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Capital Flow Cycles: A Long, Global View

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Abstract

This paper develops a new, extensive database on international capital flows over the past 200 years by combining long-run data on international debt issuance, the current account, and central bank reserves across countries. We show that cross-border financial flows from financial centers to the periphery are cyclical, with similar patterns over time. We document the interaction between the capital flow cycle, the commodity price super-cycle, and short-term interest rates. All three cycles are connected to the occurrence of financial crises, particularly sovereign defaults. We also offer an encompassing explanation of financial conditions at the world's financial centers. The most recent cycle, starting with the surge in capital flows to emerging markets during 1999-2011, and its subsequent reversal is re-examined in the context of this 200-year history. In the event, many emerging market economies fared better than history predicts from the double bust in capital flows and commodity prices.

JEL: E3, E44, F44, F6, G01, N10, N20

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> "...where it was due to more permanent causes…the stimulus to foreign loans, whilst restoring the balance for the time being, might obscure the real seriousness of the situation, and enable a country to live beyond its resources for a considerable time at the risk of ultimate default."
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> Keynes (1924), p. 160.

I. Introduction

Narratives of capital flow surges that end badly have been around since the 19th century, if not earlier, although perhaps not usually described as clearly by John Maynard Keynes in the opening excerpt from *A Tract on Monetary Reform*.[1] Fluctuations in international capital flows and commodity price swings, as well as the vagaries of international interest rates, have been associated with economic crises for a long time, especially but not exclusively in emerging markets.[2] The "type" of crisis varies across time and space. Sometimes the "sudden stop" in capital inflows sparks a currency crash, sometimes a banking crisis, and quite often a sovereign default.[3] Twin and triple crises are not uncommon.

Despite this long pedigree, most of the empirical analyses connecting capital flow cycles to economic crises start in the 1970s or later. In part, this focus on the modern era owes to the fact that between World War II and much of the 1970s capital mobility was very limited and heavily skewed toward official flows. However, the extent of capital mobility is not the story when it comes to explaining the relative paucity of pre-World War II analyses. Eichengreen (1992) and Obstfeld and Taylor (2003), among others, highlight that international capital market integration had risen dramatically during the gold standard period leading up to World War I.[4] The scarcity of cohesive historical databases on cross-border transactions in financial assets has, no doubt,

[1] An instructive précis of the post-WWII suspicion of capital flows is found in League of Nations (1944), which was mostly written by Ragnar Nurkse.
[2] See Kaminsky and Reinhart (1999), Reinhart and Reinhart (2009), Ostry (2012), Kaminsky and Vega-Garcia (2014), Caballero (2016), Ghosh, Ostry, and Qureshi (2016) and the literature cited in these studies.
[3] The economic dislocations associated with the *sudden stop* phenomenon are discussed in Calvo (1998).
[4] Reinhart and Rogoff (2009) connect the trajectory of capital mobility to the global incidence of banking crises.

significantly impeded the study of the earlier history of capital flow booms and busts.[5] Our study, which covers the post-1815 era, takes a step toward filling that gap.[6]

As part of the analysis of the cycles, we provide the dates of turning points in global capital flows and real commodity prices across approximately two centuries. While there is a substantial time-series literature about commodity prices across decades and sometimes centuries, we are not aware of a comparable unified treatment of the recurring booms and busts in cross-border capital flows at the global level.[7] One of our contributions is to study the global cycle of capital flows over the very long run and extend our earlier analysis of the connection between the commodity price super-cycle and the ebb and flow of financial capital. We discuss, where relevant, its limitations and scope for improvement. Particular attention is devoted to measurement issues, including a discussion of net versus gross capital flows. Because our sample spans two centuries and covers a large number of countries, we rely on an eclectic variety of data types and sources, including time series of our own construction; these data are described in the paper, and greater detail is provided in the primer-like Data Appendices.

As noted, we are also interested in the nexus between the end of capital flow bonanzas and economic crises. Before the widespread use of fiat money (which popularized currency crashes and the occasional inflationary spiral after World War I) and well before many countries had established domestic financial institutions (giving rise to the advent of banking crises), there were sovereign default crises. As has been documented by Reinhart and Rogoff (2009), among others, recurring waves of sovereign default usually entail significant and persistent economic

[5] Early pioneers studying the cyclicality of debt issuance over the long run are Marichal (1989) and Suter (1992).
[6] Our short earlier piece, Reinhart, Reinhart and Trebesch (2016), built on components of the Global Capital Flow Database presented here.
[7] On commodity prices, Boughton (1991), for instance, covers much of the 19th century while Jacks, O'Rourke, and Williamson (2011) start in 1700.

dislocation.[8] The last of these default waves came in the wake of a spike in international interest rates, a collapse of commodity prices, and a sharp reversal in capital flows, as inflows peaked in 1981. Building upon Reinhart, Reinhart, and Trebesch, (2016), we examine how well the core models of new and total sovereign defaults constructed to explain that experience perform out of sample. Specifically, the marked contraction in both commodity prices and capital inflows that started in 2012 provides a well-delineated case study to examine predictions of the global incidence of default (both new defaults and ongoing). In the event, we find that the out-of-sample predictions of historical models overestimate the incidence of default over this period.

Another contribution of this study is to embrace a more encompassing explanation of financial conditions in the world's financial centers. Most of the literature on the role of external financial factors, dating back to Calvo, Leiderman and Reinhart (1993), employ a narrow measurement of financial conditions at the center. Usually global financial conditions have been approximated by some measure of the risk-free short-term interest rate or, in some cases, a family of (mostly short-term) rates of return in the financial center's assets.

We stress that global liquidity conditions are importantly shaped by factors well beyond short-term interest rates, and even beyond the scope of monetary policy and central bank actions. Regulatory policies affecting both the domestic financial sector as well as cross-border capital movement have consistently influenced the global cycle. Actions by other official actors, including sovereign debt management strategies that twist the slope of the yield curve also appear to matter for cross-border flows. The UK's numerous debt conversions in the wake of the Napoleonic Wars, for instance, steadily reduced long-term interest rates in the UK through most

[8]See, for instance, De Paoli, Hoggarth and Saporta (2009) on output losses.

of the remainder of the 19th century.[9] We highlight how the most successful of these conversions helped propel British capital outward to nearly every corner of the globe, as documented by our data base on international bond issuance (which was dominated by London at this time) for 38 countries over 1815-1868 and Stone (1999), which covers 25 countries, over 1865-1914. Last, but not least, financial crises in the world's financial centers affect global liquidity conditions, not only as the crisis is unfolding, but also well into its aftermath.[10]

The topic is highly relevant today, as much of the emerging world has suffered through a double bust in capital flows and commodity prices, and may face yet a tightening of global financial condition in the years ahead. By our measurement, the trough in both commodity and capital flow cycles dates to 1999 and the peak came in 2011, followed by a severe bust. This boom episode was the second longest in real commodity prices since the late 18th century and one of the four longest capital flow booms since 1815. At the same time, however, central banks in advanced economies kept policy extraordinarily accommodative, measured both by the lowness of interest rates and the size of balance sheets.

Some of our key findings can be summarized as follows:

Across exchange-rate arrangements, with different global economic anchors, and varying attitudes toward international coordination, international capital flow cycles have displayed similar patterns over the past two hundred years, both in duration and, surprisingly, in amplitude. We count 14 such cycles. Across them, the magnitudes of the booms are comparable to the often-

[9] See Homer and Sylla (1996) for an excellent overview and Sinclair (1803), Commissioners for the Reduction of the National Debt (1891), Hamilton (1889), Hirst (1910) for more detailed analysis.
[10] See, for example, Calvo (2016), which also summarizes his earlier work on the topic.

abrupt busts, but booms take longer to build. The difference is notable, as it takes 5 years in a bust to wipe out what it took 9 years in a boom to build.

By our reckoning, commodity cycles occur more often (22 cycles for those prices relative to the 14 for capital flows) but large ones—greater than a 15 percent swing—are rarer.

The link between capital inflow booms and busts and subsequent sovereign default shows through clearly in our data. Eleven of the fourteen capital boom episodes were followed by a sharp increase in sovereign defaults. All of the six major spikes in new defaults from 1800 to 2016 occurred after a global capital inflow bonanza ended. We present some of these episodes in detail.

The results on commodity cycles and interest rate cycles provide further context. In four out of the six major default spikes, the end of the capital flow bonanza was accompanied by a collapse in global commodity prices as well as an increase in interest rates in the financial centers. We call these joint shocks to global capital flows, global commodity prices and global interest rates "triple busts". The occurrence of triple busts goes a long way in explaining why financial crises have occurred in waves in the past 200 years.

With the benefit of this historical context, we discuss some of the "old" and "new" elements that made the capital flow bonanza of 1999-2011 so long in duration and so large in scale. Turning to the reversal of flows post-2011, we provide some explanations as to why the usual wave of new defaults that often follows the capital flow reversal has largely failed to materialize (at least, to date).

The explanation for the "missing defaults" after 2011 has both a domestic and external component, as well as some important nuances on how the incidence of default is calculated. On

the external front, global liquidity conditions have not tightened as markedly or as rapidly as in the bust phase of earlier cycles. Exceptionally low and stable interest rates have acted to dampen debt-servicing difficulties among the debtor countries. Regarding the domestic factors, less procyclical fiscal and monetary policies and stronger macroprudential measures during the inflow phase may have left countries on a more solid footing to cope with sudden stops. The substantive recent empirical literature we review suggests that there is considerable evidence to support this case.

The paper proceeds as follows. Section II introduces the "Global Capital Flows Database" that stands at the core of this paper, including an overview on the data, the sources and the basic concepts that define our analysis. Section III presents the "big picture" on international capital flows from the 19th century to today and quantifies the global capital-flow cycle, in particular the boom and bust periods in global flows. We also discuss the extent of co-movement in capital flows across countries. Beyond providing descriptive statistics, Section IV documents the booms and busts in international commodity prices, the cycles of defaults on sovereign external debt over the 200-hundred-year-plus sample, and how these cycles interact with capital flows.

Financial developments in the financial centers and how these shape "global" liquidity conditions are the topic of Section V. As a complement to the available data on interest rates, a narrative approach and extensive chronologies on global financial conditions are developed. Building on the historical patterns described, Section VI examines the current capital flow cycle and how it compares to prior booms and busts. The final section charts some areas for future research and offers policy reflections.

II. The Global Capital Flows Database: 1815-2016

This section introduces the *Global Capital Flows Database: 1815-2016*, as it currently stands, highlighting the dimensions in which we are expanding and extending the coverage. We start by describing our approach to measuring capital flows after WWI, when current account and reserves data start to become available for a larger sample of countries. We then move on to the 19th century, where we approximate capital flows using data on gross international bond issuances. The last part summarizes our sources and the sample and adds a brief discussion on net versus gross flows.

1. The last 100 years - measuring capital flows from current accounts and reserves

For the period after WWI, we rely on simple rules of double-entry accounting which ensure that, excluding statistical discrepancies, the capital account surplus, or net capital inflows (denoted by KA), is related to the current account surplus (denoted by CA) and to changes in the official reserves account (denoted by RA and its change as ΔRA).[11] By convention, the accumulation of official reserves is written as $\Delta RA < 0$. These three concepts are related through the identity:

$$CA + KA + \Delta RA \equiv 0.$$

A country that runs a current account deficit must finance this deficit either by a private capital inflow or by a reduction in its official reserves. In both cases, the country runs down its net foreign wealth. As data on capital/financial account balances is limited or nonexistent, we re-

[11] Starting with the fifth edition of *Balance of Payments Manual* in 1993, the International Monetary Fund split what we write as the capital account into the financial and capital accounts. The former includes financial transactions while the latter is limited to the transfer of nonfinancial assets. For the sake of clarity and conformity to the earlier literature, we prefer the earlier definition.

construct the capital account (KA) by piecing together time series on the current account (CA) and official reserves, which in many cases are more readily available.

The main building blocks to construct the capital/financial accounts after WWI (the current account balances, official gold, and foreign exchange reserves) are culled from many different sources, as reported in detail in the Appendix. The data availability and, thus, the country coverage varies by period. For some countries our time series on current accounts and reserves extend back to the 1860s and earlier, but for most countries they start only in the early or mid-20th century. Prior to World War II, official reserves were dominated by gold. So, ideally, we would want both gold and foreign exchange reserves stocks over the full sample. This is often not possible, especially for the pre-WWII sample.

For the interwar years. we constructed capital flow data for more than 25 countries, but we only have a satisfactory data coverage for 15 of these (expanding the interwar coverage is work in progress).[12] Therefore, for this paper, we decided to use the capital flow series by the League of Nation for 1919-1939 as reported in the United Nations (1949) report on *International capital movements during the inter-war period*. These series are available for a larger sample, namely 8 creditor countries and 26 debtor countries and have less missing values. Moreover, they are consistent with the remainder of our constructed series, since the approximation to capital flows we employ was also the one adopted by the United Nations. See the Appendix for more details.

After WWII, we use the constructed series as summarized in the Appendix, with a sample of more than 50 capital-importing countries in the 1950s, 60s and 70s. Since 1980, when

[12] The total interwar sample includes up to 27 countries, but reserves data are incomplete for many of these, resulting in many gaps. For 15 countries we have almost complete data on both the current account and reserves in this period.

comprehensive IMF data on current accounts and reserves become available, our baseline sample grows to 61 capital-importing countries (including the United States).

For the Eurozone (EZ) countries after 1999, the balance of payments identity needs some modification as to the definition of international reserves reported in the International Monetary Fund's *International Financial Statistics* (IFS). As is the case for any other country, the current account (CA) reflects a member country's transactions (primarily in goods and services) with the rest of the world, including other members of the EZ. Likewise, the capital account (KA) records its purchases and sales of foreign assets (i.e, the rest of the world, including Euro zone members). However, the official reserve data, as reported by the IMF only records official purchases and sales of non-Eurozone assets. The missing transactions are official purchases and sales of the assets of other members of the Euro block. These transactions are, of course, automatic in the context of a common currency and are recorded as Target2 balances (an issue identified by Sinn and Wollmershäuser, 2012, and discussed in Obstfeld, 2012). So for Germany, for example, the positive and rising Target 2 balances reflect the inflow of capital from the rest of the Eurozone.

To account for intra-Eurozone flows in our database, we therefore use an augmented reserve series that aggregates the IFS reserve series and Target2 balances. The resulting constructed capital flow series for Eurozone countries reflects these countries' transactions with the rest of the world as with any other country.

Our baseline exercise (CA +ΔRA) approximates *net* capital flows. This measure has some advantages over the direct balance on the financial account, as it incorporates "hidden" cross-border flows. Unless the financial account is aggregated with errors and omissions, it may will miss important information. As shown in earlier studies, including Claessens (2010), errors and

omissions have often been used to construct measures of capital flight. In the section we will briefly discuss net versus gross capital flows measurement.

2. Measuring capital flows in the 19th century – gross bond issuance

For the 19th century, it is a reality that time series on current account balances and reserves are scarce for the majority of countries. These series are available for the United Kingdom, which became the primary global financial center after it emerged victorious from the Napoleonic Wars. The fact that the UK's current account balance remained consistently in surplus throughout the century and up to World War I is consistent with its role as the major exporter of capital to the rest of the world. The UK current account balance itself, however, is silent as to the destination of that capital.[13]

Fortunately, other data can provide an approximation to gross (and in some circumstances net) international capital flows. Gross flows can be approximated by compiling data on bond issuance for each country. Kaminsky and Vega-Garcia (2016) have pioneered this approach, as they document Latin America's volatile external finance since independence.

We focus on bond issuances because they were *the* instrument of cross-border flows in the 19th century. As Eichengreen has pointed out in several of his contributions, bank loans do not enter the global capital scene in significant magnitudes until the commercial bank lending boom of the 1970s. Equity flows to "periphery" Europe or the New World, especially in the first half of the 19th century, were also essentially nonexistent, as most of the bourses in the capital-importing countries did not yet exist. Moreover, in the 1820s, and even much later, *gross* capital inflows

[13] A few other countries, like the United States, also boast long time series for the current account. As a result, it is possible to see that the US (a capital importer at that time) was one of the destinations for British financial capital.

were very similar to *net* capital inflows for newly-minted nation-states that were borrowing in international capital markets for the first time.

Hence, to quantify cross-border flows in the 19th century we aggregate gross issuance.[14] Plainly put, this is a record of a country's international borrowing, irrespective of whether the bond was issued in London or in Paris, although as noted, London dominated the global underwriting scene at that time.

Specifically, for 1815-1868, our data on bond issues covers 38 countries but is limited to sovereigns and sub-sovereigns. Private bond issuance played an increasingly prominent role in the latter part of the century. For this reason, we use Stone (1999), as our main data source for the period 1867-1914, as he covers both corporate and sovereign bond issuance in the UK, for 25 capital importing countries. Figure 1 uses this bond issuance data and gross capital exports from the UK to the rest of the world and splices it up through World War I. [15]

The two datasets compiled for the 19th century result in a consistent longer series. Indeed, the bond issuance series we aggregate from data on individual bond issuances maps well with the aggregate series on UK capital exports compiled by Stone (1999).

An important limitation of these series, especially in the aftermath of the large wave of defaults (their first for the newly independent nations), is that as the 19th century wore on, new bond issues do not necessarily equate with fresh capital. Some of the spikes in bond issuance (as we shall discuss) are a byproduct of debt restructuring in which the proceeds from a new bond issue retire old debts. Our chronology of credit events helps us flag many of these cases.

[14] We are currently working on extending the sample to, at least, World War I.
[15] The overlay with the UK current account (as a percent of GDP), which records net flows from the dominant financier is shown in Reinhart, Reinhart, and Trebesch (2016).

3. Summary of sources and sample

While the appendix provides details on the sources by country, period, and variable, a less cumbersome sketch of our core data and major sources and coverage is presented in Table 1. Some measures may be available from creditor countries (who record consistent net capital outflows), the debtor countries importing capital, or (ideally) both.

As explained, the number of countries oscillates through the sample. In the 19th century we use data on 38 countries until the mid-1860s. Afterwards, we use the Stone (1999) sample of 25 capital importing countries. The interwar sample is comprised of 34 countries for which the UN (1949) provides data, while the post-World War II core group includes 61 countries (including the US as a net capital importer). Of course, World Wars I and II create major gaps in the data. Then again, owing to both capital controls and war-time dislocation, cross-border flows likely imploded anyway.

Not included in our baseline analysis is an even more inclusive sample of 130 capital importers and 13 capital exporters for which we construct capital account data since 1980, mainly using IMF *World Economic Outlook* and *International Financial Statistics* data. This data will be part of the final dataset, but is not integrated in the main figures and analysis of capital flow cycles.

Table 1. Varieties of Data and Their Sources: A Synopsis

Series	Coverage and sources	Comments
UK current account balance (scaled as a percent of GDP)	1700s to the present, Bank of England which also draws on numerous academic studies	A measure of net outflows from the world's leading financial center up until WWI.
Bond issuance	1815-1868: We compile these data for 38 countries issuing debt. CFB, Clark, Fenn, FEY, Statesman's Yearbook, Wynne, debentures listings from multiple other sources (see Appendix Section 1).	A measure of gross inflows. For the earlier bond issues it is also an approximate measure of net inflows, as these were first-time issues and there were no repayments of prior debts.
UK capital exports, public, private, and total	1865-1914, 25 recipient countries: Stone (1999)	Gross outflows (from UK vantage point and a proxy for gross inflows from the recipients'. London was the major, but not the only, source of global funding at this time
Bond issuance in the United States	1920-1930; 37 countries issuing (see list in appendix; Stallings (1987)	Gross outflows (from US vantage point and a proxy for gross inflows from the recipients'. New York at this time had overtaken London as the major (but not the only) source of global funding at this time
Net capital flows. The construction was along the lines of that adopted here, ie CA + KA + ΔRA≡ 0.	1919-1939, 34 countries. United Nations (1949) based on data from the League of Nations	
Cross-border bank loans from US and non-US banks	1970-1980, 99 countries, Stallings (1987)	A significant subset of gross inflows during this period, as portfolio bond flows were nil until the 1990s.
Construct the capital account balance, from current account and changes in reserves, CA + KA + ΔRA≡ 0.	Mid-to-late 1800s-2016 (starting points differ), 68 countries. Data culled from a wide range of country sources and academic papers. Larger data sets include *International Historical Statistics* (Mitchell), Jones and Obstfeld	This measure incorporates "hidden" cross-border flows. Unless the financial account is aggregated with errors and omissions, it will miss these transactions (which have often been used to construct measures of capital flight).
Gold reserves of central bank and government	1913-1970: Federal Reserve Bank Bulletin Other sources include Flandreau and Zumer 1880-1913, 17 countries	Gold reserves account for the majority of holdings pre-1970.
Gold and foreign exchange reserves	1946-2016; 145 countries: International Monetary Fund, *International Financial Statistics* starting points vary across countries.	Used to construct the capital account balance.
Target 2 Balances (change)	1999-2016 68 countries; European Central Bank. Starting points depend on the entry date into the Eurozone.	
Construct the capital account balance, from current account and changes in reserves, CA + KA + ΔRA≡ 0.	1980-2016, 145 countries, International Monetary Fund, *World Economic Outlook* and *International Financial Statistics*	13 capital exporters, 130 capital importers, plus China and the US.
Work in progress: *Integrating more recent measures of gross flows in the analysis*		
Post 1973 gross flows	Forbes and Warnock (2012) and Broner et.al. (2014)	Can enrich comparisons to the pre-1913 era gross flow measures.

4. Net versus gross flows

Both theoretical and empirical research has increasingly focused on gross rather than net capital flows. For instance, Obstfeld (2012), among others, emphasizes stocks as well as flows—that is, analyzing the national balance sheet in gross and net terms. Without question, we would use such data were it available across many countries and over long periods. Indeed, we have, in that the lending and gross issuance data of Stallings (1987), Stone (1999), and our own compilations from original records help to fill gaps in our series.

Measuring gross flows and stocks consistently, however, is a relatively recent phenomenon and owes, in part, to the willingness of international institutions to commit their own resources and impose a reporting on the private sector. The US Treasury International Capital System has been around since 1934 but for much of that span surveyed at long frequencies and not always consistently. The IMF's Coordinated Portfolio Investment Survey became annual only in 2001. The Bank for International Settlements coordinates surveys that are bank centric by location and at a consolidated level. The data have been exploited usefully Lane and Milesi-Ferretti (2007), Forbes and Warnock (2012), and Adrian and Shin (2010), among others.

Gross positions must surely help to understand episodes of stress. After all, the mechanism creating the possibility of runs in the Ur-contribution to the literature on crises, Diamond and Dybvig (1983), is a maturity mismatch in gross positions in an institution that, in normal times, has positive net worth. For that reason, the volume of (or change in) gross positions may indicated strains, as a large gross position (if a mismatch lurks underneath) can be a trigger or accelerant at times of crisis.

However, balance-sheet mismatches can be subtle to discern in aggregated data and are unlikely to behave systematically over time, as they depend on exchange rate arrangement, the

degree of capital mobility, the structure of finance, external constraints on small open economies posed by commodity price fluctuations, and policy accommodation in financial centers.[16] Even if it were possible to control for these differences, small events can still make a large difference. A firm might have large gross positions, matched by maturity and currency, but if it becomes the source of market strain (think Long-Term Capital Management), it will face adverse margin calls on its liabilities that are not compensated by increased margining of its assets. Such subtleties may be why the case that there are systematic co-movements among gross capital flows is still open, seen by comparing Passari and Rey (2015) with Cerutti et al. (2017).

We take this to mean that, while disaggregating among inflows and outflows and between types of instrument helps to understand events, it also dilutes the systematic signal from market-clearing and risk-sharing forces that balance out to produce net capital flows. At the end of the day, the net current account represents the real transfer of resources between a nation and the rest of the world. When national incentives and motives differ (current circumstances being a good example in which, generalizing the *Handbook of International Economics* chapter of Gourinchas and Rey, the US is the insurer, Europe the banker, and China the saver to the world), it remains important to capture how net positions change over time (Gopinath, et al. 2014).

[16] Consider three examples drawn from this list. Alberola and Sousa (2017) look at the joint effect of commodity and financial cycles in shaping fiscal consolidations. McCauley et al. (2015) argue that unconventional monetary policy by large central banks post crisis encouraged the shift of funding away from loans and toward bonds. The careful review of crises in the classical gold standard period in Meissner (2013) finds more support for capital flows (rather than credit growth) as a systematic predictor, but also shows that idiosyncratic features abound across episodes.

III. The "Big Picture"- Capital Flows over 200 Years

1. A panorama of international capital flows

Figure 1 presents a panorama of international capital flows from the 19th century to the present, building on the aggregated country-level series of the Global Capital Flows Database described above. We have opted to report our aggregate measure of capital flows (be it gross or net) as a percent of the financial center's GDP. Indeed, over a two-hundred-year span, basing the analysis on nominal or even real magnitudes makes little sense. One could envision a range of other possibilities, but this one has the advantage that the UK and the US are at the high end of the spectrum in terms of both data availability and continuity. The UK GDP covers 1815-WWII and the US the post-war era.

Three features stand out in the 19th century. First, the different measures of international capital flows provide a fairly consistent narrative of the capital flow cycle.[17] Second, the peaks and valleys are, for the most part, sharp and distinct. Third, the well-known ascent of global finance at the height of the Gold Standard Era is evident in the upward trend in these series. As we shall see, many of the sharp reversals in capital flows coincide with widespread economic crises, often precipitated by, in the words of Keynes, "*foreign loans…enable a country to live beyond its resources for a considerable time at the risk of ultimate default.*"

After World War I, we turn to the net capital flow series. In the interwar years, net inflows are highly volatile. After a boom in the 1920s, they collapse after the Great Depression. In the

[17] The correlation between gross capital exports from the UK and the current account (which abstracting from reserve changes and errors and omission, should approximate *net* capital exports from the UK) is 0.77 over 1867-1914. The correlation between bond issuance and the current account is notably lower (0.40) but statistically significant at the 1% level. In part, this may reflect that not all funds were raised in London, as Paris, Amsterdam, and other centers were associated with some of the bonds issued during 1815-1868.

post-WWII sample, capital flows remain restrained in the 1950s and 1960s but increased sharply in the mid and late 1970s after the collapse of Bretton Woods. The most recent boom in capital flows to emerging markets (in the 2000s) is similar in magnitude to several earlier historical booms.

Apart from magnitudes (Figure 1), we also examine the incidence of cross border flows in Figure 2.[18] The figure shows the share of countries issuing at least one bond in that given year for the period 1815-1915 and the share of countries with net capital inflows for post-WWI, 1919-2016. The willingness to lend or the capacity to borrow limited the number of players with access to global capital markets. It was not uncommon to see international capital flows (gross or net) dry up in years of war, widespread economic crises, lingering defaults accompanied by financial autarky among the borrowers, or a financial crisis in the creditor country. Many narratives of that era make this point. [19] However, this exercise also speaks to the extent of capital mobility over two centuries, as discussed in Obstfeld and Taylor (2003) and Reinhart and Rogoff (2009).[20] The eras of high capital mobility are the second half of the 19th and 20th centuries, with some limited rebound in the interwar period.

[18] The figures do not change noticeably if we use the extended sample of 132 capital importers after 1980.
[19] For instance, the narrative description of the British economy from 1790 to 1850 in volume I of Gayer, Rostow, and Schwartz (1953) discussed the effects of such events on finance.
[20] Indeed, it presents the mirror image of the capital control index recently introduced by Ilzeztki, Reinhart and Rogoff (2017), discussed in Section IV.

Figure 1. 200 Years of Capital Flow Cycles
(spliced series, three-year sums)

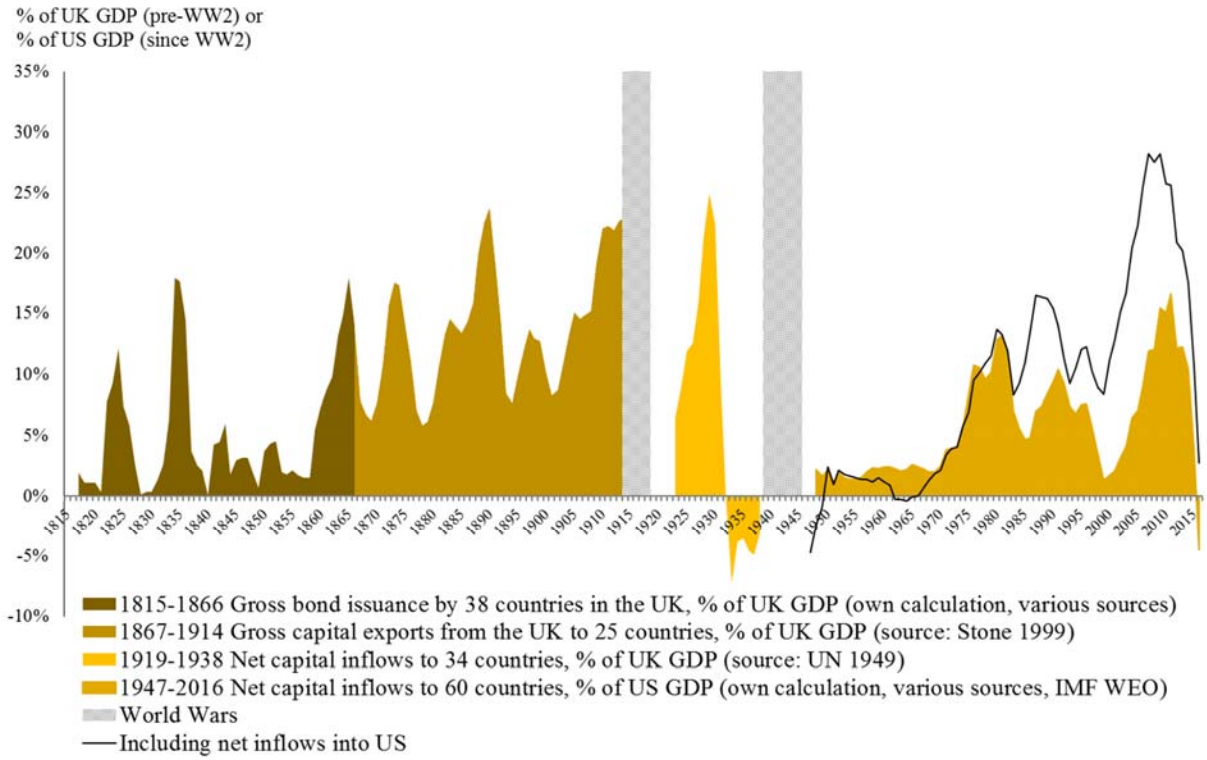


Figure 2. The incidence of cross border flows
(Share of countries issuing at least one bond, 1815-1915 and share of countries with net capital inflows, 1919-2016)

Sources: Authors' calculations based on the Global Capital Flows Database.

2. Measuring capital flow cycles

Don Harding and Adrian Pagan (2002) provide a persuasive case for a simple and mechanical scheme to date turning points in business cycles that we apply to the capital flow and commodity price data. These two authors have also addressed the synchronization of two cycles, which is of interest to describe the interplay of the individual capital flow and commodity bonanza-bust cycles and helps to define the concept of a "Double Bonanza-Bust". By way of example, the Harding-Pagan technique was used productively in a similar context as our own by Claessens et al. (2012).

This literature also counsels over-interpreting specific dates. For instance, the dating of some bond issues is less than precise (some issues are listed as 1821-1822 and discrepancies across sources are not uncommon). Information on disbursements of the funds (the actual capital flow) varies and is not uniformly reported. Balance of payments accounts (past and present) are subject to errors and omissions, which tend to worsen in times of turmoil when capital flight escalates. Valuation changes affect the gold stock and reserves data.

With these caveats in mind, Table 2 presents the dates, duration and magnitudes of the global boom and bust cycles in capital flows since 1815.

Most capital flow cycles lasted 3 to 6 years, abstracting from the thirty-year stretch following World War II during which restrictions on cross-border financial transaction kept the volume of international capital flows minimal—the era of Financial Repression.[21] As noted earlier, care has to be taken in interpreting some of the magnitudes. For instance, episode 2 (1828-1840, trough-to-trough) appears much larger (in magnitude) than it actually was. The

[21] See Reinhart and Sbrancia (2015).

significant increase in bond issuance was importantly driven by Spain's issuance of restructuring bonds. As Figure 3 makes plain, few countries actually tapped the bond market during those years. With that caveat in mind, the collapse of global finance in the 1930s (from which there was no recovery for four decades) is in a league of its own and helps explain the severity of the contraction in economic activity around the globe in that depression decade.

The capital flow bonanza that peaked in 2011 was exceptionally protracted (and came to an abrupt reversal phase after the taper tantrum of the spring of 2013 when the Federal Reserve announced its intention to taper its extended post-crisis stimulus).

Table 2. Capital Flow Surges, Declines and Sudden Stops: 1815-2016

Panel A: **Global Booms:** Rising Capital Inflows					Panel B: **Global Busts:** Decline in Inflows or Outflows			
Episode	Trough	Peak	Duration	Change (Percent of GDP)	Peak	Trough	Duration	Change (Percent of GDP)
1	1821	1824	3	11.8	1824	1828	4	-12.0
2	1828	1834	6	17.8	1834	1840	6	-17.9
3	1840	1843	3	5.9	1843	1849	6	-5.3
4	1849	1852	3	3.8	1852	1857	5	-3.1
5	1857	1865	8	16.5	1865	1869	4	n.a.
6	1869	1873	4	11.3	1873	1878	5	-11.8
7	1878	1890	12	18.1	1890	1894	4	-16.2
8	1894	1897	3	6.1	1897	1901	4	-5.5
9	1901	1914	13	14.7	1914	1918	5	n.a.
1914-1918, World War I: Private capital flows collapse but there is a surge in official flows from US								
10	1918	1929	12	18.4	1929	1933	4	-31.6
11	1933	1938	5	3.4	1938	n.a.	n.a.	n.a.
1939-1945, World War II: Widespread exchange controls introduced in 1939								
12	1946	1981	35	11.6	1981	1986	5	-7.9
13	1986	1991	5	6.1	1991	1999	8	-9.0
14	1999	2011	12	18.3	2011	2016	5	-23.7
Averages			9	11.7			5	-13.1

Sources: Reinhart, Reinhart and Trebesch (2016) and Data Appendix.

3. Co-movement in global capital flows

To understand how "global" the observed capital flow cycles are, this section studies the degree of co-movement of net capital flows across countries. We follow earlier research on the global factor in international finance (e.g. Longstaff et al. 2011 or Rey 2013) and start with simple correlations. For this purpose, we average the pairwise correlations for all possible country pairs, using the capital flow to GDP series in our sample for the entire 200-year period (for all overlapping years).

In the full sample, 43% of the pairwise correlations in capital flow are significant and of these 35% are positive (Table 3). Moreover, 34% of all pairs show a coefficient above 0.3. The degree of co-movement appears to be highest post-WWII, with more than 40% of pairs showing a correlation above 0.3. Similarly, we observe higher correlations within the sub-sample of emerging and developing economies, where every second pairwise coefficient post-WWII is above 0.3.

Table 3. Co-movement: Pairwise Correlation Coefficients of Capital Flow Series

	Full Period	Pre-WWI	Interwar	Post-WWII
All countries				
Share of statistically significant correlations[1]	42.96	28.24	49.65	53.37
of these, positive correlations	34.50	25.81	39.72	42.08
Share of correlations above 0.3	34.07	23.15	63.83	41.53

Notess: This table summarizes the pairwise correlation coefficients in the "Global Capital Flows Database", averaged across all country-pairs in each of the samples, for all overlapping years. The number of country pairs in the full period (1817 – 2016) is 2307. For pre-WWI (1817 – 1914) it is 864, interwar (1922 – 1938) 141 and post-WWII (1946-2016) it is 1825. The low number of pairs in the interwar years is due to missing values and the shorter time span under study.

In a second step, we tested for co-movement in capital flows using both factor and principal components analysis (PCA), again building on established practice. Table 4 shows the results for the two episodes for which we have a sufficiently balanced sample. First, the period

pre-WWI (1868 – 1914) using the Stone (1999) bond issuance data for 25 debtor countries and, second, the modern sample 1950-2016, this time using a total of 32 capital-importing countries for which we have data for the full span.

Table 4. Co-movement: Factor Analysis and Principal Components

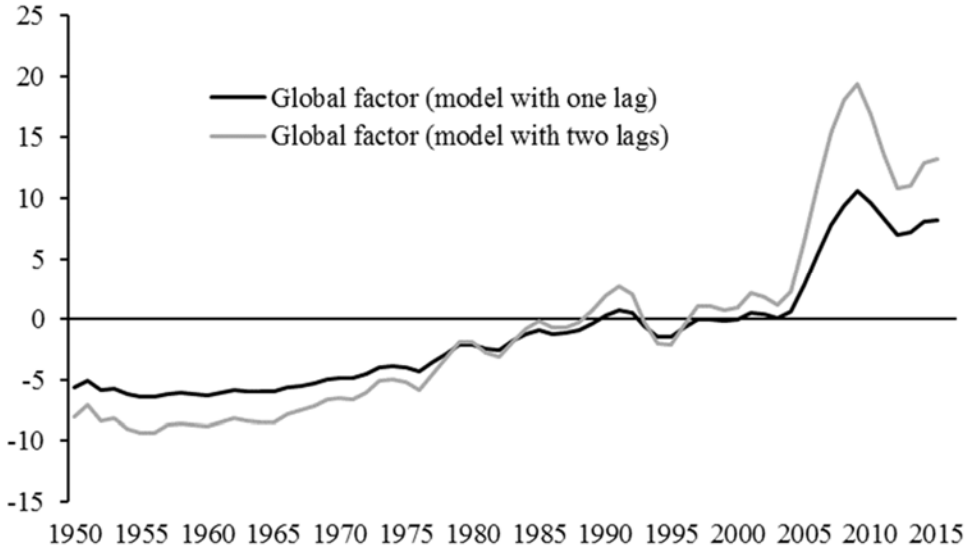
	Panel A *Pre-WWI* (1868 – 1914)				Panel B *Post-WWII* (1946 – 2016)			
	Factor		Principal Component		Factor		Principal Component	
	Percent Explained	Total	Percent Explained	Total	Percent Explained	Total	Percent Explained	Total
First	0.26	0.26	0.24	0.24	0.32	0.32	0.31	0.31
Second	0.24	0.50	0.23	0.47	0.18	0.51	0.18	0.49
Third	0.17	0.67	0.16	0.64	0.13	0.64	0.13	0.62
Fourth	0.09	0.76	0.08	0.72	0.08	0.72	0.08	0.69
Fifth	0.06	0.82	0.06	0.78	0.06	0.78	0.06	0.75

Notes: The table reports summary statistics for the factor analysis and principal components of the capital inflows as a percentage of GDP. The sample *1868-1914* includes Argentina, Australia, Austria Hungary, Brazil, Canada, Chile, China, Cuba, Egypt, France, Germany, Greece, India, Italy, Japan, Mexico, New Zealand, Peru, Rhodesia, Russia, South Africa, Spain, Turkey, United States, Uruguay. The sample *1950-2016* includes Argentina, Australia, Austria, Bolivia, Brazil, Canada, Colombia, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, France, Greece, Guatemala, Honduras, Iceland, India, Indonesia, Ireland, Italy, Korea, Peru, Philippines, Portugal, South Africa, Spain, Thailand, Turkey, United Kingdom, United States, and Venezuela.

The evidence again points to modest and increasing commonality in global capital inflows. Pre-WW1, the first factor (and principal component) explains 26% (and 24%) of the variation in capital inflows, while the first three factors (principal components) explain a total of 67% (64%). For the 1946 – 2016 sample, the numbers for the first factor and principal component are slightly higher, explaining 32% (31%) of the variation in capital inflows, while the first three factors jointly explain about 64% (62%) of the variation. To make the results comparable to more recent work using shorter samples, we also conduct the same analysis for 2000 – 2016 and including 45 countries. The first factor now explains 39% of the total variation in the capital inflows and 77% explained by the first three factors. This is higher than in the full post-WWII sample, indicating that co-movement has increased in recent years. In sum, we reconfirm the finding of previous

studies that a considerable share in the total variability of capital inflows worldwide can be explained by a small number of common drivers. Moreover, the global factor in capital flows seems to increase over time.

Figure 3. The Global Factor in Capital Flows
(Dynamic Factor Model, Post-WWII)



Model 1 (black line): $capflow\_bycountry_{it} = \alpha_0 + \alpha_1 factor_{t-1} + \varepsilon_t$
Model 2 (grey line)*:* $capflow\_bycountry_{it} = \beta_0 + \beta_1 factor_{t-1} + \beta_2 factor_{t-2} + \mu_t$
Notes: Both models were checked for stationarity and optimum convergence. Country sample: Argentina, Australia, Bolivia, Canada, Colombia, Denmark, Ecuador, Egypt, France, Greece, Guatemala, Iceland, Italy, Peru, South Africa, Spain, Turkey, United Kingdom, and United States. Years covered: 1950-2016.

To explore the time variation in the global factor of capital flows more systematically, we follow previous work such as Cerrutti et al. (2015) and Byrne and Fiess (2016), and estimate a dynamic factor model. A main advantage of this type of autoregressive model is that it allows estimating an unobserved dynamic factor to study co-movement of several time series over years and decades.[22] Figure 3 shows the evolution of the estimated "global" factor of the country-level capital flows series between 1950 and 2016 for two different model specifications and using a

[22] Formally, a dynamic factor model can be represented as $X_t = \Lambda_t F_t + \mu_t$ where $F_t = (f_t, f_{t-1}, f_{t-2}, \dots, f_{t-q})$ is a vector of lagged factors of the time series in the $T \times N$ matrix,, X_t, Λ_t is the vector that represents the estimated parameters, and μ_t is the idiosyncratic disturbance.

core sample of 19 countries which had no missing values post-WW2.[23] As can be seen, the global factor is initially small, but it increases after the 1970s, especially from the early 2000s on. This finding is in line with our previous results that the degree of co-movement has intensified.

IV. Bonanzas in Capital Flows and Commodities and their Link with Sovereign Default

Our earlier paper (Reinhart et al. 2016) sketched the extent of overlap between the capital inflow and default cycle. We show that new defaults typically spike at the end of a capital inflow bonanza. In this section, we provide new insights on commodity cycles over the past 200 years, and study the interaction of both types of cycles with defaults. We also look into individual historical episodes of capital and commodity bonanzas that went bust and examine the out-of-sample performance of our earlier regressions. The aim of these exercises is to better compare the unfolding cycle to its historical predecessors, which we do in Section V.

1. Commodity cycles

To measure the commodity cycle, we take advantage of existing data, building on the aggregate indices of non-oil, non-energy commodity price indices by Gayer, Rostow, Schwartz (1790-1850), Boughton (1854-1979), as well as the IMF *WEO* (1980-2016). We splice these to create one 200-year-long series of nominal commodity prices and deflate using export prices of manufactures (in US dollars). Based on the resulting real price series of global commodity prices, we conduct the same analysis of cycles, dating peaks and troughs as described for capital flows above.

[23] Due to the autoregressive character of the model, the estimations are sensitive to missing values. We therefore drop all countries in which the post-WW2 series was not complete.

Table 5 shows our classification results for commodity cycles, while the two panels of Figure 4 provide a visual profile of the commodity roller coaster. The comparative volatility of international commodity prices (even by the standards of volatile cross-border flows) is evident in the fact that there are 22 commodity price cycles (although major booms are somewhat fewer) in this sample versus 14 for capital flows. The amplitude of the cycle is also indicative of how destabilizing these terms-of-trade shocks can be for countries that importantly depend on primary commodity exports. Of note, the boom that began in 1999 and lasted more than a decade is about the largest (cumulatively) in the entire sample. This context makes it less of a wonder that many commodity producers were able to withstand the 2008-2009 global financial crisis and record growth rates that were well above historic norms for much of the bonanza decade.

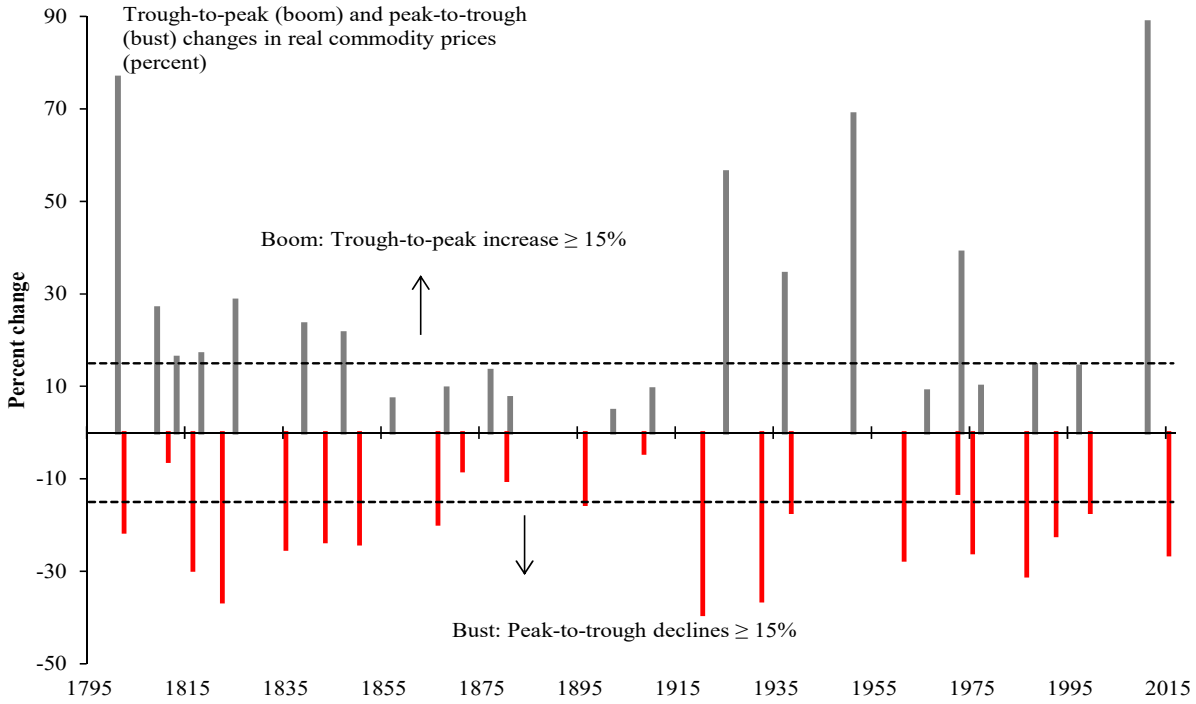
Table 5. Global Cycles in Non-oil Real Commodity Prices: 1790-2016

Global Booms: Increases in Real Commodity Prices						**Global Busts**: Declines in Real Commodity Prices				
Episode	Trough	Peak	Duration	Change (percent)	Boom criteria	Peak	Trough	Duration	Change (percent)	Bust criteria
1	1792	1801	9	76.7	yes	1801	1802	1	-21.5	yes
2	1802	1809	7	26.8	yes	1809	1811	2	-6.2	
3	1811	1813	2	16.2	yes	1813	1816	3	-29.8	yes
4	1816	1818	2	16.9	yes	1818	1822	4	-36.6	yes
5	1822	1825	3	28.6	yes	1825	1835	10	-25.2	yes
6	1835	1839	4	23.4	yes	1839	1843	4	-23.6	yes
7	1843	1847	4	21.5	yes	1847	1850	3	-24.1	yes
8	1854	1857	3	7.2		1857	1866	9	-19.8	yes
9	1866	1868	2	9.5		1868	1871	3	-8.3	
10	1871	1877	6	13.4		1877	1880	3	-10.3	
11	1880	1881	1	7.5		1881	1896	15	-15.5	yes
12	1896	1902	6	4.7		1902	1908	6	-4.4	
13	1908	1910	2	9.4		1910	1920	10	-39.3	yes
14	1920	1925	5	56.3	yes	1925	1932	7	-36.4	yes
15	1932	1937	5	34.3	yes	1937	1938	1	-17.3	yes
16	1938	1951	13	68.8	yes	1951	1961	10	-27.6	yes
17	1961	1966	5	8.9		1966	1972	6	-13.1	
18	1972	1973	1	38.9	yes	1973	1975	2	-26.0	yes
19	1975	1977	2	9.9		1977	1986	9	-31.5	yes
20	1986	1988	2	14.3		1988	1992	4	-23.1	yes
21	1992	1997	5	15.7	yes	1997	1999	2	-16.7	yes
22	1999	2011	12	88.7	yes	2011	2016	5	-23.0	yes
Average, all			5	27.2		Average, all		5	-21.8	
Average boom			6	39.1		Average busts		6	-25.7	

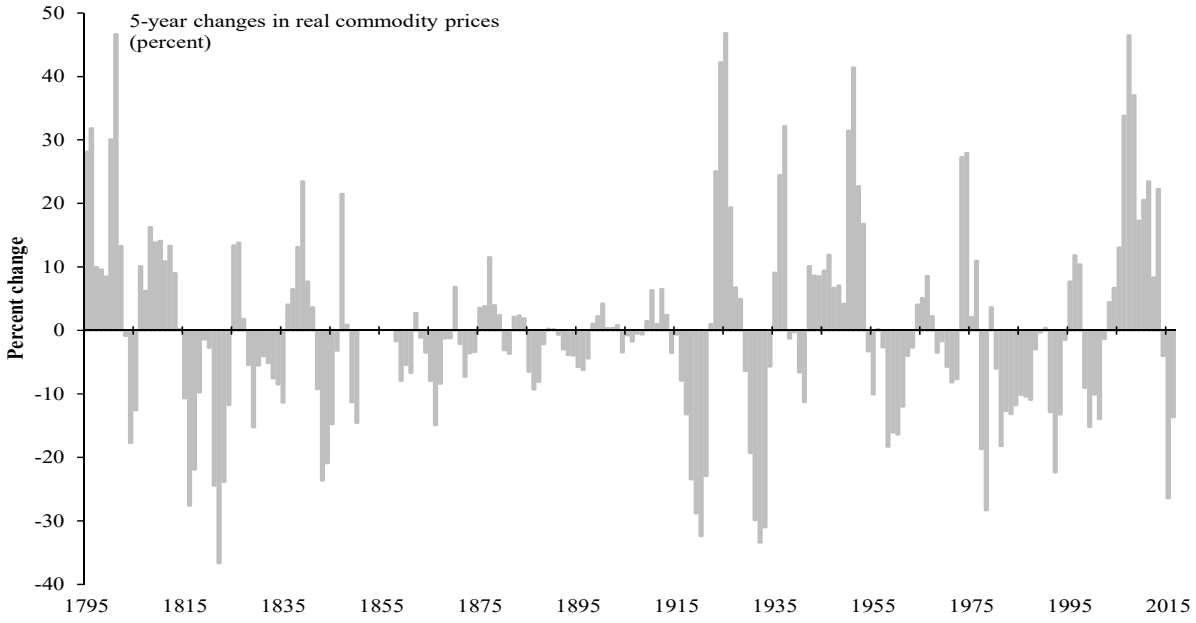
Sources: Gayer, Rostow, Schwartz (1790-1850); Boughton (1854-1979); IMF (1980-2016) and author's calculations.
Notes: The downturn in prices since the 2011 peak is still ongoing. A peak-to-trough price (trough-to-peak) decline (increase) greater than or equal to 15% is classified as a bust (boom). Export prices of manufactures (in US dollars) is used to deflate commodity prices.

Figure 4. Defining Cycles in Non-oil Real Commodity Prices: 1790-2016

Distinguishing cycles from super-cycles (boom-bust)



Five-year Changes in Commodity Prices



Sources: Gayer, Rostow, Schwartz (1790-1850); Boughton (1854-1979); IMF (1980-2016) and author's calculations.

2. Why focus on sovereign default?

Several studies have shown that capital flow surges are often followed by economic crises, which in the modern era also include banking, inflation, and currency problems.[24] As the schematic in Table 6 highlights, sovereign defaults on external debt predate the widespread use of fiat money, which made currency crashes and inflationary spikes far more common after World War I. Also, before many countries had established and developed domestic financial institutions (giving rise to the advent of domestic banking crises), the foreign banks and investment houses of London or Paris were the bankers to the government. As a result, a default on a foreign loan was both a debt crisis and a banking crisis. Sovereign default crises, as has been documented by Reinhart and Rogoff (2009), among others, have a long history featuring recurring waves of sovereign default and usually entail significant and persistent economic dislocation.[25]

[24] See Reinhart and Reinhart (2009), Meissner (2013), and Caballero (2016), among others.
[25]See, for instance, De Paoli, Hoggarth and Saporta (2009) on output losses.

Table 6. Defaults as the common thread over 1800-2016

	External debt crises	Banking crises	Inflation crises
Pre-1800	frequent in advanced economies (including the "world powers" of the time)	rare	rare
Napoleonic wars end 1815	Serial in some cases		
1826	frequent in	serial in advanced/ rare in emerging	
1850	"peripheral' advanced		
1900	economies and most	serial in advanced/ more	
WWI begins 1913	emerging markets	frequent in emerging	frequent in advanced
Depression	"Official" debt crisis		
WWII ends 1945	in advanced economies	rare in advanced **and** emerging	and emerging
post-1945			
1964			rare
1973			frequent in advanced
early 1980s	Serial in some	more frequent in advanced and in emerging	and emerging
early 1990s	emerging markets		frequent in emerging
2000			
2007			rare
2010	Debt crisis re appear in advanced economies		
2016			

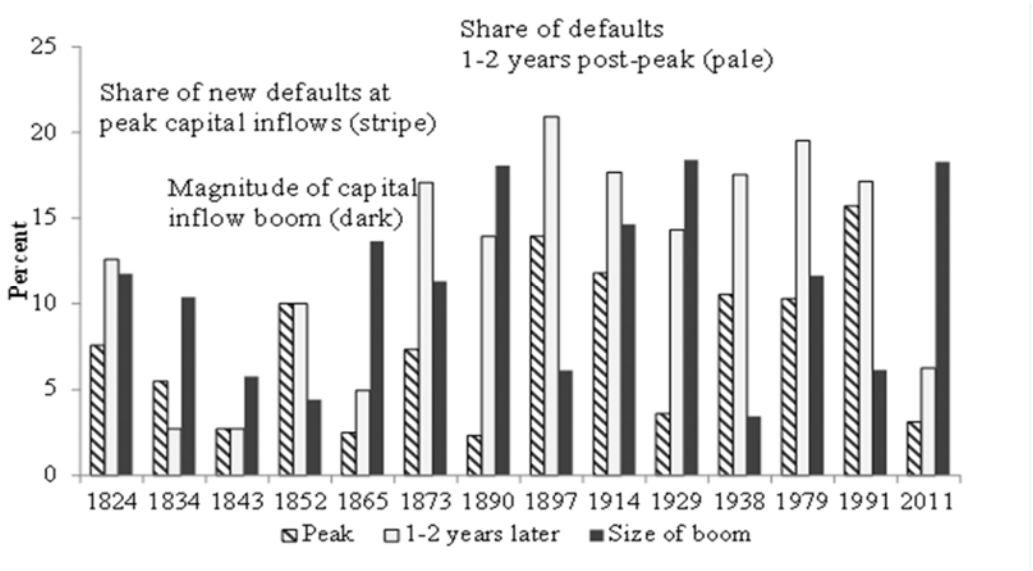
Sources: The authors' introspection based on the dating provided in Reinhart and Rogoff (2009).

3. The capital inflow-default sequence

The capital inflow-default link is clear and consistent over time and tighter than the connection between default and crashes in commodity prices. Eleven out of 14 capital boom episodes were followed by a sharp increase in sovereign defaults after the boom ended. Reinhart, Reinhart, and Trebesch (2016) showed that the six major spikes in new defaults during 1815-2015 occurred after a global capital inflow bonanza ended. Four-out-of-these-six global default peaks were associated with double busts in capital and commodity markets. However, not every default cycle is associated with collapsing commodity prices and several episodes of declining commodity prices do not usher in a higher incidence of default.

Figure 5 provides a temporal dimension to the sudden stop-default connection. The striped bar records the share of countries entering default during the year capital inflows peak, while the pale bars indicated the comparable share 1-2 years past the peak. In all but one episode (1852) new defaults are higher post bonanza. The most significant surges in new defaults follow the 1929 and 1979 capital inflow peaks—the Great Depression era and the Debt crisis of the 1980s. If one were to calculate these shares relative to the number of emerging markets in the sample (as opposed to the total number of sovereigns), the post-1824 bonanza would also stand out among the more severe of episodes. Despite the magnitude of the capital flow bonanza of 1999-2011, both the increase in new defaults and the overall share have remained modest relative the historical antecedent—an issue we will explore further.

Figure 5. Share of New Defaults Following Capital Flow Booms, 1815-2016



Sources: Table 1 and Data Appendix.

Table 7 revisits our earlier analysis to examine the out-of-sample performance during the post-bonanza years. To recap, we use a dummy for the onset of sovereign defaults to external private creditors as dependent variable and apply logit and OLS panel fixed effects regressions for

more than 120 countries (Columns 1 and 2). In Column 3, we regress the global share of countries entering default in each year between 1815 and 2011, using a fractional response logit model to account for the fact that this share is bound between 0 and 1.

Table 7: Capital Flow Busts and Defaults: 1800-2011 vs. 2012-2016

Panel A: Estimation results, 1800-2011

	(1) Country FE Logit (Default Onset)	(2) Country FE OLS (Default Onset)	(3) Fractional Logit (Share of Countries Entering Default)
End Year of Capital	1.072***	0.024***	1.078***
Flow Boom	(0.207)	(0.006)	(0.293)
Lag 1	1.127***	0.025***	0.901***
	(0.220)	(0.007)	(0.325)
Lag 2	1.555***	0.044***	1.547***
	(0.189)	(0.009)	(0.301)
Lag 3	1.120***	0.025***	1.210***
	(0.220)	(0.007)	(0.441)
Lag 4	1.149***	0.026***	1.262***
	(0.217)	(0.007)	(0.437)
Lag 5	0.272	0.004	0.112
	(0.308)	(0.005)	(0.481)
Obs.	10,883	12,953	207
R2		0.009	
Pseudo R2	0.044	0.008	0.162

Panel B: New Defaults: Predicted versus Actual Values, 2012-2016

	Predicted Share of New Defaults (percent)	Actual Share of New Defaults (percent)	Difference
2012	3.0%	3.2%	0.2%
2013	5.6%	0.8%	-4.8%
2014	4.1%	0.8%	-3.3%
2015	4.3%	0.8%	-3.5%
2016	1.4%	1.6%	0.2%

Notes: The dependent variable in Columns 1 and 2 is a dummy for the start of default. In Column 3 the dependent variable is the global share of sovereigns entering a new default. Robust standard errors clustered on country in parentheses in Columns 1 and 2. Constant is not reported. Panel B presents the results of the out-of-sample forecast for the share of countries entering a default and the respective observed values between 2012 and 2016. For the forecast, the estimated values of Column 3 in Panel A were used. Significance levels denoted by *** p<0.01, ** p<0.05, * p<0.10.

The end of global capital flow bonanzas is associated with a significant increase in sovereign default risk worldwide. The coefficients in Column 2 suggest that the risk of entering default increases 12 percentage points in the five post-boom years (including the end year of booms as listed in the left panel of Table 1). This is very large given that the unconditional probability of defaulting is just 2 percent in the full sample.

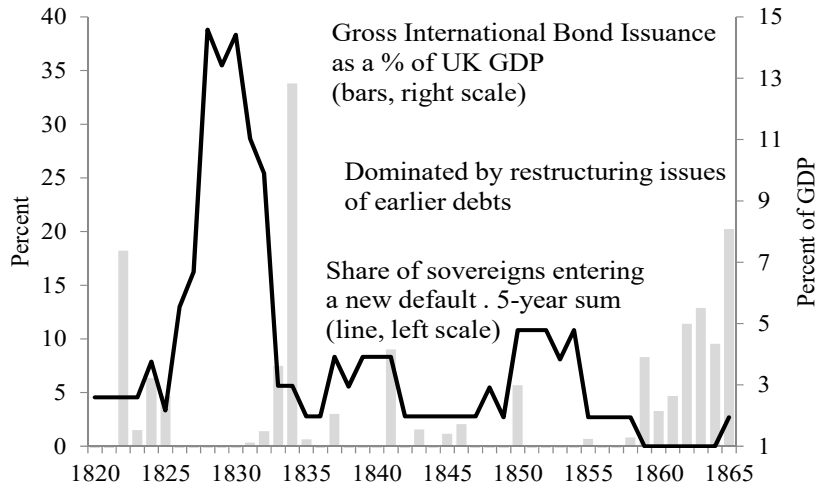
The bottom panel of Table 7 uses the estimates 1800-2011 to generate out-of-sample forecasts for 2012-2016, alongside the actual values of new defaults worldwide. As can be seen, the predicted share of new defaults after 2011 is considerably higher than the realized share. Previous capital flow busts were often followed by marked increases in new defaults, but the bust after 2011 was not. Indeed, the predicted share of new defaults is 3 to 4 percentage points higher in 2012 through 2014 than it actually was. With more than 120 countries in the sample, this corresponds to about 15-20 "missing" sovereign default cases. Presumably, the extraordinary efforts of the central banks in financial centers to bolster their flagging economies and impaired intermediaries had the subsidiary benefit of helping emerging market economies confronted with a sudden stop in capital flows and a commodity price bust. Time will tell whether unconventional monetary policy accommodation by the European Central Bank and the Federal Reserve, among others, prevented a wave of defaults or merely postponed it for the duration those policies remain in place.

4. The episodes: Booms that ended badly

The capital flow cycles/reversals reviewed in greater depth in this section were, as previously noted, the most damaging in terms of both igniting a wave of new defaults and ushering in one or more decades of economic hardship and full or near financial autarky for the debtor countries. The severity of these episodes (1820s, 1930s, and 1980s) all

shared a common thread—a sharp tightening in global liquidity conditions accompanied by some degree of turmoil at the financial center. These episodes therefore highlight the importance of incorporating a "global" financial factor as a driver of fluctuations in global capital flows.

Figure 6. Bond Issuance and New Defaults: 1820-1865



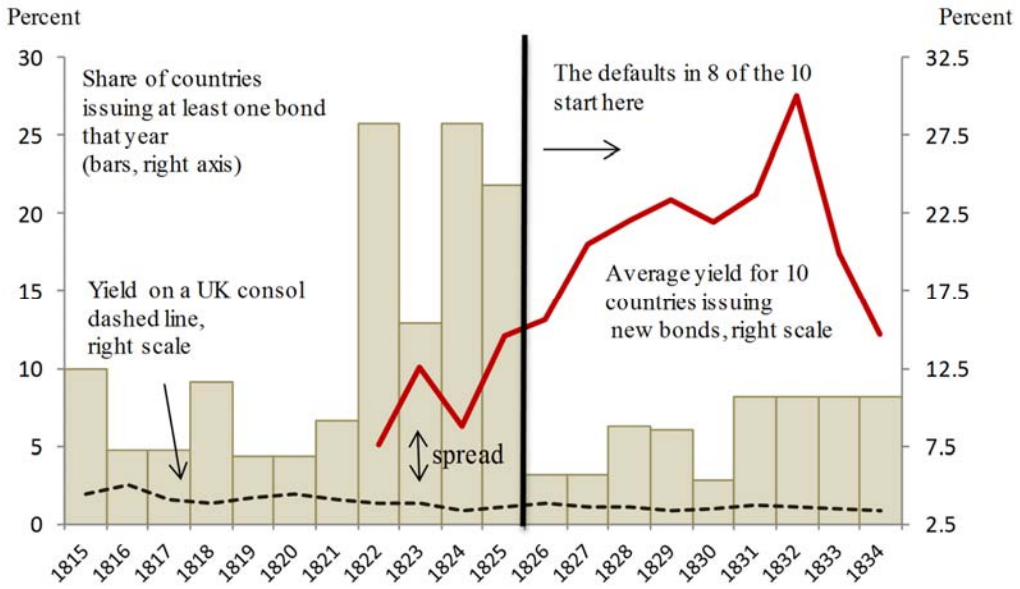
Sources: Data Appendix, and sources cited therein.

Between 1824 and 1825 Argentina, Brazil, Chile, Gran Colombia (which included Ecuador and Venezuela), Greece, Mexico, Peru, and the United States of Central America all issued their first bonds as newly-established sovereigns. [26] By 1827, all but Brazil had defaulted. The first emerging market debt crisis, which would last decades, was well underway. As Figure 6 highlights, the surge of capital inflows (from the vantage of the debtors) and bond issuance is followed by several years of no new issues in the international capital market. Indeed, the paucity of flows is somewhat masked by the pick-up in issuance shown in the figure for 1834, which almost entirely owes to Spain's restructuring of its existing debts, as it had defaulted in 1824.

[26] Greece had not yet gained independence at this time, but the independence movement tapped the London market for financing, as there was considerable "appetite" for high-yielding debt.

By most accounts, including our own narrative, the search for yield and appetite for foreign bonds in London was fueled in the first place by a significant easing in financial conditions in London. The Bank of England cut its bank rate in 1822 for the first time in more than three decades and did so again in 1823. Real short-term interest rates fell by more than 10 percent between 1821 and 1824. Furthermore, if the reduction in the short rate was not sufficient motivation, a major debt conversion was undertaken by the British government (as we document in the next section) that cut consol yields by 100 basis points. As Figure 7 makes plain, the spread between British consols between 1822 and 1825 (the last year before the explosion in new defaults) oscillated between 400 and 1,100 basis points.

Figure 7. The First Modern Emerging Market Crisis: Bond Issuance, Yield Spreads and Default



Sources: Bank of England and Data Appendix.
Notes: The 10 countries are: Argentina, Brazil, Chile, Colombia, Greece, Mexico, Peru, Portugal, Russia, and Spain.

In 1826, the Bank of England raised its rate 100 basis points, the stock market crashed, six London banks and 60 country banks closed, and, according to Connant (1915), panic in London ensued, abruptly ending the capital inflow phase of the cycle. Real commodity prices, which had

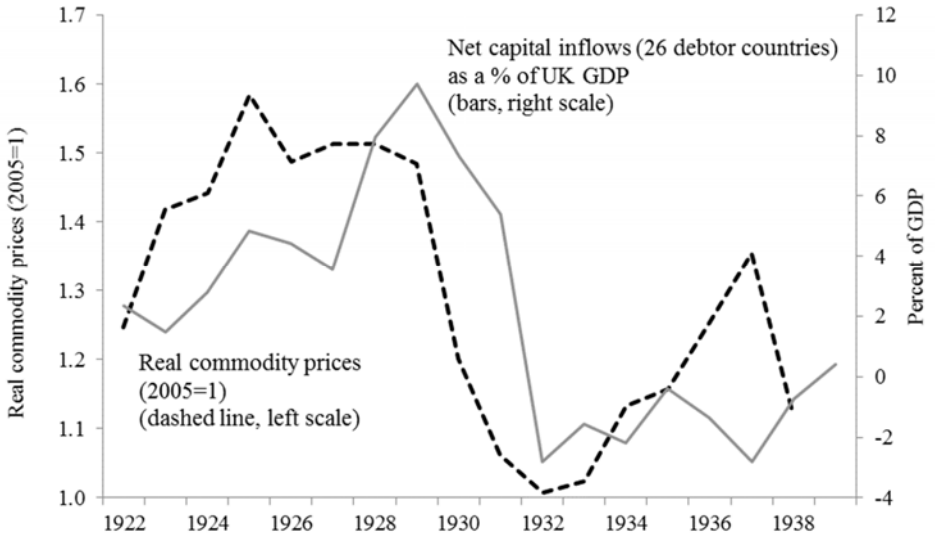
risen by nearly 30 percent during from 1822 to 1825, fell a comparable amount over the following decade. Both during the upswing as well as during its reversal, this episode was a "triple bonanza" and a "triple bust" with commodities, financial conditions, and capital flows all swinging in tandem. The magnitude these external shocks coupled with the sheer domestic disarray, if not outright chaos, for most if not all the new borrowers can help explain both the initial default and the subsequent lack of recovery.

Another "triple boom-bust episode" with comparable disastrous consequences for sovereign borrowers (advanced and emerging) emerged in the interwar years. By this time the global financial center most involved in underwriting was New York. Bond issuance would probably convey the same picture as the net capital flow data reported by the League of Nations (shown in the top panel of Figure 8) that shows a surge in flows from the end of WWI through 1929 followed by a spectacular reversal. Flows were consistently negative for the debtor countries through 1938, the last year for which there is data on the eve of war. The boom-bust for commodity prices follows a similar path.

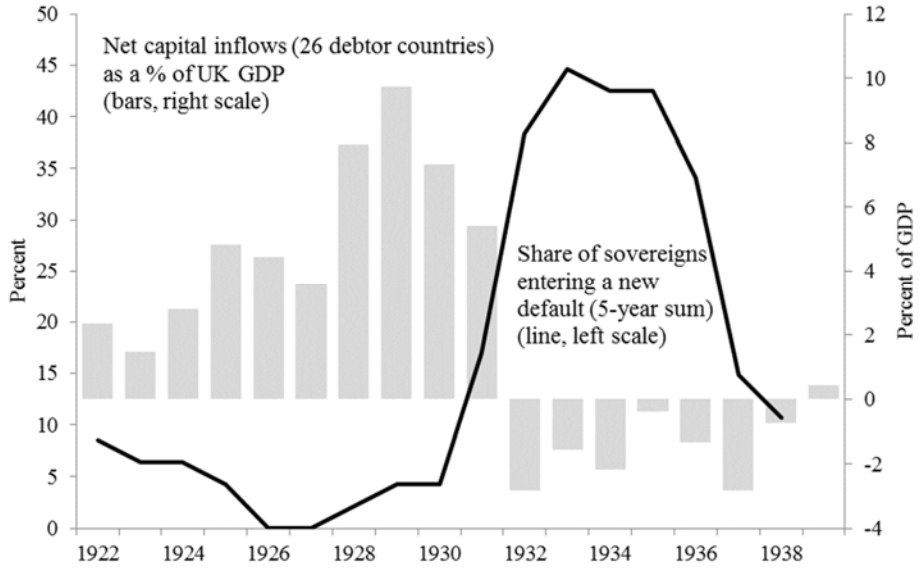
As in the episode one century earlier, there is considerable gyration in policy interest rates. The Federal Reserve's discount rate ended 1920 at 6 percent. By 1924, it had fallen to 3 percent, only to rebound to 5 percent by the end of 1928. The tightening in liquidity *de jure* became was more extreme *de facto*. The real (inflation-adjusted) discount rate, which was as low as 1.2 percent in 1925, had risen to almost 7 percent in 1928 and topped 12 percent in 1931 at the height of the global banking crisis.

Figure 8. The Interwar Capital Flow, Commodity, and Default Cycle: 1920-1938

Capital Flows and Real Commodity Prices



Capital Flows and Sovereign External Defaults



Sources: See Data Appendix and sources cited therein.

The tightening of liquidity, the collapse in commodity prices, drastic reversal in capital flows, and a full-fledged financial crisis in the United States (as well as in most other creditor countries) led to an epidemic of defaults (as shown in the bottom panel of Figure 8). The adoption

of capital controls in the United States and elsewhere to cope with the crisis was to seal the fate of cross-border flows for about four decades.

The triple boom-bust pattern would re-emerge again in the late 1970s. Lax monetary conditions and negative ex-post interest rates in the United States, the boom in commodity prices and a surge in bank lending to developing and emerging economies set the stage for the spike in new defaults that would follow the Federal Reserve's spectacular tightening under the leadership of Paul Volker at the end of 1979. The lost decade of Latin America followed; Africa lost more than a decade.

It should be clear from this discussion that a long history of capital flows would not be complete without incorporating in the analysis a measure (or measures) of a global financial factor.

V. Global Financial Conditions: Concepts and Measurement

"John Bull can stand many things, but he can't stand 2 percent."

19th century financial cliché cited by Kindelberger (2001)
and a favorite of Bagehot (1873)

As noted, most of the literature on the role of external financial factors has employed a narrower measurement of financial conditions at the center than suggested here. Usually, global financial conditions have been approximated by the risk-free short-term interest rate or the central bank policy rate at one or more of the world's financial centers. The experience of the past decade shows that the stance of central bank policy cannot be summarized by its short-term policy rate. So, too, does the longer sweep of history. The size, composition, and maturity profile of its asset holdings matter. Also of consequence is regulatory and supervisory policies regarding

banks, other intermediaries, and market utilities. Actions by other official actors, including sovereign debt management strategies that twist the slope of the yield curve, also appear to matter for cross-border flows. As our discussion of the notorious cycles of the 1820s and 1930s made plain, financial crises in the world's financial centers affect global liquidity conditions, not only as the crisis is unfolding, but also well into its aftermath.

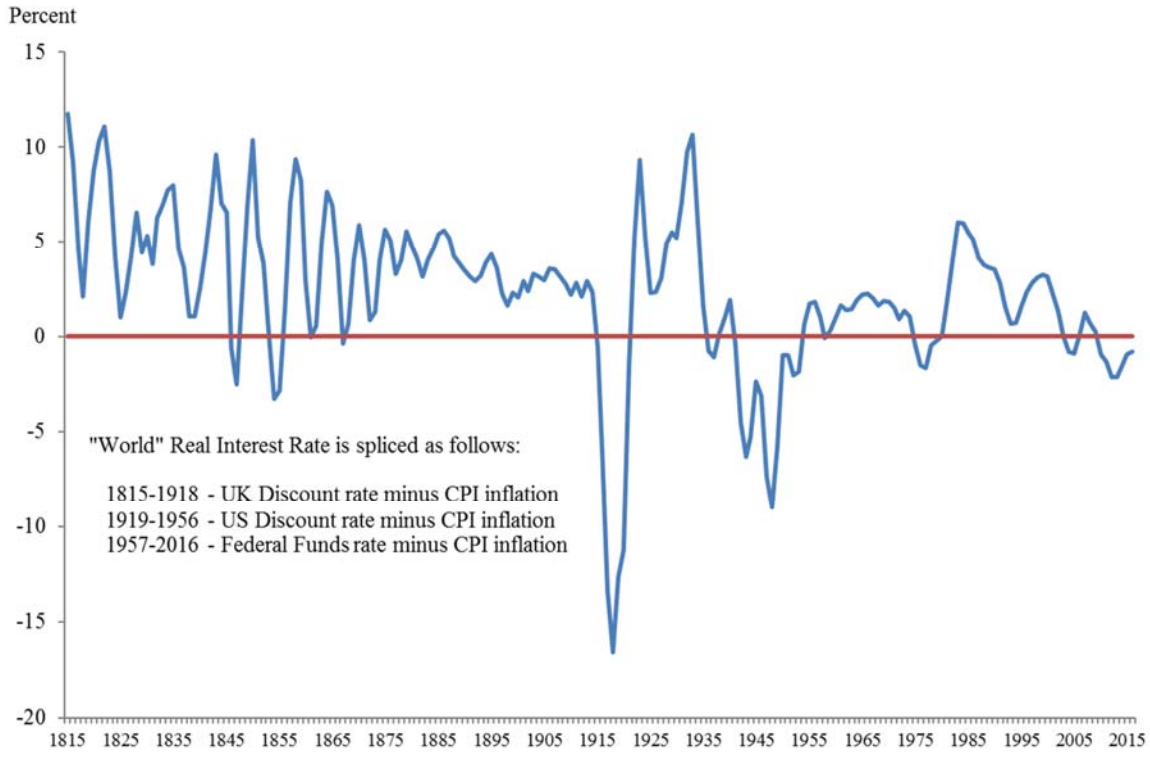
This presumably is the impulse behind using a measure of the implied volatility of the US equity price index the S&P 500, the VIX, traded on the Chicago Board Options Exchange to identify global financial cycles, including (but not limited to) Longstaff et al. (2011), Bruno and Shin (2014), Cerutti et al. (2014), Passari and Rey (2015), Rey (2015), and Cerutti et al. (2017). Mechanically derived from the Black-Scholes pricing formula and near-term contracts, the VIX represents a nonlinear manipulation of those prices, the S&P 500 share price index, and the current short-term nominal interest rate. In that sense, it does incorporate some of what likely drives the global financial cycle, the short rate and equity values at one financial center and attitudes toward and the expectation of uncertainty about one market. As a practical matter, the VIX as currently configured is available beginning around 1990. There are, of course, realized equivalents (owing to Scwhert, 1989) that, for example, allowed Giesche et al. (2011) to examine corporate spreads over 150 years. However, we also are concerned about packing multiple factors that influence and reflect the force of interest nonlinearly into one variable. In that regard, we are more inclined to the disaggregate approach taken, say, by Claessens et al. (2012). Also, the globalization of finance calls for a less US centered approach (as in Cerutti, et al., 2014).

We start with the familiar, nominal and real policy rates at the financial center, and proceed to introduce other factors that shape global financial liquidity one at a time, providing historical examples along the way.

1. *Central bank and short-term rates*

Focusing on the discount rates for the Bank of England (1812-1919) and the US Federal Reserve (1920-1955) and the Federal Funds rate for 1956 to the present, Figure 8 shows the trajectory of a short-term policy rate for the leading financial center of the time, adjusted (ex-post for consumer price inflation. There are four protracted valleys (some deeper than others) in the 200-year history of the ex-post real rate depicted in Figure 9.

Figure 9. "World" Real Short-term Interest Rates, 1815-2016
(3-year moving average)



Sources: Bank of England, Federal Reserve Bank of St. Louis FRED Database, and authors' calculations. See Data Appendix.

All these occur following the adoption of fiat money in the early part of the 20th century. Three of these episodes of protracted negative real interest rates (1920s, 1970s, and post-2008) coincide with major capital flow bonanzas (Table 2). The fourth long spell of negative real interest rates occurs in the aftermath of World War II, an era of widespread

capital controls and financial repression that, as discussed, saw the disappearance of cross-border capital flows. [27]

Table 8 presents the dating of the short-term ex-post real interest rate cycle; we report the results for both nominal rates in the Appendix. It is the comparable exercise in spirit to that shown in Tables 2 and 3 for capital flows and real commodity prices, respectively. The exercise was done as in Burns and Mitchell, rather than the more mechanical algorithm because of the distinct difference in variance before and after World War i. As Figure 8 makes plain, the volatility in real rates during most of the gold standard era (1821-1913) owes largely to the fact that the price level

Table 8. The Short-term Real "Policy" Interest Rate Cycle: 1815-2016

Rising interest rates				**Declining interest rates**			
Trough	Peak	Duration	Change (Percentage points)	Peak	Trough	Duration	Change (Percentage points)
1816	1821	5	16.8	1821	1824	3	-13.3
1824	1835	11	10.8	1835	1836	1	-10.4
1836	1843	7	15.3	1843	1846	3	-21.4
1846	1848	2	25.6	1848	1853	5	-25.5
1853	1858	5	18.0	1858	1860	2	-16.9
1860	1864	4	16.0	1864	1867	3	-13.3
1867	1869	2	12.1	1869	1872	3	-9.5
1872	1874	2	8.5	1874	1900	26	-8.5
1900	1906	6	4.6	1906	1917	11	-24.5
1918	1921	3	29.0	1921	1925	4	-13.8
1925	1931	6	11.3	1931	1937	6	-15.1
1937	1938	1	5.7	1938	1947	9	-16.6
1947	1955	8	16.3	1955	1958	3	-3.2
1958	1959	1	3.5	1959	1975	16	-5.7
1975	1982	7	9.5	1982	1993	11	-6.1
1993	1998	5	3.7	1998	2004	6	-5.1
2004	2007	3	3.5	2007	2011	4	-5.2
Averages		5	12.4			6	-15.9

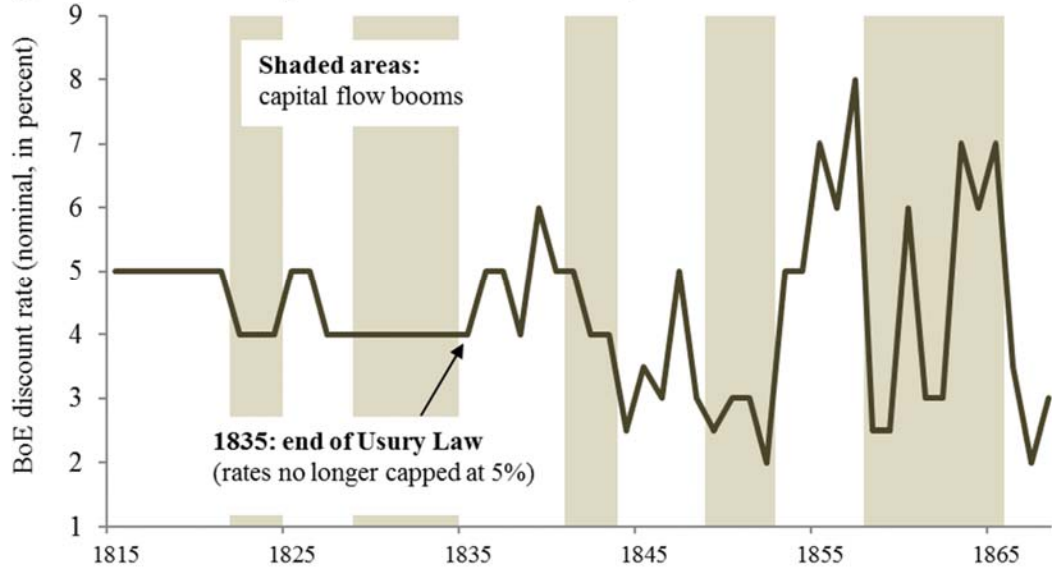
Sources: Bank of England, FRED, Federal Reserve Bank of St. Louis, and the authors' calculations.
Notes: The three shaded areas correspond to the three policy rates that are spliced. As indicated in Figure 8, these are: the Bank of England discount rate; the Federal Reserve's discount rate and post 1955 the Federal Funds rate.

[27] See Reinhart and Sbrancia (2015).

was mean-reverting. Large deflations were interspersed with inflation (see Appendix Figure 1). The adoption of fiat money, and the structural break that entailed, among other changes, had a significant impact on the evolution of real interest rates. The dates line up relatively well with Cagan (1969), who identifies turning points in US high-grade corporate bond yields from 1857 to 1965 in a similar fashion. Recognize that, compared to this paper, Cagan is US-centric and employs a longer-term nominal yield with credit risk.

The picture that emerges mirrors the earlier discussion of the acute cycles of the 1820s, 1930s, and 1980s. Declines in interest rates at the center act as a push factor to capital inflows, and rate hikes often contribute to their abrupt reversal. The unusually high and persistent real interest rates of the 1930s—a consequence of severe deflation stand out as a key factor in explaining the virulence of that cycle. Developing capital importers became exporters of capital to the United States and defaults, as shown in Reinhart, Reinhart, and Trebesch (2016) escalated to record highs.

Figure 10. Bank of England Discount Rate and Capital Flow Booms: the 19th Century

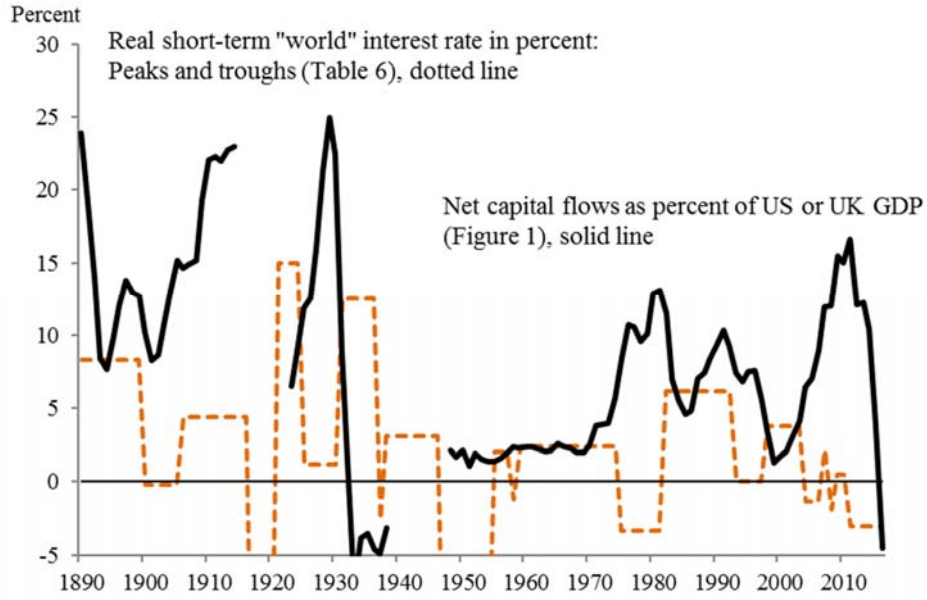


Notes: Shaded areas show years of capital flow booms based on Table 2. The solid line plots the nominal discount rate by the Bank of England. See Data Appendix for more details.

Interest rates at the financial center appear so much in the literature for a reason—their negative association with capital flows shows through relatively clearly over the past 200 years. Figure 10 is one such example for the 19th century, plotting the Bank of England rate alongside the episodes of capital flow booms (shaded). It can be seen that all major inflow booms of the time started after a decline in nominal rates in England and ended once the rate started to rise again. A particularly noteworthy episode is the mid-1830s when the English usury law was repealed. The removal of the 5 percent usury ceiling in 1835 sent short-term rates immediately higher, possibly cutting short the ongoing capital inflow phase of the cycle.

Figure 11 takes a broader view by combining our long series on aggregate capital inflows with that on "global" real interest rates for a time span of almost 130 years. To deal with the high volatility of real rates before and after WWI (see Figure 9), the dotted line shows the highest/lowest annual real interest rate during each of the peak/trough interest rate spells summarized in Table 8. The resulting graph shows that low real interest rates again correspond to peaks in inflows, notably including the booms of 1873, 1894, and the 1920s.

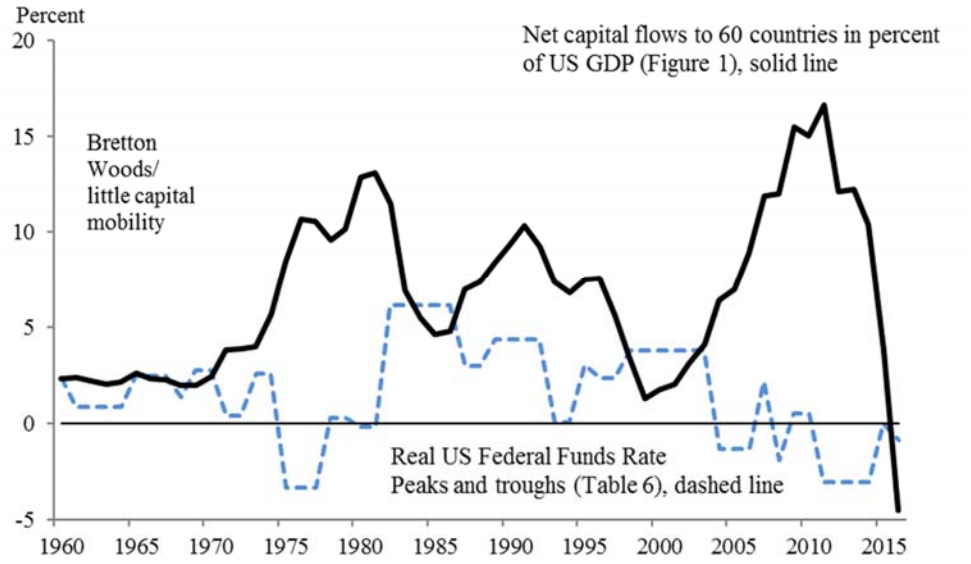
Figure 11: Real "World" Interest Rates and Global Capital Flows, 1890-2016



Notes: The solid line shows the aggregate world capital flows to UK or US GDP from Figure 1. The dotted line shows the peaks and troughs in real short-term "world" interest rates for each cycle of Table 8.

The link between interest rates in the financial center and cross-border capital flows has remained tight in more recent decades, as Figure 12 illustrates. Both the inflow boom to Latin America, Africa and Asia in the 1970s and the global capital flow boom of the 2000s were presaged by low real interest rates in the United States. Moreover, the bust of the early 1980s coincided with the sharp increase in US rates (the "Volcker Shock").

Figure 12: Real US Federal Funds Rate and Global Capital Flows, 1890-2016



Notes: The solid line shows capital flows to 60ß countries as percent of US GDP from Figure 1. The dotted line shows the peaks and troughs in the real US Federal Funds rates for each cycle from Table 8.

Table 9 summarizes the financial center/global capital flow nexus over 200 years. As has been stressed, the negative effects of rising rates on cross-border capital flows is greatest in the two samples characterized by comparatively high capital mobility, 1870-1914 and 1975-2016. The point estimates are also substantive, indicating around a one-to-one relationship. By contrast, there is no systematic link between capital flows and US interest rates (the financial center of that span) in the 1918-1975 sample, which was dominated by capital controls during war and well thereafter. Of interest is our inability to detect an interest rate-capital flow link for 1815-1869, where capital account restrictions were not thought to be as dominant as during the world wars and Bretton Woods. We interpret this result as also reflecting little or no access to international capital markets by a substantial number of countries that had borrowed heavily in the 1820s and plunged into default before the end of that decade. Unlike most modern defaults, many of these episodes stretched on for decades and were not resolved until the latter part of the 19th

century. For this reason, we think it important to further refine the analysis to incorporate at the country level these limited capital market access episodes.

Table 9. Global Capital Flows, Capital Mobility, and "Global" Interest Rates, 1815-2016

	(1)	(2)	(3)	(4)	(5)
Time Period	1815 - 1869	1815 - 1869	1870 - 1914	1918 - 1975	1976 - 2016
Nominal interest rate in financial center	0.249				
	(0.891)				
Real interest rate in financial center		0.216	-1.317**	0.582*	-0.936***
		(0.163)	(0.494)	(0.305)	(0.327)
Observations	53	53	45	50	41
R^2	0.001	0.023	0.098	0.114	0.120

Notes: The dependent variable is the value of global capital flows as percent of UK or US GDP (Figure 1). The explanatory variable is the interest rate in financial centers (UK until WW1, US thereafter, see Data Appendix) Robust standard errors in parentheses. *, **, and ***, indicate significance at the 10%, 5% and 1% - level.

2. Debt management

A subtler influence on international flows at the global level are the debt management practices in the financial centers and official actions regarding sovereign securities. We offer three examples spanning the historical record: UK debt conversions over the 19th century, the US Treasury's attempt to systemically tilt the term structure lower in the mid-20th century to meeting conflicting domestic and external goals, and the US sponsorship of the restructuring of emerging market debt in the early 1990s (the Brady plan, which was another debt conversion). All three were driven by multiple objectives, and all three mattered for international capital flows.

British debt conversions. Perhaps one of the most salient and sustained historical episodes in our sample is the United Kingdom's numerous debt conversions in the wake of the Napoleonic Wars.[28] These conversions steadily reduced long-term interest rates in the UK through most of the 19th century. In their authoritative history of interest rates, Homer and Sylla (1996) devote considerable attention to them, as a policy that shaped British and, therefore, global interest rates. Indeed, the more successful of these conversions helped propel British capital outward to nearly every corner of the globe, as documented by our data base on international bond issuance and Stone's (1999) series on British capital exports. Combined, these data span a century, 1815-1914.

Table 10 lists the nine conversions that took place between the years 1749 and 1888. Our synopsis of the multiple episodes draws on the detailed analyses presented in Sinclair (1803), Commissioners for the Reduction of the National Debt (1891), Hamilton (1889), Hirst (1910). Examining the particular circumstances, goals, and outcomes of these episodes, their degree of success across conversion attempts was far from uniform. Outcomes, as measured by the share of debt converted and the resultant interest savings varies markedly from one episode to the next.[29] Based on these outcomes, we have shaded the relatively successful cases in Table 10.

[28] Edwards et a. (2015) examine the consequences of another notable debt conversion, the suspension of the gold clause by US President Roosevelt in1933.

[29] We regard conversions as successful if they fulfill two criteria: 1) if they were well received by bond investors and involved large amounts of debt (defined here as a ratio of debt converted to total debt outstanding of at least 10%), and 2) if they achieved their main goal, namely substantial interest savings (defined here as savings of at least 1% of total government revenue in that year).

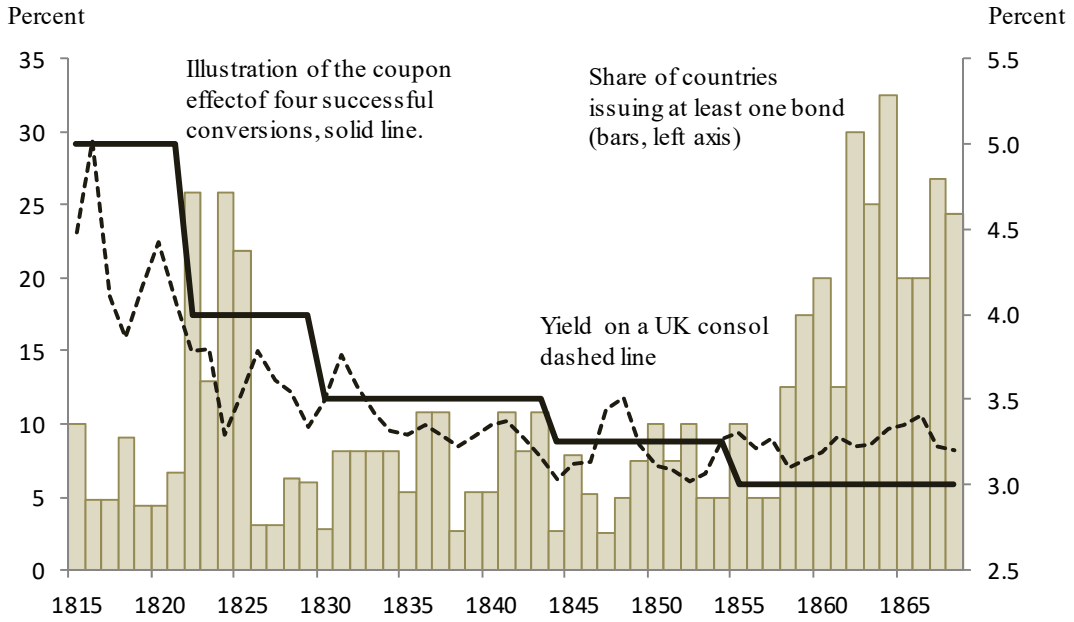
Table 10. Conversions of Funded Debt in the United Kingdom: 1749-1888
(Successful conversions are shaded)

Conversion	Year	Coupon reduction (perc. points)	Total Debt Outstanding	Debt Eligible for Conversion	Debt Converted	Share of Total Debt Converted	Interest savings (% of revenue)
Pelham	1749	from 4 to 3	71,340,398	57,703,475	54,413,434	76.3%	7.3%
Vansittart	1822	from 5 to 4	798,463,711	152,422,143	149,627,867	18.7%	2.0%
Robinson	1824	from 4 to 3.5	792,851,971	76,248,180	70,098,934	8.8%	6.4%
Goulburn	1830	from 4 to 3.5	772,607,326	153,671,091	150,790,176	19.5%	1.4%
Althorp	1834	from 4 to 3.5	753,238,754	10,622,911	6,489,790	0.9%	1.1%
Goulburn	1844	from 3.5 to 3.25	773,990,293	248,860,663	248,757,311	32.1%	2.1%
Gladstone	1853	n.a.	764,541,297	9,541,569	3,063,907	0.4%	0.1%
Childers	1884	from 3 to 2.75	640,631,095	612,761,061	22,362,595	3.5%	0.1%
Goschen	1888	from 3 to 2.5	609,740,743	592,180,868	565,766,933	92.8%	3.1%

Sources: Sinclair (1803), Commissioners for the Reduction of the National Debt (1891), Hamilton (1889), Hirst (1910), and authors' calculations.
Notes: All numbers in current British pounds. We mark conversions as successful if they fulfill two criteria: 1) if they were well received by bond investors and involved large amounts of debt (defined here as a ratio of debt converted to total debt outstanding of at least 10%), and 2) if they achieved their main goal, namely substantial interest savings (defined here as savings of at least 1% of total government revenue in that year).

Setting aside the first 1749 conversion (as our sample starts at the turn of the 19th century), the change in coupon and yield in the subsequent four conversions through 1865 are shown in Figure 13. The largest "coupon shock" is associated with the 1822 exchange, and its role in the capital inflow boom-bust of the 1820s has already been discussed by Kindelberger and others. Cumulatively from 1822 to the significant Goschen conversion in 1888, coupons on British consols were halved from 5 to 2.5 percent. By the end of the 19th century and the peak in capital outflows from the United Kingdom (Figures 1 and 2) consol yields had breached 2 percent.

Figure 13. United Kingdom: Debt Conversions, Yields and Foreign Bond Issuance: 1815-1865



Sources: Bank of England, Table 9, Data Appendix, and sources cited therein.

Operation Twist. If specific strategies result in a shift or a tilt the yield curve in an appreciable manner or for a sustained period, it may well act as a catalyst for change in the volume or composition of capital flows. Sometimes capital flows themselves are the whole point of the exercise. The original "Operation Twist" of 1961 was an explicit attempt of US officials to tilt the term structure down by shortening the maturities of Treasury issuance (as discussed originally by Modigliani and Sutch, 1966, and subsequently by Alon and Swanson, 2011). With the domestic economy weak, the Kennedy Administration wanted to provide stimulus without lowering the short-term rate and encouraging gold outflows under the prevailing Bretton Woods system.

Since Operation Twist, even without the intent to manage capital flow, officials have made meaningful changes to the maturity structure of government debt over time. In the US, for instance, the average maturity of marketable Treasury debt has varied in a two-

year range since 1980.[30] Across countries, which presumably is the appropriate comparison for understanding bilateral capital flows, the range is much more considerable. In the advanced economy group as defined by the International Monetary Fund, the average maturity of sovereign debt in 2017 spans over ten years, from as short as 4.2 years in New Zealand and as long as14.9 years in the United Kingdom.[31] If there are significant effects on yields, as suggested by portfolio balance theory, these differences would presumably shape capital flows.[32] The revealed preference of central bankers at the Bank of Japan, the Bank of England, the European Central Bank, and the Federal Reserve, who showed themselves willing over the past decade to experiment with the size and composition of their asset holdings, seems to show the acceptance of the premise. That McCauley et al. (2015) assert that there is evidence that asset purchases tilted funding away from private loans toward bonds suggests that those central bankers may be correct.

The Brady Plan. In 1989, US Treasury Secretary Nicholas Brady put forward a work-out plan to lift some of the debt burdens that had produced a lost decade of economic performance for many emerging market economies (mostly in Latin America and at the time referred to as less developed countries). The core idea was to encourage banks to trade their impaired loans for an upgrade of principal (in the form of new securities paired with zero-coupon US Treasury securities defeasing principal) in return for some debt relief. In doing so, the Brady Plan started the rotation of the funding of emerging market economies from banks to bonds, effectively resurrecting the tradable sovereign debt

[30] The latest data reside here: https://www.treasury.gov/resource-center/data-chart-center/quarterly-refunding/Documents/Q22017CombinedChargesforArchives.pdf and are also available in Table FD-5 of the *Treasury Bulletin*.
[31]The data are found in Table A25 of the International Monetary Fund, *Fiscal Monitor*, available at http://www.imf.org/~/media/Files/Publications/fiscal-monitor/2017/April/
[32] Bernanke and Reinhart (2004) review the basic channels of influence of unconventional monetary policies.

market of the interwar period. For US banks, the shift away from such loans was relatively permanent. European banks, with the break-up of the former Soviet Union, were relatively well positioned to lend subsequently to periphery European economies, and Japanese banks somewhat later stepped up lending to economies around the Asia-Pacific Rim. That the record was mixed is clear. As Reinhart, Rogoff, and Savastano (2003) point out, many of the Brady bunch were back in default not long thereafter, Kaminsky and Reinhart (1998) discuss how bank lending was central to the Asian financial crisis, and European banks are still encumbered by a troubled loan book relative to their capital. What is also clear, however, is that the patterns of international capital flows materially shifted from the intervention.

3. Financial sector and capital account regulations

The particular type of financial regulation that we are interested in are those that potentially affects cross-border capital flows. Over the longer historical record, the variety and scope of such policies has been considerable over time and across countries. For instance, in July 1979, the United Kingdom abolished restrictions on outward FDI and liberalized outward portfolio investment.[33] Large capital flows to emerging markets continued (although primarily through US banks until 1981).[34]

Creating a cross sectional data set involves the laborious work of determining when and how countries changed their rules and regulations regarding cross-border transactions. More subtle still is that authorities may change enforcement of existing cross-border rules or change

[33] Later that year, the Exchange Control Act of 1947 was suspended and all remaining barriers to inward and outward flows of capital removed.

[34] See Table 2.

domestic rules to have an effect on capital flows. As an example of the latter, consider that putting transaction caps on domestic currency withdrawals was a feature of some Euro area stress events precisely to prevent a run to other euro note issuers.

History provides ample case studies in which changes in policies or regulations affecting domestic interest rates, such as the elimination of usury laws in the UK in the 1830s (see Figure 9) or the shelving of regulation Q in the United States, also matter for capital flows.

As one more complication, Calvo, Leiderman and Reinhart (1993) and El Erian (1992) noted that the resurgence of capital flows to emerging markets in the early 1990s was also connected to important regulatory changes in the capital markets of the advanced economies in 1990. In some sense, market illiquidity represents a form of capital tax that, because it varies across country and over time, shapes capital flows. Perhaps, the most salient of these was the approval of "Regulation S" and "Rule 144A" in the United States, which reduced transaction and liquidity costs faced by developing countries in approaching capital markets. In addition, banks in financial centers made increased use of leverage to support issuance and trading of debt obligations. Over the 1990s, partly as a consequence, the value and volume of securities transferred for private and official parties on the Federal Reserve's settlement system doubled.[35]

There are several possibilities as to how to measure the capital mobility-regulatory dimension, and all share the important limitation of less-than-complete coverage. One option would be to focus primarily on the financial center(s). These policies may have a domestic orientation, such as interest rate ceilings (or their predecessors in the form of usury laws), or the type of regulation directed at transactions in the external capital or

[35] The data reside here: https://www.federalreserve.gov/paymentsystems.htm.

financial account. Obviously, the range of capital control measures over time has varied dramatically from the near airtight measures in place during the world wars (and even the financial crisis of the 1930s) to modern macro-prudential regulations that require financial institutions to hold higher shares of domestic government debt. [36] Also as obvious, the mobility of capital internationally depends on the controls in place on both sides of potential transactions. That is, what are the controls on inflows and outflows for all potential partners? Of course, unlike their counterparts in the financial centers, changes outside the core are far less likely to have global repercussions and are not necessarily common to other countries.

The index introduced in Ilzetzki, Reinhart and Rogoff (2017) for 1946 to 2016 based on a combination of de jure policy and de facto exchange rate policy is one attempt at measurement. The index provided for 194 countries is based on three criteria: (i) the existence of a de jure dual exchange rate market; (ii) a de jure system of multiple exchange rates; (iii) or, a parallel market (official, tolerated or outright illegal) and, if there is, is a parallel market premium above 10 percent over the majority of a moving 12-month period. If any of these criteria hold, the index takes on the value of one. It is zero otherwise.

This measure of capital mobility is not as comprehensive as others that weigh specific measures designed to limit or ban capital outflows or inflows, regulate the repatriation of profits abroad, cap foreign ownership, and require the surrender of foreign exchange receipts, among other features. The index is informative as a "minimum measure" of restrictions nonetheless. While a country can have many of the capital account restrictions listed above (or others) and still

[36] The latter, more subtle, variety may simply serve to accentuate a home bias.

have a de facto as well as a de jure unified exchange rate, the converse is not true. Figure 14 presents the index (the share of countries with restrictions)—which offers the mirror image of the incidence of capital inflows index, as one might expect.

Figure 14. Capital Controls, 1946-2016

Share of Independent Countries with Dual, Multiple, or Parallel Exchange Rates

Source: Ilzetzki, Reinhart and Rogoff, (2017)

A more inclusive treatment would involve some proxy measure for global capital mobility. One such index, based on introspection and the reading of financial history, is offered in Obstfeld and Taylor (2003) for 1860 to 2000 and extended by Reinhart and Rogoff (2009) back to 1800 and updated through 2009. As noted earlier, this notional index maps well onto the incidence measure of capital inflows shown in Figure 2. The financial openness variable presumably interacts with interest rate fluctuations in the financial center, whether these owed to changes in monetary policy or not. The intuition is

straightforward. In an era of capital controls and near financial autarky, such as the decades following World War II or sub-periods in the 19th century where convertibility was suspended, one should not expect that a change in the financial center interest rate to have comparable repercussions on other countries as in periods of tighter global capital market integration. Allowing for the time variation in capital market integration would have the effect of, for example, "scaling down" a 100 basis point change in the policy rate in the US in the 1950s and "scaling up" a comparable change in the more globalized 1990s.

4. The way forward on financial conditions

It is beyond the scope of this paper to put forward a specific indicator summarizing the disparate influences on global capital flows, but we think that we have identified some of the important building blocks. Also, to capture the appropriate interactions, we believe that the index should be a geometric, not arithmetic, mean. A low real interest in a financial center matters more when controls on capital are weak, banks have space on their balance sheets, and financial markets are liquid. Tighten the screws on any or all items on that list and the same policy rate has less traction. This makes a necessity of understanding the prevailing composition of financing and official attitudes, as reflected in regulation and guidance, about that financing. Sovereign bond issuance, for example, mattered in the 1920s but not the 1970s and official action to help clean up the legacy issues on bank balance sheets of excesses from the 1970s revived the sovereign bond market in the 1990s.

Among the other institutional arrangements that matter is the exchange rate system. The pre-war gold standard differed from the post-war Bretton Woods management of

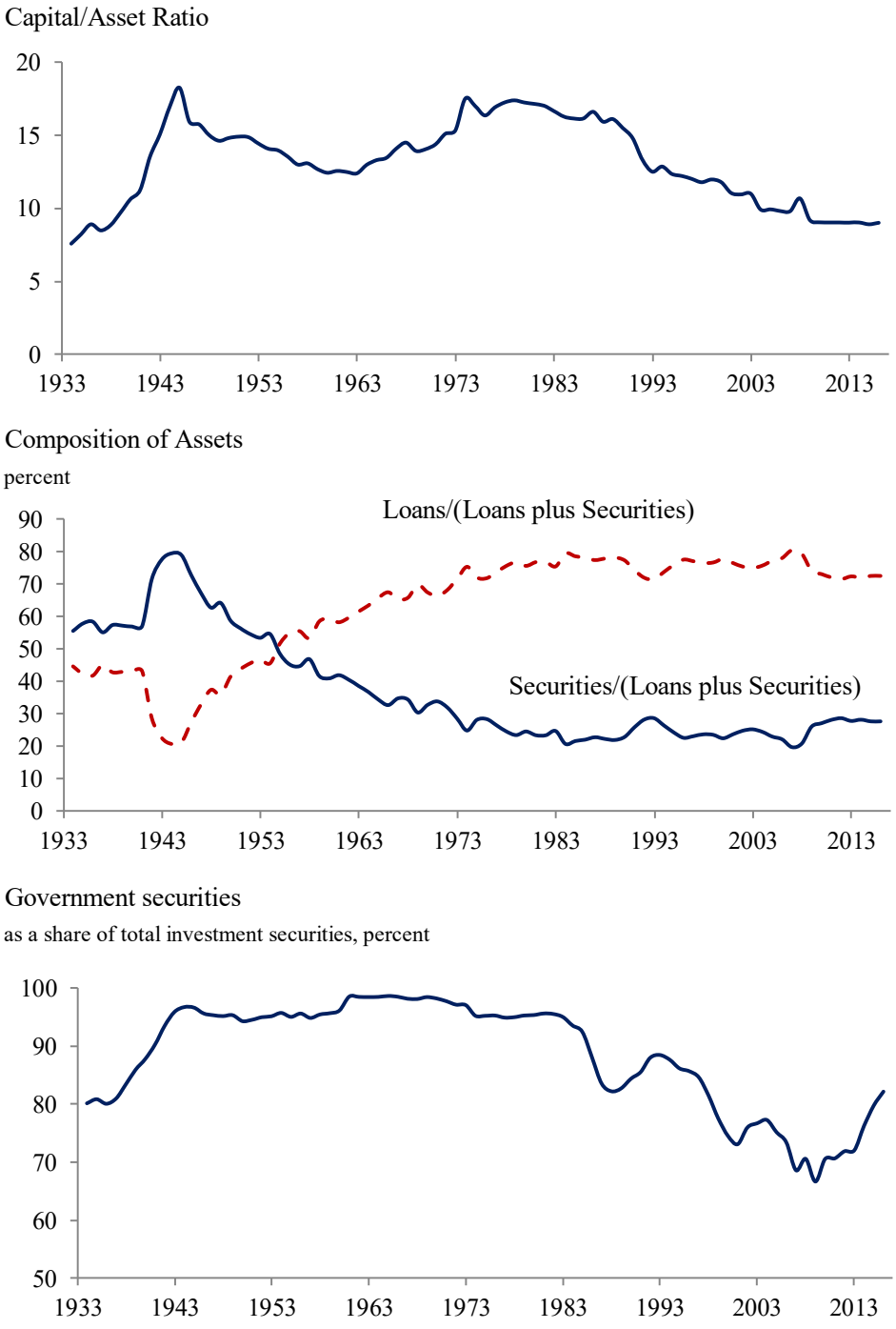
exchange rates. That about 60 percent of the economies of the world anchor their currency fluctuations to the US dollar (according to Ilzetzki, Reinhart, and Rogoff, 2016) broadens the footprint of Federal Reserve interest-rate setting.

A deeper cycle is at work as well. The nearness or distance of a financial crisis, in time and location, influences attitudes of the private and official sectors toward capital flows. The 1880s, 1920s, and early 2000s were heady times because the recent record had been relatively tame. This attitude had the effect of magnifying the relative attractiveness of investment opportunities. In the 1890s, 1930s, and early 2010s, bankers and other investors hunkered down, expecting losses in any direction.

We offer two examples of quantification, recognizing that these are potential inputs to a financial conditions index because they both influence capital flows and are influenced by the same forces that affect capital flows.

Figure 15 plots balance-sheet ratios for US banks from 1934 to 2016. The post-World-War-II climb in their capital (shown as the rise in the top panel of the aggregate capital-to-asset ratio) left them with balance sheet space to expand if an opportunity presented itself. The opportunity, bankers thought, took the form of sovereign obligations of emerging market economies, which were growing faster than advanced economies and enjoying a commodity-price boom (as in Table 5). Those banks had already reoriented their business toward lending rather than securities owning (as in the middle panel), so the obligations (mostly of money center banks) took the form of loans to abroad. When nonpayment was the result, the loan book stabilized and the Brady Plan encouraged security holding to switch from those obligations of the US government to those of foreign sovereigns (the bottom panel).

Figure 15. Balance-sheet ratios of FDIC-insured US banks, 1934 to 2016
percent



Note: Government securities include the obligations of the federal and state and local governments.
Source: Federal Deposit Insurance Corporation, Historical Statistics on Banking.

Consider also the waves imparted on global finance from crises in the financial centers. Many of the crises years from Reinhart and Rogoff (2009, updated) for the UK before and the US after World War II line up with the peaks and troughs of capital inflows and commodity prices. Not all those events were equal in effect, however.

Four stand out. We already discussed at length the first emerging market debt crisis, the defaults of newly independent countries in the 1820s not soon after they were formed. Recognize that their financing mostly traded water thereafter, with many Latin American countries and Greece raising no new funds for decades. The Barings Crisis of 1891-2, although with Argentina at its epicenter, darkened UK investors' attitudes toward the Western Offshoots (importantly including Australia and New Zealand) and South Africa. The crises associated with the two "Greats," the Depression commencing in 1929 and the recession starting in 2008, impaired intermediation and slashed capital flows.

Of late, financing for emerging market economies has been transformed by lending from China. Some of this is official, through development banks and hard to quantify, and some of it has been through the private sector, in the form of credit from the burgeoning shadow banking sector and even harder to quantify. As for the latter, the work of Shin and coauthors (Bruno and Shin, 2014 and 2015) and Allen et al. (2012) has moved the ball down the field.

VI. The Current Cycle in Historical Context

While we have stressed some of the recurring features across cycles separated by decades and even centuries, in this section we delve into what some of the distinguishing features of the ongoing cycle. We discuss, in turn, the upswing and its inevitable reversal.

1. A boom among booms: 1999-2011

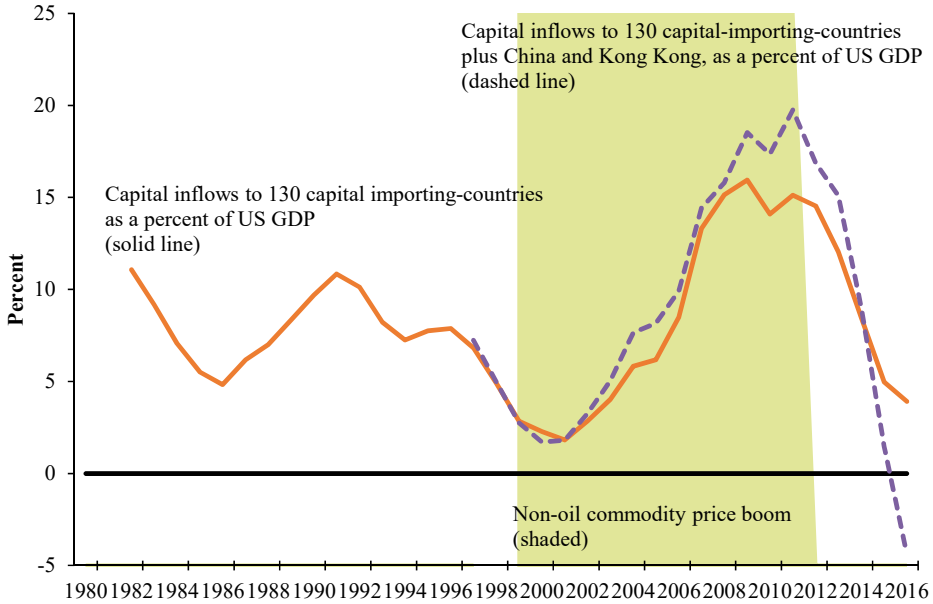
If one had to summarize in a single word what was different and singular about this cycle, that word would be China. Between 1999 and 2011 (the boom phase of the commodity cycle), Chinese real GDP grew at an average rate of 10.1 percent, pulling along its neighbors along the Pacific Rim and other emerging market economies more generally. It is not the first time that a country averages that kind of growth for more than a decade, but it is the first time (given the available data) that a country that size—the second largest economy in the world and rapidly encroaching first place—posts such a performance. Furthermore, that growth was heavily skewed toward fixed investment, especially including infrastructure investment, so its footprint on primary commodity markets, especially in energy and metals was sufficiently significant to more than offset the recessionary effects of on the advanced economies of the global financial crisis.

Table 11. The Latest Cycle in Historical Perspective

	Global Boom (trough to peak)	Duration (years)	Change (in %)	Global Bust (peak to trough)	Duration (years)	Change (in %)
Panel A: Global capital flows *(change in percent of US GDP)*						
Recent Cycle:	1999-2011	12	18.4	2011-2016	5, ongoing	-23.7
Average Cycle (capital flows):		9	11.2		5	-13.0
Panel B: Global commodity prices *(change in percent)*						
Recent Cycle:	1999-2011	12	88.7	2011-2015	4	-25.1
Average Cycle (commodities):		6	39.1		6	-25.8

As Table 5 illustrated, in the 200-year span covered here the most recent boom is the largest cumulative increase in real prices--almost 90 percent peak-to-trough. No less impressive, it is the second longest boom, lasting 12 years and second only to the World War II and post-war recovery (1938-1951), which lasted 13 years. Most commodity price upturns last 5 years or less. Table 11, expands on this comparison by focusing on the cycle averages. As Figure 16 shows, the overlap of the commodity cycle with the capital flow surge is almost complete over the duration of the price rise. The inflow surge, while not setting a record is comparable in magnitude to the super-booms of the 1880s (the height of the Gold standard era and capital mobility) and the interwar underwriting "craze" that Max Winkler warned of, writing in 1927 that "promiscuous buying, however, is destined to be disastrous" (Winkler, 1933, p. 86).

Figure 16. Capital Flows and Real Commodity Price Booms: 1980-2016
(Commodity booms are shaded)



Sources International Monetary Fund, *World Economic Outlook,* and *International Financial Statistics.*
Notes: Capital inflows > 0; outflows < 0.

Roughly mid-way through the double boom, the global financial crisis of 2008-2009 ended the capital inflow cycle for the "periphery" economies of Europe but only interrupted it about a year or so for most emerging markets.

2. The curious case of the "missing defaults" 2012-2016

As shown in Table 5, the global economy has been subject to a double bust since 2012, with a collapse in commodity prices and stark decline in capital inflows (and in some cases, outflows). Since then, the worldwide incidence of sovereign defaults has risen only modestly. Perhaps emerging market economies are more resilient this time around. As Table 7 highlighted, predicted defaults out of sample, (on the basis of the historical relationship) are consistently higher than what has materialized to date. Perhaps, this is a structural shift. Perhaps, the protracted nature of the downturn in international conditions has yet to take its cumulative toll or lingering weaknesses will only become evidence once the major central banks move further along in renormalizing the stances of their policies.

In this section, we offer some explanations and some conjectures.

Our explanations of the "missing defaults" have both a domestic and external component as well as some important nuances on how the incidence of default is calculated.

On the external front, we note that the global incidence of default following the crash in commodity prices and the post-2011 reversal in capital flows has not matched that of some of the worst historical episodes. In particular, global liquidity conditions have not tightened as markedly or as rapidly as in the bust phase of earlier cycles. Exceptionally low and stable interest rates have acted to dampen debt-servicing difficulties among the debtor countries.

Table 12 summarizes that point. The matrix connects the historical waves of defaults, capital flow reversals, commodity price crashes, and interest rate hikes. It is evident that the worst outcomes (the category 5 hurricanes) were the episodes involving a triple blow to at least some capital importers (i.e., the commodity producers). Of course, while this table speaks to the reversal of the external forces, it is silent on both the orders of magnitude and/or persistence of the reversal as well as on their relative importance.

Table 12. Triple Shocks: Capital Flows, Real Commodity Prices, and Real Interest Rates: 1815-2016

Double bust episodes	Capital flow bust	Commodity price bust	Interest Rate Spike (real)	Default Spike?	
				Share of Countries in Default (in peak year)	New Defaults (percentage point increase during bust)
1824 - 1828	yes	yes	yes	43.75	40.52
1890 - 1894	yes	yes	*no*	18.60	9.30
1914 - 1918	yes	yes	yes	17.65	4.90
1929 - 1933	yes	yes	yes	46.43	39.16
1981 - 1986	yes	yes	yes	42.74	24.79
1991 - 1999	yes	yes	yes	46.34	decline in defaults
2011 - 2016	yes	yes	*no*	13.82	no change

Notes: Ex-post real interest rate is calculated using consumer prices.

As to some of the domestic factors that have helped countries transition from a capital flow bonanza to a near-drought, less procyclical fiscal and monetary policies and stronger macro-prudential measures during the inflow phase may have left countries on a more solid footing to cope with sudden stops. Frankel and Vegh (2013), present evidence that fiscal procyclicality in emerging and developing markets has been on the wane, while McGettigan et al. (2015) make a similar claim about monetary policy in emerging markets.[37] Federico, Vegh, and Vuletin (2014) present evidence that for the more recent past emerging markets have commonly used reserve

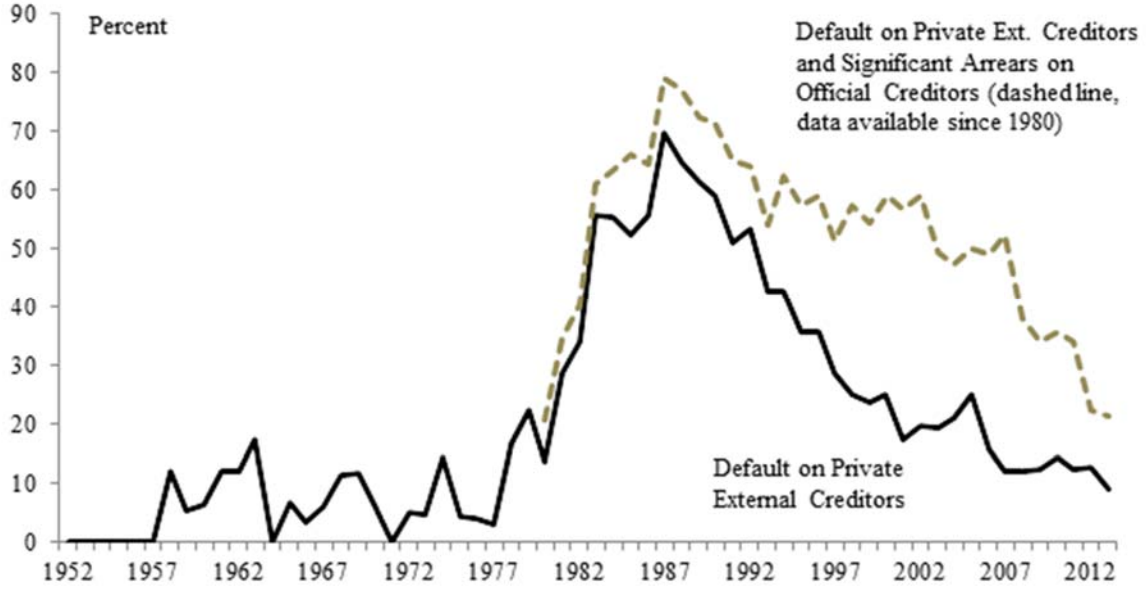
[37] Earlier studies, including Kaminsky, Reinhart, and Vegh (2004) and Ilzetzki and Végh (2008) had presented evidence of widespread fiscal policy procyclicality among the emerging markets; the former study examined both fiscal and monetary policies while the latter focused on the fiscal side.

requirements as a countercyclical tool, in line with what was suggested earlier by Reinhart and Reinhart (1999). Ostry, Ghosh, Chamon, and Qureshi (2012) show that macroprudential policies and capital controls appear to help restrain the intensity of aggregate credit booms and that the policies in place during the boom enhanced economic resilience during the bust. Furthermore, Ghosh, Ostry and Qureshi (2016), conclude that countries that managed the booms well, limited macroeconomic and financial vulnerabilities, and received more FDI and less debt flows are significantly less likely to subsequently experience a financial crisis. In sum, there is evidence to suggest that the macroeconomic management of capital inflow surges has been improving over time in emerging markets as a whole.

There are also substantive issues regarding how default is defined or measured, as shown in Reinhart and Trebesch (2016). A fuller picture of solvency also requires an assessment of a debtor country's standing with its official creditors (see also Alfaro et al. 2014). Indeed, the most prominent debt crisis of the last few years, the situation in in Greece, now revolves almost entirely around the country's debts to official creditors, including the IMF. While official creditors are not the main story for most middle-to-high income countries, they play a dominant role in many low-income countries. It is important, therefore to assess also to what extent *official* debt is in default, under restructuring, or in substantial arrears. This task was recently attempted by Beers and Mavalwalla (2017), mainly based on World Bank and Paris Club data on defaults and arrears with official creditors. Reinhart and Trebesch (2016) use an earlier version of their data to quantify the incidence of the augmented (private plus official) defaults. As we show in Figure 18, these run consistently higher than the more widely used historical measure. Notwithstanding, the fact that the incidence of default is higher in the more comprehensive measure, there is little to suggest a post-bonanza spike.

There is, however, a potential mismeasurement of the "true" incidence of default which we cannot begin to quantify at this time—namely defaults or accumulated arrears on Chinese loans. As already noted, China's lending to many emerging markets, most notably commodity producers, rose significantly during the boom era. While most of this lending is from official Chinese sources, much of it is not reflected in the World Bank data and unknown amounts may well be in default or protracted arrears. This state of affairs describes the situation in a number of African commodity producers and also notably includes Venezuela. While Venezuela's government-run oil company continues to service its external bonds (hence, it does not show up as a default case in the books of the credit rating agencies), debts owed to China are understood to be in arrears.

Figure 18. The Incidence of Default With and Without Official Creditors: 1952-2016



Source: Reinhart and Trebesch (2016).

VII. Final Remarks

After much data collection, interpolation, and interpretation, we have documented that global capital inflows swung through pronounced cycles over the past two centuries. Those cycles were importantly related to similarly pronounced swings in commodity prices globally and interest rates at the financial centers of the world. Equally striking, but more subjective, is the peaks and troughs in attitudes toward those flows we discovered in supporting documentation. Compare the evolution of the biennial *World Economic Surveys* of the League of Nations from 1919 to 1944 to the succession of IMF *World Economic Outlooks.* Around 1931 and eighty years later, those professional staffs both took a more pessimistic attitude toward financial flows and became more accommodating toward controls on capital.

Fernandez et al. (2016) note a similar transition in the commentary of the source of our opening quote, John Maynard Keynes. His remarks from 1919 in *The Economic Consequences of the Peace* warrant more extended citation. The young Keynes, most likely channeling his experience as a speculator of his own and Cambridge University's funds, considers the life of a prewar punter:

> "The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he may see fit, and reasonably expect their early delivery upon his doorstep;…or he could decide to couple the security of his fortunes with the good faith of the townspeople of any substantial municipality in any continent that fancy of information may recommend." Keynes (1919, p. 11.)

About thirty years later, the same author held in a speech that "…let goods be homespun whenever it is reasonably and conveniently possible; and, above all, let finance be primarily national." (Skidelsky, 1992, p. 477.)

There is much more work to be done, and, in that ongoing work, we are intrigued by a dual dichotomy among the potential indicators that could contribute to an overall measure of the mobility of capital. Firstly, some indicators are useful because they are associated with swings in capital inflows. An analogy helps. Models of risk spreads always do better by including the implied volatility of equity prices gotten from options prices, the "VIX." Forecasting subsequently then requires having a view on sentiment. Other variable more directly influence capital flows, such as the recency of financial crisis, the balance sheet space of financial intermediaries, and the stringency of controls on capital. Opting for the latter as opposed to the former seems to us to produce a more robust, if poorer fitting, predictor.

Secondly, among potential variables, some relate to the global economic cycle and others have an element of policy exogeneity, recognizing that a pure policy case study is rare for the reasons explained by Bartolini and Drazen (1997). In point of fact, policy interest rates are mostly set for domestic considerations, whereas changes in capital controls are directed toward capital flows.

Knowing the relative importance of policy choices about the macro cycle and those about financial stability would help to explain the conundrum we identified. Events, meaning sovereign defaults, did not worsen nearly as much as history would suggest. Was it good luck or good policy? The good luck for emerging market economies is that domestic considerations in the US, Europe, and Japan led policymakers to extend their accommodation well past any precedent. This kept rates low and their balance sheets big, turning global investors desirous of additional yield. However, prudential policy may have played a role, too, which can be interpreted as a more exogenous concern about

financial stability. Banks were directed to bolster their capital, resources to trading were reduced (a form of capital control), and scrutiny on balance sheet decisions stepped up. The macro cycle will do what it does and capital flows will follow. Macro prudential policies are a policy decision.

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Data Appendix

Appendix 1. The Global Capital Flows Database: Sources and Samples

The Global Capital Flows Database constructs yearly capital flow time series to capital-importing countries over the past 200 years, compiled from a wide range of sources. This Appendix describes the sources used to construct the database, structured by the four main eras covered (first half of the 19th century; 1860s to WWI; Interwar; and Post-WWII).

1815-1866: International sovereign bond issuances (gross capital export)

For the years 1815-1866, we compile data on international sovereign bonds issued by 38 countries between 1815 and 1866, mostly on the London Stock Exchange. Specifically, the data covers foreign sovereign debt issuance of *Argentina, Austria, Belgium, Bolivia, Brazil, Central America, Chile, Costa Rica, Cuba, Denmark, Ecuador, Egypt, El Salvador, Colombia, Germany, Greece, Guatemala, Italy, Jamaica, Mauritius, Mexico, Morocco, Naples, New Zealand, Peru, Portugal, Prussia, Romania, Russia, Sardinia, South Africa, Spain, Sweden, Tunisia, Turkey, United States, Uruguay and Venezuela.*

Our main data sources for this period include:

- Clarke, Hyde (1878). Sovereign and Quasi Sovereign States: Their Debts to Foreign Countries. *Journal of the Statistical Society,* June 1878.
- Corporation of Foreign Bond Holders. Annual Reports: 1873-1914.
- Fenn, Charles (Various years). *Fenn's compendium of the English and foreign funds, debts and revenues of all nation*. London: E. Wilson.
- Fortune, Thomas (Various years). *Fortune's Epitome of the Stock and Public Funds*. Various years. London: Boosey & Sons.
- Kimber, Albert (1922). *Kimber's Records of Government Debts and other Foreign Securities*. New York: A. W. Kimber & Company.
- Lindert, Peter H. and Morton, Peter J. (1989). How Sovereign Debt Has Worked. In Jeffrey Sachs (Ed.), *Developing Country Debt and Economic Performance*. NBER and University of Chicago Press.
- London Stock Exchange (Various years). The Stock Exchange Official Yearbook, London.
- Marichal, Carlos (1989). *A Century of Debt Crises in Latin America*. Princeton: Princeton University Press.
- Wynne, William H. (1951). *State Insolvency and Foreign Bondholders*, Volume II. New Haven: Yale University Press.

Moreover, we also use data from:

- Bazant, Jan (1968). *Historia de la Deuda Exterior de México, 1823-1946*. El Colegio de Mexico, Guanajuato, Mexico.
- Clay, Christopher (2001). *Gold for the Sultan: Western Bankers and Ottoman Finance 1856-81*. London: I. B. Tauris.
- Cohen, Bernard (1822): *Compendium of Finance*. London, W. Phillips.
- Collignon Library (1866) *Almanach de la bourse*. Paris: Collignon Library
- Costeloe, M. P. (2003). *Bonds and Bondholders, British Investors and Mexico's Foreign Debt*, 1824 1888. Westport: Praeger.
- Flandreau, Marc, and Flores, Juan H. (2007): *Bonds and Brands: Intermediaries and Reputation in Sovereign Debt Markets 1820-1830*. Conference on Globalization and Democracy, Princeton University, Sept. 27-28, 2007.
- Miller, M.S. (1926): *The Economic Development of Russia, 1905-1914*. London: King and Son Ltd.
- Landes, David S. (1958). *Bankers and Pashas.* Cambridge: Harvard University Press.
- Payno, Manuel (1862). *Mexico y sus Cuestiones Financieras con la Inglaterra, la Espana y la Francia.* Mexico City, Imprenta de Ignacio Cumplido.
- Summerhill, William R. (2015). *Inglorious Revolution: Political Institutions, Sovereign Debt, and Financial Underdevelopment in Imperial Brazil.* New Haven: Yale University Press.
- Suter, Christian (1990). *Debt Cycles in the World-Economy: Foreign Loans, Financial Crises, and Debt Settlements, 1820-1990.* Boulder: Westview Press Inc.
- Winkler, Max (1933). *Foreign Bonds, an Autopsy.* Philadelphia: Swain & Co.

1867-1914: Bond issuance in the UK by 25 countries (Stone 1999, gross capital exports)

For the period between 1867 until WWI we draw on data on total bond issuance in the UK from Stone (1999). In his book "The Global Export of Capital from Great Britain 1865-1914", Stone collects fine-grained information on magnitude, composition and destination of corporate and sovereign bond issuance (gross capital exports) from the United Kingdom to 25 countries and colonies. Originally, the data have been compiled by Simon (1967), who in turn used a variety of pre-WW1 periodicals, reports and books as well as "the `Jenk Files´", a collection of unpublished research material gathered by Leland Jenks. The detailed sources are in Stone (1999, pp. 419).

The countries covered are (by volume of cumulative inflows): *United States, Canada, Argentina, Australia, India, South Africa, Brazil, Russia, New Zealand, Mexico, Japan, China, Egypt, Chile, France, Rhodesia, Turkey, Italy, Austria-Hungary, Peru, Spain, Uruguay, Cuba, Germany, Greece*. The detailed references are as follows:

- Simon, Matthew (1967). The Pattern of New British Portfolio Foreign Investment, 1865-1914. In Adler, John H. (Ed.), *Capital Movements and Economic Development*. London, Macmillan for the International Economic Association.
- Stone, Irving (1999). *The Global Export of Capital from Great Britain, 1865-1914: A Statistical Survey*, New York: St. Martin's Press.

1919-2016: Net capital flows constructed from current account and reserves data

After WWI, as current account and reserves data become more widely available, we construct net capital flows via the accounting identity:

$$CA + KA + \Delta RA \equiv 0$$

where CA is the current account, ΔRA is the change in foreign exchange reserves and gold reserves and KA is the capital account, capturing net capital flows. We now describe the data used for the interwar years and the Post-WW2 period. A country by country overview on the sources used on the current account and reserves series is shown in Table A1 below.

While we use the constructed series from WWI onwards, we did gather longer time series whenever available, sometimes reaching as far back as 1790, e.g. for the United States.

a. Inter-War (1919-1938)

For the interwar years we constructed net capital flows for a sample of up to 27 countries, using the historical current account and reserve data we could gather. For many of these countries, however, the resulting time series show gaps and missing values, mainly because reserves data are incomplete. As a result, the core sample for this period covers 15 countries, for which we have complete data on both the current account and reserves.

For broader coverage we use the United Nations (1949) report on "International Capital Movements during the Inter-War Period" as our main source for this period. The report compiles net capital flows for a sample of up to 34 countries between 1919 and 1938. More specifically, it measures the "balance of total capital transaction" by computing the balance of "current items and gold" (UN, 1949: 6). As explained, we use that same approach to construct capital flows from WWII until today, so that the two datasets should be consistent (as we show in Appendix 2 below, this is indeed the case).

The data on reserves and the current account used by the UN draw on the League of Nations' annual publication "Balances of Payments". The statistical note by the League of Nations (1943) includes a more detailed discussion on capital flow data at the time.

Regarding the countries included, the UN dataset distinguishes between eight "creditors" (*Belgium, France, Ireland, Netherlands, Sweden, Switzerland, United Kingdom, United States*) and 26 "debtors" (*Argentina, Australia, Czechoslovakia, Canada, Denmark, Estonia, Finland, Germany, Italy, Japan, Latvia, New-Zealand, Norway, South Africa, Bulgaria, China, Greece, Hungary, India, Iraq, Lithuania, Dutch Indies, Poland, Romania, Turkey and Yugoslavia*). Creditor countries are defined as "capital exporting […] on balances", while debtor countries are capital importing. In this paper, the baseline sample used includes all 26 debtor countries, but our final database also includes net flow series by the eight creditor countries. The detailed references are as follows:

- League of Nations (Various years). Balances of Payments. Geneva: League of Nations.
- League of Nations (1943). Europe's Capital Movements, 1919-1932: A Statistical Note. Geneva: League of Nations.
- United Nations (1946). "International Capital Movement during the Inter-War Period." Department of Economic Affairs, United Nations Publications: No. 1949.II.D.2.
- Constructed series for the interwar years (27 countries): various sources, see Table A1

b. Post-WWII (1945-2016)

For the time after WWII, and especially for the 1950s, 1960s and 1970s we draw on a broad range of data sources on the current account, foreign exchange and gold reserves. Table A1 shows a detailed overview by country. The main source for current account data post-WWII are Mitchell's "International Historical Statistics" on Europe, the Americas and Africa, Asia and Oceania. We use this source whenever it is available up until the year 1979. Afterwards, starting in 1980, we shift to the IMF World Economic Outlook (WEO) database and use this sources whenever possible. Further important sources on long-run current account and reserves data were Jones and Obstfeld (1997), Lane and Millessi-Ferretti (2007) and Flandreau and Zumer (2004).

Regarding Eurozone economies after 1999, we augment data on international reserves by national claims and liabilities within the TARGET-2 system of the ECB. We obtain annual end-of-period Target balances from the ECB's Statistical Data Warehouse online database for every member country since entry into the European Monetary Union.

For sample selection, we follow the same approach as for the interwar years and identify 61 countries that are importers of foreign capital and for which we have a good data coverage that spans several decades. We exclude net inflows to the United States in main parts of our analysis (e.g. in Figure 1), so that the core sample boils down to 60 capital-importing countries. Three of these economies (Singapore, Sweden and Norway) see a turnaround from debtors to creditors during the 1990s.

In more detail, the main sources for the **current account** data include:

- IMF (2017). World Economic Outlook Database. Washington.
- Jones, Matthew T., and Maurice Obstfeld (1997). Saving, investment, and gold: A reassessment of historical current account data. NBER WP 6103. http://www.nber.org/databases/jones-obstfeld/
- Lane, Philip R., and Gian Maria Milesi-Ferretti (2007). The external wealth of nations mark II: Revised and extended estimates of foreign assets and liabilities, 1970–2004. *Journal of International Economics*, vol. 73:2, 223-250.
- Mitchell, Brian R. (1998) *International Historical Statistics: Africa, Asia and Oceania*. Palgrave Macmillan.
- Mitchell, Brian R. (1992) I*nternational Historical Statistics: Europe*. Palgrave Macmillan.
- Mitchell, Brian R. (1998) *International Historical Statistics: Americas*. Palgrave Macmillan.

- Reinhart, Carmen, and Rogoff, Kenneth (2004). A Modern History of Exchange Rate Arrangements. NBER Working Paper 8963.
- Reinhart, Carmen and Rogoff, Kenneth (2011). This Time is Different. Princeton: Princeton University Press.

In addition, current account data came from

- Central Intelligence Agency (1966). Communist China's Balance of Payments, 1950-1965. Washington: CIA Directorate.
- Branco, Amelia, Valerio, Nuno and de Sousa, Rita Martins (2012). *Echoes from the Past: Portugese Stabilizations of the 1890s and 1920s.* Lisboa: Gabinete de História Económica e Social.
- Braun, Juan, Braun, Matías, Briones, Ignacio, Díaz, José, Lüders, Rolf and Wagner, Gert (2000). *Economía Chilena 1810-1995: Estadísticas Históricas*. Santiago de Chile: Pontificia Universidad Católica de Chile.
- Cárdenas, Enrique, Gaviria, José A., Thorp, Rosemary (2000). *An Economic History of Twentieth-century Latin America*. Basingstoke: Palgrave Macmillan.
- Ferreres, Orlando J.(2005) *Dos Siglos de Economia Argentina 1810-2004*. Buenos Aires: Editorial El Ateneo.
- League of Nations (1942). Network of World Trade. Geneva: League of Nations.
- League of Nations (1945). Industrialization and Foreign Trade. Geneva: League of Nations.
- Prados de las Escosura, Leandro (2009). *Spain's International Position, 1850-1913*. Madrid: Universidad Carlos III de Madrid.
- Statistics Iceland (1997). *Icelandic Historical Statistics.* Rejkjavik: Statistics Iceland.
- Statistics Netherlands (2016). *Historical Statistics*. Heerlen: Centraal Bureau voor de Statistiek.

Data on **gold and foreign exchange reserves** stem from:

- Central Bank of the Republic of China (2016). Statistics and Publications. Taipeh: Central Bank of the Republic of China.
- Greene, Timothy (1999). *Central Bank Gold Reserves: An Historical Perspective Since 1845*. World Gold Council Research Paper No. 23.
- IMF (2017). International Financial Statistics. IMF.
- IMF (1984). International Financial Statistics: Supplement on Balance of Payments.
- Flandreau, Marc and Zumer, Frederic (2004). T*he Making of Global Finance, 1880–1913*. Paris: Organization of Economic Co-operation and Development.
- Federal Reserve Bulletin: Financial Statistics of Foreign Countries. Various issues. Washington: Federal Reserve Board of Governors.
- League of Nations (1944). *International Currency Experience.* Geneva: United Nations.
- League of Nations (1944). *Statistical Yearbook.* Geneva: League of Nations.
- Moody's (various years). *Manual of Investments*: Various Issues. New York: Moody's.

- Norges Bank (2004). *Historical Monetary Statistics for Norway 1819-2003*. Oslo: Norges Bank, Occasional Papers: No. 35.

Data on Eurozone **Target2** balances are from:

- ECB (2017). Target Balances. *Statistical Data Warehouse.* Available online at: http://sdw.ecb.europa.eu/browseTable.do?node=bbn4859
- Sinn, Hans-Werner and Timo Wollmershaeuser (2012). "Target Loans, Current Account Balances and Capital Flows: The ECB's Rescue Facility", International Tax and Public Finance 4. Available online at: http://www.cesifo-group.de/ifoHome/policy/Haftungspegel.html
- Westermann, Frank, and Steinkamp, Sven. 2012. Euro Crisis Monitor. *University of Osnabrück*. Available online at: http://www.eurocrisismonitor.com/

Table A1: Data sources on current account and reserves (core sample: 61 countries, 1913-2016)

	Current account		**Foreign Exchange Reserves**		**Gold Reserves**	
	Sources	Years	Source	Years	Source	Years
Algeria	IHS (1998)	1964-79	IMF IFS (2017)	1948-2016	FED	1913-39; 45-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
Angola	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1995-2016		
Argentina	Ferreres (2005)	1881-1950	F&Z (2004)	1880-1941; 45-70	League of Nations	1913; 1920-34
	IHS (1998)	1951-79	Moody's	1935-47	Moody's	1935-47
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
					IMF IFS (2017)	1948-2016
Australia	IHS (1998)	1861-1979	IMF IFS (2017)	1948-2016	FED	1913-39; 44-1970
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1949-2016
Austria	IHS (2007)	1948-79	League of Nations	1922-36	League of Nations	1913; 1920-23
	IMF WEO (2017)	1980-2016	Moody's	1946-49	Moody's	1924-36
			IMF IFS (2017)	1948-2016	FED	1923-37; 1945-70
					IMF IFS (2017)	1948-2016
Belgium	IHS (2007)	1948-79	F&Z (2004)	1880-1941; 44-79	League of Nations	1913
	IMF WEO (2017)	1980-2016	League of Nations	1913; 1922-30	Moody's	1920-47; 50-59
			Moody's	1936-47	FED	1913-41; 45-70
			IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948; 55-2016
Bolivia	IHS (1998)	1938-40; 1947-79	League of Nations	1929-44	League of Nations	1913; 1920-44
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1913-41; 45-70
					IMF IFS (2017)	1948-2016
Brazil	Setor	1930-46	F&Z (2004)	1880-1941; 44-70	FED	1913-41; 45-70
	IHS (1998)	1947-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
	IMF WEO (2017)	1980-2016				

Canada	J&O (1997)	1870-99	IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
	IHS (1998)	1900-78			IMF IFS (2017)	1948-2016
	IMF WEO (2017)	1980-2016				
Central African	IHS (1998)	1968-79	IMF IFS (2017)	1962-2016	IMF IFS (2017)	1977-2008; 2010-16
Republic	IMF WEO (2017)	1980-2016				
Chile	Braun et al (2000)	1822-1931; 1944-1979	IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
	IHS (1998)	1938; 1942-43			IMF IFS (2017)	1957-2016
	IMF WEO (2017)	1980-2016				
China	CIA (1966)	1959-64	IMF IFS (2017)	1977-2016	FED	1930-39
	WB WDI	1982-96			IMF IFS (2017)	1977-2016
	IMF WEO (2017)	1997-2016				
Colombia	Cardenas (2000)	1905-37; 1939-45	League of Nations	1923-44	Moody's	1928-59
	IHS (1998)	1938; 1946-79	IMF IFS (2017)	1948-2016	FED	1923-41; 1945-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
Costa Rica	IHS (1998) IMF WEO (2017)	1946-79 1980-2016	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-82; 1985-93; 1997-2006; 2009-16
Cote d'Ivoire	IHS (1998)	1962-79	IMF IFS (2017)	1962-2016	IMF IFS (2017)	1977-1994
	IMF WEO (2017)	1980-2016				
Denmark	IHS (2007)	1874-1914; 1921-79	F&Z (2004)	1880-1941; 44-70	League of Nations	1913; 1920-42
	IMF WEO (2017)	1980-2016	League of Nations	1913; 1920-44	Moody's	1943-59
			IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
					IMF IFS (2017)	1948-2016
Dominican	IHS (1998)	1946-1979	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
Republic	IMF WEO (2017)	1980-2016				
Ecuador	IHS (1998)	1939; 1946-79	League of Nations	1927-1944	League of Nations	1927-44
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1927-41; 1945-70
					IMF IFS (2017)	1948-2016
Egypt	IHS (1998)	1930-34; 1946-79	League of Nations	1913; 1920-44	League of Nations	1913; 1920-44
			IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
					IMF IFS (2017)	1948-2016
El Salvador	IHS (1998)	1946-79	IMF IFS (2017)	1948-2016	FED	1920-41; 1945-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
Finland	J&O (1997)	1860-1921	League of Nations	1913; 1922-44	League of Nations	1913; 1920
	IHS (2007)	1922-79	IMF IFS (2017)	1948-2016	Moody's	1921-49
	IMF WEO (2017)	1980-2016			FED	1913-41; 1945-70
					IMF IFS (2017)	1953-2016
France	IHS (2007)	1820-1913; 1920-38; 1945-79	F&Z (2004)	1880-1941; 1945-70	League of Nations	1913; 1920-44
	J&O (1997)	1919, 1939	League of Nations	1920-1944	Moody's	1945-50; 1952-59
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
					IMF IFS (2017)	1948-2016
Germany	J&O (1997)	1860-1913; 1925-38	F&Z (2004)	1880-1938; 41; 50-70	League of Nations	1913; 1920-43
	IHS (2007)	1948-79	League of Nations	1913; 1922-44	FED	1913-38; 41; 51-70
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-49; 51-2016
Greece	IHS (2007)	1923; 26; 29-38; 46-68	F&Z (2004)	1880-1940; 45-70	League of Nations	1913; 1920-37

	IMF IFS	1969-79	League of Nations	1913; 1925-37	FED	1913-41; 1945-70
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
Guatemala	IHS (1998)	1946-79	League of Nations	1926-42	League of Nations	1926-42
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1926-41; 1945-70
					IMF IFS (2017)	1948-2016
Honduras	IHS (1998)	1947-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
	IMF WEO (2017)	1980-2016				
Hungary	IHS (2007)	1923-24; 26-37; 1970-79	League of Nations	1924-40	League of Nations	1921-41
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1983-2016	FED	1924-41
					IMF IFS (2017)	1971-2016
Iceland	Statistics Iceland	1901-79	IMF IFS (2017)	1948-2016	FED	1913-41
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
India	IHS (1998)	1923-38; 1946-79	League of Nations	1913; 1920-44	League of Nations	1913; 1920-44
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
Indonesia	IHS (1998)	1925-39; 1946-79	League of Nations	1913; 1920-26	League of Nations	1913; 1920-41
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	Moody's	1950-59
					FED	1945-63
					IMF IFS (2017)	1948-2016
Ireland	IHS (2007)	1931; 1933-79	IMF IFS (2017)	1948-2016	FED	1945-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
Italy	IHS (2007)	1861 - 1979	F&Z (2004)	1880-1940; 45-70	League of Nations	1913; 1922-59
	IMF WEO (2017)	1980-2016	League of Nations	1913; 1922-39	FED	1913-40; 1945-70
			IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
Japan	IHS (1998)	1868-1944; 1946-79	IMF IFS (2017)	1948-2016	League of Nations	1913
	IMF WEO (2017)	1980-2016			Moody's	1920-41; 43; 1950-59
					FED	1913-40; 1945-70
					IMF IFS (2017)	1948-2016
Kenya	IHS (1998)	1963-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1973-97; 2000-16
	IMF WEO (2017)	1980-2016				
Malaysia	IHS (1998)	1956-79	IMF IFS (2017)	1948-2016	FED	1962-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-49; 1962-2016
Mauritius	IHS (1998)	1964-79; 1992	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1977-2016
	IMF WEO (2017)	1980-1991; 1993-2016				
Mexico	IHS (1998)	1940-79	League of Nations	1925-39	League of Nations	1925-44
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1925-41; 1945-70
					IMF IFS (2017)	1948-85; 1988-2016
Morocco	IHS (1998)	1955-79	IMF IFS (2017)	1948-2016	FED	1922-39; 1945-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
Myanmar	IHS (1998)	1950-97	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-49; 62-2016
	IMF WEO (2017)	1998-2016				
Netherlands	Dutch Stat. Office	1806-07; 11; 1814-	F&Z (2004)	1880-1941; 45-71	League of Nations	1913
		1913; 1930-39	League of Nations	1913; 1920-44	Moody's	1920-59
	IHS (2007)	1946-1979	Moody's	1949-50	FED	1913-41; 1945-70
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016

New Zealand	IHS (1998)	1950-79	Moody's	1934-1959	League of Nations	1913
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	Moody's	1920-59
					FED	1913-41; 45-64; 67-70
					IMF IFS (2017)	1948-92
Nicaragua	IHS (1998)	1946-79	IMF IFS (2017)	1948-83; 87-2016	IMF IFS (2017)	1948-83; 87-2016
	IMF WEO (2017)	1980-2016				
Nigeria	IHS (1998)	1957-79	IMF IFS (2017)	1948-2016	FED	1961-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-49; 1961-2016
Norway	IHS (2007)	1865-1939; 1946-79	F&Z (2004)	1880-1939; 45-70	League of Nations	1913; 1920-39
	IMF WEO (2017)	1980-2016	League of Nations	1913; 1920-39	Moody's	1945-59
			Moody's	1945-1959	FED	1913-39; 1945-70
			IMF IFS (2017)	1948-2016	IMF IFS (2017)	1959-2003
Panama	IHS (1998)	1950-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-49; 1979-2016
	IMF WEO (2017)	1980-2016				
Paraguay	IHS (1998)	1948-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2003; 2008-16
	IMF WEO (2017)	1980-2016				
Peru	IHS (1998)	1938-43;1946-79	League of Nations	1923-45	League of Nations	1923-44
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1914-41; 1945-70
					IMF IFS (2017)	1948-2016
Philippines	IHS (1998)	1934; 1946-79	IMF IFS (2017)	1948-2016	FED	1945-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
Poland	L&M-F (2007)	1970-1979	League of Nations	1920; 1922-35	League of Nations	1920-39
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1979-2016	FED	1919-38; 1945-70
					IMF IFS (2017)	1979-2016
Portugal	IHS (2007)	1948-1979	F&Z (2004)	1880-1941; 45-70	FED	1913-41; 1945-70
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
Romania	L&M-F (2007)	1970	IMF IFS (2017)	1973-2016	Moody's	1920-47
	IHS (2007)	1971-79			FED	1913-41
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1973-2016
Russia	J&O (1997)	1885-1913	F&Z (2004)	1880-1917; 22-34	FED	1913-17; 1922-34
	IMF WEO (2017)	1992-2016	IMF IFS (2017)	1993-2016	IMF IFS (2017)	1993-2016
Singapore	IHS (1998)	1963-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-49; 2000-16
	IMF WEO (2017)	1980-2016				
South Africa	IHS (1998)	1923-37; 1941-79	League of Nations	1922-30; 33-44	League of Nations	1922-34
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	Moody's	1935-59
					FED	1913-41; 1945-70
					IMF IFS (2017)	1948-2016
South Korea	IHS (1998)	1910-38; 1951-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
	IMF WEO (2017)	1980-2016				
Spain	de la Escosura (2014)	1850-1913	F&Z (2004)	1880-1935; 1941; 1945-70	League of Nations	1913; 1920-37
	IHS (2007)	1931-34; 1940-79	League of Nations	1913; 20-37; 41-42	Moody's	1940-59
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1913-35; 41; 45-70

					IMF IFS (2017)	1948-2016
Sri Lanka	IHS (1998)	1930-31; 1946-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1978-2016
	IMF WEO (2017)	1980-2016				
Sweden	IHS (2007)	1861-1979	F&Z (2004)	1880-1941; 45-70	League of Nations	1913
	IMF WEO (2017)	1980-2016	League of Nations	1913; 1920-44	Moody's	1920-59
			IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
					IMF IFS (2017)	1948-2016
Switzerland	IHS (2007)	1948-79	F&Z (2004)	1883-1941; 45-70	League of Nations	1913; 1920-29
	IMF WEO (2017)	1980-2016	League of Nations	1913; 1920-44	Moody's	1930-52; 1954-59
			IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
					IMF IFS (2017)	1948-2016
Taiwan	IHS (1998)	1896-38; 1950-83	Taiwan Central Bank (2016)	1961-2015	FED	1949-70
	IMF WEO (2017)	1984-2016				
Thailand	IHS (1998)	1924-27; 32-37; 1946-79	IMF IFS (2017)	1948-2016	FED	1931-33; 39-40; 1945-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
Tunisia	IHS (1998)	1957-79	IMF IFS (2017)	1948-2016	IMF IFS (2017)	1958-2016
	IMF WEO (2017)	1980-2016				
Turkey	IHS (1998)	1850-1913; 1927-34; 1946-79	League of Nations	1932-44	Moody's	1932-59
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1932-41; 1945-70
					IMF IFS (2017)	1948-2016
United	IHS (2007)	1816-1979	F&Z (2004)	1880-1941; 45-70	League of Nations	1913; 1920-42
Kingdom	IMF WEO (2017)	1980-2016			FED	1913-41; 1945-70
			IMF IFS (2017)	1948-2016	IMF IFS (2017)	1948-2016
United States	IHS (1998)	1790-1861; 63-1979	IMF IFS (2017)	1948-2016	Moody's	1920-59
	J&O (1997)	1862			FED	1913-41; 1945-70
	IMF WEO (2017)	1980-2016			IMF IFS (2017)	1948-2016
Uruguay	IHS (1998)	1930-31; 40-44; 1946-79	League of Nations	1921-1929	League of Nations	1913; 1920-44
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	FED	1913-41; 1945-70
					IMF IFS (2017)	1971-2016
Venezuela	IHS (1998)	1938; 42-44; 46-79	League of Nations	1940-44	League of Nations	1913; 1920-44
	IMF WEO (2017)	1980-2016	IMF IFS (2017)	1948-2016	Moody's	1945-59
					FED	1913-41; 1945-70
					IMF IFS (2017)	1948-2016
Zambia	IHS (1998)	1945-53; 65-79	IMF IFS (2017)	1965-91; 93-2016	IMF IFS (2017)	1965-2016
	IMF WEO (2017)	1980-2016				
Zimbabwe	IHS (1998)	1939; 1946-64; 78-79	IMF IFS (2017)	1966-2016	IMF IFS (2017)	1965-2008; 2011-16
	IMF WEO (2017)	1980-2016				

Notes: J&O (1997) = Jones and Obstfeld (1997); L&M-F (2007) = Lane and Millesi-Ferretti (2007); F&Z (2004) = Flandreau and Zumer (2004). Post-WWII, total reserves are measured as the sum of foreign exchange reserves and gold reserves. If gold reserve data was missing post-WWII we proxy total reserves by foreign exchange reserves.

Appendix 2. Additional Data and Sources

Data on sovereign defaults: 1800-2016

The data on sovereign defaults in Figure 3 and Tables 2 and 3 comes from the most recent vintage of the dataset compiled by Reinhart and Rogoff (2009). Only sovereign defaults to private external creditors are included. The data does not consider sovereign defaults and arrears to official creditors (e.g. other governments or the IMF). See Reinhart and Trebesch (2016a, 2016b) for data updates and default data on official creditors. In more detail, we draw on:

- Cruces, Juan J., and Christoph Trebesch (2013). "Sovereign Defaults: The Price of Haircuts," *American Economic Journal: Macroeconomics*, 5(3): 85-117.
- Reinhart, Carmen M. and Kenneth S. Rogoff (2009). *This time is Different: Eight Centuries of Financial Folly*, Princeton: Princeton University Press.
- Reinhart, Carmen M. and Christoph Trebesch (2016). Sovereign Debt Relief and its Aftermath. *Journal of the European Economic Association,* 14(1): 215-251.
- Reinhart, Carmen M. and Christoph Trebesch (2016). The International Monetary Fund: 70 Years of Reinvention. *Journal of Economic Perspectives*, 30(1): 3-28.

Data on global commodity prices: 1791-2016

To construct the spliced 200-plus-year non-energy commodity price index we combined data compiled by Gayer, Rostow, Schwartz (1790-1850), Boughton (1854-1979) as well as by IMF WEO (1980-2016).

More specifically, Gayer et al. (1953) combine monthly price data on 78 commodities weighted by their proportion in British consumption. The full list of commodities and weights can be found in Gayer et al. (1953:484). The data was originally collected by Silberling (1923).

Boughton (1991) combines primary data from multiple sources. First, he uses monthly data from January 1957 onwards for 34 non-fuel primary commodities traded on world markets and compiled by the IMF (1986). Second, he extends this series back to 1900 using unit value indexes from the UN (1969) derived from world trade data with "comprehensive […] primary product coverage". Third, for 1854-99 he uses the data presented in Schlote (1952). The remaining data gaps (1914-20, 1939-47 and 1949) are then interpolated by processing data on British trade from Schlote (1952), the British Central Statistical Office and from US trade data from the Department of Commerce.

The IMF WEO index on non-fuel commodity prices covers eight metals (*copper, aluminium, iron ore, tin, nickel, zinc, lead, uranium)* nine raw materials (*hardwood- and softwood logs and -sawnwood, cotton, fine and coarse wool, rubber, hides*), four beverages (*robusta and other coffee, cocoa beans, tea*) and 24 food items (*wheat, maize, rice, barley, soybeans, soybean meal, soybean oil, palm oil, sunflower oil, olive oil, fishmeal, groundnuts, rapeseed oil, beef, lamb, swine,*

poultry, fish, shrimp, US sugar, EU sugar, free market sugar, bananas, oranges). Individual prices are drawn from various primary sources. Composition and weights are derived from relative trade volumes as reported in the UN Comtrade database.

In more detail, we draw on:

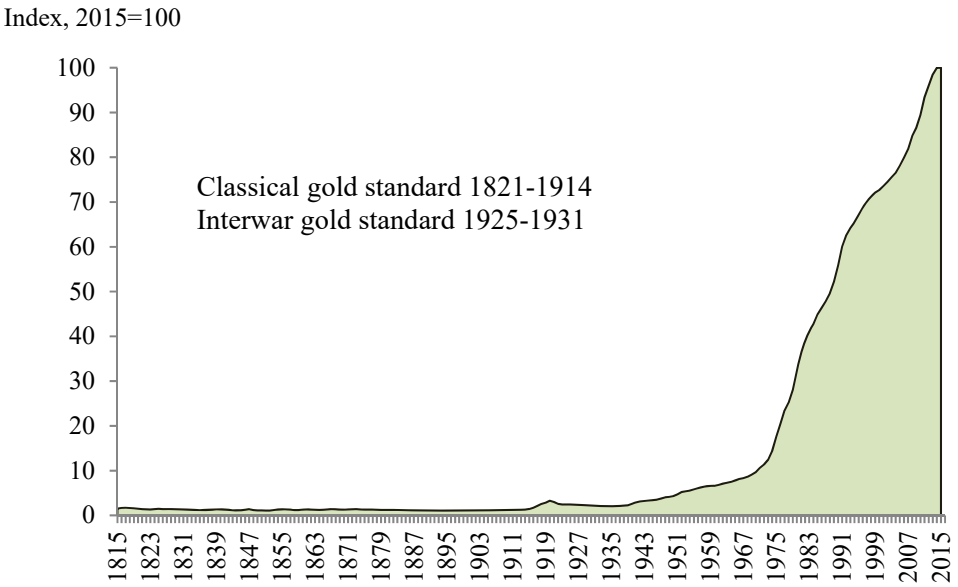
- Boughton, James, (1991). "Commodity and Manufactures Prices in the Long Run," IMF Working Paper No. 91/47, May.
- Gayer, Arthur D., W. W. Rostow, and Anna J. Schwartz. (1953). *The Growth and Fluctuation of the British Economy, 1790–1850*, Clarendon Press.
- Schlote, W. (1951). *British Overseas Trade from 1700 to the 1930s* (translated by W.O. Henderson and W.H. Chaloner). Oxford: Basil Blackwell.
- Silberling, Norman J. (1923). British Prices and Business Cycles, 1779-1850. *The Review of Economic Statistics*, 5, 222-261.
- United Nations (1969). Statistical Yearbook. Geneva: United Nations.
- IMF (1986), Primary Commodities Market Developments and Outlook (May 1986 and 1987).
- IMF (2017). World Economic Outlook Database. Washington.

Data on nominal and real interest rates in financial centers: 1790-2016

The long series on "global" short-term nominal interest rates is spliced by combining the UK discount rate 1790-1918 (Bank of England, 2017), the US discount rate 1919-1956 (Federal Reserve Bank of St. Louis, 2017) and the Federal Funds rate thereafter (Federal Reserve Bank of St. Louis, 2017). To obtain real interest rates, we deflate by CPI inflation, which we derive as follows: UK, 1812-1918: Global Financial Data (2017) and Bank of England (2017); US, 1919-1946: Carter et al. (2006); US, 1947-2016: Bureau of Labor Statistics (2017). A long time series on UK inflation is shown in the following Figure A1. In more detail, we draw on:

- Federal Reserve Bank of St. Louis (2017). Federal Reserve Bank Discount Rate and Effective Federal Funds Rate. Available online at: https://fred.stlouisfed.org/series/FEDFUNDS.
- Bank of England. (2017). Official Bank Rate history. Available online at: http://www.bankofengland.co.uk/monetarypolicy/Pages/decisions.aspx.
- Global Financial Data (2017). UK Annual Consumer Price Inflation.
- Bureau of Labor Statistics (2017). Consumer Price Index. Available online at: https://data.bls.gov/pdq/SurveyOutputServlet.
- Carter, S. B., Gartner, S. S., Haines, M. R., Olmstead, A. L., Sutch, R., & Wright, G. (2006). *Historical Statistics of the United States* (vol. 3). Cambridge University Press.

Figure A1. United Kingdom: Consumer Price Index, 1815-2015



Sources: Bank of England, EH.net, https://eh.net/encyclopedia/gold-standard/

Figure A2. A Modern Analog of the 1822-1827 Episode: the1980s Debt Crisis