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Global Cycles: Capital Flows, Commodities, and Sovereign Defaults, 1815–2015[†]

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Capital flow cycles and commodity price swings, as well as fluctuations in international interest rates, have long been connected with economic crises, especially but not exclusively, in emerging markets.[1] Narratives of capital flow surges that end badly have been around since the nineteenth century, if not earlier (see Sutter 1990). However, the sparse historical data on cross-border transactions in financial assets has made it difficult to systematically connect the timing of economic crises to the availability of international capital, especially in the pre-World War II era. This paper takes a step toward filling that gap. We provide a first pass at dating turning points in global capital flow and real commodity price cycles across approximately two centuries. Because of the significant variation across time and countries in the phenomenon we study and in the availability and quality of the data, our methodology is (by necessity) eclectic.[2]

There is a substantial time-series literature about commodity prices across decades and sometimes centuries; but we are not aware of a comparable unified treatment of the recurring booms and busts in cross-border capital flows at the global level. Our contribution is to study the global cycle of capital flows over the very long run. We also touch on the connection between the commodity price super-cycle and the ebb and flow of financial capital, although the issue is studied in more detail in a companion paper (Reinhart, Reinhart, and Trebesch 2016). The impact of global economic cycles is highly relevant today, since much of the emerging world faces a sobering reversal of a *double bonanza* in capital inflows and primary commodity prices. By our measurement, the trough in both commodity and capital flow cycle dates to 1999 and the peak came in 2011, followed by a severe bust. This boom episode was the second longest boom in real commodity prices since the late eighteenth century and one of the four longest capital flow booms since 1815. Not surprisingly given the historical context, this "double bust" in commodities and capital flows was associated with a 2 percentage point markdown in the IMF's recent forecast for 2015 growth in emerging markets, from 6 percent to 4 percent.

We are also interested in the nexus between the end of capital flow bonanzas and economic crises, specifically sovereign defaults. 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 elsewhere, these events usually entail significant and persistent economic dislocation.

Section I describes the data and empirical strategy used to date the capital flow cycle. Particular attention is devoted to measurement issues including a discussion on net versus gross capital flows. The following section studies the connection between capital flow cycles

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[1]See Reinhart and Reinhart (2009); Ostry (2012); Kaminsky and Vega-García (2016), and the literature cited therein.

[2]For a more comprehensive description of our approach, data, and coding, see the companion paper Reinhart, Reinhart, and Trebesch (2016). The online Appendix lists all sources used.

and the recurring waves of sovereign default documented in Reinhart and Rogoff (2009) since 1800. The last of these default waves came in the wake of rising international interest rates, collapsing commodity prices, and a sharp capital flow reversal, as inflows peaked in 1981 (commodity prices had peaked earlier). We conclude by recapping our main findings and their implications for the current cycle.

I. Data and Methodology

A. *Capital Flow Accounting and Net versus Gross Flows*

The simple rules of double-entry accounting ensure that, excluding statistical discrepancies, the capital account surplus, or net capital inflow (denoted by KA), is related to the current account surplus (denoted by CA) and to changes in the official reserves account (denoted by RA, where $\Delta RA < 0$ implies the accumulation of reserves by the monetary authority) 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 reconstruct the capital account (KA) by piecing together time series on the current account (CA) and official reserves. Prior to World War II, official reserves were dominated by gold.

This exercise approximates *net* capital flows. Such measures may be available from creditor countries (who record consistent net capital outflows), debtor countries importing capital, or (ideally) both. As in other studies of nineteenth century financial markets, much of the capital flow activity and data used in this study comes from the United Kingdom, which dominated finance until World War I. We also exploit that in recent years scholars have been able to build longer time series on individual countries' external transactions—usually the current account. However, for the earlier part of the 1800s, current account data is still rare among the advanced economies and even rarer for emerging markets.

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. Kaminsky and Vega-García (2016) have pioneered this approach, as they document Latin America's volatile external finance since independence. In effect, in the 1820s, and even much later, *gross* capital inflows were very similar to *net* capital inflows for newly-minted nation-states that were borrowing in international capital markets for the first time. Also, the work of Stone (1999) traces capital exports from the United Kingdom to 25 countries in five continents over 1865–1914. See Reinhart, Reinhart, and Trebesch (2016) for more details on the dataset.

Figure 1 presents a panorama of the capital flow cycles of the nineteenth century. 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. The figure overlays the bond issuance data and gross capital exports from the UK to the rest of the world with the UK current account (as a percent of GDP), which records net flows from the dominant financier. Three features stand out.

First, the different measures of international capital flows provide a fairly consistent narrative of the capital flow cycle.[3] 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. Global capital flows since World War I are aggregated from the constructed capital/financial account for individual countries, as described. The building blocks (i.e., current account balances, official gold, and foreign exchange reserves) are culled from a broad range of sources. The data availability and, thus, the country coverage vary by period, as noted in Figure 2. The interwar sample is comprised of 34 countries, while

[3] The correlation between gross capital exports from the United Kingdom and the current account (which, abstracting from reserve changes and errors and omissions, should approximate *net* capital exports from the United Kingdom) 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 percent 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.

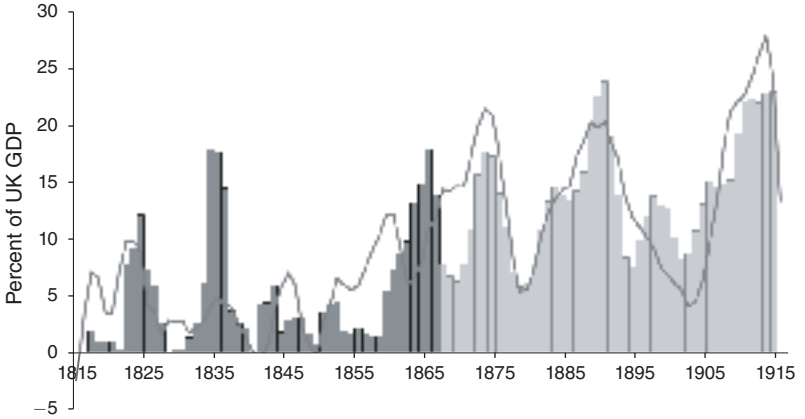

Figure 1. Measuring International Capital Flows in the Nineteenth Century

Notes: **Dark bars** show total international bond issues by 38 countries, as a percent of UK GDP, 1815-1866, 3-year sum. **Pale bars** show gross capital exports from the UK to 25 countries, as a percent of UK GDP, 1867–1914, 3-year sum. The **gray line** shows the UK current account balance as a percent of UK GDP (net outflows from the UK to the rest of the world).

Sources: Reinhart, Reinhart, and Trebesch (2016). See also the online Appendix.

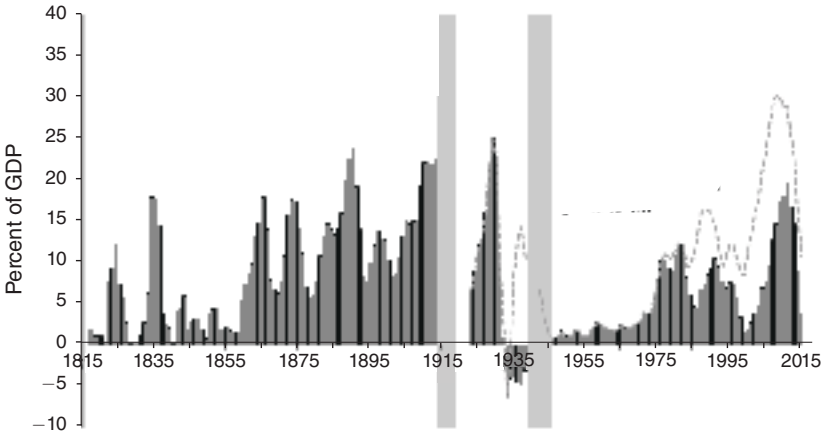

Figure 2. Quantifying 200 Years of Capital Flow Cycles: Alternative Measures

Notes: Shaded years are Napoleonic and World Wars I and II. The bars show our estimates of global capital flows over the past 200 years using different data across eras. For the period 1815–1866 we use total international bond issues by 38 countries, as a percent of UK GDP. For 1867–1914 we use gross capital exports from the UK to 25 countries, as a percent of UK GDP. For 1919–1938, we use net capital inflows to 34 countries, as a percent of UK GDP. Post-WW II (1945–2015) we use net capital inflows to 68 countries, as a percent of US GDP. All bars represent 3-year sums. The dashed gray line adds flows to the United States to our global capital flow estimate.

Sources: Reinhart, Reinhart, and Trebesch (2016). See also the online Appendix.

the post-World War II core group includes 68 countries. For many of these countries our time series extend back to the 1860s and earlier. Not included in Figure 2 is an even more inclusive

Table 1—Capital Flow Surges, Declines, and Sudden Stops: 1815–2015

	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	NA
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*	*NA*
	1914–1918, World War I: Private capital flows collapse but there is a surge in official flows from United States							
10	1918?	1929	12	18.4	1929	1933	4	−31.6
11	1933	1938	5	3.4	1938	NA	NA	NA
	1914–1918, World War I: Private capital flows collapse but there is a surge in official flows from United States							
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*	*2015*	*4*	*−15.9*
Averages			9	11.7			5	−12.4

Notes: Episodes marked in italics denote a double (capital flow and commodity price) boom or bust. To qualify as a double boom or bust, there must be at least two years of overlap in that phase of the cycle.

Sources: Reinhart, Reinhart, and Trebesch (2016). See also the online Appendix.

sample of 132 capital importers for which we construct capital account data since 1980.[4]

B. *Defining the Cycles and Episodes: 1815–2015*

Harding and Pagan (2002) provide a persuasive case for a simple and mechanical scheme to date turning points in business cycles which we apply to the capital flow and commodity price data. These two authors also address 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."

This literature also counsels against overinterpreting 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 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 1 presents the dates, duration, and magnitudes of the global boom and bust cycles in capital flows since 1815. Online Appendix Table A1 and the longer working paper show a comparable exercise for real commodity prices. Most capital flow cycles lasted three to six years, abstracting from the 30-year stretch following World War II, during which restrictions on cross-border financial transactions kept the volume of international capital flows minimal. The capital flow bonanza that peaked in 2011 was exceptionally protracted (and came to an abrupt reversal after the taper tantrum of the spring of 2013 when the

[4] The larger sample does not appreciably change the pattern shown in Figure 2.

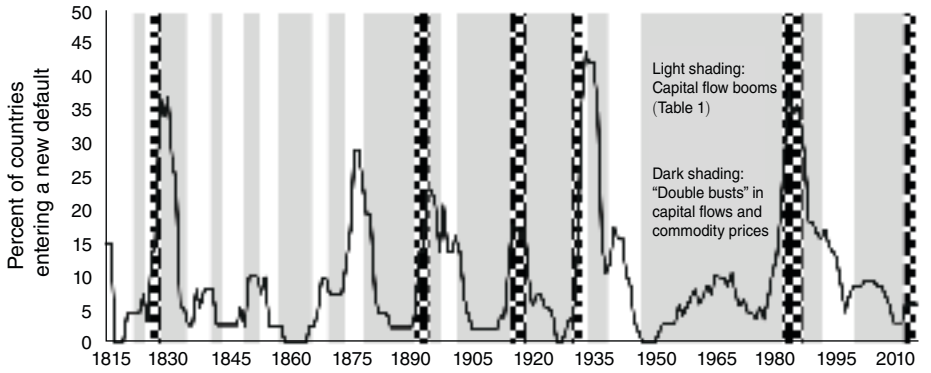

Figure 3. Capital Flow Booms, Double Busts, and New Sovereign Defaults, 1815–2015

Notes: The solid black line shows the percent of countries entering a new default in that year (worldwide, 3-year sum). Light shaded areas denote global capital flow booms (through-to-peak phase, see Table 1). Dark shaded areas denote global "double bust" episodes (>1 year) of joint declines in capital flows and commodity prices (years in italics in the right panel of Table 1).

Sources: See Table 1, Reinhart, Reinhart, and Trebesch (2016) and the online Appendix.

Federal Reserve announced its intention to taper its extended post-crisis stimulus).

II. The End of Bonanzas

While the longer companion piece to this paper provides detailed analysis of the individual cycles and their connection (or not) to crises, Figure 3 provides a synthesis of the overlap between capital flow booms (pale shading) and the waves of (new) sovereign defaults. Darker shading in Figure 3 highlights double busts, meaning episodes where a decline in capital inflows overlaps with a contraction in real commodity prices (see Table 1).

The capital inflow-default link is clear and consistent over time. Out of a total of 14 capital boom episodes, 11 were followed by a sharp increase in sovereign defaults after the boom ended. All of the six major spikes in new defaults shown in Figure 3 occurred following the end of a global capital inflow bonanza. Moreover, four out of these six global default peaks can be associated with double busts in capital and commodity markets (dark shading). Not every default cycle is associated with collapsing commodity prices, as our sample includes countries that are not primary commodity producers and would not be adversely affected by falling commodity prices (see Reinhart, Reinhart, and Trebesch 2016).

Table 2 examines the connection between capital flow cycles and defaults more systematically. 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 100 countries (lines 1 and 2). In line 3, we regress the global share of countries entering default in each year between 1815 and 2015, using a fractional response logit model to account for the fact that this share is bound between zero and one. The end of global capital flow bonanzas is associated with a significant increase in sovereign default risk worldwide. The coefficients in line 2 suggest that the risk of entering default increases by a total of 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.

III. Final Remarks

International capital flow cycles have displayed similar patterns over the past 200 years, both in duration and amplitude. While not all capital inflow cycles ended with a global wave of new debt crises, all the major spikes in sovereign defaults came on the heels of surges in capital inflows, especially those followed

Table 2—The End of Capital Flow Booms and Sovereign Default, 1815–2015

	End year of capital flow boom	Lag 1	Lag 2	Lag 3	Lag 4	Lag 5		
(1) Country FE logit (default onset)	1.014*** (0.213)	1.075*** (0.208)	1.385*** (0.187)	0.965*** (0.216)	0.959*** (0.216)	0.266 (0.308)	Obs. Pseudo R^2	11,175 0.036
(2) Country FE OLS (default onset)	0.022*** (0.006)	0.024*** (0.006)	0.037*** (0.008)	0.020*** (0.006)	0.020*** (0.006)	0.004 (0.005)	Obs. R^2	13,254 0.007
(3) Fractional logit (share of countries entering default)	1.070*** (0.280)	0.988*** (0.304)	1.448*** (0.304)	1.276*** (0.442)	1.309*** (0.444)	−0.016 (0.469)	Obs. Pseudo R^2	211 0.150

Notes: The dependent variable in lines 1 and 2 is a dummy for the start of default. In line 3 we use the global share of sovereigns entering a new default. Robust standard errors in parentheses (clustered on country in lines 1 and 2). Constant in lines 2 and 3 not reported.

***Significant at the 1 percent level.
**Significant at the 5 percent level.
*Significant at the 10 percent level.

Table 3—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	18.3	2011–2015	4, ongoing	−15.9
Average cycle		9	11.7		5	−12.4
Panel B. Global real commodity prices (*change in percent*)						
Recent cycle	1999–2011	12	88.7	2011–2015	4	−25.1
Average cycle		6	39.1		6	−25.8

Notes: Capital inflows to 60 capital importers, excluding the United States. Since the end of the "double bonanza" in 2011, the global share of sovereigns in default has risen from 3 percent to 6 percent. Historically, the average increase after capital flow booms was 12 percentage points. For "double busts" it was 24 percentage points.

by "double busts" in capital and commodity markets.

As shown in Table 3, 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. But perhaps the protracted nature of the downturn in international conditions has yet to take its cumulative toll.

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