

The Fundamental Structure of the International Monetary System

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ABSTRACT

A fundamental function of the International Monetary System is to allocate scarce safe assets across countries. The system is fundamentally asymmetric. Net global safe asset producers are at the center. They enjoy an external premium and face a slack external adjustment constraint. This fundamental characteristic is largely independent of formal exchange rate arrangements (fixed or flexible exchange rates). Global imbalances mutate at the zero lower bound (ZLB) from benign to malign. Away from the ZLB, safe asset scarcity propagates low equilibrium real interest rates via current account surpluses. At the ZLB, safe asset scarcity propagates recessions via current account surpluses. Away from the ZLB, net safe asset suppliers enjoy a premium. At the ZLB, they must absorb a larger share of the global recession.

In a stabilized world, a recession in one part of the world economy is balanced by expanded lending by the depressed country. This finances balance-of-payments deficits of other countries, and enables investment to be maintained. Britain operated such a mechanism in the years before 1914; it was unable to do so after 1929. [Neither the United States] nor France proved able or willing to maintain the system with loans. . . . One reason was that potential borrowers had lost their credit-worthiness. Default, currency depreciation, political coups, but especially falling prices made most countries unattractive risks for loans.

—Charles Kindleberger, *The World in Depression, 1929–1939*

These remarks were originally published in shorter form in the *NBER Reporter* 2016, no. 1, available at <http://nber.org/reporter/2016number1/gourinchas.html>. Most of the research described in this article was done in collaboration with Ricardo Caballero (MIT) and Emmanuel Farhi (Harvard) or H el ene Rey (London Business School).

Anyone looking at recent financial headlines could be forgiven for thinking that the international monetary system is under heavy strains. The People's Bank of China faces severe private capital outflows, a result of the yuan's appreciation in tandem with the US dollar and the slowing down of the Chinese economy. The Bank of Japan is battling persistent deflation by trying to depreciate the yen. The European Central Bank has clearly telegraphed that it, too, would welcome further depreciation of the euro. In the United States, notwithstanding a modest "lift-off" in December 2015, the Federal Reserve is confronted with a global slowdown and a rising dollar. Policy discussions explicitly mention the possibility of negative policy rates in the future. Talks of "currency wars" abound. To understand the current environment, it is helpful to step back and consider the international monetary system circa 1960, during the Bretton Woods era.

The international monetary system then . . .

Back in those days, the international monetary system was relatively simple. Market economies pegged their currency against the US dollar. In turn, the United States maintained the value of its dollar at \$35 per ounce of gold. With the assistance of the International Monetary Fund, countries could obtain liquidity to deal with "temporary" imbalances, but it was incumbent upon them to implement a fiscal and monetary policy mix that would be consistent with a stable dollar parity or, infrequently, to request an adjustment in their exchange rate.

The United States faced no such constraint. The requirement to maintain the \$35 an ounce parity had only minimal bite on US monetary authorities, as long as foreign central banks were willing, or could be convinced, to support the dollar. By design, then, the system was asymmetric, with the United States at its center, a situ-

ation that reflected the country's economic and political strengths in the immediate aftermath of World War II.¹

Not everyone was happy about this state of affairs. Some objected to the special role of the dollar. In 1965, France famously requested the conversion of its dollar reserves into gold, while its minister of finance complained loudly about the United States' "exorbitant privilege" (Aron 1965).² The Bretton Woods regime allowed the United States to acquire valuable foreign assets, so the argument went, because the dollar reserves required to maintain the dollar parity of foreign countries amounted to automatic low-interest, dollar-denominated loans to the United States (Rueff 1961, 126–127, 262, 267–268).

Others worried about the long-term sustainability of the system. As the world economy grew rapidly in the 1950s and 1960s, so did the global demand for liquidity and the stock of dollar assets held abroad. With unchanged global gold supplies, something had to give. This is the celebrated "Triffin dilemma" (1960). In 1968, Triffin's predictions came to pass: faced with a run on gold reserves, the US authorities suspended dollar-gold convertibility. Shortly thereafter, the Bretton Woods system of fixed but adjustable parities was consigned to the dustbin of history. The era of floating rates began.

The international monetary system outside the ZLB: Exorbitant privilege, safe assets, and exorbitant duty

Under the new regime, countries were free to adjust their monetary policy independently. Mundell's "trilemma" required either that market forces determine the value of their currency or that

1. For a discussion of the original Bretton Woods negotiations and especially the exchanges between J. M. Keynes, on the UK delegation, and H. D. White, from the US Treasury, see Steil (2013).

2. For a historical perspective on the exorbitant privilege, see also Eichengreen (2012).

capital controls be imposed (Mundell, 1963). In principle, this environment should be more symmetrical: no more “exorbitant privilege” for the United States since other countries would not be forced to hold low-interest dollar reserves to maintain the value of their dollar exchange rate; no asymmetry in external adjustment between the United States and the rest of the world since exchange rates would now adjust freely; and no Triffin dilemma since dollar liquidity would be decoupled from gold supply.

Yet, recent research illustrates that the era of floating rates shares many of the same structural features as the Bretton Woods regime. Consider the question of the “exorbitant privilege,” defined as the excess return on US gross external assets relative to US gross external liabilities. H el ene Rey and I set out to measure this excess return using disaggregated data on the US net international investment position and its balance of payment. These calculations are often imprecise, given the coarseness of the historical data, but they all point in the same direction: the United States earns a significant excess return which has *increased* since the end of Bretton Woods from 0.8% per annum between 1952 and 1972 to between 2.0% and 3.8% per annum since 1973 (Gourinchas and Rey 2007a).³

A large share of these excess returns arises because of the changing composition of the US external balance sheet over time: as financial globalization proceeded, US investors concentrated their foreign holdings in risky and/or illiquid securities such as portfolio equity or direct investment, while foreign investors concentrated their US asset purchases in portfolio debt, especially Treasuries and bonds issued by government-affiliated agencies, and cross-border loans (see figure 4.1).⁴ The “exorbitant privilege” should be properly understood as a risk premium.

3. See also Gourinchas and Rey (2014). For a more conservative estimate on a shorter time period, see Curcuru et al. (2008).

4. Recent work on the structure of global banking flows helps nuance this picture. For instance, Shin (2012) shows that prior to the financial crisis, foreign banks borrowed dollars

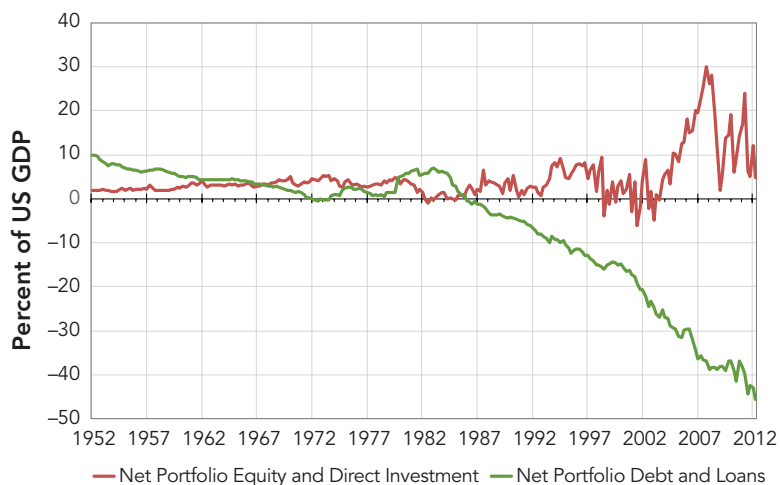


FIGURE 4.1. US External Leverage.

Note: The figure reports US net portfolio equity and direct investment (as a percent of US GDP) and US net portfolio debt and other assets (as a percent of US GDP). Starting in the 1970s, the United States builds a large short position in “safer” assets (portfolio debt and loans) and a large long position in riskier investments (portfolio equity and direct investment).

Source: P-O. Gourinchas and H. Rey, “External Adjustment, Global Imbalances and Valuation Effects,” NBER Working Paper No. 19240, July 2013, and Chapter 10 in *Handbook of International Economics*, Volume 4, 2014, pp. 585–645.

These large and growing US excess returns have first order implications for the sustainability of US trade deficits and the interpretation of current account deficits. As an illustration of the orders of magnitude involved, suppose that the United States has a balanced net international investment position with gross assets and liabilities of 100% of GDP. An excess return of 2% per annum implies that, on average, the United States can run a trade deficit of 2% of GDP while leaving its net international investment position unchanged. More generally, since a large part of realized returns takes the form of valuation gains—due to changes in asset

from US money market funds and invested into riskier US assets such as mortgage-backed securities.

prices and exchange rates—the current account, which excludes nonproduced income such as capital gains, will provide an increasingly distorted picture of the change in a country’s external position.⁵

Consider next the question of external adjustment. The United States still faces a very different process than most other countries. For instance, H el ene Rey and I found that a deterioration of the US trade balance or of its net international investment position is often followed by a predictable depreciation of the US dollar against other currencies. This depreciation may subsequently improve the US trade balance, along the usual channels, but it also improves the return on US financial assets held abroad, thereby making the United States relatively richer (Gourinchas and Rey 2007b).⁶ Most other countries don’t seem to enjoy a similar advantage.⁷ These findings help us understand why markets have taken a somewhat benign view of the United States’ persistent current account deficits since the 1980s (see figure 4.2).

What accounts for this risk premium? In my work with Ricardo Caballero and Emmanuel Farhi, we argued that it reflects a superior capacity of the United States to supply “safe assets”—assets that deliver stable returns even in global downturns. To illustrate the argument, consider a world consisting of only two regions, the United States (U) and the rest of the world (R). The regions may vary in their capacity to produce safe assets because of differences in the soundness of their fiscal policy or in their levels of financial development. They may also differ in their demand for these assets, because of demographic differences, financial frictions, and/or differences in preferences for saving (Caballero et al. 2008).⁸

5. See for instance Obstfeld (2012) and also Gourinchas and Rey (2014) for a range of countries.

6. See also Corsetti and Konstantinou (2012).

7. However, Rogoff and Tashiro (2015) find positive excess returns for Japan between 2001 and 2013.

8. See also Bernanke (2005) and Mendoza et al. (2009).

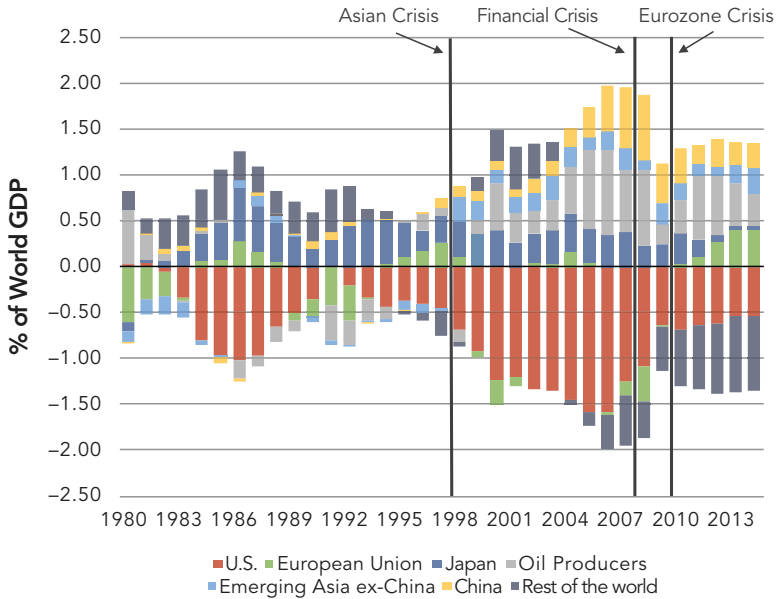


FIGURE 4.2. Global Imbalances.

Note: The graph shows current account balances as a fraction of world GDP. We observe the buildup of global imbalances in the early 2000s, until the financial crisis of 2008. Since then, global imbalances have receded but not disappeared. Notably, deficits subsided in the United States, and surpluses emerged in Europe. Oil Producers: Bahrain, Canada, Iran, Iraq, Kuwait, Libya, Mexico, Nigeria, Norway, Oman, Russia, Saudi Arabia, United Arab Emirates, Venezuela; Emerging Asia ex-China: India, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand, Vietnam.

Source: World Economic Outlook Database, April 2015 and author's calculations.

Suppose U is a natural *net* supplier of these assets. If the two countries were forced to live in financial autarky, unable to borrow from, or lend to, one another, the price of safe assets would be higher in R , and their return lower. If the two countries integrate financially, capital will flow from R to U , as R investors are eager to purchase U 's safe assets. From the perspective of U , two things happen: it runs a current account deficit (foreign capital flows in), and interest rates decrease. By the same logic, suppose R 's risky assets offer a higher autarky return. Then U would also want to invest in these risky assets. The pattern of cross-border *gross* financial

flows and positions would resemble the one we observe in the data with the United States investing in foreign risky assets, issuing safe assets, and earning a risk premium.⁹

This line of research successfully accounts for the simultaneous deterioration in US current account imbalances (figure 4.2), the secular decline in real interest rates (figure 4.3), and the increased leverage of the US external portfolio since the 1980s (figure 4.1). These trends reflect a combination of shocks such as the collapse of the Japanese equity and housing bubble of the early 1990s and the Asian financial crisis of 1997, and trends such as the integration of China into the world economy with low initial levels of financial development and rapidly aging populations in Japan, Germany, and China.¹⁰

The flip side of the “exorbitant privilege” is an increased vulnerability of the United States’ external portfolio to global shocks, which H el ene Rey and I dubbed the “exorbitant duty” (Gourinchas et al. 2010). Indeed, we estimate that, at the peak of the global financial crisis, US valuation losses, corresponding to the valuation gains of the rest of the world, amounted to roughly 14% of US GDP.¹¹ We then build a model in which the United States has more risk-absorbing capacity than the rest of the world. The model replicates the external portfolio structure of the United States, long on risky assets and short on safe ones, the “exorbitant privilege” as well as the “exorbitant duty.” The model has one key implication: willingly or not, global suppliers of safe-haven assets must bear more exposure to global risks. These findings carry important lessons for regional safe-asset providers such as Germany or Switzerland, or for

9. The implications in terms of overall current account surplus or deficit are more complex when both risky and safe assets are traded and depend on the relative scarcities in safe and risky assets. See Caballero et al. (2016).

10. On China, see Song et al. (2011) and Coeurdacier et al. (2015).

11. Gourinchas et al. (2012) explores the geographic distribution of valuation gains and losses during the financial crisis and finds that losses are concentrated in the United States, the Eurozone, and China.

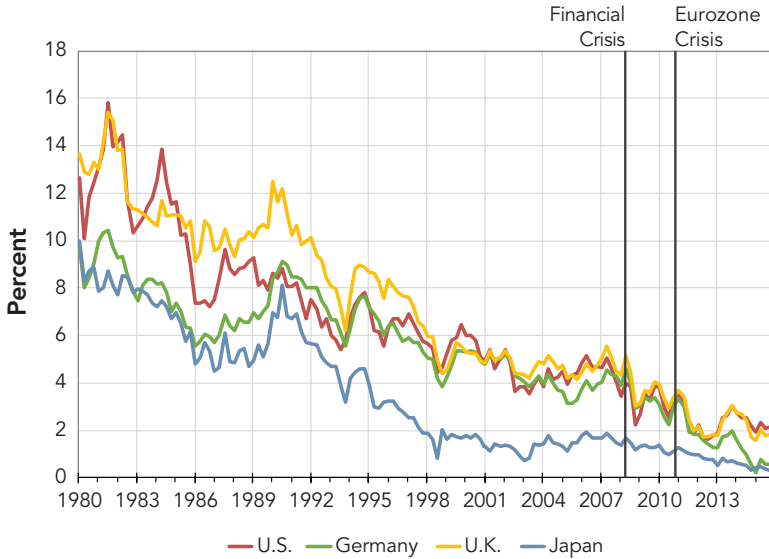


FIGURE 4.3. Global Interest Rates.

Note: The figure reports the yield on ten-year government securities for the United States, Germany, the United Kingdom, and Japan. Following the global financial crisis, long-term yields in many advanced economies declined to historically low levels, while policy rates remained at the ZLB.

Source: Global Financial Database.

future safe-asset providers, be they the Eurozone or China: lower funding costs come with a commensurate increase in the global exposure of their external balance sheet.

The international monetary system at the ZLB: Capital flows and currency wars

With the global financial crisis and its aftermath, we have entered a new phase in the relationship between safe-asset imbalances and capital flows. The crisis triggered a sharp contraction in safe-asset supply and a surge in global safe-asset demand as households and the nonfinancial corporate sector attempted to deleverage. These shocks depressed further equilibrium real

interest rates, pushing policy rates throughout the developed world to the ZLB.¹²

In recent theoretical work, Caballero et al. (2015) argue that the safe-asset scarcity *mutates* at the ZLB, from a *benign* phenomenon that depresses risk-free rates to a *malign* one where interest rates cannot equilibrate asset markets any longer, leading to a global recession.¹³

The fundamental reason is that the decline in output generically reduces asset demand more than asset supply. To understand why, observe that by definition the supply of true safe assets does not change with a decline in output, hence the recession disproportionately affects safe-asset demand. Equilibrium in the asset market is restored by making savers poorer. Our analysis predicts the emergence of potentially persistent global liquidity traps, a situation that characterizes most of the advanced economies today.

Our theoretical model features nominal rigidities, so that the ZLB matters, and a non-Ricardian setting, so that heterogeneity in asset supply and demand affects interest rates. We use this framework to address two questions.

First, we ask: What is the role of capital flows at the ZLB? We find that, everything else equal, at the ZLB capital flows propagate recessions from one country to another. Countries with more severe safe-asset scarcities under financial autarky will experience milder recessions when integrated, and run current account surpluses. Current account surpluses help spread liquidity traps globally.

Second, we ask: What is the role of exchange rates? Here, our theoretical analysis delivers an important result: within a range,

12. Most estimates of the natural rate of interest rate such as Laubach and Williams (2015) or Hamilton et al. (2015) are consistent with a substantial decline in the natural real interest rate. Strictly speaking, the ZLB should be defined as the lowest admissible nominal interest rate. As demonstrated by various central banks in recent months, this lowest admissible nominal interest rate may well be negative.

13. A related analysis is Eggertsson et al. (2015).

the nominal exchange rate becomes indeterminate. The fundamental reason is that exchange rates are indeterminate when countries follow pure interest rate targets, as is the case at the ZLB (Kareken and Wallace 1981). In our environment, this indeterminacy has real consequences: different values of the nominal exchange rate translate into different values of the real exchange rate and therefore affect the relative demand for domestic versus foreign goods. Our theoretical framework provides a powerful way to think about the current lively debate on currency wars. By pursuing policies that lead to a more depreciated exchange rate, a country can shift the burden of the global recession onto its trading partners, a *beggar-thy-neighbor* policy.¹⁴

Our analysis also uncovers a new and important dimension of the “exorbitant duty” faced by safe-asset net suppliers. In a ZLB environment, such nations either have more appreciated currencies, as a result of investors’ flight to safety, or lower funding costs, because their currencies are expected to appreciate in case of global shocks. The first effect tends to worsen the size of the ZLB recession for these countries. The second indicates that they are more likely to hit the ZLB in the first place and experience a recession. Either way, safe-asset suppliers shoulder a larger share of the burden. Yet, because issuance of safe assets anywhere, public or private, is beneficial everywhere, the global provision of safe assets may remain inadequate.

Because our model is non-Ricardian, there is an important role for debt policy. Issuing additional debt (or a balanced budget increase in government spending, or even helicopter drops of money, which are equivalent to debt policy at the ZLB) can potentially address the net shortage of assets and stimulate the economy in all countries, alleviating a global liquidity trap. They are both as-

14. Outside the ZLB, this type of beggar-thy-neighbor policy is unnecessary since each country can reach potential output via traditional monetary policy while letting its currency fluctuate.

sociated with large Keynesian multipliers, which exceed one in the case of government spending. Yet, they also worsen the current account and net foreign asset position of the country undertaking the policy stimulus.

Our baseline model abstracted away from risk, focusing instead on the supply of “stores of value.” Yet the distinction between safe and risky assets is an important one. There is substantial evidence that the relevant asset shortage is a *safe* asset shortage, rather than a *general* shortage of stores of value. For instance, while real returns on *safe* assets have *declined* (see figure 4.3), estimates of the real returns on productive capital in the United States indicate that they are currently high, not low.¹⁵ Similarly, current estimates of the equity risk premium indicate that it is at an all-time high (figure 4.4). How, it is sometimes argued, can the expected risk premium be so high given that price/earnings ratios have recovered from their decline during the crisis, and are high by historical norms?¹⁶ The answer is that price/earnings ratios are high precisely because risk-free interest rates are at historical lows.

The evidence, I would argue, is consistent with a world where investors’ desire to hold safe assets has increased—some of which is undoubtedly the result of investor mandates and increased regulation of the financial sector—while the supply of safe stores of value has declined globally.¹⁷

To model differences in the net supply of safe asset, we allow heterogeneity in risk aversion within and across countries, and in

15. See Gomme et al. (2015). These authors find that pre- and post-tax real returns on business capital and all capital have not been declining. In fact, they are now at the highest level over the past three decades. Their estimated real after-tax return to business capital is 8%.

16. For instance, the Standard and Poor’s 500 price/earnings ratio is close to 25, well below its maximum of 124 in May 2009, but also higher than its historical average of 15.6.

17. The supply of US safe assets may well have increased. For instance, US marketable debt is now in excess of 100% of GDP, up from 64% in 2006. Yet, what matters is the global supply of safe assets. Eichengreen (2016) estimates that the global supply of international liquid assets has declined from 60% of global GDP in 2009 to 30% now.

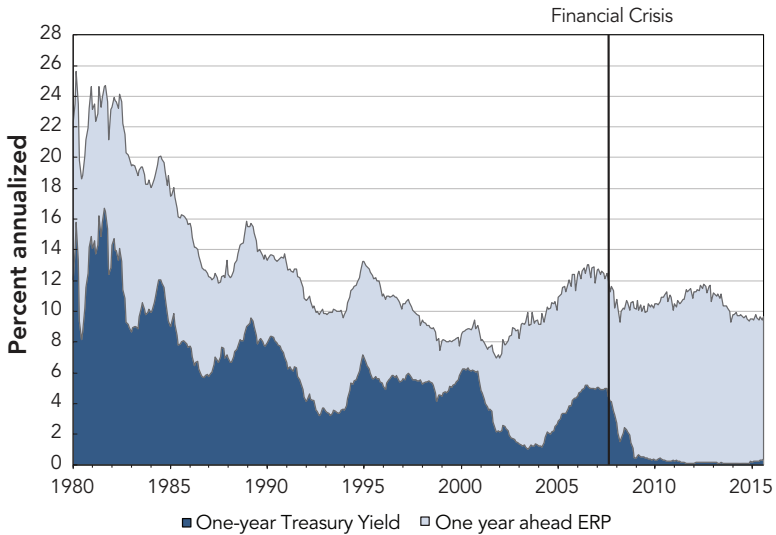


FIGURE 4.4. US Interest Rate and Expected Risk Premium.

Note: The graph shows the one-year US Treasury yield and the one-year expected risk premium (ERP), calculated as the first principal component of twenty models of the one-year-ahead equity risk premium. The figure shows that the equity risk premium has increased, especially since the global financial crisis.

Source: One-year Treasury yield: Federal Reserve H.15; ERP: Duarte and Rosa (2015).

the ability to produce safe assets. By introducing risk and heterogeneity, we are able to account for the increase in the expected risk premium (figure 4.4) and to rationalize the “exorbitant privilege.” In the model, the expected risk premium rises because the decline in output makes all savers poorer, reducing the demand for risky and safe assets altogether. Further, net safe-asset issuers run a permanent current account deficit, financed by the excess return of their (riskier) external assets on their (safer) external liabilities. Moreover, the model gives rise to a risk premium in the uncovered interest rate parity: because the currency of safe-asset net issuers is expected to appreciate in bad times, they face lower interest rates, which makes them more likely to enter the ZLB, even if the rest of the world is able to avoid it.

Conclusion

This recent research illustrates that the *fundamental* structure of the international monetary system may largely transcend formal exchange-rate arrangements, with US dollar assets at the center. Going forward, this raises a number of important questions which current research is exploring. First, a recent and influential line of work is questioning whether floating exchange rates provide much insulation against foreign shocks, a central tenet of Mundell's trilemma (Rey 2013; Farhi and Werning 2014).¹⁸ If they don't, monetary authorities may find that they are even more dependent on the monetary policy "at the center," as was the case during Bretton Woods.

Second, our results point to a modern—and more sinister—version of the Triffin dilemma. As the world economy grows faster than that of the United States, so does the global demand for safe assets relative to its supply (Farhi et al. 2011).¹⁹ This depresses global interest rates and could push the global economy into a persistent ZLB environment, a form of "secular stagnation" (Summers 2015).

One likely response would be the endogenous emergence of alternatives to dollar-denominated safe assets produced either by the private sector or by other countries. This raises the difficult question of how different safe assets can coexist and compete in equilibrium and suggests that the safety of an asset is an equilibrium outcome, one that depends not only on the underlying fundamental characteristics of the asset itself but also on the coordination decisions of investors (Gourinchas and Jeanne 2012).²⁰

Finally, a body of empirical evidence suggests that environments with low interest rates may fuel leverage boom and bust cycles. The vulnerability of emerging and advanced economies alike to these

18. See also Bernanke (2016).

19. See also Obstfeld (2014).

20. See also He et al. (2015).

crises has been amply demonstrated in the past. At the country level, the empirical evidence suggests that self-insurance via official reserve (safe-asset) accumulation is an effective line of defense against leveraged booms (Gourinchas and Obstfeld 2012). But what is optimal at the level of an individual country may be inefficient at a global level if it fuels further the safe-asset scarcity and depresses global interest rates. This question is central to current discussions on global safety nets.

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