Rethinking International Macroeconomic Policy*

Gita Gopinath

Harvard and NBER

October 25, 2017

Abstract: In this paper I make the following ten *remarks* on the topics of exchange rate policy, capital flow management, protectionism, and global cooperation: 1) The gains to exchange rate flexibility are worse than you think; 2) The 'Trilemma' lives on; 3) The U.S. dollar exchange rate drives global trade prices and volumes; 4) Gross capital flows matter as much as net flows, and global banks have internationalized U.S. monetary policy. 5) Emerging markets tilt away from foreign currency to local currency debt reduces their exposure to global risk factors; 6) Low interest rate environments can lead to misallocation of resources and lower productivity; 7) The relationship between global imbalances, reserve accumulation, and currency manipulation is not well identified. 8) Uniform border taxes are not neutral; 9) Trade is not the main driver of earnings inequality, but at the same time policy has failed to address its redistributive consequences. 10) Global coordination of financial regulation is essential alongside country level macroprudential polices. Reserve accumulation and currency swap lines do not substitute for the lender of last resort role of the IMF.

*This paper was prepared for the conference on "Rethinking Macroeconomic Policy IV" organized by the Peterson Institute on International Economics. I acknowledge that this material is based upon work supported by the NSF under Grant Number #1628874. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the views of the NSF. All remaining errors are my own.

The global financial crisis and its aftermath have inspired many new ideas on international macroeconomic policy, though to survey them all is quite near impossible. Some of these ideas, such as the arguments in favor of capital controls, have been discussed at length over the years and so I touch on them only briefly. Instead I focus on a subset of issues on which I believe the 'rethinking' is relatively new both in terms of empirical evidence and theory, not as well absorbed, and maybe not surprisingly, that I have paid more attention to in my own work.

I organize the paper as a set of ten *remarks* on exchange rate policy, capital flow management, protectionism, and global cooperation. On exchange rate policy, described in Section 1, I highlight new thinking on the virtues or lack of it of exchange rate flexibility for emerging markets, on the 'trilemma,' and discuss a new finding on the relationship between the U.S. dollar and global trade. On the topic of capital flow management I make three remarks in Section 2. I first flag the new focus on gross capital flows and its components as opposed to the traditional focus on the current account, and the sharp rise in global banking flows that transmit conventional and unconventional monetary policies in the advanced economies to the rest of the world. Second, I describe the decline of so called 'original sin' in emerging markets with the shift in the currency composition of emerging market sovereign external borrowing away from foreign and towards local currency and how that lowers the sensitivity of sovereign borrowing cost to global shocks. Third, I highlight a perverse cost of low interest rates when financial markets are underdeveloped that is related to the misallocation of resources.

The disenchantment with globalization in the developed world has triggered an appetite for protectionism unlike anything seen since the world wars. There is yet to be a real reversal of globalization but the threat is high and in this context I examine the issues of currency manipulation, uniform border taxes, the challenges to globalization and the evidence on trade protectionism and growth in Section 3.

Lastly, Section 4 addresses issues on global coordination of policies, safety nets, and multilateralism, likely the final frontier of international macroeconomic policy.

1 Exchange Rate Policy

The vast majority of countries in the world have de facto embraced 'limited flexibility' as their exchange rate policy. Ilzetzki et al. (2017) estimate that 'limited flexibility' exchange rate arrangements now describe 80% of all countries and half of world GDP. Following the collapse of Bretton Woods countries have indeed moved away from explicit de jure pegs but then settled into managed floats away from the corner of freely floating exchange rates. There is every reason to believe that for most countries, especially in the developing world, this will continue to be the constrained optimal policy. This leads me to my first remark.

Remark 1 *The gains to exchange rate flexibility are worse than you think*

The classic argument for the optimality of floating exchange rates, dating back to Milton Friedman, goes along the following lines: When prices are sticky, shocks to the economy generate deviations of output from its potential and consequently inefficient recessions and booms. For example a positive productivity shock at home should with flexible prices lower the relative price of home goods relative to foreign goods. When prices are sticky in the producers currency this relative price adjustment however does not happen automatically. In this case a depreciation of the exchange rate can bring about the right relative price adjustment. A depreciation raises the price of imports relative to exports generating a depreciation of the terms of trade and therefore a shift in demand towards domestically produced goods and away from foreign goods. This exchange rate flexiblity closes the output gap and leaves the economy at its first best level. On the other hand, if the exchange rate is fixed then the economy suffers from a negative output gap (output below its potential).

A core piece of this argument that favors flexible exchange rates is the strong comovement of the nominal exchange rate and the terms of trade: A depreciation of the nominal exchange rate should be associated with an almost one-to-one depreciation of the terms of trade (of goods with sticky prices). That is a 1% depreciation of the bilateral exchange rate should be associated with a close to 1% depreciation of the terms of trade.

Boz et al. (2017) find no evidence of this in the data. Using a newly constructed data set of harmonized (non-commodity) annual bilateral import and export unit value and volume

indices for 55 countries covering 91% of world trade for the period 1989-2015, they estimate that a 1% depreciation of the bilateral exchange rate is associated with only a 0.1% depreciation of the bilateral terms of trade (in the year of the depreciation), a coefficient that is not significantly different from zero as reported in Table 1.

This finding while strongly counter to the implications of the Mundell-Fleming producer currency pricing assumptions that drive the case for flexible exchange rates, is consistent with the fact that prices in international trade are not sticky in the producers currency but are sticky in a dominant currency, which is overwhelmingly the dollar. Importantly, the dollar's share in trade invoicing is far out of proportion to the U.S. economy's role as an exporter or importer of traded goods. In a sample of 43 countries, Gopinath (2015) finds that the dollar's share as an invoicing currency is approximately 4.7 times the share of U.S. goods in world imports and 3.1 times its share in world exports. In comparison, the euro invoicing share is more closely aligned with its share in world trade as the corresponding multiple is 1.2 only (Figure 1). For the vast majority of countries the share of their own currency in their own trade with the world is close to zero.

Casas et al. (2017) incorporate this dollar dominance fact into a Keynesian framework and develop a "dominant currency paradigm" (DCP) where trade prices are sticky in dollars and demonstrate that this predicts a stable terms of trade even at annual frequencies. Quite simply, when imports and exports are all priced and sticky in dollars in the short-run the terms of trade which is the ratio of the two should be insensitive to the exchange rate. While invoicing alone does not guarantee that prices are also 'sticky' in the invoicing currency, the evidence in Casas et al. (2017) and Boz et al. (2017) strongly supports the sticky price assumption.

An important implication of DCP is that even in the best case scenario there is no so-called "divine coincidence," that is inflation targeting does not suffice to close the output gap, a result that is obtained under Mundell-Fleming assumptions. As derived in Casas et al. (2017) inflation targeting (domestic producer price inflation) continues to be optimal monetary policy from a small open economy's perspective, except that now the output gap fluctuates with shocks and this gap is greater the more open the economy is.

VARIABLES	(1) $\Delta tot_{ij,t}$
$\Delta e_{ij,t}$	0.0121
	(0.0127)
$\Delta e_{ij,t-1}$	-0.0126
	(0.0169)
$\Delta e_{ij,t-2}$	-0.00807
	(0.0105)
PPI controls	Yes

Table 1: Disconnect between ER and Terms of Trade; Source Boz et al. (2017)

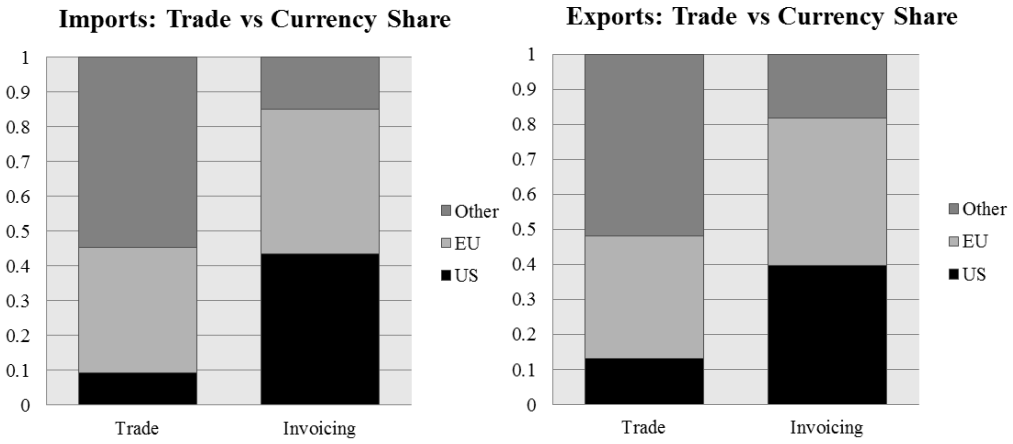


Figure 1: Dollar Dominance in World Trade; Source: Gopinath (2015)

The reason the output gap does not close can be understood as follows: Under Mundell-Fleming assumptions an exchange rate depreciation accomplishes two things. First, it raises the prices of imports relative to domestically produced goods and, second, it depreciates the terms of trade that is lowers the price of exports relative to world prices in world currency. Under DCP the exchange rate depreciation accomplishes the first but not the second and consequently the output gap cannot be closed.

The additional implications of DCP for exchange rate policy are as follows:

1. While exchange rate flexibility continues to be valuable for macroeconomic stabiliza-

tion it is not as powerful as originally believed given that international trade is best described as being governed by dominant currency pricing.

2. The exports of non-dominant currency countries (non-U.S. and non-Euro) will not be very sensitive to exchange rates. This is consistent with the weak response of exports to exchange rate fluctuations including during large devaluations in emerging markets, as has been documented by Alessandria et al. (2013), Casas et al. (2017), Boz et al. (2017) among others.

3. This does not imply that exporters in non-dominant currency countries do not benefit from an exchange rate depreciation. They do, it but mainly works through increases in mark-ups and profits even while the quantity exported does not change significantly. The benefits of higher profits in a world with financial frictions can of course be large and raise production and export capacity in the longer run.

4. Tourism is the one export that should be most sensitive to exchange rate changes given that its prices are sticky in the producer's currency. The dramatic growth in tourism in Iceland following the large exchange rate depreciation is testimony to this (Benediktsdttir et al. (2017)).

5. Once you include all the other arguments for the disruptive effects of exchange rate flexibility in emerging markets the rationale for 'fear of floating' is strengthened. These disruptions include the 'balance sheet channel' according to which exchange rate depreciations worsen balance sheets of firms that mainly earn in local currency but borrow in dollars. This in turn has real consequences such as lower investment. For developing countries imperfect credibility of monetary policy remains a challenge and large swings in exchange rates can lead to sharp exits of risk averse international lenders, in turn amplifying exchange rate fluctuations.

6. At the other extreme, the arguments against hard pegs, namely the loss of monetary independence and the greater risk of speculative currency attacks support the shift away from hard pegs. The commodity price collapse of 2014 also highlights the virtues

of having some exchange rate flexibility over none as commodity exporters with flexible exchange rates appear to have had greater resilience to the shock.

This last comment presumes that flexible exchange rates allow for greater independence of monetary policy. This presumption has however been questioned in recent years triggered by Rey (2013). In my next remark I summarize the state of our knowledge on this all important question of whether or not exchange rate flexibility allows for greater monetary policy independence.

Remark 2 *The 'Trilemma' lives on.*

Rey (2013) in highly influential work argues that flexible exchange rates alone do not suffice to maintain monetary policy independence as long as capital mobility is unrestricted. This goes counter to the 'trilemma' that countries can choose two of the following three: stable exchange rates, monetary policy independence and free capital mobility, but not all three. According to the 'dilemma not trilemma' once you allow for capital mobility then you give up monetary policy independence regardless of your exchange rate regime. This 'dilemma' follows from the astute observation of Rey (2013) that there is a global financial cycle in capital flows, asset prices and credit growth and this cycle is influenced by U.S. monetary policy. This claim finds strong support from the evidence on spillovers of U.S. monetary policy onto long term interest rates in the rest of the world via global banks.

However, just to ensure that the pendulum does not swing to the other extreme that flexible exchange rates provide no greater monetary independence and ability to control credit growth (something I suspect Rey would not also argue for) it is important to recognize the following findings. Firstly, Shambaugh (2004) demonstrates that short term rates of countries with pegged exchange rates tracks the short term rates of the country whose currency they are pegged to much more closely as compared to floaters, even conditional on capital mobility, in direct support of the trilemma. Secondly, Obstfeld et al. (2017) document that while increases in global risk measures like the VIX negatively impact capital flows into emerging markets, their domestic credit growth and asset prices, this negative effect is greater for emerging markets that are on a fixed exchange rate as compared to pure

floats or managed floats (Figure 2). They conclude that consistent with the Trilemma fixed exchange rate regimes are more sensitive to global risk shocks and therefore more prone to economic boom-bust cycles because of the greater loss of monetary independence. So the take away from this research is that while the trilemma is weakened for reasons Rey (2013) highlights, it continues to have bite.

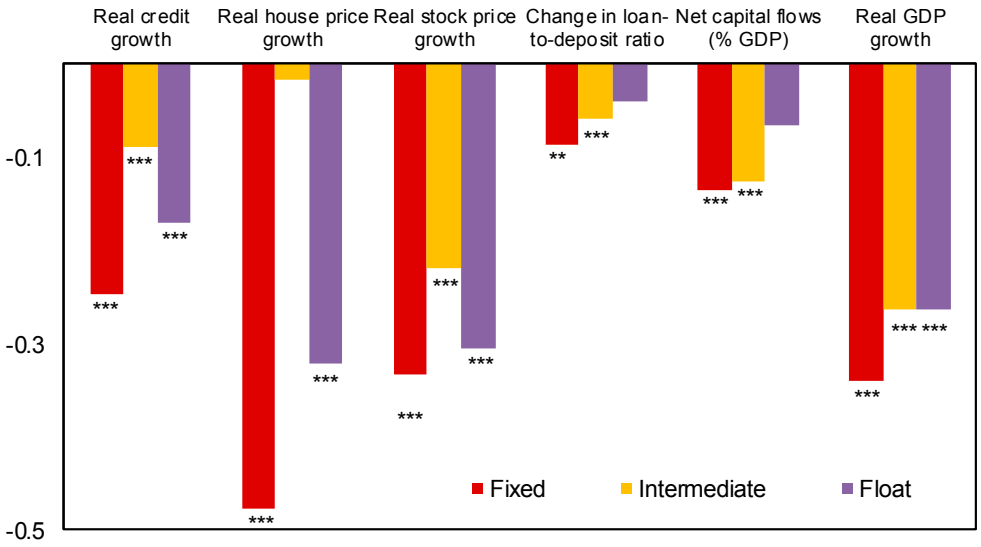


Figure 2: Trilemma; Source: Obstfeld et al. (2017)
Note: This figure plots the correlation of financial and macroeconomic variables in emerging market economies with global investor risk aversion.

Both Remark 1 and Remark 2 are related to the dollar's dominance in world trade and in asset markets. While it is long known that the dollar has a special status in international markets the implications of this have been fleshed out only recently. I highlight here in Remark 3 one consequence of dollar dominance that has not been fully recognized.

Remark 3 *The U.S. dollar exchange rate drives global trade prices and volumes.*

Countries (and researchers more generally) assess the impact of exchange rate fluctuations on their economy by estimating the pass-through of *bilateral* or *trade-weighted* exchange rates into export and import prices and volumes. This practice follows naturally from the classic Mundell-Fleming paradigm of sticky prices and producer currency pricing wherein

exporting firms infrequently change prices denominated in their own home currency. Casas et al. (2017) and Boz et al. (2017) demonstrate that in fact it is not the bilateral exchange rate but the dollar exchange rate that drives trade between country pairs. That is the dollar exchange rate quantitatively dominates the bilateral exchange rate in price pass-through and trade elasticity regressions for country pairs where the U.S. is on neither side of the trade transaction.

Boz et al. (2017) estimate that a 1% depreciation of an importing country's currency relative to the dollar raises the import prices of goods in home currency by 0.78% even when controlling for its bilateral exchange rate with its trading partner. On the other hand, a 1% depreciation relative to its trading partners currency raises import prices by only 0.16%, when controlling for the importing country's exchange rate relative to the dollar. The strength of the U.S. dollar is therefore shown to be a key predictor of rest-of-world aggregate trade volume and consumer/producer price inflation. Specifically, they establish that a persistent 1% U.S. dollar appreciation against all other currencies in the world predicts a 0.6–0.8% decline within a year in the volume of total trade between countries in the rest of the world, holding constant various proxies for the global business cycle. The dollar's role as an invoicing currency is also special as it handily beats the explanatory power of the euro in predicting trade prices and volumes.

To summarize, the consequences of exchange rate variability and the determination of exchange rate policy should be viewed through the lens of the dominant currency paradigm given the dollars dominance in world trade. Flexible exchange rates provide greater monetary policy independence but its benefits in an open economy environment may not be as large as you think.

2 Capital Flow Management

In this section I address issues related to capital flows and its management. This is an area where there has been a major rethink of policy over the last many years even preceding the financial crisis. There is now a new consensus that capital account liberalizations are a

mixed blessing, they are associated with excess volatility tied to abrupt surges and reversals in capital flows, and consequently there can be prudent limits to capital account liberalization.

The recent financial crisis and its aftermath made these tradeoffs with capital flows even more stark with the collapse in capital flows in the immediate aftermath of the financial crisis and the surge in capital inflows into emerging markets during the period of exceptionally loose monetary policy and quantitative easing in advanced economies. In my next remark I address two important lessons from the last two decades of capital flows.

Remark 4 *Gross capital flows matter as much as net flows, and global banks have internationalized U.S. monetary policy.*

As argued by Obstfeld (2012) and Gourinchas and Rey (2014) the crisis made a compelling case for the importance of expanding surveillance beyond the traditional focus on current accounts that is the difference between net savings and investment decisions to include gross flows. In the run up to the crisis there were large increases in gross flows (Figure 3) especially between advanced economies that did not necessarily show up as large net imbalances but were a major source of financial instability.

A separate but equally important gross flow that does not show up in measures of cross-border flows but played an important role in the transmission of the crisis was highlighted by Bruno and Shin (2015), Shin (2012). This was the phenomenon of European banks raising dollar funds in the U.S. and reinvesting it into U.S. subprime mortgages (Figure 4). These flows do not show up in the current account nor as cross-border gross flows as the transactions took place within the boundaries of the U.S. Avdjiev et al. (2016) argue that such flows played a central role in the transmission of the financial crisis and should therefore be monitored.

Post-crisis there is a renewed focus on the so called 'Global Financial Cycle,' which captures the co-movement in global capital flows triggered mainly by monetary policy and risk appetite in advanced economies (Rey (2013), Blanchard et al. (2016)). In the case of emerging markets these flows have been primarily intermediated through global banks and large domestic banks and as highlighted in Brauning and Ivashina (2017) the claims of global banks nearly doubled since the onset of the global financial crisis reaching about

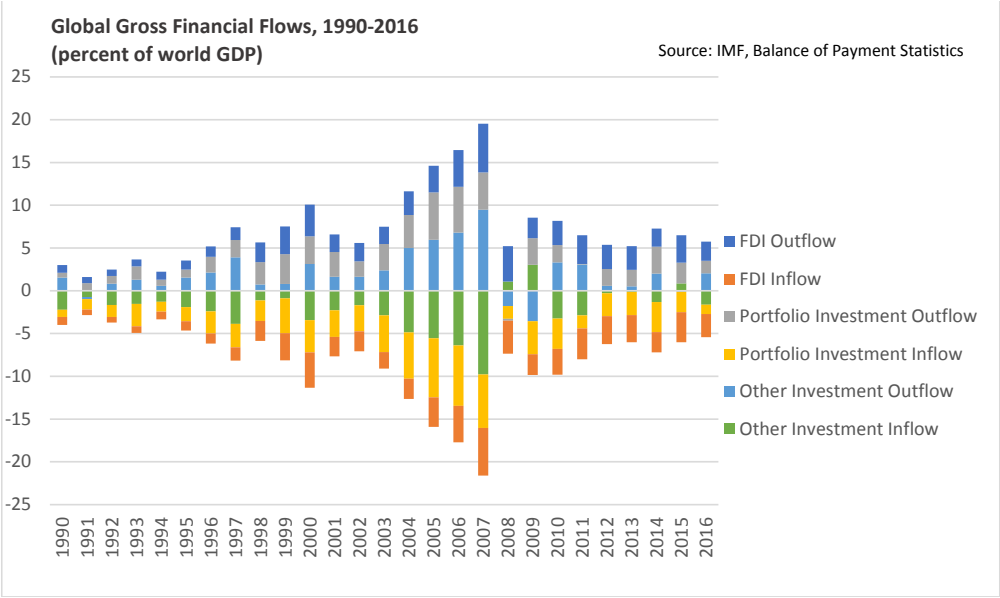


Figure 3: Cross border gross flows matter; Source: Obstfeld (2017)

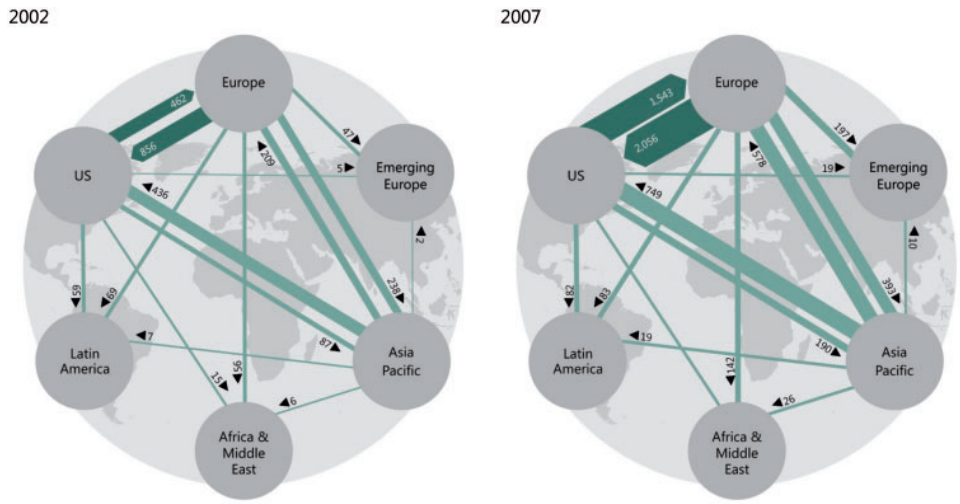


Figure 4: Within country gross flows matter; Source: Avdjiev et al. (2016)

seven trillion dollars in 2016. According to Brauning and Ivashina (2017) over a typical U.S. monetary easing cycle there is a 32 percent loan volume increase for emerging market economies, with a similarly large effect upon reversal of U.S. monetary stance, controlling for demand factors. Baskaya et al. (2017) estimate that increases in global risk-appetite (VIX) enabled large domestic banks in Turkey to lower credit rates and this channel explains 43% of the observed credit growth in Turkey.

While global banking has raised sensitivity to global factors there is one phenomenon that has reduced it:

Remark 5 *Emerging markets tilt away from foreign currency to local currency debt reduces their exposure to global risk factors.*

The shift in the currency composition of emerging market sovereign external borrowing away from foreign and towards local currency is one of the prominent trends of recent decades, a decline in so called 'original sin' (Eichengreen and Hausmann (2005)) for emerging markets. Du and Schregger (2016b) document that the mean share of local currency debt in total external sovereign debt held by nonresidents increased from around 10% in 2000 to nearly 60% in 2013 for a sample of fourteen emerging markets. They also document that the share of local currency debt in total offshore emerging market debt trading volume increased from 35% to 66% in 2013 reaching 3.5 trillion over the same period. This phenomenon is owed to an important extent to more independent central banks and inflation targeting in these countries, as foreign investors worry less about losing real value through unanticipated devaluations. IMF (2016) importantly attribute some of the greater resilience of emerging markets to the post financial crisis slow down in net capital inflows to the decline in the reliance of emerging markets on foreign currency debt (Figures 5, 6, 7).

While the balance sheet gains of matching the currency of assets and liabilities are well understood, Du and Schregger (2016a) point to other less recognized benefits of local currency debt. Importantly, they document that local currency credit spreads are much less correlated across countries and with global risk factors than foreign currency credit spreads. They estimate that the average pairwise correlation of local currency credit spreads between countries is only 43%, in contrast to 73% for foreign currency credit spreads. Also global factors explains less than 54% of the variation in local currency credit spreads but over 77% of the variation in foreign currency credit spreads.

These findings highlight the additional virtues of local currency borrowing that it both reduces the exposure of emerging markets to external shocks alongside improving its resilience. As Du and Schregger (2016b) point out the decline in original sin is however limited to sovereign borrowing because emerging market corporates continue to borrow in

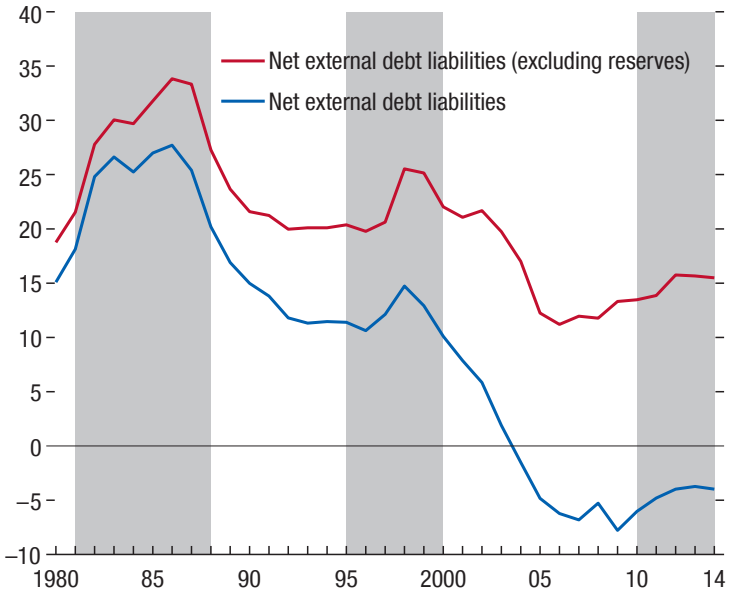


Figure 5: Net external debt liabilities of Emerging Market Economies (percent of GDP), 1980-2014; Source: IMF (2016)

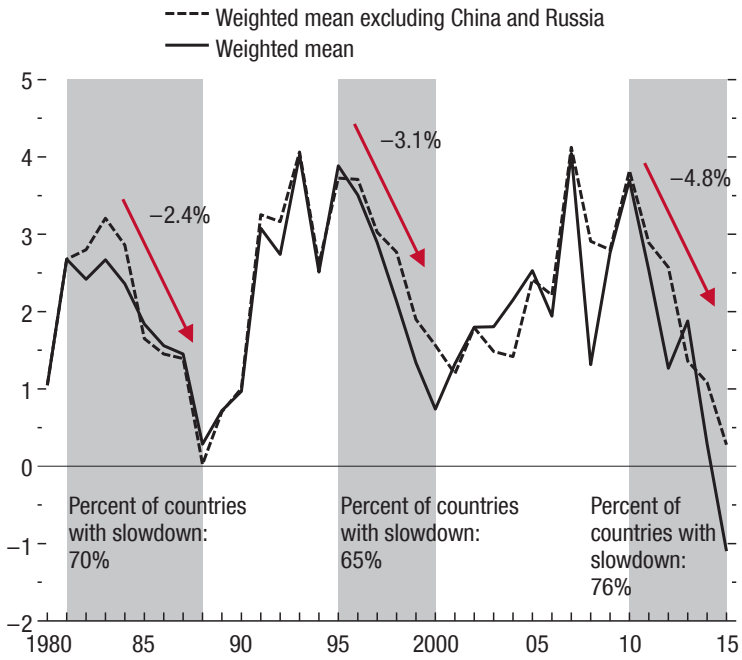


Figure 6: Episodes of Net Capital Inflows Slowdown (% of GDP); Source: IMF (2016)

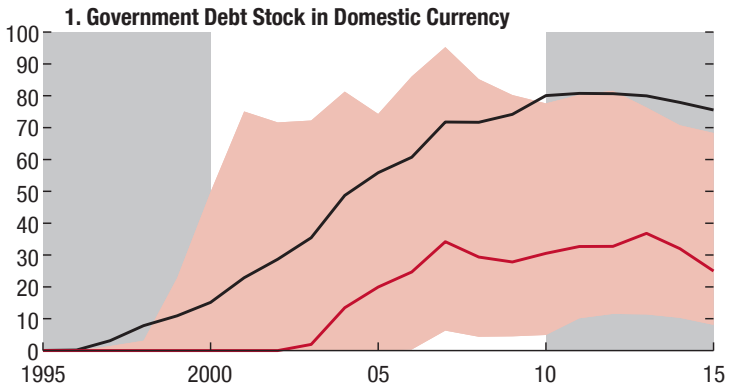


Figure 7: Local currency financing of government debt (% of total); Source: IMF (2016)

foreign currency. Policies that encourage a switch away from foreign currency debt (alongside maintaining sustainable overall debt levels) should therefore continue to be a part of the toolkit of capital flow management.

Remark 6 *Low interest rate environments can lead to misallocation of resources and lower productivity.*

Interest rates are predicted to remain at low levels in advanced economies (Summers (2014), Gourinchas and Rey (2016)) and therefore it is helpful to keep in mind the potential risks they pose especially when unaccompanied by financial sector reforms. Besides the risks associated with disruptive capital flows to emerging markets in the search for yield and the temptation for the finance industry to load up on risk, another lesson of the financial crisis is the potential for low interest rates to cause a misallocation of resources and therefore lower aggregate productivity.

One striking feature of the run up to the Euro crisis was the divergence in the current accounts of Germany and Spain alongside a divergence in productivity (Figure 8). From 1999 to 2007 Germany ran large current account surpluses and was a net lender while experiencing strong productivity growth. During the same period Spain ran large current account deficits financed by large capital inflows while experiencing a decline productivity. This is an allocation puzzle if any as standard forces would predict that capital flows into the country with higher productivity growth.

Gopinath et al. (2016) provide an explanation that reverses the direction of causation. They argue that lower borrowing costs for Spain that arose from euro convergence caused a decline in productivity through greater misallocation of resources. The mechanism is as follows: Lower borrowing costs disproportionately benefit larger (high net worth) firms because they are less constrained in their borrowing in financial markets as compared to small firms. Because larger firms are not necessarily the most productive firms this ends up with resources being misallocated away from more productive to less productive firms, thus generating a decline in aggregate productivity. In support of this argument they document that for manufacturing firms in Spain between 1999 and 2007 capital was increasingly misallocated as the dispersion of the return to capital (marginal revenue product of capital) across firms increased significantly without an increase in dispersion of the return to labor (marginal revenue product of labor) as depicted in Figure 9. Further this rise in dispersion was not evident within the group of large firms but was driven by the difference in returns to capital across large and small firms. They estimate that the increasing misallocation of resources lead to a significant decline in productivity.

A lesson of this period is therefore that low interest rate environments when combined with less developed financial markets can have perverse effects on productivity. As in the case of Spain, low interest rates can lead to rapid capital accumulation but weaken productivity through inefficient resource allocation.

To summarize, international finance like domestic finance turns out to be far less benign than previously thought and all its complexity deserves attention including the strong spillovers across countries in a world of globalized finance. There are sound arguments for intervening in capital markets, including the use of capital controls and macro prudential regulation, based on market failures such as pecuniary externalities and aggregate demand externalities. At the same time one certainly should not 'throw the baby out with the bath water' as not all capital flows have negative consequences for recipient countries. Foreign direct investment continues to get top billing among capital flows, but some portfolio flows and loan flows are shown to positively impact growth and consequently have benefits for the recipient country (Blanchard et al. (2016), Varela (2016)).

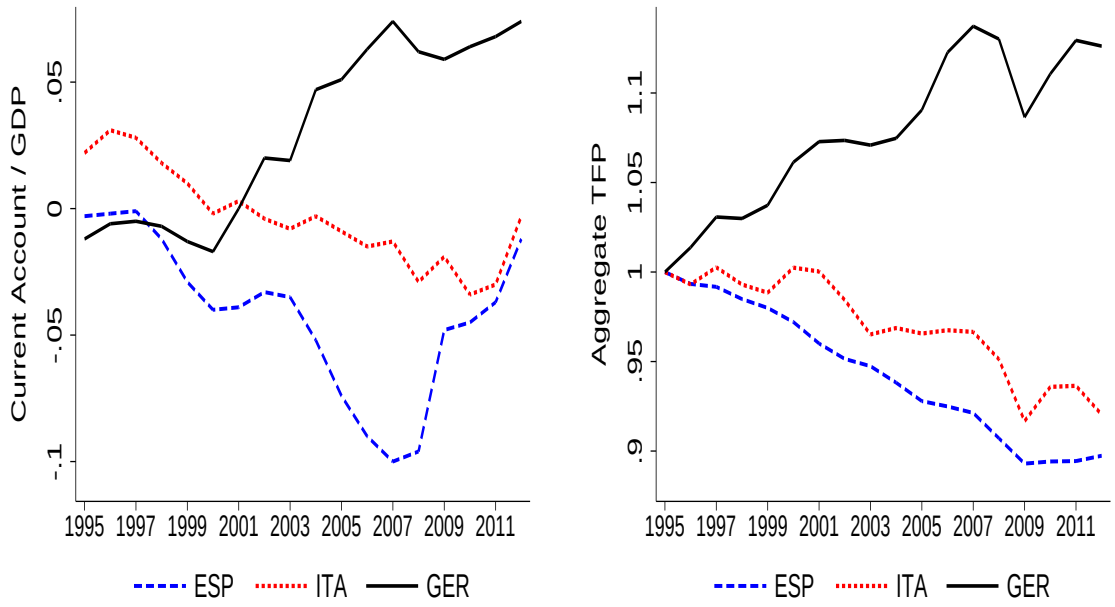


Figure 8: Misallocation of Capital: Source: Gopinath et al. (2016)

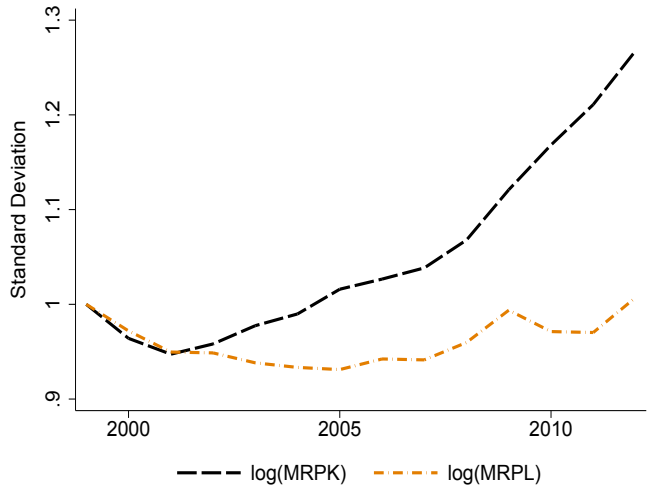


Figure 9: Misallocation of Capital in Spain Manufacturing: Source: Gopinath et al. (2016)

3 Protectionism and Currency Wars

Globalization faces serious threats and though so far there have been no major reversals in trade policy the odds that it will happen have risen significantly over the past year. Surveys by the Pew Research Institute on attitudes towards international trade point to a divergence between developed and developing economies, with the former viewing trade far more unfavorably in recent years as compared to the latter. There is a sense in the developed world that they have lost their prosperity to developing countries because of trade.

This triggers concerns of unfair trade practices in developing countries with large surpluses. One prominent accusation is that of currency manipulation by China. The dramatic accumulation of dollar reserves by China is accused of directly causing its large surpluses (Figure 10) . Such arguments have lead to proposals to include currency manipulation clauses in trade agreements (Bergsten and Gagnon (2017)).

Large imbalances certainly raise concerns of sustainable global growth and require monitoring and redressal, however it is important to flag that the state of knowledge on what *causally* drives global imbalances is quite limited. This is quite simply because imbalances are equilibrium phenomenon and driven by decisions of private agents, the government, domestic and foreign shocks, that all interact in nonlinear ways. Moreover there exist several explanations for global imbalances that have nothing to do with manipulation such as differential (across countries) demand for precautionary savings, differing ability to produce financial assets, differing demographics etc. (Gourinchas and Rey (2014)). For these reasons,

Remark 7 *The empirical relationship between global imbalances, reserve accumulation, and currency manipulation is not well identified.*

Bayoumi et al. (2015), Gagnon et al. (2017) and Chinn (2017) explore the empirical relation between reserve accumulation and current account balances. While this research provides valuable insights, the estimated relation is sensitive to the sample period covered and the variables controlled for (see also the discussion by Obstfeld (2017)). Germany's large current account surpluses clearly have no relation to reserve accumulation. While more research is required the bottom line is that caution needs to be exercised in arriving at conclusions of

currency manipulation and its ability to cause trade surpluses.

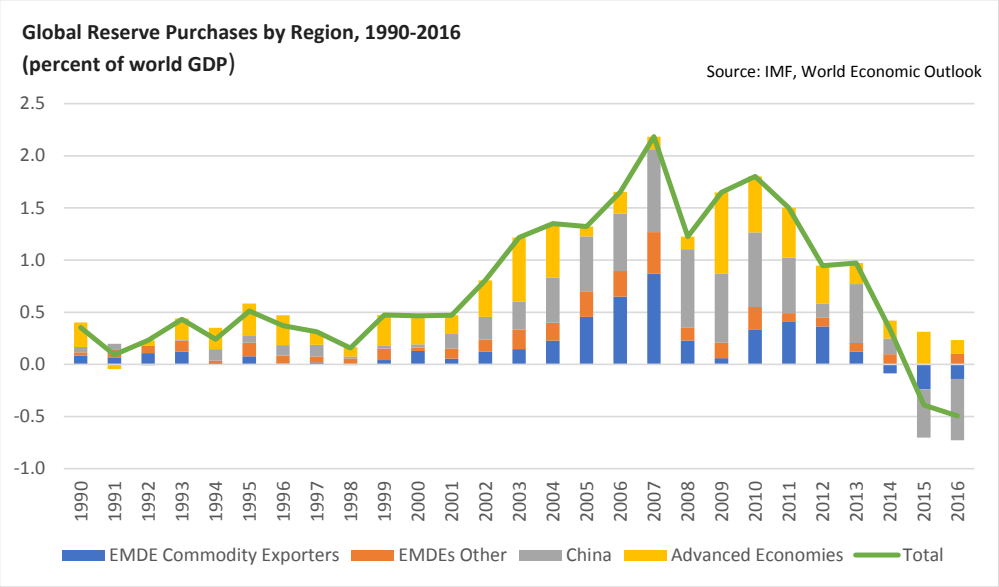


Figure 10: Global Imbalances and Reserve Accumulation: Source Obstfeld (2017)

A policy that recently grabbed headlines is the border adjustment tax (BAT) proposed as part of the House Republican plan for U.S. business tax reform (Auerbach et al. (2017).) The BAT disallows deductions of imported input costs from corporate revenue when computing taxable corporate profits, and excludes export revenue from taxation. This sparked a debate on whether this amounted to protectionism and what the implications were for trade. Some argued that the U.S. dollar would appreciate to offset the tax advantage fully and therefore trade would be unaffected. More strongly, the BAT itself would be *neutral*, that is have no effect on real allocations, consumption, GDP, investment, saving etc, as flexible exchange rates adjust to undo any real effect of the border tax. There were others who questioned both the prediction about the exchange rate and the claims of neutrality.

It now seems unlikely that the BAT will be implemented but I doubt this is the last time countries consider tax interventions of this kind. Moreover there are other tax interventions that are in the same economic equivalence class as BAT, such as uniform changes to the value added tax (VAT) and the payroll tax. These are all forms of "Uniform Border Taxes (UBT)". It is therefore useful to be clear what the economic consequences are to inform

current and future policy. I summarize the state of knowledge here on UBTs and why such taxes are unlikely to be neutral.

Remark 8 *Uniform border taxes are not neutral*

The prediction that UBTs are neutral has its origins in a classic result in the field of international trade, called the Lerner (1936) symmetry, and in its applications in Grossman (1980) and Feldstein and Krugman (1990). According to this result, when prices and wages are *fully flexible* and *trade is balanced* a combination of a uniform import tariff and an export subsidy of the same magnitude must be neutral, having no effect on imports, exports and other economic outcomes. This is because the tax leads to an increase in domestic wages relative to foreign wages (in a common currency), which in turn leaves unchanged the post-tax relative price of imported to domestically produced goods in all countries. That is, despite the higher tax on imports relative to domestically produced goods the lower relative wage of foreign products leaves the relative price of imported to domestic goods unchanged. Similarly on the export side, despite the export subsidy, the higher relative domestic wage, leaves unchanged the relative price of domestic goods in foreign markets. This result follows through if instead the tax combination was a uniform value added tax increase and cut in payroll taxes, or the BAT. If, in addition, monetary policy targets the price level then the nominal exchange rate does all the adjusting and we obtain the prediction that the nominal exchange rate appreciates by the amount of the tax and there are no real effects.

It is of course unrealistic to assume that prices are flexible and trade is balanced. Based on the work of Farhi et al. (2014) and Barbiero et al. (2017) I summarize the five conditions that all need to hold to maintain neutrality when we depart from these assumptions (see Gopinath (2017) for a lengthier discussion).

1. When prices/wages are sticky, if there is *symmetry* in the pass-through of exchange rates and taxes into prices faced by buyers in each market then neutrality is preserved. This symmetry is satisfied when prices are sticky in the producer's currency or in the local currency. In the former case, with fully preset prices, the pass-through of either is 100% and consequently the exchange rate appreciation offsets taxes and there are

no real effects. In the later case the pass-through is zero in either case and there are no real effects.

In reality though prices of traded goods are sticky in dollars regardless of origin and destination, which leads to a break down of neutrality. In this case, with fully preset prices, the exchange rate appreciation has no pass-through into import prices faced by domestic households and firms while taxes have 100% pass-through. On the flip side the tax has no pass-through into export prices (in foreign currency) while the exchange rate has 100% passthrough. In this case, the exchange rate appreciation leads to a decline in imports and in exports and therefore a decline in overall trade in the short-run. These results hold more generally with staggered or state-contingent pricing.

2. Monetary policy should respond only to the output gap and CPI inflation, and not respond to the exchange rate, to maintain neutrality. If exchange rates are targeted then these same taxes serve the purpose of stimulating the economy. Famously, Keynes in 1931 proposed in the Macmillan Report to the British Parliament that a combination of an import tariff and an export subsidy be used to mimic the effects of an exchange rate devaluation while maintaining the gold pound parity. Farhi et al. (2014) demonstrate the equivalence of the VAT-payroll tax swap policy to replicate the effects of a nominal exchange rate devaluation in economies with a fixed exchange rate. Relatedly, if foreign monetary authorities attempt to mitigate the depreciation of their currencies, a reasonable assumption, it will also lead to a break down in neutrality.

3. When trade is not balanced neutrality continues to hold as long as all international assets and liabilities are in *foreign currency*. If however, some international holdings are in domestic currency then neutrality is no longer preserved. Because this assumption breaks down for the U.S. with its large dollar liabilities the BAT would lead to wealth transfers from the U.S. to the rest of the world.

4. The implementation of the border adjustment tax must take the form of a *one-time permanent* and *unanticipated* policy shift for it to be neutral. Otherwise, expectations

of a border tax in the future will cause immediate exchange rate appreciations that impact portfolio choices of private agents and therefore will have real consequences. Similarly, neutrality fails to hold if the policy is expected to be reversed and therefore transitory, or if the other countries are expected to retaliate with their own policies in the future.

5. Neutrality requires that the border taxes be *uniform* and cover all goods and services. Service sectors such as tourism whose sales to foreigners take place within borders are not treated the same as exports that cross borders, which in turn effects neutrality.

Because all of these conditions need to be satisfied simultaneously the UBTs are unlikely to be neutral and will have significant consequences for international trade.

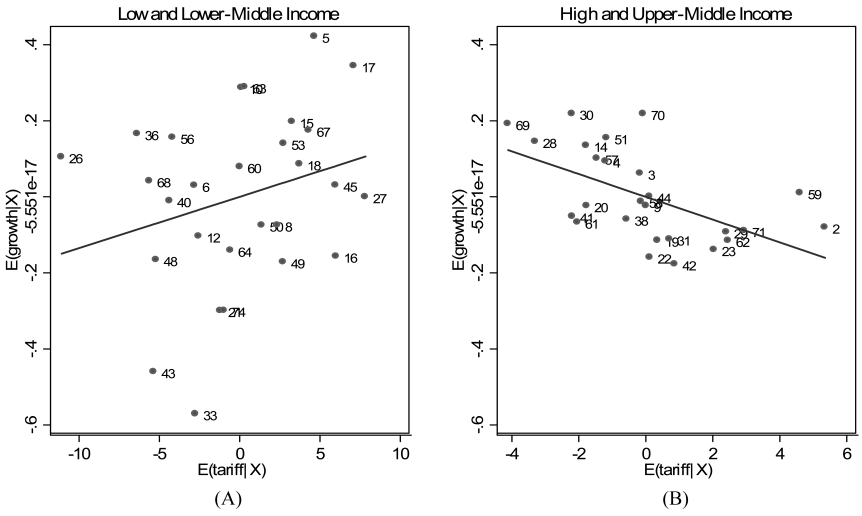
Remark 9 *Trade is not the main driver of earnings inequality, but at the same time policy has failed to address its redistributive consequences.*

In terms of the bigger picture the main policy challenge to globalization is to ensure that the gains are more fairly shared. While it is well understood that trade, despite raising aggregate welfare, creates winners and losers the expectation was that losers would be compensated and they would migrate to better performing sectors and geographic locations. The evidence however points to the fact that inter-regional mobility is limited and trade assistant programs do not come close to compensating losers (Pavcnik (2017)). Consequently the adverse effects of trade on labor markets have persisted for long periods in some countries. Dix-Carneiro and Kovak (2016) document that in the case of Brazil the negative effects of import liberalization lasted twenty years. Autor et al. (2014) similarly point to long lasting negative effects of China's import competition on U.S. labor markets in some geographical areas.

While the academic literature has concluded that trade is not the main driver of earnings inequality within countries and factors like automation and skill biased technical change play a bigger role (Helpman (2016)), the bottom line is that trade will continue to be a scape goat for labor market woes. It is therefore imperative to correct the failures in addressing the redistributive effects arising not just from trade but also from technology so as to avoid a costly reversal in globalization.

Given the fact that some advanced country administrations are trigger happy with protectionsim it is useful to remind ourselves of the empirical evidence on protectionism and growth. Despite the contentious nature of the evidence I believe a fair summary is that there is no evidence that tariffs are good for growth in *high-income* countries in the post-world war period. DeJong and Ripoll (2006) examine the relationship between ad valorem tariffs and growth, using a panel data set comprising sixty countries and spanning 1975-2000. They find that while there is no significant relation between tariffs and growth in low income countries, higher tariffs are associated with significantly lower growth in high income countries (Figure 11). Specifically, a 10 percentage point increase in tariff rates corresponds with a 1.6 percentage point decline in per capita growth rate for the country.

FIGURE 2.—PARTIAL REGRESSION PLOTS FOR OLS—INCOME SAMPLE SPLITS



Note: The set of regressors *X* includes initial income, life expectancy, schooling, *I/Y*, and *G/Y*. *E*(growth|*X*) is the fitted growth, and *E*(tariff|*X*) is the fitted tariff.

Figure 11: Protectionism and Growth: Source DeJong and Ripoll (2006)

4 Global Cooperation

Issues related to cross-border cooperation on financial regulation, on global safety nets, and maybe even on monetary policy will continue to be center stage in discussions on the next generation of the international financial and monetary system. Despite the U.S. threatening to withdraw from multilateralism, the arguments for cooperation have only strengthened

over time. This leads me to my last remark,

Remark 10 *Global coordination of financial regulation is required alongside individual countries macroprudential polices. Reserve accumulation and currency swap lines do not substitute for the lender of last resort role of the International Monetary Fund.*

The arguments in favor of international cooperation in financial regulation are clearly articulated in Cecchetti and Tucker (2016). Quite simply, when financial institutions are global, individual countries that maximize their own welfare do not internalize all the costs and benefits of their regulatory policies and consequently such policies are suboptimal. Countries can engage in a race to the bottom with lax regulations so as to win the favor of the financial services industry, while imposing large costs on the rest of the world. The lessons of the financial crisis if anything should highlight the costs of weak financial regulation and the virtues of international coordination of regulatory standards.

Safety Nets: The many financial crisis of the eighties and nineties in emerging markets have led them to accumulate large amounts of international reserves as a rainy day fund for future crisis. These reserves certainly help countries weather crisis as evidenced by the recent financial crisis and therefore should continue to be a part of the arsenal of macroprudential policies. That said, countries appear to display a 'fear of losing international reserves' as articulated by Aizenman and Sun (2009), with the majority of the emerging markets not willing to deplete their reserves by more than 25%. This suggests that there are hard-to-explain limits to how reserves can be used in the event of a crisis, which then should be weighed against the costs of accumulating these reserves.

One very successful act of global cooperation that emerged during the financial crisis was the creation of the central bank swap lines that were created to deal with the dollar shortage in financial markets following the Lehman collapse. Since then there has developed a proliferation of bilateral and regional swap lines with the potential to ameliorate panic driven currency shortages (Denbee et al. (2016).) The virtue of these swap lines is that they appear limitless and consequently they are a useful deterrence tool for self-fulfilling panics. The downside is that they can be used only if they are consistent with the mandate of the

country providing the liquidity and the loans tend to be of very short duration of up to three months, which may in turn reduce its deterrence potential.

Given these limitations to reserve accumulation and swap lines it is apparent that they are not substitutes for the IMF's role as as the international lender of last resort. As highlighted in Denbee et al. (2016) IMF financing has the following virtues: First, it shares risks across the largest group of countries (all of its 188 members). Second, it serves a broader purpose than just dealing with currency shortages by targeting all the manifestations of a balance of payments crisis. Third, the lending is of longer three to five year maturities. The main critique against the IMF's role is the stigma attached with borrowing from the IMF which leads countries to not use their facilities. That has changed some over the past few years with the creation of facilities that provide funding without conditionalities such as the 'Flexible Credit Line' for countries with sound fundamentals. Figure 12 from Denbee et al. (2016) documents the growing sources of safety nets besides reserve accumulation by countries.

The structure of the international monetary system with the dominance of the dollar in international trade, finance, and in central bank reserves poses its own challenges such as the new age Triffin dilemma arising from a potential conflict between demand for U.S. safe assets and the fiscal capacity of the U.S. to produce these safe assets. In addition there are spillovers from U.S. monetary policy onto global trade that I previously described. Further, the dollars role as a funding currency in international markets raises the sensitivity of non-U.S. balance sheets to dollar exchange rate fluctuations (Avdjiev et al. (2016)). While these spillovers raise demands for greater cooperation in monetary policy, the answers for how to get this done will probably remain elusive. It is then all the more important for countries to cooperate on financial regulation, to strengthen the global safety net, and to reduce the stigma attached to the lender of last resort role of the IMF.

The creation of regional monetary funds like the European Stability Mechanism (ESB) set up in 2012, the Chiang Mai Initiative Multilateralization (CMIM) in 2012, BRICS Contingent Reserve Arrangement (CRA) in 2014 and other smaller regional arrangements that taken together have committed resources of US 1.3 trillion dollars similar to that of the IMF (Denbee et al. (2016)) are welcome developments that complement the IMF in supporting a

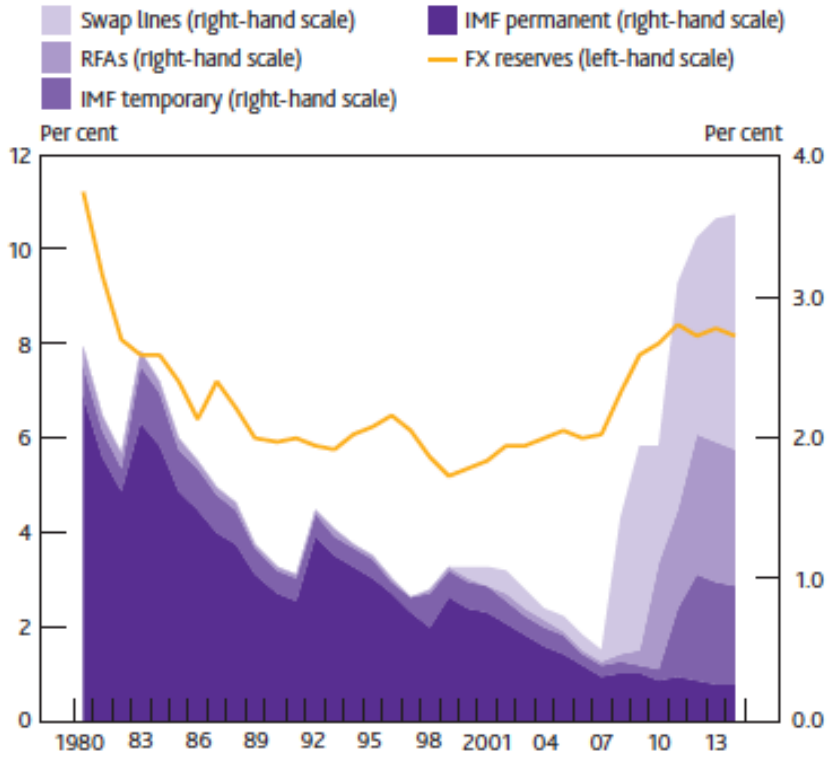


Figure 12: Global financial safety net as percentage of external liabilities, 1980-2014: Source: Denbee et al. (2016)

well functioning international monetary and financial system.

References

Aizenman, J. and Sun, Y. (2009). The financial crisis and sizable international reserves depletion: From 'fear of floating' to the 'fear of losing international reserves'? NBER Working Paper # 15308.

Alessandria, G., Pratap, S., and Yue, V. Z. (2013). Export dynamics in large devaluations. International Finance Discussion Papers 1087, Board of Governors of the Federal Reserve System.

Auerbach, A. J., Devereux, M. P., Keen, M., and Vella, J. (2017). Destination-based cash flow taxation. Oxford University Center for Business Taxation WP 17/01.

Autor, D. H., Dorn, D., Hanson, G. H., and Song, J. (2014). Trade adjustment: Worker-level evidence. *The Quarterly Journal of Economics*, 129(4):1799–1860.

Avdjiev, S., McCauley, R. N., and Shin, H. S. (2016). Breaking free of the triple coincidence in international finance. *Economic Policy*, pages 409–451.

Barbiero, O., Farhi, E., Gopinath, G., and Itskhoki, O. (2017). The economics of border adjustment tax. Working Paper.

Baskaya, Y. S., di Giovanni, J., Kalemli-Ozcan, S., and Ulu, M. F. (2017). International spillovers and local credit cycles. Working Paper.

Bayoumi, T., Gagnon, J., and Saborowski, C. (2015). Official financial flows, capital mobility, and global imbalances. *Journal of International Money and Finance*, 52:146 – 174. Adjustment in the Aftermath of the Global Crisis 2008-09: New Global Order?

Benediktsdttir, S., Eggertsson, G., and Prarinsson, E. (2017). The rise, the fall, and the resurrection of iceland. Working Paper.

Bergsten, C. F. and Gagnon, J. E. (2017). *Currency conflict and trade policy : a new strategy for the United States*. Peterson Institute for International Economics, Washington D.C.

Blanchard, O., Ostry, J. D., Ghosh, A. R., and Chamon, M. (2016). Capital flows: Expansionary or contractionary? *American Economic Review*, 106(5):565–69.

Boz, E., Gopinath, G., and Plagborg-Møller, M. (2017). Global trade and the dollar. Working Paper.

Brauning, F. and Ivashina, V. (2017). Monetary policy and global banking. NBER Working Paper Series, No. 23316.

Bruno, V. and Shin, H. (2015). Cross-border banking and global liquidity. *Review of Economic Studies*, pages 1–30.

Casas, C., Díez, F. J., Gopinath, G., and Gourinchas, P.-O. (2017). Dominant currency paradigm: A new model for small open economies. Working Paper.

Cecchetti, S. G. and Tucker, P. M. W. (2016). Is there macroprudential policy without international cooperation? CEPR Discussion Paper # 11042.

Chinn, M. D. (2017). The once and future global imbalances? interpreting the post-crisis record. Working paper.

DeJong, D. N. and Ripoll, M. (2006). Tariffs and growth: An empirical exploration of contingent relationships. *The Review of Economics and Statistics*, 88(4):625?640.

Denbee, E., Jung, C., and Paternó, F. (2016). Stitching together the global financial safety net. Financial Stability Paper No. 36.

Dix-Carneiro, R. and Kovak, B. K. (2016). Trade reform and regional dynamics: Evidence from 25 years of brazilian matched employer-employee data. *American Economic Review*. forthcoming.

Du, W. and Schregger, J. (2016a). Local currency sovereign risk. *The Journal of Finance*, 71(3):1027–1070.

Du, W. and Schregger, J. (2016b). Sovereign risk, currency risk, and corporate balance sheets. Working Paper.

Eichengreen, B. and Hausmann, R. (2005). *Other People's Money: Debt Denomination and Financial Instability in Emerging Market Economies*. The University of Chicago Press.

Farhi, E., Gopinath, G., and Itskhoki, O. (2014). Fiscal devaluations. *Review of Economics Studies*, 81(2):725–760.

Feldstein, M. S. and Krugman, P. R. (1990). International trade effects of value-added taxation. In *Taxation in the Global Economy*, pages 263–282. National Bureau of Economic Research, Inc.

Gagnon, J. E., Bayoumi, T., Londono, J. M., Saborowski, C., and Sapriza, H. (2017). Direct and spillover effects of unconventional monetary and exchange rate policies. *IMF Working Paper*.

Gopinath, G. (2015). The international price system. In *Jackson Hole Symposium*, volume 27. Federal Reserve Bank at Kansas City.

Gopinath, G. (2017). A macroeconomic perspective on border taxes. Working paper.

Gopinath, G., Kalemli-Ozcan, S., Karabarbounis, L., and Villegas-Sanchez, C. (2016). Capital allocation and productivity in south europe. *The Quarterly Journal of Economics (forthcoming)*.

Gourinchas, P.-O. and Rey, H. (2014). External adjustment, global imbalances, valuation effects. In Gita Gopinath, E. H. and Rogoff, K., editors, *Handbook of International Economics*, volume 4 of *Handbook of International Economics*, pages 585 – 645. Elsevier.

Gourinchas, P.-O. and Rey, H. (2016). Real interest rates, imbalances and the curse of regional safe asset providers at the zero lower bound. ECB Forum on Central Banking.

Grossman, G. M. (1980). Border tax adjustments: Do they distort trade? *Journal of International Economics*, 10(1):117–128.

Helpman, E. (2016). Globalization and wage inequality. NBER Working paper # 22944.

Ilzetzki, E., Reinhart, C. M., and Rogoff, K. S. (2017). Exchange arrangements entering the 21st century: Which anchor will hold? Working paper.

IMF (2016). Understanding the slowdown in capital flows to emerging markets. *World Economic Outlook*.

Lerner, A. P. (1936). The symmetry between import and export taxes. *Economica*, 3:306–313.

Obstfeld, M. (2012). Does the current account still matter? *American Economic Review*, 102(3):1–23.

Obstfeld, M. (2017). Comments on "the once and future global imbalances? interpreting the post-crisis record". Working paper.

Obstfeld, M., Ostry, J. D., and Qureshi, M. S. (2017). A tie that binds: Revisiting the

trilemma in emerging market economies. IMF Working Paper.

Pavcnik, N. (2017). The impact of trade on inequality in developing countries. Working paper.

Rey, H. (2013). Dilemma not trilemma: The global financial cycle and monetary policy independence. In *Jackson Hole Symposium*. Federal Reserve Bank at Kansas City.

Shambaugh, J. C. (2004). The Effect of Fixed Exchange Rates on Monetary Policy. *The Quarterly Journal of Economics*, 119(1):301–352.

Shin, S. (2012). Global banking glut and loan risk premium. *The Quarterly Journal of Economics*, 60(2):155–192.

Summers, L. H. (2014). Us economic prospects: Secular stagnation, hysteresis, and the zero lower bound. *Business Economics*, 49(2):65?73.

Varela, L. (2016). Reallocation, competition and productivity: Evidence from a financial liberalization episode. *Review of Economic Studies*. forthcoming.