However, these authors give little attention to the balance sheet effects on the different EMEs' actors.

In the following, we present the stylized balance sheet effects only on the main actors of a Southern country, as displayed in Figure 7a: a firm, an investor, a bank, the treasury, and the central bank. In this analytical endeavor, we exclusively focus on transactions in \$S. The net effects on actors will completely depend on the currency composition of their assets and liabilities, i.e. the combination of balance sheet effects related to original sin and to original sin

redux. It is likely that, in an empirical analysis, at least some of these actors may have net gains when the currency depreciates, i.e., firms having net income in foreign exchange from exporting their products while holding predominantly long-term debt in domestic currency. At the same time, these firms may incur even higher losses due to original sin-related balance sheet effects, i.e., an increase in their debt measured in $S, especially when they are indebted in $N and suffer from a currency mismatch. The aim here, however, is not to assess net effects on actors but to analytically isolate the balance sheet effects related to the original sin redux phenomenon to derive the most relevant channels and implications within a Southern economy.

The context is an appreciation of the US dollar (as happened at the beginning of the COVID-19 pandemic; see section 2.3) and/or an increase in the US dollar interest rate that leads to capital flight by global investors. This triggers a depreciation of $S (as dirty floating exchange rate regimes predominate in Southern countries[†††††††]) and a fall in asset prices (such as private and Treasury bonds) due to the sell-off by global investors and the feedback loops to domestic asset prices and the exchange rate[†††††††]. To contain inflation spiraling from currency depreciation, the Southern Central Bank raises the domestic policy rate.

Southern Investor:

[†††††††] After the financial crises of the 1990s, most EMEs adopted a dirty floating exchange rate regime in which the exchange rate is allowed to fluctuate, but the domestic central bank intervenes in the currency market either to curb the exchange rate volatility, to prevent it from trending in an unfavourable direction, or to accumulate foreign exchange reserves. However, the frequency and degree of intervention, as well as its specific objective, have varied across EMEs (BIS, 2013). Ilzetzki et al (2017) provides a comprehensive history of exchange rate arrangements for 194 countries and territories over 1946-2016, and found that the often-cited post-Bretton Woods transition from fixed to flexible arrangements is overstated; regimes with limited exchange rate flexibility remain in the majority.

[†††††††] The financial turmoil experienced by Brazil in 2020 serves as a compelling illustration of the resurgence of the original sin phenomenon: the domestic currency depreciated by 32.2% from March 3, 2020, to May 14, 2020. Concurrently, the IBOVESPA stock exchange index plummeted from 115 points on February 17, 2020, to 63 points on March 23, 2020 (Statista, 2024). Additionally, data from CEPAL reveals a staggering 35.4% decline in foreign capital inflows in 2020 compared to the previous year, amounting to approximately US$24 billion (CNN Brasil, 2024). Many emerging market economies (EMEs) heavily reliant on international investments in their domestic currencies faced similar challenges during the COVID-19 crisis, with Brazil being among the hardest hit. Without the decisive interventions of central banks in advanced economies worldwide, the Brazilian central bank would have been compelled to dramatically increase the policy rate in 2020, resulting in amplified borrowing costs for domestic investors, exacerbating liquidity and solvency concerns.

A Southern investor holding equities (a_a) or fixed income security (q_y) in $S will suffer losses on the asset side of its balance sheet due to the fall in the securities' prices caused by global investors' sell-off (arrows 3 and 4). On its passive side, it might suffer from increasing debt service costs (q_r) if it has accumulated short-term debt in $S that will need to be rolled over at higher interest rates (arrow 5)[§§§§§§§].

Southern Firm:

Under financial globalization, the Southern firm has become financialized (Bonizzi et al., 2020; Horn, 2017), investing in securities in $S (arrow 6). Thus, a Southern firm may suffer losses on its asset side, such as a Southern investor. On its passive side, it might suffer from increasing debt service costs (q_r), if it has accumulated short-term debt in $S (arrow 7).

Southern Bank:

A bank, under the conditions of financial globalization, typically holds credit in $S and other assets on its asset side (arrows 5 and 7), while on its passive side it holds deposits in $S (arrow 8). With asset prices deflating due to fire sales by global investors, the bank can run into maturity mismatch, as deposits can be withdrawn in the short term by its customers, while a new phase of increase in asset prices – associated, for instance, with the return of global investors attracted by lower prices - usually takes a longer time. Such negative effects, however, can be attenuated by the action of the Central Bank as LLR, as detailed below.

Southern Treasury:

We consider a situation where global investors hold a significant amount of Treasury bonds (arrow 1). In this scenario, these bonds will suffer losses on the secondary market (q_y). This will not directly affect the Treasury's balance sheet as usually these bonds have pre-fixed interest rates[********]. However, the Treasury can incur additional costs in rolling over its bonds because the medium and long interest rates will also increase as a result of the higher policy rate and the rise in the sovereign risk that usually happens in stressful times. Even in this case of increased public debt service, its effect may be much smaller than the negative balance sheet effects of

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[§§§§§§§] In financial globalization, investors get on debt to buy securities in search for capital gains greater than the debt service costs.
[********] In contrast, if there are also Treasury bonds indexed to the policy rate, there is a direct negative balance sheet effect for the Treasury as monetary tightening by the Southern Central Bank will raise debt service costs.

original sin (i.e., the rise in the $S value of the Treasury bonds denominated in $N increases due to the currency depreciation).

Southern Central Bank:

Usually, Treasury bonds in $S are the main assets that the central bank holds as they are a vital instrument in open market operations (OMO) (arrow 9)[††††††††]. The Southern central bank may face losses on its asset side due to the fall in these bonds' prices (q_y) triggered by global investors' sell-off if they are mark to market. Also, it may lose FX reserves if it seeks to limit exchange rate depreciation by intervening in the foreign exchange market. Yet, these negative effects might be compensated by the revaluation of the remaining stock of FX reserves when converted in S$ due to the currency depreciation. Both the lower market value of Treasury bonds and the net effect of foreign reserve reduction may incur losses to the central bank, which the treasury may absorb, exercising pressure on the government's fiscal space.[‡‡‡‡‡‡‡‡] But the main gain, compared to original sin effects, is that the Southern central bank keeps its capacity to act as LLR due to the increase in financial contracts denominated in $S.

The net fiscal effect on the public sector (treasury and central bank) depends on the balance between FX reserves (foreign assets) and public external debt: if positive, it generates revenues, and if negative, losses.

However, the public sector might be affected indirectly, as the new generation of balance of payments crisis models argues. This generation emerged after the series of EMEs' financial crises in the 1990s, among them the so-called Asian crisis (see Aghion et al., 2004; Allen et al., 2002; Calvo et al., 2004). Allen et al. (2002), for example, point to the high balance sheet effects spilling over from one sector to others, i. e. from the corporate sector to the financial sector, and from both sectors to the State. The latter may be affected especially by the expectation of a possible rescue action of the private sector, and by this spillover effect the crisis effect growing larger ('snowballing'). Even if these models do not yet refer to the phenomenon

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[††††††††] OMO can be either outright operations (definitive sell or purchase) or repurchase agreements (repos and reverse-repos); see more on this in Bindseil (2004).
[‡‡‡‡‡‡‡‡] The institutional framework governing the relationship between central bank and treasury can take various forms and differs across countries (i. e. Blommestein & Turner, 2013). The IMF sets as 'good practice' the Central Bank transferring gains and losses to the Treasury (Pessoa & Williams, 2012).

of original sin redux, as investments in EMEs' currencies were small back then, they can grasp the effects of deep and complex EMEs' financial integration under financial globalization.

5. **Conclusion**

In this paper, we have asked how new patterns of capital flows under financial globalization influence the external vulnerability of EMEs, considering their peripheral integration in global financial markets. For this, we extended the Keynesian-structuralist concept of currency hierarchy to theoretically grasp the increased relevance of portfolio flows and global investment in EMEs' currencies. We provided a balance sheet analysis inspired by Minsky's framework to systematically assess the metamorphosis of these vulnerabilities.

For the period of financial internationalization, we identify as the main vulnerability the negative effects of the so-called 'original sin' in the balance sheet of Southern agents indebted in Northern currency. For the period of financial globalization, we find that on the one hand, 'original sin' effects have augmented with increased debt volumes especially for the corporate sector. We then use the concept of 'original sin redux' from Carsten and Shin (2019) for global investment in EMEs' currencies. These authors find that the currency mismatch is shifted from EMEs' debtors to global investors. They show empirically, for the period of sharp capital outflows from EMEs at the beginning of the Covid-19 pandemic, that Northern investors reacted to these losses by selling their assets in EMEs' currencies, causing both a fall of EME asset prices denominated in $S and a depreciation of EMEs' currencies.

We take this analysis further and undertake a comparative analysis of the balance sheet effects for the relevant Southern actors, comparing the effects of original sin and original sin redux to grasp the metamorphosis of external vulnerabilities of EMEs under financial globalization.

One key difference between the consequences of original sin and original sin redux is that in the latter case the Southern central bank maintains its capacity to act as an LLR when global investors sell Treasury bonds denominated in $S, ensuing liquidity problems in the domestic financial sector. This might explain the absence of big financial crises in EMEs in the last decade, with the exception of a few countries such as Turkey and Argentina. Additionally,

the accumulation of large FX reserves can help to protect EME against sudden stops of capital inflows and avoid problems of external liquidity that may lead to insolvency.

Moreover, the public sector of the Southern economy is shielded from the direct consequences of currency depreciation, at least for the share of bonds it has issued in $S and which have been purchased by global investors. The treasury may still bear the increased costs of rolling over its bonds due to monetary tightening, and the Southern central bank may be forced to sell part of its FX reserves to curb currency depreciation. However, these losses may be much smaller compared to those associated with the Treasury bonds issued in $N. The overall effects will depend, as for all actors, on the mix regarding the currency denomination of public assets and liabilities.

Our analysis shows that it is the private sector that carries the main burden of the costs associated with global investors' capital flight. Southern firms and investors might suffer losses on both sides of their balance sheets through falling domestic asset prices and increasing costs of domestic debt. At the same time, it is the private sector in EMEs that accumulated large quantities of debt in $N due to its low costs during the booms phases of the capital flow cycles, such as the period of extremely low global interest rates following the global financial crisis. So, these actors are affected in multiple ways: by asset prices deflation when external investors leave, by currency mismatch regarding their debt in $N when the exchange rate depreciates and by maturity mismatch when the costs of their domestic short-term debt go up.

In general, because of more intense financial integration, even domestic transactions in $S (marked in blue in Figures 7a and 7b), before rather isolated from global financial shocks, are now exposed more intensively to the vagaries of the global financial market. In the context of financial internationalization, when the balance sheet effects due to original sin predominate, domestic debt was already exposed to maturity mismatch since EMEs' domestic financial markets were characterized by mostly short-term financial contracts. Now, in addition to these negative liability side effects, losses on the active side of investors and banks due to asset price deflation and lower yields create a higher degree of vulnerability to global changes.

This higher exposure to global financial volatility increases the financial fragility of the private corporate and financial sector of EMEs. This not only limits private investment capacity and thus growth, but also increases the risk of liquidity or even solvency crises amongst EMEs private actors. We know from past crises that a crisis in the private sector may expand to the public sector in several ways. One mechanism is the spillover to the public sector through higher

perceived country risk and thus financing costs. This happens when investors suspect the State might hold contingent liabilities in the form of implicit bailing out guarantees for large domestic banks and firms, as observed for the EMEs' financial crises during the 1990s. A form of socializing private losses may occur in case the State has to bail out domestic banks and especially firms in order to prevent a major financial crisis.

Therefore, the deepening of EMEs' external financial integration has created new and complex patterns of vulnerability. In the context of financial globalization foresee gains and losses for agents in global markets in periods of global turmoil has become more difficult. Moreover, global investors' reactions to shocks have turned increasingly brusque as the abrupt and massive capital outflows from EMEs in the early COVID-19 period laid bare, exposing EMEs to ever-higher volatility of capital flows and exchange rate variations, with all of its damaging effects for growth and sustainable development.

In terms of policy lessons, we echo Hofmann et al. (2022), who call for foreign exchange intervention and capital flow management. However, we emphasize the relevance of a very broad concept of capital flow management to be applied: this brings two issues to the table: first, concerning which indicators policy-makers need to grasp these new complex vulnerabilities; and second, the necessity of containing the adverse impacts of financial globalization with instruments, such as comprehensive regulation of capital flows (see Epstein at al., 2004; and Ocampo, 2012). As Prates and Fritz (2016) argue, in EMEs with a high degree of financial openness and sophisticated domestic financial markets, these markets and cross-border flows are deeply intertwined. Consequently, the traditional analytical division between domestic and external financial regulation is no longer useful or even possible. Prudential financial regulation, capital controls and other regulatory measures (such as the regulation of derivatives markets) should be seen as an essential part of the financial regulatory toolkit governing residents and non-residents, as well as financial and non-financial agents, with respect to their portfolio decisions in foreign and domestic currency. This toolkit should be country-specific, shaped by local context in terms of the degree of financial openness and the financial system's institutional framework.

With our contribution, we also seek to provide a research framework for open new fields for research. This may be a quantitative analysis of the effects of original sin and original sin redux within Southern economies, for example, large-n analysis using firm level data for several countries. The proposed framework also may be useful for country studies to grasp the specific composition of balance sheets in terms of currency denomination and exposure to different

kinds of balance sheet effects of each relevant Southern actors and with this, the relative weight of the old and new external vulnerabilities and their entanglement. Moreover, our idealized balance sheets might serve as an analytical tool for identifying the new complex distribution of gains and losses across borders and the resulting wealth transfers, as well as their cumulative effects on EMEs in periods of global turmoil.

References

Aghion, P., Bacchetta, P., & Banerjee, A. (2004). A Corporate Balance-Sheet Approach to Currency Crises. *Journal of Economic Theory, 119*, 6-30.

Aldasoro, I., Ehlers, T., McGuire, P., & von Peter, G. (2020). Global banks' dollar funding needs and central bank swap lines. *BIS Bulletin, 27*, July.

Allen, M., Rosenberg, C. B., Keller, C., Setser, B., & Roubini, N. (2002). A Balance Sheet Approach to Financial Crisis. *IMF Working Paper 02/210.*

Andrade, R., & Prates, D. M. (2013). Exchange rate dynamics in a peripheral monetary economy. *Journal of Post Keynesian Economics, 35*(3), 399-416. DOI: 10.2753/PKE0160-3477350304

Akyüz, Y. (2011). Capital flows to developing countries in a historical perspective: Will the current boom end with a bust? *South Center Research Paper, 37*, March.

Akyüz, Y. (2017). *Playing with Fire: Deepened Financial Integration and Changing Vulnerabilities of the Global South.* Oxford University Press. Oxford.

Akyüz, Y. (2019). External balance sheets of emerging economies: Low-yielding assets, high-yielding liabilities. *PERI Working Papers Series, 475*, April.

Bagehot, W. (1873). *Lombard Street: A description of the money market.* Henry S. King and Co.

Bertaut, C., Bruno, V., & Shin, H. S. (2023). Original sin redux: role of duration risk. *BIS Working Papers 1109*, July.

Bindseil, U. (2004). *Monetary policy implementation. Theory, past and present.* Oxford University Press, Oxford.

BIS (2013) Market volatility and foreign exchange intervention in EMEs: what has changed? *BIS Papers No 73.*

Blommestein, H., & Turner, P. (2013). Interactions between sovereign debt management and monetary policy under fiscal dominance and financial instability. *BIS Papers No 65.*

Bonizzi, B., Kaltenbrunner, A., & Powell, J. (2019). Subordinate financialization in emerging capitalist economies. In P. Mader, D. Mertens, & N. van der Zwan (Eds.), *The Routledge International Handbook of Financialization* (pp. 177-187). Routledge.

Brunnermeier, M. K., Nagel, S., & Pedersen, L. H. (2008). Carry trades and currency crashes. *NBER Working Paper, n. 14473*, Nov.

Calvo, G., & Frenkel, J. A. (1991). Credit markets, credibility, and economic transformation. *Journal of Economic Perspectives, 5*(4), 139-148.

Calvo, G., Izquierdo, A., & Mejia L.F. (2004). On the empirics of sudden stops: The relevance of balance-sheet effects. *NBER Working Paper, 10520*, May.

Carstens, A., & Shin, H. S. (2019). Emerging markets aren't out of the woods yet. *Foreign Affairs, March 15.*

Chancellor, E. (1999). *Devil Take the Hindmost: A History of Financial Speculation.* New York: Penguin Book Ltd.

Chesnais, F. (1996). Introduction Générale. In F. Chesnais (Ed.), *La Mondialisation financière: Genèse, coût et enjeux* (pp. 9-29). Syros.

CNN Brasil (2022). Investimento estrangeiro no Brasil atinge pior patamar dos últimos 12 anos, https://www.cnnbrasil.com.br/economia/investimento-estrangeiro-no-brasil-atinge-pior-patamar-dos-ultimos-12-anos/, access in 04/04/2014

Cormier, B., & Naqvi, N. (2023). Delegating discipline: how indexes restructured the political economy of sovereign bond markets. *The Journal of Politics, 85*(4), 1501-1515.

De Grauwe, P., & Grimaldi, M. (2006). *The exchange rate in a behavioral finance framework.* New Jersey: Princeton University Press.

Dutta, S., Kremers, R., Pape, F., & Petry, J. (2020). Critical macro-finance. An introduction. *Finance and Society, 6*(1), 34–44. DOI: 10.2218/finsoc.v6i1.4407

Dymski, G., & Pollin, R. (1992). Hyman Minsky as hedgehog: The power of the Wall Street paradigm. In S. Fazzari & D. Papadimitriou (Eds.), *Financial conditions and macroeconomic performance* (pp. 27-61). M.E. Sharpe.

Eichengreen, B., & Hausmann, R. (1999). Exchange rates and financial fragility. In *New Challenges for Monetary Policy*, proceedings of the economic policy symposium sponsored by the Federal Reserve Bank of Kansas City in Jackson Hole, pp 319-67.

Eichengreen, B., Hausmann, R., & Panizza, U. (2002). Original sin: The pain, the mystery and the road to redemption [Paper presentation]. *Currency and Maturity Matchmaking: Redeeming Debt from Original Sin*, Inter-American Development Bank, Washington D.C, November.

Eichengreen, B., Hausmann, R., & Panizza, U. (2022). Yet it endures: The persistence of original sin. *CID Faculty Working Paper, 420*, November.

El-Erian, M. (2023). Why passive investing makes less sense in the current environment. *Financial Times, 25 January.*

Epstein, G., Grabel, I., & Jomo, K.S. (2004). Capital management techniques in developing countries: An assessment of experiences from the 1990s and lessons for the future. *G-24 Discussion Paper No. 27*, Geneva, UNCTAD.

Fanelli, J.M., Frenkel, R., & Winograd, C. (1987). "Country Study 12: Argentina". Stabilization and Adjustment Policies and Programmes. New York: World Institute for Development Economics Research – WIDER.

Fontana, G., Pitelis, C., & Runde, J. (2019). Financialization and the new capitalism? *Cambridge Journal of Economics, 43*(4), 799–804. DOI: 10.1093/cje/bez029

French, S., & Leyshon, A. (2004). The New, New Financial System? Towards a Conceptualization of Financial Reintermediation. *Review of International Political Economy, 11*(2), 263–288.

Frenkel, R. (1992). Adjustment and stabilization: Review of some Latin American experience. Inn: Oliveira, J.C. &. Fawsett, C. (eds.): *Latin America: Facing the Challenges of Adjustment and Growth, Volume 1.* The Economic Development Institute of The World Bank, p. 19-48.

Fritz, B., Prates, D., & Paula, L.F. (2018). Global currency hierarchy and policy space: A framework for peripheral economies. *Intervention: European Journal of Economics and Economic Policies, 15*(2), 208-218. DOI: 10.4337/ejeep.2018.02.11

Gabor, D. (2020). Critical macro-finance. A theoretical lens. *Finance and Society, 6*(1), 45–55. DOI: 10.2218/finsoc.v6i1.4408

Godley, W., & Lavoie, M. (2007). *Monetary Economics. An integrated approach to credit, money, income, production and wealth.* Palgrave Macmillan.

Goldstein, M., and Turner, P. (2004): Controlling currency mismatches in Emerging markets. *Institute for International Economics.* Columbia University Press, Washington, DC.

Guttman, R. (2016). *Finance led capitalism: Shadow banking, re-regulation, and the future of global markets.* Palgrave McMillan.

Hannan, S.A. (2018). Revisiting the determinants of capital flows to emerging markets—A survey of the evolving literature. *IMF Working Paper, WP/18/214*, September.

Hofmann, B., Shim, I., & Shin, H.S. (2020). Emerging market economy exchange rates and local currency bond markets amid the COVID-19 pandemic. *BIS Bulletin, 5*, April.

Hofmann, B., Patel, H., & Wu, S.P. (2022). Original sin redux: a model-based evaluation. *BIS Working Papers, 1004*, February.

Horn, L. (2017). The Financialization of the Corporation. In G. Baars & A. Spicer (Eds.), *The Corporation: A Critical, Multi-Disciplinary Handbook* (pp. 281-290). Cambridge: Cambridge University Press. DOI:10.1017/9781139681025.017

Horn, S., Reinhart, C. M., & Trebesch, C. (2019). China's overseas lending. *NBER Working Paper 26050*, July.

Ilzetzki, E., Reinhart, C.M. & Rogoff, K.S. (2017). Exchange arrangements entering the 21st Century: Which anchor will hold? *NBER Working Paper* 23134, February.

IMF (2019). *Global Financial Stability Report, (Report October 2019).* Link

IMF (2022). *EM Local Currency Bond Holdings Monitor, Global Markets Analysis, November 30.*

Kaltenbrunner, A. (2015). A post Keynesian framework of exchange rate determination: a Minskyan approach. *Journal of Post Keynesian Economics, 38*(3), 426-448. DOI:10.1080/01603477.2015.1065678

Kaltenbrunner, A. and Paincera, J.P. (2015). Developing countries' changing nature of financial integration and new forms of external vulnerability: the Brazilian experience. *Cambridge Journal of Economics,* 39(5), 1281-1306. https://doi.org/10.1093/cje/beu038

Krippner, G. (2005). The financialization of the American economy. *Socio-Economic Review, 3*, 173-208. DOI: 10.1093/SER/mwi008

Lane, P.R. & Milesi-Ferretti, G.M. (2018). The external wealth of nations revisited: International financial integration in the aftermath of the global financial crisis. *IMF Economic Review 66*, 189-222. DOI: 10.1057/s41308-017-0048-y

López, G.G. & Stracca, L. (2021). Changing patterns of capital flows. *CGFS Papers 66*, Committee on the Global Financial System, Bank of International Settlements.

Mayer, J. (2019). Returns on external balance sheets and the currency hierarchy [Unpublished manuscript].

McKinsey Global Institute. (2017). *The New Dynamics of Financial Globalization.* (Report August).

Mehrling, P. (2020). Payment vs. funding. The law of reflux for today. *Institute for New Economic Thinking Working Paper, 113*, April. DOI: 10.36687/inetwp113

Milesi-Ferretti, G.M. (2022). *The external wealth of nations database.* Retrieved September 04, 2022.

Minsky, H. (1982). *Can 'it' happen again?* M.E. Sharpe.

Minsky, H. (1986). *Stabilizing an unstable economy.* Yale University Press.

Murau, S. (2020). *A macro-financial model of the Eurozone architecture embedded in the global offshore US-dollar system.* GEGI Study Global Development Policy Center, Global Economic Governance Initiative (GEGI), Boston University. DOI: 10.2312/iass.2020.041.

Nitsch, M. (1999). Vom Nutzen des monetär-keynesianischen Ansatzes für Entwicklungstheorie und -politik. In R. Schubert (Hg.), *Neue wachstums- und außenhandelstheorie.* (pp. 183-214) Duncker & Humblot.

Ocampo, J.A. (2012), The case for and experience with capital account regulations. In Gallagher, K. et al (ed). *Regulating Global Capital Flows for Long-Run Development.* Boston, Frederick S. Pardee Center for the Study of the Longer-Rate Future.

OECD. (2020). *Covid-19 and global capital flows.* Retrieved August 23, 2020.

Paula, L.F., Fritz, B. & Prates, D. (2017). Keynes at the periphery: Currency hierarchy and challenges for economic policy in emerging economies. *Journal of Post Keynesian Economics, 40*(2), 183-202. DOI: 10.1080/01603477.2016.1252267

Pessoa, M. & Williams, M. (2012). *Government cash management: Relationship between the Treasury and the Central Bank.* IMF, Technical Notes and Manuals.

Prates, D., and Fritz, B. (2016). Beyond capital controls: The regulation of foreign currency derivatives markets in South Korea and Brazil after the global financial crisis, in: *CEPAL Review 118, April 2016*, 183-201.

Prates, D., Fritz, B. & Paula, L.F. (2023). Frontier-market economies as a new group of the financial periphery: Patterns and transmission channels of global shocks. *European Journal of Economics and Economic Policies: Intervention, 15*(2), 208-218. DOI:10.4337/ejeep.2023.0106

Ramos, R.A. (2019). A Minskyan account of emerging currencies dynamics. *Journal of Post Keynesian Economics, 42*(4), 638-661. DOI: 10.1080/01603477.2019.1640066

Shin, H.S. (2023). Overcoming 'original sin' to secure policy space. *Oxford Review of Economic Policy 39*, 333-340. DOI: 10.1093/oxrep/grad018

Statista (2024), https://www.statista.com/statistics/1045027/brazil-ibovespa-stock-market-index, access in 04/04/2024

Stiglitz, J., & Ocampo, J.A. (Eds.). (2008). *Capital market liberalization and development.* Oxford University Press.

Studart, R. (2006). Integrating uneven partners: The destabilizing effects of financial liberalization and internationalization of Latin American economies. In M. Vernengo (Ed.), *Money integration and dollarization* (pp. 176-197). Edward Elgar.

Raddatz, C., Schmukler, S. L. and Williams, T. (2017). International asset allocations and capital flows: the benchmark effect, *Journal of International Economics, 108*(C), 413–430.

UNCTAD. (2019). *Managing capital inflows to reduce resource transfer from developing to developed countries.* UNCTAD Policy Brief No.17, December.

UNCTAD. (2020). *Trade and Development Report (Report September).*

World Bank. (2020). *World Bank Open Data by Indicator.* Retrieved April 04, 2020.

World Bank (2020). *Global Economic Prospects (Report January).*

World Bank (2023). *International Debt Report (Report December).*

Figures and Tables

Figure 1. Global external assets (left) and external liabilities (right)* (US$ billion)
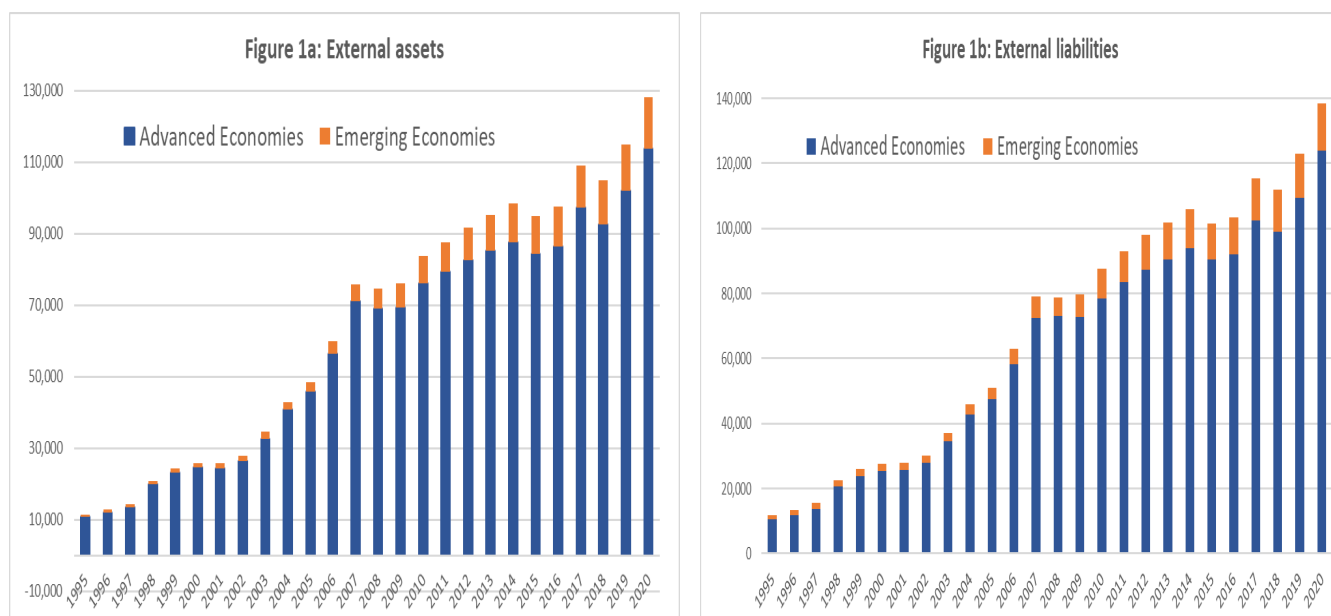
Source: Authors' elaboration with data from Milesi-Ferretti (2022).

Note: (*) Major EMEs: Argentina, Brazil, China, Indonesia, India, Mexico, Poland, Thailand, Turkey and Russia; Major AEs: Australia, Canada, Euro Area, Japan, Korea, Switzerland, United Kingdom, United States and Taiwan
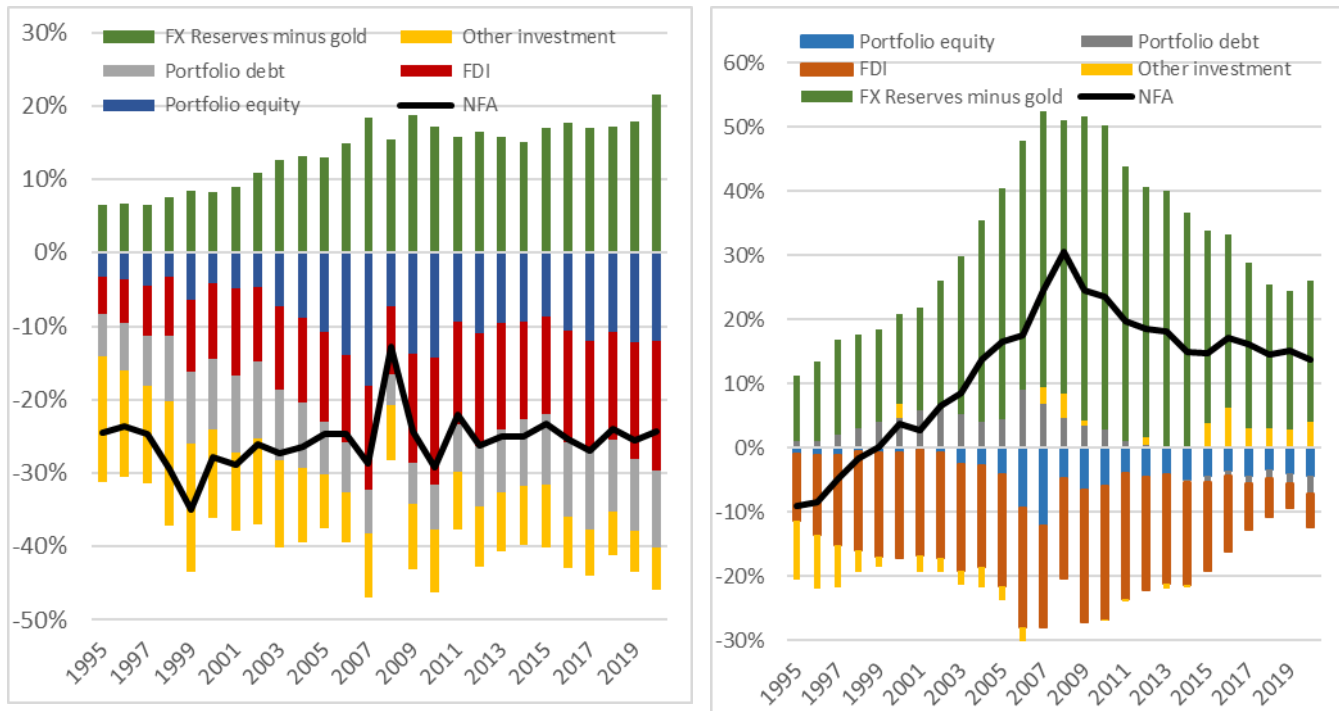
Figure 2. External liabilities (left) and external assets to GDP (right): Major EMEs* (percentage) – 1995-2020
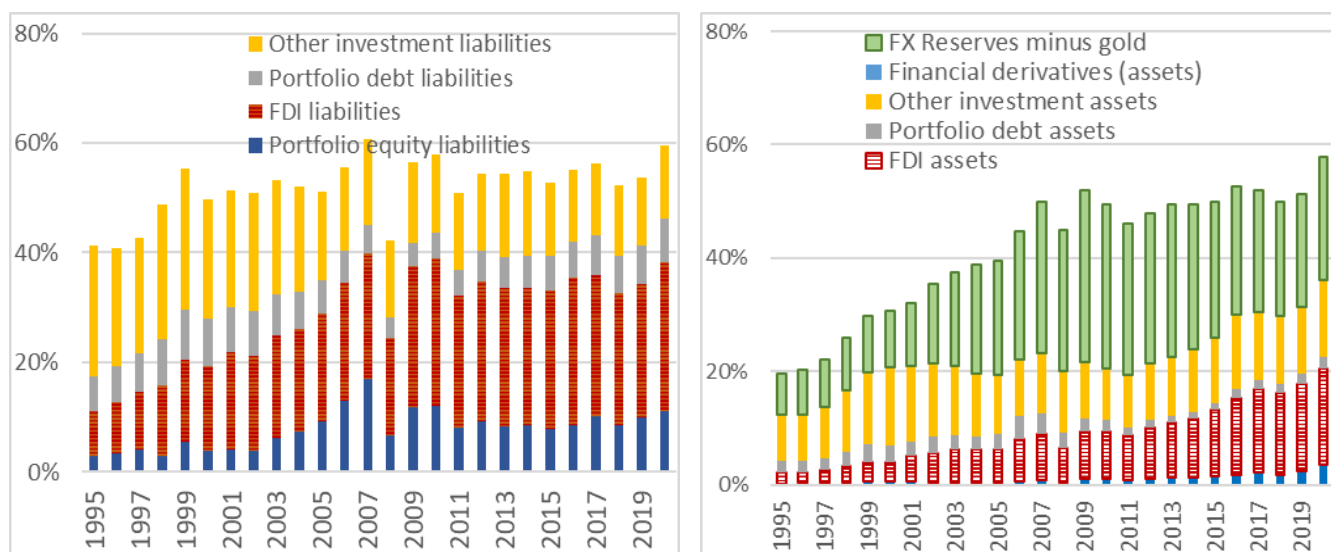
Source: Authors' elaboration with data from Milesi-Ferretti (2022).

Note: see Figure 1

Figure 3. Net external position: Major EMEs* (without China, left) and China (right) – as
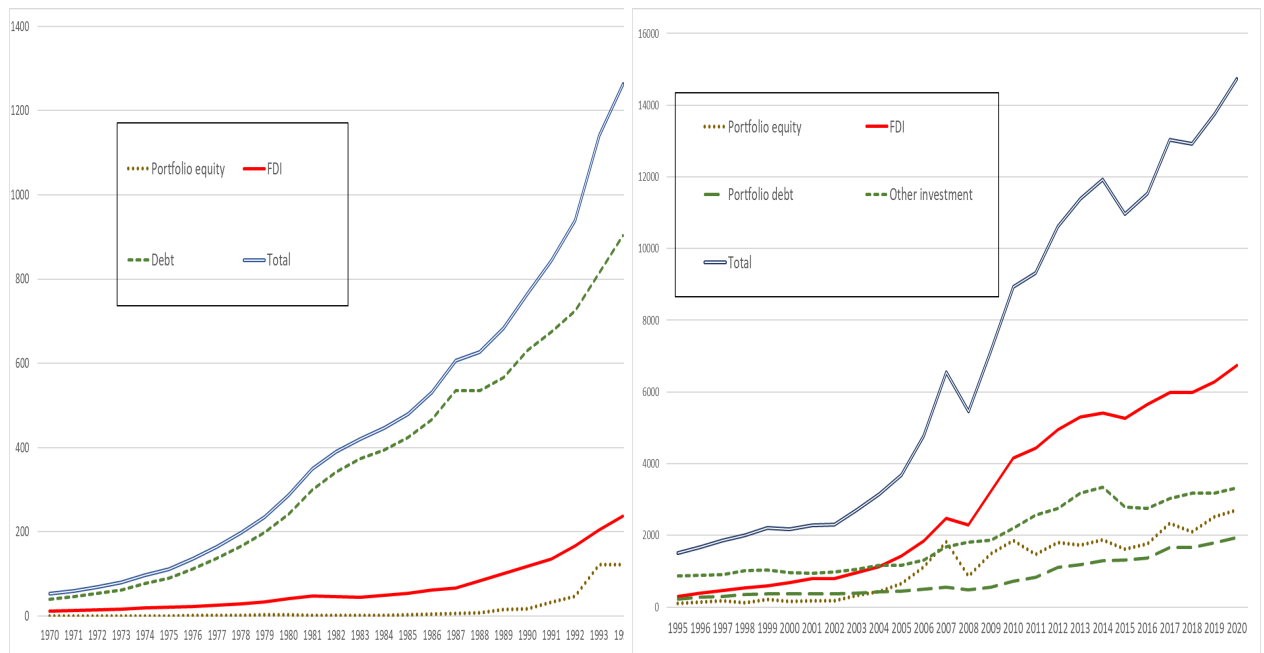percentage of GDP) – 1995-2020

Source: Authors' elaboration with data from Milesi-Ferretti (2022).

(*) Argentina, Brazil, Indonesia, India, Mexico, Poland, Thailand, Turkey and Russia.

Note: Net external position = external assets minus external liabilities

Figure 4. External liabilities of major emerging economies* – 1970-1994 (a) and 1995-2020 (b) (US$ billion)

Source: Authors' elaboration with data from Milesi-Ferretti (2022).

Note: (i) Major emerging economies: Argentina, Brazil, China, Indonesia, India, Mexico, Poland, Thailand, Turkey and Russia; (ii) On the left graph: debt = other investments plus portfolio debt.

Figure 5. Net portfolio outflows from selected EMEs* – US$ billion (left) and exchange rate
(US$/local currency; 100 = 2 Jan.), January-August 2020 (right)
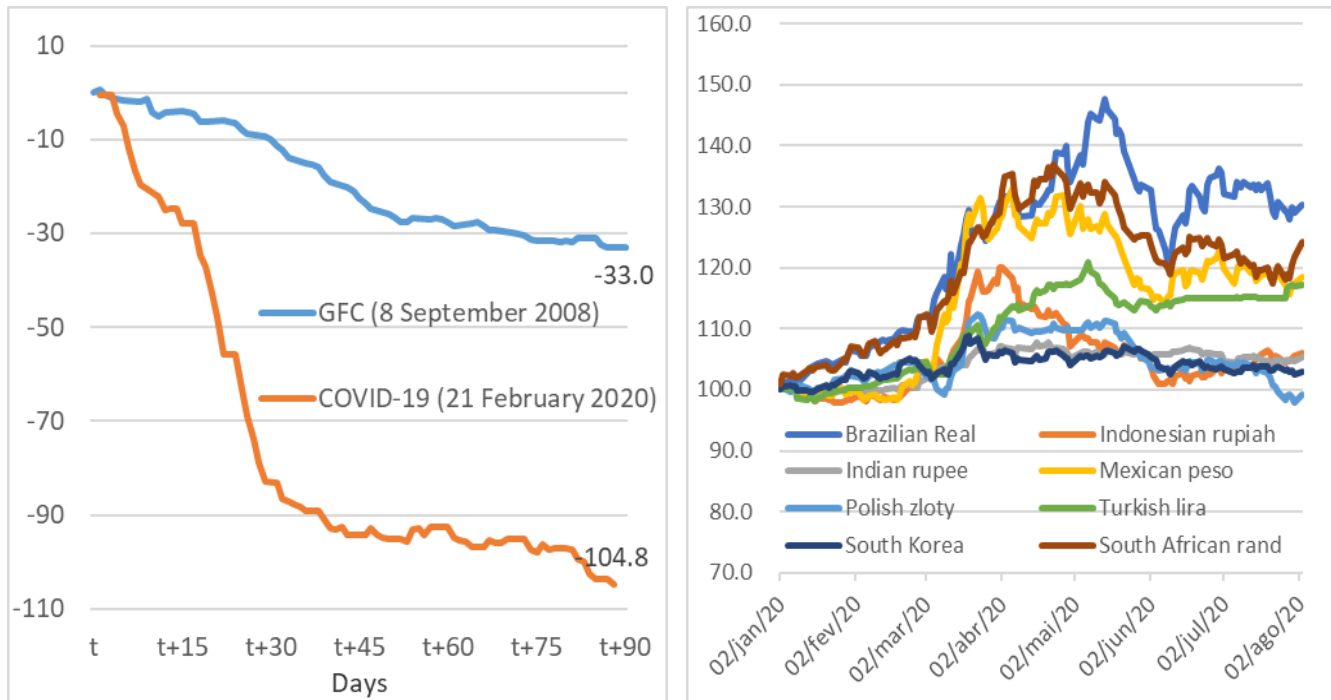
Source: UNCTAD secretariat calculations based on IFF Daily Emerging Market Portfolio database

(*) Selected: Brazil, China, India, Indonesia, Mexico, Pakistan, Philippines, Qatar Republic of
Korea, Saudi Arabia, Sri Lanka, South Africa, Thailand, Turkey, and Vietnam.
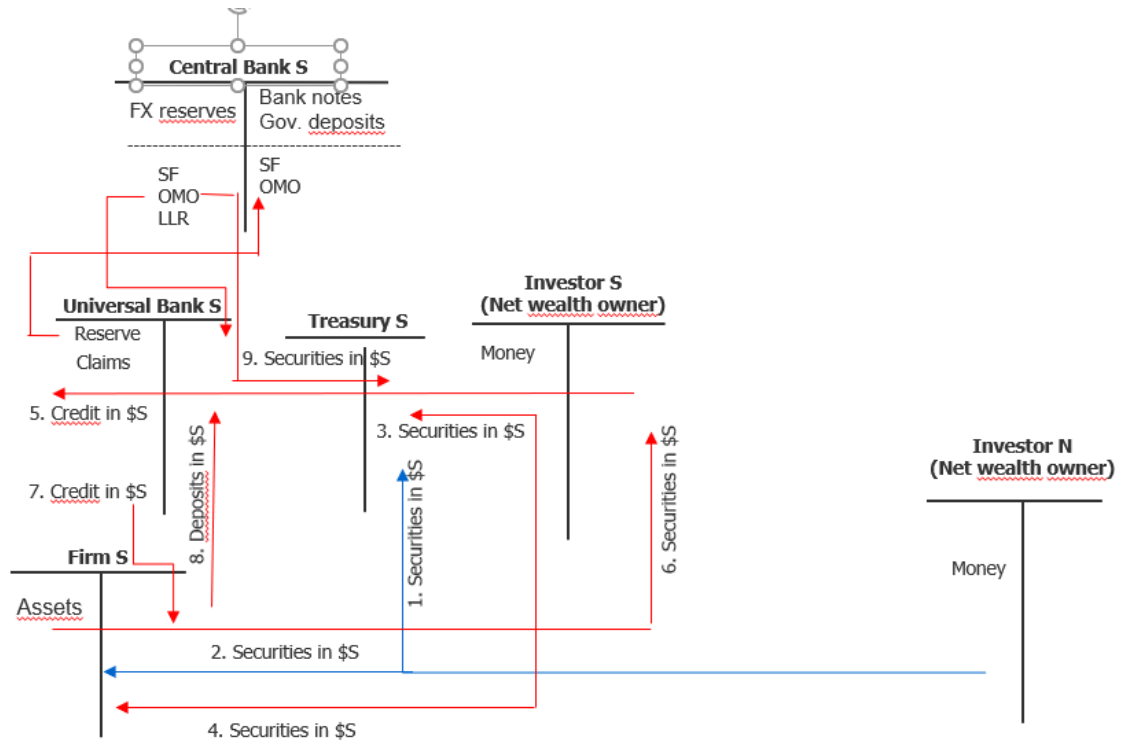
Figure 6. Balance sheet effects in Southern economy from original sin

under financial internationalization
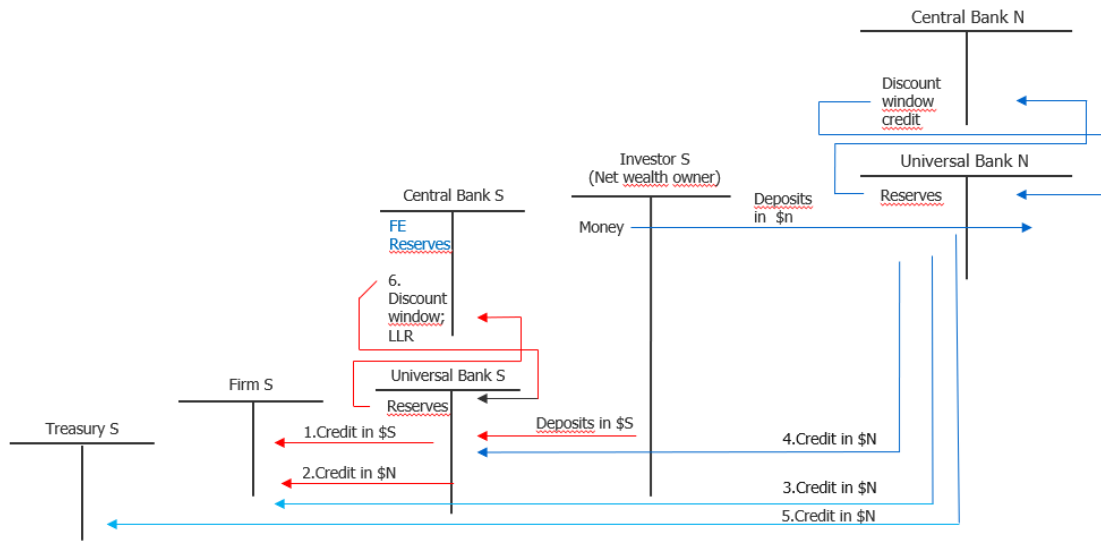
Source: own compilation, loosely based on Bindseil (2004), Nitsch (1995)
Notes: LLR = Lender of Last resort
Red: domestic transactions; blue: cross-border transactions

Figure 7a. Southern economy under financial globalization:

Balance sheet effects of original sin redux

Source: own compilation, loosely based on Bindseil (2004), Nitsch (1995)
Notes: SF = Standing Facilities; OMO = Open Market Operations; LLR = Lender of Last resort
Red: domestic transactions; blue: cross-border transactions

Figure 7b. Southern economy under financial globalization:

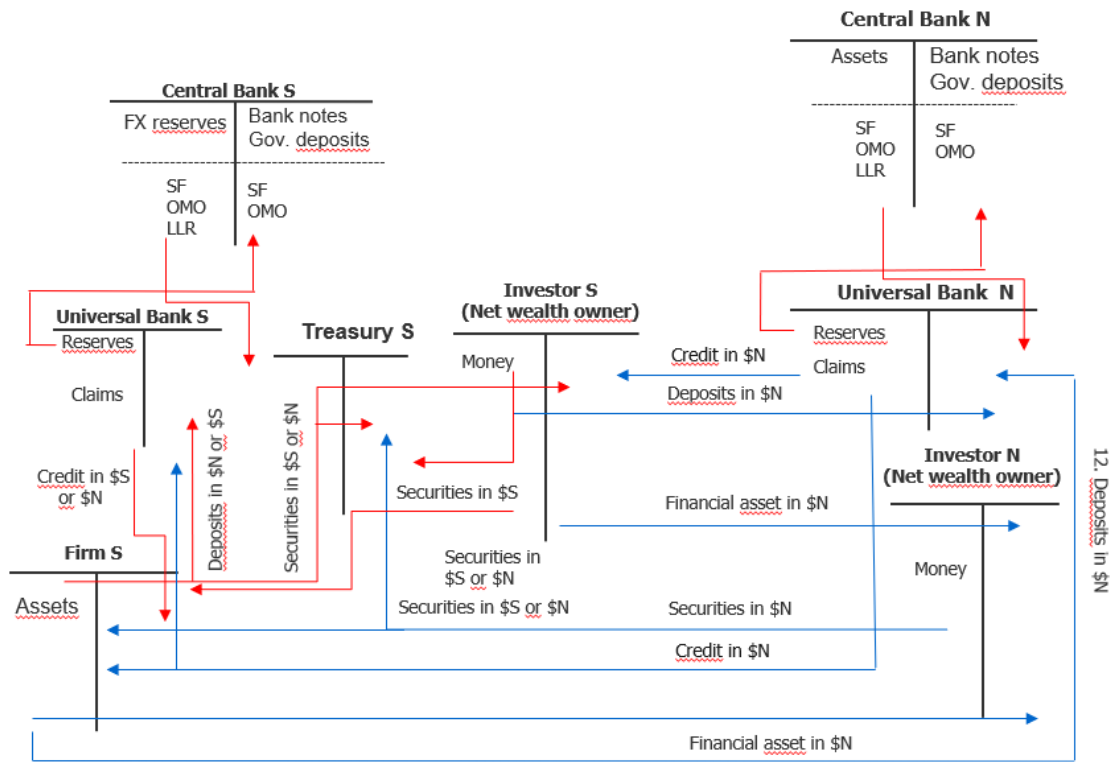Balance sheet effects of original sin and original sin redux

Source: own compilation, loosely based on Bindseil (2004), Nitsch (1995)
Notes: SF = Standing Facilities; OMO = Open Market Operations; LLR = Lender of Last resort
Red: domestic transactions; blue: cross-border transactions

Table 1. Returns, yields and capital gains and losses of EMEs and AEs(percentage)

	Yield*			Capital gains/Losses**			Total returns***		
	Assets	Liabilities	Differential	Assets	Liabilities	Total	Assets	Liabilities	Differential
2000-2016									
EMEs	3.1	5.7	-2.6	-1.0	-1.7	-2.7	2.1	7.4	-5.3
AEs	3.5	2.7	0.8	2.1	-1.3	0.8	5.6	4.0	1.6
2000-2007									
EMEs	3.3	5.9	-2.6	1.3	-5.3	-4.0	4.6	11.2	-6.6
AEs	4.3	3.4	0.9	4.9	-2.8	2.1	9.2	6.2	3.0
2008-2016									
EMEs	3.0	5.4	-2.4	-3.1	1.4	-1.7	-0.1	4.0	-4.1
AEs	2.8	2.0	0.8	-0.5	-0.1	-0.6	2.3	2.1	0.2

Source: Akyüz (2019, p. 66).

Note: (*)   Yields (dollar rates) on gross assets and on gross liabilities

(**)   Capital gains and losses result from changes in assets prices and exchange rates

(***) Sum of yield and capital gains/losses

Table A1. Phases of the metamorphosis of external vulnerabilities

Features	Financial internationalization (1970-80s)	Financial globalization		
		1990s	**2000s to GFC**	**Post-GFC to 2020**
Stage of financial liberalization in EME	Low	Liberalization ↑↑	Liberalization ↑	Liberalization ↑
Exchange rate regime	Fix, but adjustable	Fix/semi-fix	Flexible with dirty floating	Flexible with dirty floating
Currency denomination for public / private debt	All international debt in $N	Bond issuance in $N (public and private); starting portfolio investment in sovereign bonds and, mainly, in equity in $S	↑Portfolio investment in equity and, mainly, sovereign bonds in $S; ↑ private debt in $N	Further ↑ in portfolio investment in sovereign bonds in $S and in private debt $N
Balance sheet effects	Original sin	Predominance of original sin	Original sin ↓ Original sin redux ↑	Original sin ↓ Original sin redux ↑↑

Source: Authors' elaboration