Volume Title: NBER International Seminar on Macroeconomics 2008

Volume Author/Editor: Jeffrey Frankel and Christopher Pissarides

Volume Publisher: University of Chicago Press

Volume ISBN: 978-0-226-10732-5

Volume URL: http://www.nber.org/books/fran08-1

Conference Date: June 20-21, 2008

Publication Date: April 2009

Title: Capital Flow Bonanzas: An Encompassing View of the Past and Present

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URL: http://www.nber.org/chapters/c8229

Chapter pages in book: (9 - 62)

1

Capital Flow Bonanzas: An Encompassing View of the Past and Present

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I. Introduction

A pattern has often been repeated in the modern era of global finance. Foreign investors turn with interest toward some developing country. Capital flows in volume into small and shallow local financial markets. The exchange rate tends to appreciate, asset prices to rally, and local commodity prices to boom. These favorable asset price movements improve national fiscal indicators and encourage domestic credit expansion. These, in turn, exacerbate structural weaknesses in the domestic banking sector even as those local institutions are courted by global financial institutions seeking entry into a hot market. At the same time, local authorities resort to large-scale foreign exchange sales of the local currency to cushion the effects on the exchange rate of the capital inflow bonanza.

Other policy interventions, such as increases in reserve requirements and transactions taxes, usually follow to insulate the domestic economy from the accumulation of reserves. An inherent tension emerges: Local authorities take such changes as a global vote of approval that might encourage them to delay the difficult task of structural adjustment.

This pattern is etched sharply in the experience of the exchange rate mechanism, the exchange rate mechanism squared, and the Latin convergence associated with the North American Free Trade Agreement and its regional successors. In the run-up to a more perfect union, potential entrants are increasingly looked on favorably by global investors. Those investors appreciate that close integration with a strong anchor country or group of countries will ultimately discipline policy makers in the periphery, which will narrow exchange rate fluctuations and country risk spreads and buoy local equity prices. But these same dynamics also play out in commodity-exporting emerging market economies when the prices of their output surge on world markets or

978-0-226-10732-5/2009/2008-0010$10.00

when very low interest rates and sluggish growth in the advanced countries turn the attention of investors there outward. Across countries, a different rising tide raises all boats.

But tides also go out when the fancy of global investors shifts and the "new paradigm" looks shopworn. Flows reverse and asset prices give back their gains, often forcing a painful adjustment on the economy.

This experience has provided a fertile testing ground for international economists. A varied flora has blossomed that will be reviewed in Section II. Given double-entry bookkeeping and the zero-sum nature of global trade, these issues of global adjustment have been described in terms of the current or financial accounts and as deterioration in some countries or improvement in others. Moreover, the time windows have been chosen to isolate the buildup or rundown of any of these measures.

This paper attempts to be encompassing in its examination of these issues by simplifying the definition of the key event that is studied and by widening the time window around that event. We investigate what happens before, during, and after a capital flow bonanza. That is, we ask, how do economies perform in and around periods when capital inflows are relatively large (or, equivalently, when their financial account surpluses are relatively large)? Owing to data limitations discussed below, we make this operational by examining episodes of large current account deficits.

We study 181 countries from 1980 to 2007, a subset of 66 countries from 1960 to 2007 for which more detailed information on economic variables is available, and a smaller group of 18 countries for which house price data are available; the samples include all regions and income groups. Our primary aim is to quantitatively define and date capital inflow bonanza episodes so as to study their various aspects. In Section III, we document several features of these bonanza periods, including their incidence and duration. In Section IV, we examine the evidence on potential links between capital flow bonanzas and debt, currency, inflation, and banking crises. In Section V, we systematically illustrate the behavior of a variety of macroeconomic, financial, and policy indicators on the eve and aftermath of these episodes.

Our main findings can be summarized as follows: With nearly 50 years of data, it is evident that bonanzas have become more frequent as restrictions on international capital flows have been relaxed worldwide. Although the approaches differ, this finding is in line with the evidence presented in Eichengreen and Adalet (2005).

The heavy inflow episode can persist, often lulling policy makers and investors into treating the bonanza as a permanent phenomenon rather than a temporary shock. Episodes end, more often than not, with an

abrupt reversal or "sudden stop" à la Calvo (as in Calvo [1998]). The current account path around bonanzas is distinctly V-shaped, irrespective of whether the broader, but more recent, sample or the less inclusive, but longer, sample is the benchmark.

Capital inflow bonanza periods are associated with a higher incidence of banking, currency, and inflation crises in all but the high-income countries (using some of the crises indicators developed in Kaminsky and Reinhart [1999] and codified in Reinhart and Rogoff [2008b]). This result is not the artifact of a few extreme cases; in more than 60% of the countries, the probability of a crisis around the dates of a capital flow bonanza is higher than for the entire sample. Capital flow bonanzas systematically precede sovereign default episodes.

In developing countries (those designated by the World Bank as middle and low income), the stance of fiscal policy, as measured by the growth in real government spending, is notoriously procyclical during capital inflow bonanzas. This is consistent with the earlier observation that temporary "good times" are often treated as permanent. In effect, our preliminary results also suggest that fiscal policy plays a destabilizing role around capital flow bonanzas—and possibly more generally.

For the advanced economies, the results are not as stark, since there is no systematic cross-country evidence over 1960–2007 that the probability of a financial crisis increases during bouts of heavy capital inflows. The crisis-prone Nordic countries in the early 1990s and the Icelandic, U.K., and U.S. crises at present would appear to be important departures from this general result (as in Reinhart and Rogoff [2008a]). Nonetheless, capital flow bonanzas are associated with more volatile macroeconomic outcomes for real GDP growth, inflation, and the external accounts.

Real GDP growth tends to be higher in the run-up to a bonanza and then systematically lower. The imprint of bonanzas is evident in asset markets. Equity prices rise when capital flows in and retreat when capital flows out. A similar pattern is evident in house prices for our small sample. A bonanza is not to be confused with a blessing.

The last section (Sec. VI) turns to some of the policy implications of our analysis and discusses possible future research in this area.

II. Concepts and Data Issues

A. Reviewing the Existing Literature

The existing literature has studied multiple manifestations of international adjustment in the balance-of-payments data. Double-entry bookkeeping

and the global summing to zero of trade flows produce the four alternative frames of reference laid out in table 1. The main issues of adjustment can be described in terms of either an improvement or a deterioration (along the rows of the matrix) in either the current or capital accounts (along the columns).

There is a rich empirical literature on current account reversals, the upper-left cell mostly documenting the macroeconomic consequences of a marked improvement in a sample of many countries. Many features of these studies follow the path laid out in the pioneering paper by Milesi-Ferretti and Razin (2000). As summarized in table 2, they established three criteria to identify a current account reversal that are now the norm: The change in the balance must be large relative to nominal GDP, must be large absolutely in dollar terms, and must not be the product of a spike in a single year. Focusing on low- and middle-income countries, they find that the adjustment experience is heterogeneous and depends importantly on whether the currency crashes on the foreign exchange market.

Eichengreen and Adalet (2005) extended the sample to include the pre-1970 experience, thereby providing historical context. In particular, large current account reversals appear to be the product of open trade in goods, services, and assets. Reversals have been frequent only in the two heydays of global capital markets—the recent period and the 1920s and 1930s. Large adjustments were much rarer under the pre–World War I gold standard and during the Bretton Woods years.

An important fuel to the study of current account reversals has been the U.S. experience of sustained large deficits. The intent is to find rules of thumb that will be informative about the U.S. experience when the presumed "day of reckoning" comes and the unsustainable is no longer sustained. The search for such lessons appears in important papers by Edwards (2005, 2007) and Freund and Warnock (2005). They find an important role for the textbook forces thought to rein in a current account imbalance—a slowing in income growth and a real depreciation of the currency.

Table 1
Frames of Reference in the Literature

	Balance-of-Payments Account	
Change	Current Account	Capital Account
Improvement	Current account reversal	Capital inflow problem
Deterioration	Twin deficits	Sudden stop

Similar interest in the U.S. experience produced work in the 1980s on why the current account deteriorated, which is the subject of the lower-left cell of table 1. The main culprit at that time was identified to be the large budget deficit, which through national income accounting was mirrored in its twin, the current account. Contemporaneous discussions of this can be found in Federal Reserve Bank of Kansas City (1985), and a later review has been provided by Bosworth (1993). This line of argument petered out in the late 1990s when the U.S. federal budget went into surplus but the current account remained deeply in red.

Those researchers focusing on the right cells of the contingency table typically take the perspective of emerging market economies. In particular, they view the portfolio investment decisions of investors at the center of the global financial system as somewhat fickle. Assets in some emerging markets may be in fashion for a time. Those inflows tend to appreciate the exchange rate, lead to reserve accumulation as authorities attempt to offset that force, and push up prices in asset markets. Altogether, this presents a "capital inflow problem" as described by Calvo, Leiderman, and Reinhart (1993), an issue also studied by Fernandez-Arias and Montiel (1996).

When capital no longer flows into an emerging market, the nation can no longer support an excess of spending over income. The result, in the phrase of Calvo and his coauthors, is a "sudden stop," forcing current account adjustment. The empirical application of this insight can be found in Calvo, Izquierdo, and Mejía (2004) and Calvo, Izquierdo, and Loo-Kung (2006), both of which are described in more detail in table 2.

B. Defining a Capital Flow Bonanza

The decision to adopt a particular algorithm to date and catalog capital inflow bonanzas naturally involves trade-offs. An advantage of casting our net wide to all large capital inflow episodes is that it does not predispose us to episodes that inevitably ended in a marked reversal. In this sense, there is a lower predisposition to tilt the analysis toward economic crises. An inflow bonanza can end with a bang or with a whimper. In this sense, our approach parallels the analysis of Goldfajn and Valdes (1999), who, rather than starting their analysis with currency crises dates, began by documenting episodes of cumulative real exchange rate appreciations of varying degrees and then sorted out which episodes unwound through an abrupt nominal exchange rate crash

Table 2
Current and Capital Account Reversals: Some Definitions

Study	Criteria Used to Select the Episodes of Interest
Current account reversals: Milesi-Ferretti and Razin (2000); also Edwards (2005), Eichengreen and Adalet (2005), and Freund and Warnock (2005)	Their underlying idea is that "large" events provide more information on determinants of reductions in current account deficits than short-run fluctuations. These events have to satisfy three requirements: 1. There must be an average reduction in the current account deficit of at least 3 (or 5) percentage points of GDP over a period of 3 years with respect to the 3 years before the event. 2. The maximum deficit after the reversal must be no larger than the minimum deficit in the 3 years preceding the reversal. 3. The average current account deficit must be reduced by at least one-third. The first and second requirements should ensure that we capture only reductions of sustained current account deficits rather than sharp but temporary reversals. The third requirement is necessary so as to avoid counting as a reversal a reduction in the current account deficit from, say, 15% to 12%. Events are based on 3-year averages.
Capital account—sudden stops: Calvo, Izquierdo, and Mejía (2004)	A sudden stop is defined as a phase that meets the following conditions: 1. It contains at least one observation in which the year-on-year fall in capital flows lies at least two standard deviations below its sample mean (this addresses the "unexpected" requirement of a sudden stop). 2. The sudden stop phase ends once the annual change in capital flows exceeds one standard deviation below its sample mean. This will generally introduce persistence, a common fact of sudden stops. 3. Moreover, for the sake of symmetry, the start of a sudden stop phase is determined by the first time the annual change in capital flows falls one standard deviation below the mean.

(continued)

Table 2
Continued

Study	Criteria Used to Select the Episodes of Interest
Capital account—sudden stops: Calvo, Izquierdo, and Loo-Kung (2006)	1. In addition to the criterion of large capital flow reversals exceeding two standard deviations from the mean (for their capital flow proxy), Calvo et al. have the following requirement: 2. These reversals must be accompanied by a spike in some external aggregate measure of the cost of funds in order to capture systemic effects. More specifically, Calvo et al. use the (log of the) J. P. Morgan Emerging Market Bond Index spread over U.S. Treasury bonds for emerging markets, the Merrill Lynch euro area Government Index spreads for euro area countries (as well as Nordic countries such as Denmark, Norway, and Sweden), and G7 Government Index spreads for all remaining developed countries. Calvo et al. construct aggregate high-spread episodes in a fashion analogous to the Calvo, Izquierdo, and Mejía (2004) measure of large capital flow reversals (i.e., Calvo et al. consider spikes in spreads exceeding two standard deviations from the mean) and determine that a sudden stop occurs when the measure of the fall-in-capital-flows phase overlaps (on a yearly basis) with the aggregate high-spread phase. Episodes that lie within a 6-month interval are considered part of the same sudden stop phase.

and which did so through reductions in inflation versus their trading partners.[1]

We began with the presumption that the best indicator of capital flows would be reserve accumulation less the current account balance, since it measures the resources acquired (or dispersed) through issuance (or retirement) of home country liabilities. This indirect measurement of the change in liabilities seemed more likely to be available for a longer time span and for more countries than direct information from financial accounts. In the event, data on reserves tend to be published only on a delayed basis in many countries. To keep our efforts topical, the current account balance as a percentage of GDP is our benchmark indicator. It is measured more consistently across time and international boundaries than its capital account and financial account counterpart.[2] For the more recent period, the same filter rules are applied to the other measures as a robustness check as is reported in the appendix.

We began by applying the three-step approach proposed by Milesi-Ferretti and Razin to our data set with a suitable revision that does not enforce a current account reversal. This approach, however, raised some issues about dating the bonanzas of many well-known episodes. In some countries in which the deterioration in the current account (and hence the rise in capital inflows) was a relatively smooth process over several years, this algorithm did not flag these episodes as bonanzas even though the current account deficits were large by historical standards. Heavy inflow cases, such as the United States since 2004 and Australia in several cycles since 1960, were missed altogether. In other cases, the inflow bonanza persisted after the peak current account deficit had been reached. For instance, the Thai and Malaysian current account deficits peaked in the early 1990s; however, while the deficits remained large by historical standards well into 1996, these years are not classified as bonanzas by this algorithm. Many of the important (but less persistent) surges in capital inflows of the late 1970s and early 1980s also go undetected.

We ultimately settled on an alternative algorithm that provided uniform treatment across countries but was flexible enough to allow for significant cross-country variation in the current account. As in Kaminsky and Reinhart (1999), we select a threshold to define bonanzas that is common across countries (in this case the 20th percentile).[3] This threshold included most of the better-known episodes in the literature but was not so inclusive as to label a bonanza more "routine" deteriorations in the current account. Because the underlying frequency distributions vary widely across countries, the common threshold produces quite disperse country-specific cutoffs. For instance, in the case of relatively closed India, the cutoff to define a bonanza is a current account deficit/GDP ratio in excess of 1.8%, whereas for trade-oriented Malaysia the comparable cutoff is a deficit/GDP ratio of 6.6%.[4]

Figure 1, which plots the frequency distribution for 181 countries, highlights these differences across both countries and major income groups. As the figure makes clear, the range of experience is wide, but large deficits appear more frequently in lower-income countries.

C. Sample Coverage and Data

We employ three samples to analyze the capital bonanza phenomenon. The broadest sample includes the 181 countries covered in the International Monetary Fund's *World Economic Outlook* for 1980–2007. Information is available on the current account, real GDP, inflation, and the real

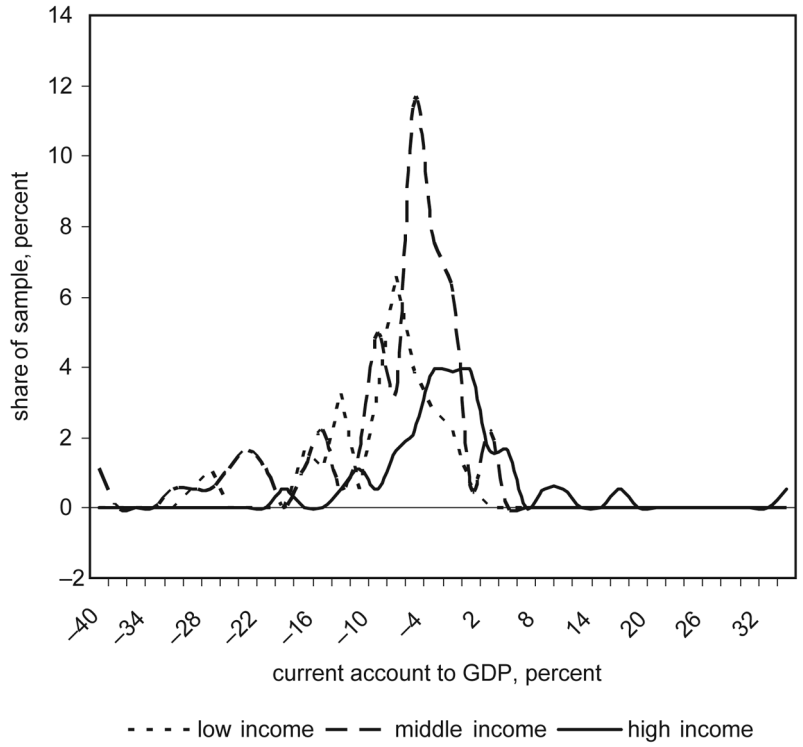


Fig. 1. Distribution of current account cutoffs, used in defining bonanzas: 181 countries, 1980–2008. Sources: International Monetary Fund, *World Economic Outlook*, and authors' calculations.

exchange rate. This allows us to examine the recent country experiences in a truly global setting.

We will refer to the second data set as the "core" sample, which spans 1960–2007 and covers 64 countries across all regions. This sample is dominated by high- and middle-income countries, where data availability poses less of a constraint. It is for this sample that we are able to examine in greater depth the macroeconomic features of the bonanzas. Also, for the core countries, we have a sufficiently complete dating of economic crises (debt, banking, etc.) that allows us to assess whether a capital inflow bonanza predisposes countries to financial crises.

The third set is a small sample of 18 industrial countries for which we have data on house prices from the Bank for International Settlements. Otherwise, the data coverage for this group is the same as for the core group. Appendix tables A1 and A2 list the countries (and the income group they belong to) that make up the three samples.[5]

All data are annual. In addition to including time series on the current account, capital and financial accounts, and nominal GDP (all in U.S. dollars), we employ a variety of macroeconomic time series. These include country-specific variables: international reserves, nominal and real exchange rates, real GDP, consumer prices, export, imports, government expenditure, revenue, deficits, equity, and (in the case of some advanced economies) real estate prices. In addition, we have dichotomous variables that date external debt crises, currency crashes, and inflation and banking crises. Global variables, such as commodity prices, international interest rates, growth in the world's largest economies, measures of macroeconomic volatility, and the global incidence of capital flow bonanzas and various "types" of economic crises, round out the analysis. Appendix table A3 provides a full list of the variables as well as their respective sources.

The availability of long time series on various aspects of macroeconomic performance was important in deciding on the design principle of our key indicator—a capital flow bonanza. Because we had gathered a sufficiently rich data set, we could be somewhat general in defining events, because we will be able to characterize behavior in a wide window around those events. That is, we can see the run-up and the winddown in a manner that encompasses the definitions of earlier work.

III. Capital Flow Bonanzas: Global Cycles and Country Episodes

In what follows, we provide a sketch of country-specific and global capital flow cycles, including incidence, by region and income group; duration; and links to global indicators.

A. The Big Picture

It is relatively well known that international capital flows have an important cyclical component.[6] The fact that capital (contrary to the predictions of the neoclassical growth paradigm) does not flow from rich to poor countries has also received considerable attention.[7] Both of these stylized facts are illustrated in the two panels of figure 2, which plot the incidence (i.e., the percentage of countries) of capital inflow bonanzas for the broad sample consisting of 181 countries. The specific dates of the bonanza episodes on a country-by-country basis are listed in the four-part appendix table A4, for high, middle-high, middle-low, and low-income groupings. Column 2 of this table also provides the dates of sovereign external debt crises (defaults or restructuring).[8] For

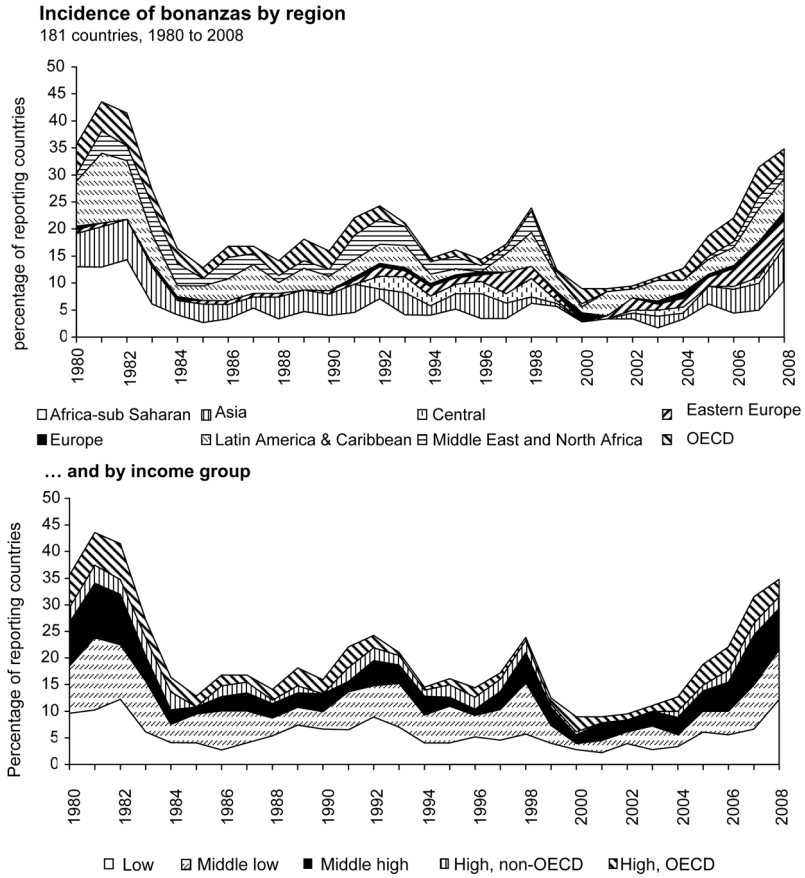


Fig. 2. Incidence of bonanzas by region and income group: 181 countries, 1980–2007. Sources: International Monetary Fund, *World Economic Outlook* (April 2008), and authors' calculations.

our core sample of 66 countries, which account for about 90% of world GDP, the bonanza dates for 1960–2007 are listed in table 3.

As the top panel of the figure illustrates, the last major "boom in booms" was the early 1980s. To be more precise, as the core sample reveals for the longer 1960–2007 period, the upswing of this cycle was from 1975 to 1982, or just before the onset of the debt crisis of the 1980s. Prior to 1975, capital flow bonanzas were fewer and further between, consistent with the historical evidence presented in Eichengreen and Adalet (2005). Capital flow bonanzas resurfaced in the early 1990s coinciding with a decline in U.S. interest rates (see Calvo et al. 1993; Chuhan, Claessens, and Mamingi 1998) and the large-scale Brady plan restructuring of emerging

Table 3
Dates of Capital Flow Bonanzas: Core Sample, 1960–2007

Country	Years of Bonanzas
High income, OECD:	
Australia	1965, 1986, 1989, 2004–5, 2007
Austria	1972–74, 1976–77, 1979–81, 1995–97, 1999
Belgium	1967–68, 1975–84
Canada	1975–79, 1981, 1989–93
Denmark	1969–70, 1974–77, 1979, 1981–82, 1984–87
Finland	1975–76, 1980, 1988–92
France	1966–67, 1969, 1974, 1976, 1982–83, 2005–7
Germany	1980, 1991, 1994–95, 1999–2000
Greece	1983, 1985, 2000, 2006–7
Italy	1974, 1980–82, 1991–92
Korea	1980–83, 1991, 1996
New Zealand	1974–75, 1982, 1984–85, 2005–7
Norway	1974–79, 1986–89, 1998
Portugal	1981–82, 2000–2001, 2005
Spain	1965–66, 1974, 1976, 2000, 2004–7
Sweden	1976–77, 1979–82, 1990–92
United Kingdom	1960–76, 1988–90, 2005–7
United States	2002–7
High income, non-OECD:	
Hong Kong, SAR	1980–81, 1994–97
Singapore	1980–84, 1987
Middle-high income:	
Argentina	1982, 1987, 1994, 1997–99
Brazil	1974–83, 1999, 2001
Chile	1978, 1980–82, 1984–86
Costa Rica	1970–83, 1989–90
Hungary	1986–87, 1993–94, 1998–99, 2003–4
Malaysia	1981–83, 1991, 1994–95
Mauritius	1979–82, 2006–7
Mexico	1974–76, 1979–81, 1991–94
Panama	1967–73, 1975–82, 1997–98, 2007
Poland	1980–81, 1985–89
Romania	1992, 2004–7
Russia	1992, 1997
South Africa	1981–82, 2005–7
Turkey	1977, 1980, 2000, 2004–7
Uruguay	1980–84, 2001
Venezuela	1967, 1977–78, 1982, 1987–88, 1992–93, 1998
Middle-low income:	
Algeria	1969, 1973, 1975–79, 1986, 1988–89, 1994–95, 1998
Angola	1982, 1995, 1997–99, 2001
Bolivia	1978–79, 1981, 1985–87, 1993, 1998
China	1979, 1985–86, 1988–89, 1993
Colombia	1971, 1982–83, 1995, 1997–98
Dominican Republic	1966–70, 1972–73, 1975–82, 1987
Ecuador	1978, 1981–82, 1987, 1989, 1991, 1998
Egypt	1967–71, 1974–76, 1979, 1981–85, 1998

(continued)

Table 3
Continued

Country	Years of Bonanzas
El Salvador	1978, 1989, 1990, 2003, 2005, 2007
Guatemala	1981, 1987, 1992–93, 1994, 1999, 2001
Honduras	1974–75, 1978–81, 1984, 2003–4, 2007
Indonesia	1967–73, 1975,1982–83, 1986–87, 1991, 1995
Morocco	1976–77, 1981, 1983–87
Nicaragua	1988, 1990–94
Paraguay	1980–82, 1986–87, 1996
Peru	1973–77, 1981–83, 1993, 1995, 1998
Philippines	1975–80, 1982–83, 1990, 1993, 1997
Sri Lanka	1979–84, 1986, 1988
Thailand	1975–77, 1981–83, 1990–91, 1995–96
Tunisia	1981–84, 1986, 1993
Low income:	
Central African Republic	1980, 1982–84, 1992–95
Côte d'Ivoire	1980, 1988–92
India	1984, 1987–90
Kenya	1980–81, 1987, 1989, 1995
Myanmar	1981–82, 1990–92, 1998
Nigeria	1981–83, 1986, 1993, 2002
Zambia	1981–82, 1998, 2000–2001
Zimbabwe	1981–82, 1992, 2004–5

Note: The dates shown are those picked up by the algorithm described in the preceding section. Consecutive years (e.g., Greece 2000, 2001) are treated as a single episode.

market debt. This resurgence was modest and occurred in a more selective group of countries—a feature well documented by the World Bank (1997). With Uruguay in 2002 marking the last major crisis in emerging markets, bonanzas have reappeared in force. The regional breakdown indicates that the recipients in this latest wave include countries in Latin America, mostly smaller ones benefiting from the commodity-price boom, industrial countries in which real estate prices had been rising rapidly, and the nations of central and eastern Europe and the former Soviet Union, presumably being rewarded for closer integration with the European Union.[9]

Illustrated in the bottom panel of the figure is the well-publicized empirical regularity that middle- and high-income countries receive the lion's share of cross-border capital flows. This is true by a huge margin when flows are measured in U.S. dollar terms and remains so when we calculate the incidence of bonanzas (which scale current account deficits by GDP). Despite the fact that low-income countries account for 28% (50 countries) of the 181 countries in this sample, fewer than 18 countries have recorded a capital bonanza in any given year during the past

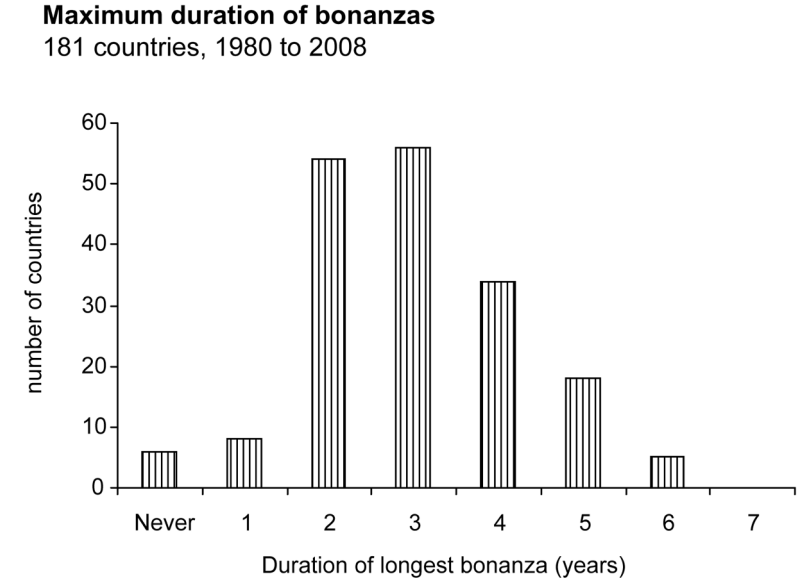
30 years or so. The incidence of capital flow bonanzas is far less cyclical for the low-income group. On the basis of these observations, we base our more in-depth analysis of capital flow bonanzas and their link to financial crises in the next two sections on a group of 66 countries, of which 58 are middle or high income.[10]

The two panels in figure 3 provide complementary information on the duration of bonanzas. The upper panel plots the maximum duration of bonanzas (in years) by countries (rather than episodes). So, for example, six of the 181 countries never experienced a capital inflow bonanza since they are net capital exporters; this group includes Brunei, Luxembourg, Namibia, the Netherlands, Switzerland, and the United Arab Emirates. For most countries, bonanzas lasted somewhere between 2 and 4 years, which is perhaps why so many governments (and investors) fall into the all-too-common trap of treating bonanzas as permanent rather than transitory shocks—an issue we take up later when examining the typical fiscal response to the abundance of foreign capital.

We turn now to an analysis of individual episodes. Consistent with their cyclical nature, three-quarters of the episodes identified during 1980–2007 last 2 years or less. Some caution is in order in that there are a large number of instances in which bonanza episodes are separated by a single year, which de facto makes the bonanza episode much longer and adds to the ex ante confusion as to what is permanent and what is transitory. The present U.S. bonanza, which began in 2002 and was into its sixth consecutive year by 2007, is by no means common, but neither is it unique. Australia and the United Kingdom, among others, experienced similar long-lived bonanzas in the earlier (1960–79) period, as table 3 makes plain.

B. The Capital Flow Cycle and World Commodity Prices

Capital inflow surges have often been linked to reductions in international interest rates, economic growth in advanced economies, and global commodity price booms.[11] In the remainder of this section, we briefly revisit the well-trodden path of the external roots of capital flow bonanzas. Our primary aim in this paper—beyond establishing systematically the dates and incidence of capital inflow bonanzas—is to focus on the macroeconomic consequences or developments surrounding capital flows (a topic that takes up the next two sections of the paper). As such, we provide only a mere sketch of the links between the bonanza cycle and selected developments in global macroeconomic conditions, so as to build on earlier analyses using the most recent data.



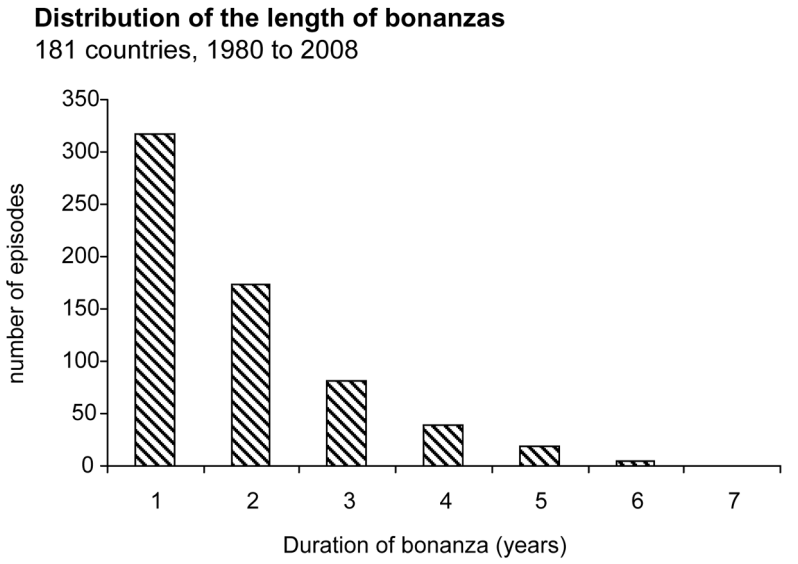


Fig. 3. Characteristics of bonanzas, 181 countries, 1980–2008. Sources: Authors' calculations and data cited in table 3.

To this end, we perform two simple exercises. First, we plot our time series on the incidence of bonanzas for the 181-country sample over 1980–2007 against (i) real per capita GDP growth in the advanced economies, as reported in the IMF's *World Economic Outlook* (upper panel of fig. 4); and (ii) the IMF's index of real commodity prices, excluding oil (bottom panel of fig. 4).[12] The evidence presented in the top panel of figure 4 is in line with evidence of Calvo et al. (1993), who posit that when growth slows in the advanced economies, global capital searches for higher yields and profit opportunities abroad in emerging markets—a phenomenon that is well under way at the current conjuncture, as discussed in Frankel (2007) in the context of the carry trade and its previous incarnations. The capital flow bonanza-commodity price boom link has

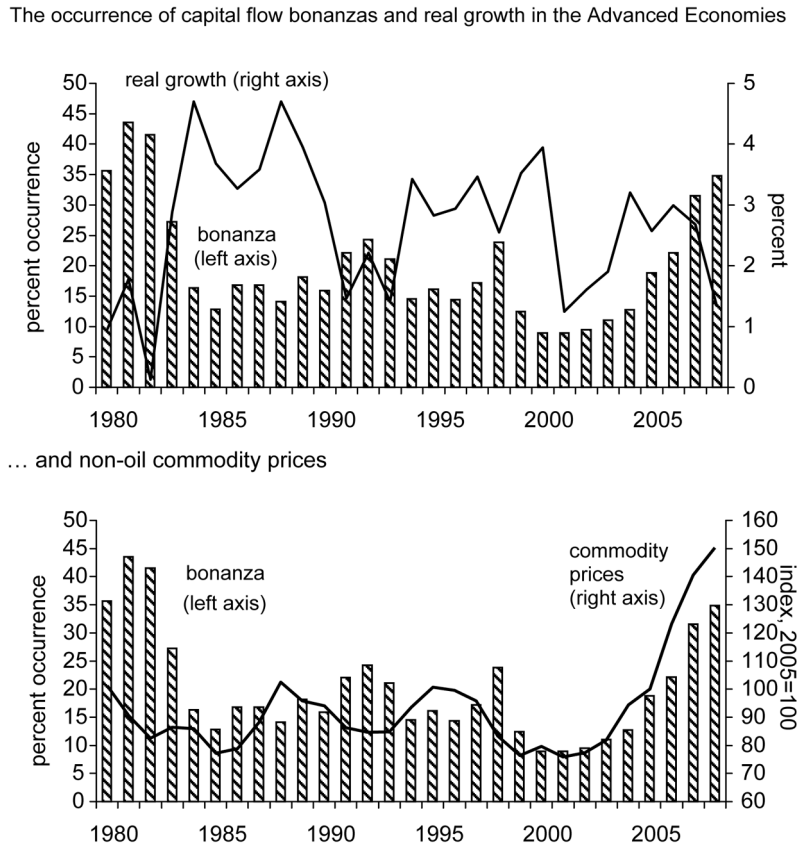


Fig. 4. Capital flow bonanzas, advanced economies' growth performance, and world commodity prices: 181 countries, 1980–2007. Sources: Authors' calculations and data cited in app. table A3.

an old history, and some classic episodes of well-managed (in terms of the macroeconomic policy response) and badly botched varieties make for interesting reading in Cuddington (1989) and sources cited therein. While the earlier 1980s do not fit the pattern as neatly, it is important to note that a spectacular boom in commodity prices prevailed in the late 1970s when the surge in the incidence of bonanzas began in earnest, as shown in the next section. Beyond the direct positive implications of higher commodity prices for export revenues for much of the emerging world, as Frankel (2006, 2008a, 2008b) demonstrates, an underlying impetus to world commodity prices is low or negative world interest rates, much along the lines of the late 1970s and the last few years. Hence, the effects of lower international interest rates work through not only the portfolio channels stressed in Calvo et al. (1993) but also the commodity price channel à la Frankel (2006). A third and important link between world real interest rates and capital flows to emerging markets comes from the channel stressed by Dooley, Fernandez-Arias, and Kletzer (1996), who emphasize the benign impacts of low real rates on default probabilities.

Our second empirical exercise is an attempt to explain the share of bonanzas in terms of the growth of real GDP in the advanced economies, real commodity prices, and the U.S. real short-term interest rate. We employ the core data set to capture the significant swing in real commodity prices as well as the long stretch of negative real interest rates in the United States in the 1970s. Our dependent variable is contained in a limited range, from zero to 100% as befits a share of a total. Accordingly, we specify that our independent variables explain the dependent variable by way of a logistic function. That is, the explanatory variables, along with a vector of ones to capture a constant term, are aligned in the vector x_t with corresponding coefficients in the vector β to obey the functional form $100 \cdot \exp(x_t\beta)/[1 + \exp(x_t\beta)]$.

The coefficients reported in the first column of table 4 were estimated with a maximum likelihood procedure using annual data from 1967 to 2006. As this is a probability forecasting model, the goodness-of-fit measure we rely on chiefly is the quadratic probability score (QPS), for the reasons explained in Diebold and Rudebusch (1989).

As anticipated in the figures, the coefficient on commodity prices is positive and that on growth is negative; both are statistically significant at the 1% confidence level. The coefficient on the contemporaneous real interest rate, however, does not match the intuition provided in Calvo et al. (1993). Their explanation relies on the cumulative encouragement

Table 4
Logistic Models Explaining the Probability of a Capital Flow Bonanza Estimated with Annual Data from 1967 to 2006

		Real Short-Term Interest Rate						
			Lagged					
	Constant Term	Current	1	2	3	4	5	6
Constant	−2.345	−2.775	−2.121	−1.855	−1.884	−1.872	−1.727	−1.800
	(−13.470)	(−6.402)	(−5.208)	(−4.785)	(−4.565)	(−4.501)	(−4.623)	(−5.747)
Real interest rate		.129						
		(3.006)						
			−.049					
			(−.960)					
				−.138				
				(−2.708)				
					−.103			
					(−1.942)			
						−.108		
						(−2.006)		
							−.147	
							(−3.033)	
								−.199
								(−4.730)
Real GDP growth		−.226	−.137	−.142	−.130	−.140	−.137	−.115
		(−3.731)	(−2.162)	(−2.370)	(−2.106)	(−2.227)	(−2.324)	(−2.135)
Commodity prices		.076	.049	.042	.042	.043	.039	.041
		(4.912)	(3.278)	(2.920)	(2.735)	(2.827)	(2.867)	(3.669)
Log likelihood function	−135.3	−145.2	−148.9	−146.1	−147.4	−147.4	−144.8	−140.0
R^2	.471	.440	.323	.415	.372	.373	.450	.568
QPS	3.060	3.973	4.727	5.619	5.016	4.936	5.149	5.250

Sources: Authors' calculations and data cited in app. table A3.
Note: *t*-statistics are in parentheses.

to capital flows to the periphery afforded by low interest rates at the core. To match this, the next six columns of the table report estimates using successive individual lags of the real rate, from 1 to 6 years. In the event, the size of the negative effect of real rates on the share and the significance of that effect, as well as the explanatory power of the model, tends to increase as the lag lengthens.

IV. Do Capital Flow Bonanzas Make Countries More Crisis Prone?

Are capital flow bonanzas a blessing, a curse, or neutral in making financial crises more likely or more severe? The literature is filled with famous

case studies of capital flow bonanzas that ended in spectacular crises. The papers range from the infamous episodes in the Southern Cone in the late 1970s to early 1980s (see, e.g., Diaz-Alejandro's [1985] classic) to Calvo and Talvi (2005), which places great store in the capital flow sudden stop following the Russian 1998 crisis in explaining Argentina's subsequent crash. Rather than focusing on specific episodes that are either as famous or more obscure, we systematically examine the potential links between the likelihood of a capital inflow bonanza and financial crises. Our analysis is conducted on a country-by-country basis as well as at the "global" level consistent with the aim of providing an encompassing approach. Our comprehensive database on the dates of bonanza and crises episodes allows us to uncover novel results on the systematic connection between the incidence of bonanzas and debt, currency, inflation, and banking crises. Hence, our analysis sheds light on the first part of the question of whether financial crises are more likely; it remains for future research to investigate issues glimpsed here pertaining to a possible link between the order of magnitude of the bonanza and the severity of the crises. The latter part of the section is devoted to more general macroeconomic volatility (as opposed to crises).

A. Bonanzas and Financial Crises: Preamble and Evidence

Section II delineated the criteria used to define a capital flow bonanza and catalogued, country by country, all the identified bonanza episodes. To examine the potential links with financial crises of various stripes, we proceed symmetrically. Our crisis analysis is taken directly from Reinhart and Rogoff (2008b). These crises definitions are reproduced in table 5, and a full listing of dates for sovereign external defaults (or restructurings), currency crashes, inflation crises, and banking crises are presented in table 6 for 64 of the 66 core countries for which we have dates on capital flow bonanzas.[13] In line with our dating of bonanzas, table 6 provides beginning and ending dates to define each crisis episode. Hence, an entry of a single year denotes that the crises lasted only that long.

From the crises dates shown in table 6 and the bonanza dates listed in table 3, we constructed a family of country-specific probabilities. For each of the countries, this implies four unconditional crisis probabilities: that of default (or restructuring) on external sovereign debt, a currency crash, an inflation crisis, and a banking crisis. We also construct the probability of each type of crisis within a window of 3 years before and after the bonanza year or years; we refer to this as the conditional probability of a crisis. If capital flow bonanzas make countries more crisis prone, the

Table 5
Defining Crises by Events: A Summary

Type of Crisis	Definition and/or Criteria	Comments
Banking crisis	We mark a banking crisis by two types of events: (1) bank runs that lead to the closure, merging, or takeover by the public sector of one or more financial institutions; and (2) if there are no runs, the closure, merging, takeover, or large-scale government assistance of an important financial institution (or group of institutions) that marks the start of a string of similar outcomes for other financial institutions.	This approach to dating the beginning of the banking crises is not without drawbacks. It could date the crises too late, because the financial problems usually begin well before a bank is finally closed or merged; it could also date the crises too early, because the worst of a crisis may come later. Unlike external debt crises (see below), which have well-defined closure dates, it is often difficult or impossible to accurately pinpoint the year in which the crisis ended.
External debt crises	A sovereign default is defined as the failure to meet a principal or interest payment on the due date (or within the specified grace period). The episodes also include instances in which rescheduled debt is ultimately extinguished in terms less favorable than the original obligation.	While the time of default is accurately classified as a crisis year, there are a large number of cases in which the final resolution with the creditors (if it ever did take place) seems interminable. For this reason we also work with a crisis dummy that picks up only the first year.
Inflation crisis	An annual inflation rate of 20% or higher. We also examine separately the incidence of more extreme cases in which inflation exceeds 40% per year.	All consecutive years in which the threshold is met or exceeded are counted as a part of the same inflation crisis.
Currency crash	An annual depreciation vs. the U.S. dollar (or the relevant anchor currency—historically the U.K. pound, the French franc, or the German deutsche mark and presently the euro) of 15% or more. This is similar to the Frankel and Rose (1996) approach to dating crashes.	In parallel treatment to the inflation crisis dating, all consecutive years in which the threshold is met or exceeded are counted as a part of the same inflation crisis.

Source: Reinhart and Rogoff (2008b).

Table 6
Dates of Economic Crises: Core Sample, 1960–2007

Country	Within 3 Years of the Bonanza			
	External Default	Currency Crash	Inflation Crisis	Banking Crisis
High income, OECD:				
Australia		1976, 1982, 1985, 1997, 2000	1966, 1975	1989–92
Austria		2005		
Belgium		1982, 2005		
Canada				1983–85
Denmark				1987–92
Finland		1967, 1992		1991–94
France		1976, 2005		1994–95
Germany		1984, 1997, 1999, 2005		1977–79
Greece		1976, 1980, 1983, 1985–86, 1990, 2005		1991–95
Italy		1976, 1992, 2005	1974, 1980	1990–95
Korea	1998[a]	1966, 1970, 1975, 1979–80, 1997	1974, 1980–81	1982, 1985–88, 1997–2002
New Zealand		1976, 1980–82, 1987, 1989		1987–90
Norway		1982, 1986		1987–93
Portugal		1976–77, 1981–84, 2005	1974, 1982–84	
Spain		1967, 1977, 1982, 1993, 2005	1977	1977–85
Sweden		1977, 1982, 1992, 2005		1991–94
United Kingdom		1967, 1975–76, 1981–83, 1993	1975	1974–76, 1984, 1991, 1995, 2007
United States		1969, 1971, 1975		1984-91, 2007
High income, non-OECD:				
Hong Kong, SAR		1983		1982–86, 1998
Singapore		1997	1973	1982
Middle-high income:				
Argentina	1956–65, 1982–93, 2001–5	1965–71, 1974–91, 2002	1965–67, 1971–92, 2002	1980–82, 1995–96, 2001–3

(continued)

Table 6
Continued

Country	Within 3 Years of the Bonanza			
	External Default	Currency Crash	Inflation Crisis	Banking Crisis
Brazil	1983–94	1965–71, 1974–95, 1999, 2001–2	1965–71, 1974–95	1985, 1990, 1994–97
Chile	1965, 1972, 1974–75, 1983–90	1962–79, 1982–85, 1987, 1989	1962–80, 1983, 1985, 1990–91	1982–84
Costa Rica	1981–90	1974, 1981, 1987, 1991, 1995	1974, 1981–83, 1988, 1991–92, 1995	1987, 1994–96
Hungary	1941–67	1993, 1995–97	1990–93, 1995–96	1991–95
Malaysia		1998		1985–88, 1997–2001
Mauritius		1979, 1981, 1983–84	1979–81	
Mexico	1982–90, 1995[a]	1976, 1982–87, 1989, 1994–95, 1999	1976–77, 1980–92, 1995–96	1981–82, 1994–2000
Panama	1983–96			1988–89
Poland	1981–94	1987–95	1996–97, 1999	1991–95
Romania	1981–83, 1986	1973, 1983, 1990–2001	1990–2002	1990–99
Russia	1991–2000	1987–96, 1998–99	1993–97, 1998–2001	1995, 1998
South Africa	1985–87, 1989, 1993	1967, 1982, 1984–85, 1988, 1996, 1998, 2000–2001		1977
Turkey	1978–79, 1982	1971, 1977–2001	1977–2003	1982–84, 1994
Uruguay	1983, 1987, 1990, 2003	1967–86, 1970–72, 1974–97, 2001–2	1964–96	1981–84, 2002
Venezuela	1983–88, 1990	1984, 1986, 1989–96, 2002–4	1980, 1983–88, 1990, 1995–97, 2004–5	1978–86, 1993–94
Middle-low income:				
Algeria	1991–96	1988–91, 1994–95	1991–95	1990–92
Angola	1985–2003	1966–73, 1991–2003	1974–80, 1991–2005	1992–97
Bolivia	1980–84, 1986–97	1972, 1979, 1982–85, 1987, 1989	1973–75, 1979–86, 1991	1986–87, 1994–97

(continued)

Table 6
Continued

Country	Within 3 Years of the Bonanza			
	External Default	Currency Crash	Inflation Crisis	Banking Crisis
China		1984, 1986, 1989, 1994	1994	1992–99
Colombia		1979–82, 1985, 1987–96	1980–91, 1995, 1997–2000	1982–87, 1998
Dominican Republic	1982–94, 2005	1985, 1987–88, 1990, 2003–4	1980, 1984–85, 1988–91, 2003–5	
Ecuador	1982–95, 1999–2000	1971, 1982–92, 1995–2000	1974, 1983–2001	1981, 1984, 1988, 1991, 1996–2002
Egypt	1983	1979, 1989–91, 2001, 2003	1980, 1986–87, 1989–90, 1992	1981–83, 1990–95
El Salvador		1973, 1988	1985–87, 1990, 1993	1989
Guatemala	1986, 1989	1986, 1989–90	1986, 1990–91	
Honduras	1981–2007	1990, 1993–94, 1996	1990–91, 1994–97	
Indonesia	1966–70, 1998–2000, 2002	1962–68, 1978, 1983, 1986, 1997–98, 2000	1960–68, 1979, 1998–99	1992, 1994, 1996–2002
Morocco	1983, 1986–90	1985		1983–84
Nicaragua	1983–2007	1979, 1985–93	1973, 1979–92	1987–96
Paraguay	1968–69, 1986–92, 2003–4	1984–86, 1989, 1992–93, 1998–99, 2001–2	1974, 1979–80, 1984–91, 1994	1995–2000
Peru	1969, 1976, 1978, 1980, 1983–97	1976–93, 1998	1975–94	1983–90
Philippines	1983–92	1971, 1983–84, 1990, 1997, 2000	1973–74, 1984–85	1981–87, 1997–2001
Sri Lanka	1979, 1981–93			1989–93
Thailand		1984, 1997, 2000	1974	1980–87, 1996–2001
Tunisia	1979–82	1974, 1978, 1986		
Low income:				
Central African Republic	1981, 1983–2007	1994	1994	1976–82, 1988–99
Côte d'Ivoire	1983–98, 2000-2007	1994	1977, 1979, 1994	1988–91
India	1969, 1972–76	1967, 1984, 1988, 1991, 1993	1973–74	1993–98
Kenya	1994–98, 2000		1984, 1992–94	1985–89, 1992–95

(continued)

Table 6
Continued

Country	Within 3 Years of the Bonanza			
	External Default	Currency Crash	Inflation Crisis	Banking Crisis
Myanmar	2002–7	1975	1966, 1973–76, 1988–98, 2001–3, 2006	1996–2003
Nigeria	1987–94, 2004–5	1972, 1981, 1985–92, 1999	1975, 1977, 1981, 1983–84, 1988–89, 1992–96	1992–96
Zambia	1983–94	1983–86, 1988–96, 1998, 2000	1984–2003	1995
Zimbabwe	2000–2007	1982–84, 1988–2006	1983–84, 1991–2006	1995–2006

Source: Reinhart and Rogoff (2008b) and sources cited therein.
Note: These include all crises (by type) around the bonanzas. Crisis definitions are presented in table 5.
[a]A near default episode.

conditional probability, $P(\text{Crisis}_i|\text{Bonanza})$, should be greater than the unconditional probability of a crisis, $P(\text{Crisis}_i)$, where the subscript i refers to the ith "type" of crisis (default, currency, etc.).

Table 7 aggregates these country-specific conditional and unconditional probabilities by three groups (all countries, high-income, and middle- and low-income). The test statistic for the equality between two proportions,

$$Z = \frac{p_1 - p_2}{\{P(1-P)[(1/n_1) + (1/n_2)]\}^{1/2}},$$

where $P = (p_1 n_1 + p_2 n_2)/(n_1 + n_2)$, is calculated for each pair of probabilities, where $n_1 = n_2$ is the number of observations in each group. The instances in table 7 in which the difference in proportions is significantly different at the 1% confidence level are marked with an asterisk.

The main results are summarized as follows. For the full sample, the probability of any of the four varieties of crises conditional on a capital flow bonanza is significantly higher than the unconditional probability. Put differently, the incidence of a financial crisis is higher around a capital inflow bonanza. However, separating the high-income countries from the rest qualifies the general result. As for the high-income group, there are no systematic differences between the conditional and unconditional probabilities.

Table 7
Are Bonanza Episodes More Crisis Prone? Core Sample, 1960–2007

Probability of Crisis (in Percent)	External Default	Currency Crash	Inflation Crisis	Banking Crisis
	High Income			
Conditional on a bonanza (3-year window)	.2	9.5	2.6	11.9
Unconditional	.0	8.2	2.1	11.2
Difference	.2	1.3	.5	.7
	Middle and Low Income			
Conditional on a bonanza (3-year window)	29.6	31.5	31.7	20.7
Unconditional	21.0	22.7	23.5	14.3
Difference	8.6*	8.8*	8.2*	6.4*
	All Countries			
Conditional on a bonanza (3-year window)	22.2	25.8	24.2	18.4
Unconditional	15.7	19.1	18.0	13.2
Difference	6.5*	6.7*	6.2*	5.2*
Percentage of countries for which conditional probability is greater than unconditional	42.2	65.6	59.4	60.9

Sources: Based on tables 2 and 4 and authors' calculations.
Note: The 3-year window encompasses 3 years before the bonanza years listed in table 2, the year (or years if these are consecutive) of the bonanza, and the 3 years following the episode.
*Significant at the 1% confidence level.

These results are not entirely surprising since the high-income countries do not default on their sovereign debts during the sample in question.[14] Given that the threshold that defines an inflation crisis is 20% per year, it is also hardly a surprise that this cutoff is seldom surpassed by wealthy countries—whether experiencing a capital flow bonanza or not. It is less obvious, a priori, that there is no discernible increase in the likelihood of a banking or currency crisis for the advanced economies. The bottom row of table 7 provides the share of countries for which $P(\text{Crisis}_i|\text{Bonanza}) \geq P(\text{Crisis}_i)$ as an additional indication of how commonplace it is across countries to see bonanzas associated with a more crisis-prone environment. For sovereign defaults, less than half the countries record an increase in default probabilities around capital flow bonanzas. (Here, it is important to recall that about one-third of the countries in the core sample are high income.) For currency, banking, and inflation crises, the majority of countries register a higher propensity to enter into a crisis around bonanza periods.

Beyond the aggregate results presented in table 7, figures 5–8 for debt, currency, inflation, and banking crises, respectively, present a

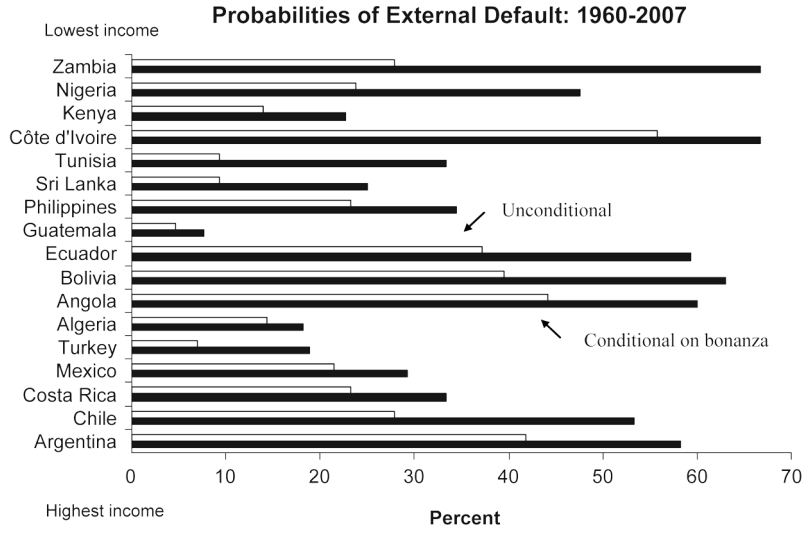


Fig. 5. Are bonanza episodes more crisis prone? Sovereign external default, 66 countries, 1960–2007. Sources: Authors' calculations, Reinhart and Rogoff (2008b), and sources cited therein.

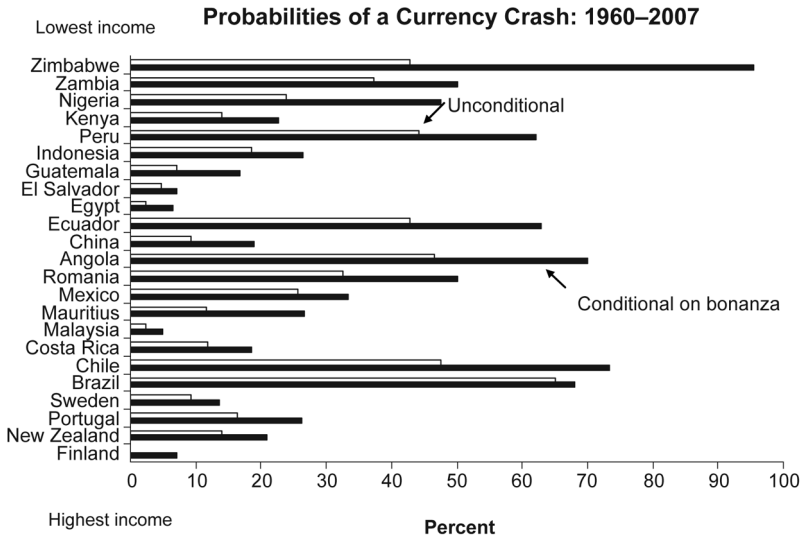


Fig. 6. Are bonanza episodes more crisis prone? Currency crashes, 66 countries, 1960–2007. Sources: Authors' calculations, Reinhart and Rogoff (2008b), and sources cited therein.

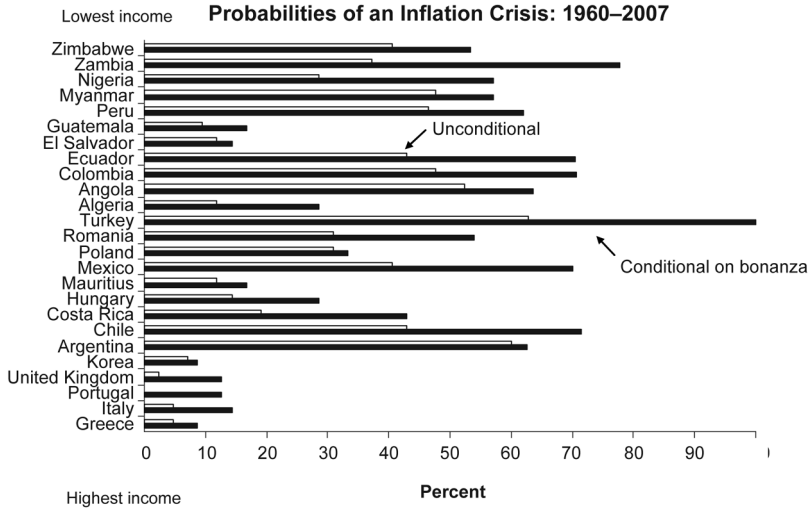


Fig. 7. Are bonanza episodes more crisis prone? Inflation crises, 66 countries, 1960–2007. Sources: Authors' calculations, Reinhart and Rogoff (2008b), and sources cited therein.

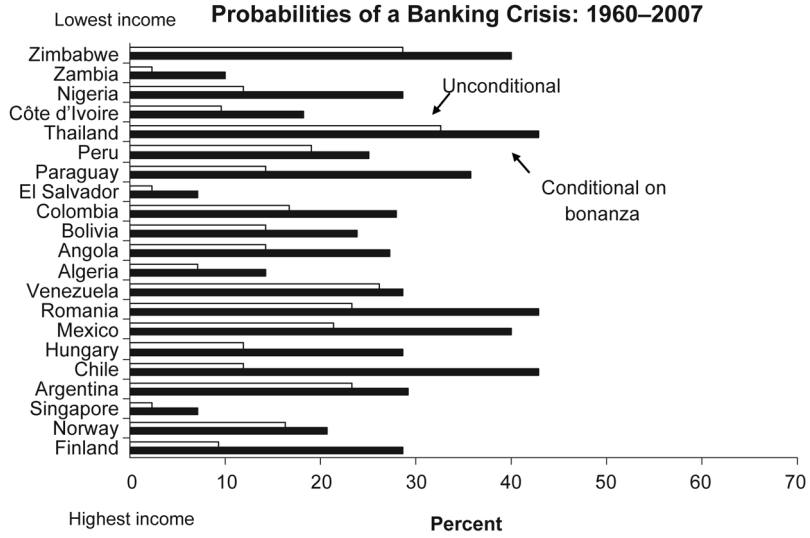


Fig. 8. Are bonanza episodes more crisis prone? Banking crises, 66 countries, 1960–2007. Sources: Authors' calculations, Reinhart and Rogoff (2008b), and sources cited therein.

comparison of conditional and unconditional probabilities for individual countries, where the differences in crisis probabilities were greatest. (Hence, the country list varies across figures.) As noted earlier, no high-income country turns up in figure 5 on debt crises. The same cannot be said of figures 6–8. While the advanced economies register much lower (conditional and unconditional) crisis probabilities than their lower-income counterparts, the likelihood of a crisis is higher around bonanza episodes in several instances. Notably, Finland and Norway record a higher probability of a banking crisis during the vicinity of a capital flow bonanza, whereas Greece, Italy, and the United Kingdom show a greater predisposition to an inflation crisis when bonanzas are present.

B. Bonanzas as a Predictor of Sovereign Defaults

Beyond the country-by-country comparisons described in the preceding section, we wanted to refine further the relationship between bonanzas and sovereign defaults. As discussed in Reinhart and Rogoff (2008b) in the context of the evidence from 1800–2007, there is an intimate connection between the global capital flows (as measured annually in terms of U.S. dollars) and default (exactly as measured here, by the incidence of sovereign default). A variant of this relationship is presented in figure 9,

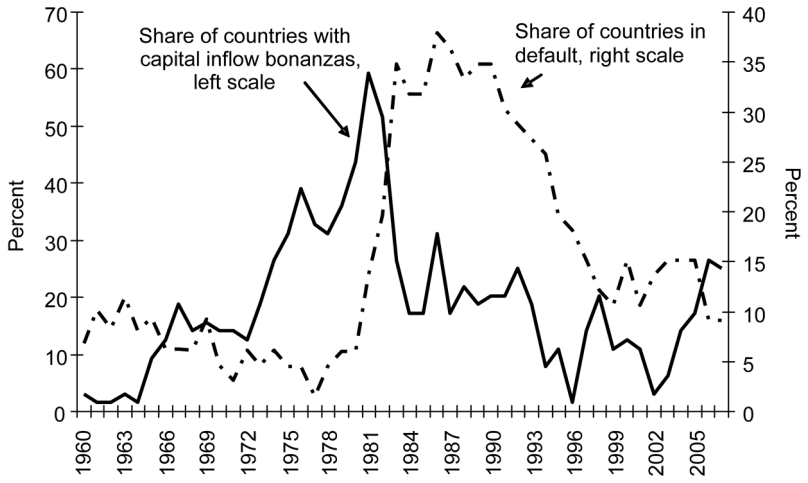


Fig. 9. Capital flow bonanzas as predictors of sovereign default, 66 countries, 1960–2007. Sources: Authors' calculations, Reinhart and Rogoff (2008b), and sources cited therein.

which plots the annual incidence of capital flow bonanzas during 1960–2007 for the core sample and the comparable incidence on sovereign default. The overall incidence is higher and more variable than that shown in figure 1 for the 181 countries, since the core sample predominantly represents countries that have access to international capital markets and, in particular, private flows. A cursory inspection of this figure is suggestive that the incidence of bonanzas possibly "leads" the incidence of default. This temporal pattern would seem plausible in light of the fact that capital inflows to developing countries have historically been predominantly debt-creating flows.[15] As the bonanza continues, leverage (usually public and private) increases.[16]

To investigate this possibility formally, we ran a series of logistic regressions in which the dependent variable is the aggregate or global probability of sovereign default against the aggregate or global probability of a capital flow bonanza, either contemporaneous or lagged anywhere between 1 year and 6 years. As in the prior section, this functional form respects the limited range of the dependent variable. These results are summarized in table 8 along the column headings for lags up to 6 years. As the results indicate, the fit of regression improves steadily as the lag length is extended up to 6 years. The single bonanza regressor is statistically significant at the 1% level for the regressions, where the *t*-statistics appear in parentheses. The preferred specification (six lags) yields an R^2 of about 0.50. Similarly, the QPS statistic falls. As in the previous discussion on determinants, the global factors behind bonanzas, this exercise is meant to be illustrative rather than a self-contained model of sovereign default. It is worth mentioning that this external default time series registers a contemporaneous correlation with world real interest rates of 0.59, underscoring that there are multiple factors beyond bonanzas that determine the likelihood of a sovereign debt crisis. These results would not be unfamiliar to the reader of Mendoza and Terrones (2008), who conclude that not all credit booms end in financial crises, but most emerging markets crises were associated with credit booms.

C. Bonanzas and Macroeconomic Volatility

Crises, like bonanzas, are discrete, traumatic, and (in the more stable countries) relatively rare. Yet another possibility in which capital flow bonanzas would be less than a blessing might be if these bouts of capital inflows led to an overall increase in macroeconomic volatility, even if it did not increase the odds of a financial crisis outright. To shed some light on this issue, we performed some simple exercises involving

Table 8
Logistic Models Explaining the Probability of Default: Estimated with Annual Data from 1967 to 2006

		Share of Countries with Capital Flow Bonanzas						
			Lagged					
	Constant Term	Current	1	2	3	4	5	6
Constant	−1.637	−1.526	−1.778	−1.989	−2.093	−2.211	−2.323	−2.345
	(−14.2)	(−6.5)	(−7.7)	(−9.0)	(−10.0)	(−11.1)	(−12.6)	(−13.5)
Bonanza		−.005						
		(−.5)						
			.007					
			(.7)					
				.016				
				(2.1)				
					.021			
					(3.0)			
						.027		
						(4.1)		
							.031	
							(5.4)	
								.033
								(6.0)
Log likelihood function	−148.1	−147.9	−147.8	−146.2	−144.3	−141.4	−137.4	−135.3
R^2	.000	.008	.014	.091	.173	.284	.413	.471
QPS	1.921	1.906	1.895	1.747	1.589	1.375	1.129	1.018

Sources: Authors' calculations and data cited in app. table A3.
Note: *t*-statistics are in parentheses.

the volatilities of real GDP growth, consumer price inflation, and the current account/GDP ratio. Needless to say, this only skims the surface of the potential links between bonanzas and macroeconomic volatility.

We measure volatility as the 66th percentile of the absolute annual change in each macroeconomic variable. Table 9 reports for the full sample the simple pairwise correlations between the incidence of capital

Table 9
Incidence of Bonanzas and Volatility: 181 Countries, 1980–2007

Volatility	Correlation
Real GDP growth	.43
Inflation	.25
Current account to GDP	.39

Sources: International Monetary Fund *World Economic Outlook* and authors' calculations.
Note: We measure volatility as the 66th percentile of the absolute annual change in each macroeconomic variable.

inflow bonanzas from 1981 to 2007 and the volatility (as described above) of real GDP growth, inflation, and the current account to GDP. For all three variables the correlation is positive (ranging from a low of 0.25 for inflation to a high of 0.43 for real GDP growth) and statistically significant. Of course, this exercise does not speak of causality or how representative this "global" bonanza-volatility link plays out for individual countries.

V. Anatomy of Bonanza Episodes

The macroeconomic developments associated with surges in capital inflows are a mixture of anecdotal evidence from case studies and more systematic analyses that (to our knowledge) have no standardized definition of "a capital inflow episode" or bonanza.[17] The collective evidence from this literature suggests that capital inflows are most often associated with both a deterioration in the current account and an accumulation in international reserves, ostensibly from the central bank's persistent efforts to avoid or mitigate the tendency toward a nominal and real exchange rate appreciation that usually goes hand-in-hand with the capital inflow.[18] As Calvo et al. (1993) document in several papers, the pressures for the exchange rate to appreciate stem both from an increased demand for the local assets (which may or may not lead to an asset price boom or bubble) and from an increase in aggregate demand for both traded and nontraded goods. As long as the supply of the nontraded good is not perfectly elastic, the relative price of nontradables increases (i.e., a real exchange rate appreciation).

In an attempt to analyze the cyclical behavior of fiscal policy in advanced and emerging market economies, Kaminsky, Reinhart, and Végh (2004) present evidence for emerging markets of the "when it rains, it pours" phenomenon; that is to say, that the cyclical components of GDP, net capital flows, and real fiscal spending all reinforce each other. Periods of cyclically high capital inflows are associated with an expansion in real government spending: fiscal policy is procyclical in relation to both output and capital inflows.

Some of these macroeconomic trends, notably the worsening current account, appreciating real exchange rates, and rising asset prices, regularly present themselves on the eve of currency and banking crises (Kaminsky and Reinhart 1999) and sudden stops (Edwards 2004, 2007). In the remainder of this section, we extend such comparisons.

A. *Growth, Inflation, and the Current Account*

Capital flow bonanzas—as with sudden stops, current account reversals, and financial crises—each have their own idiosyncrasies. However, these episodes also tend to share common threads that cut across time and national boundaries, which we exploit by opening a wide window of comparison.

Our strategy is to examine the behavior of key macroeconomic and financial indicators in the run-up and aftermath of the identified bonanza episodes, starting with the "big picture." Figure 10 presents four panels showing medians across episodes during 1980–2007 for key macroeconomic

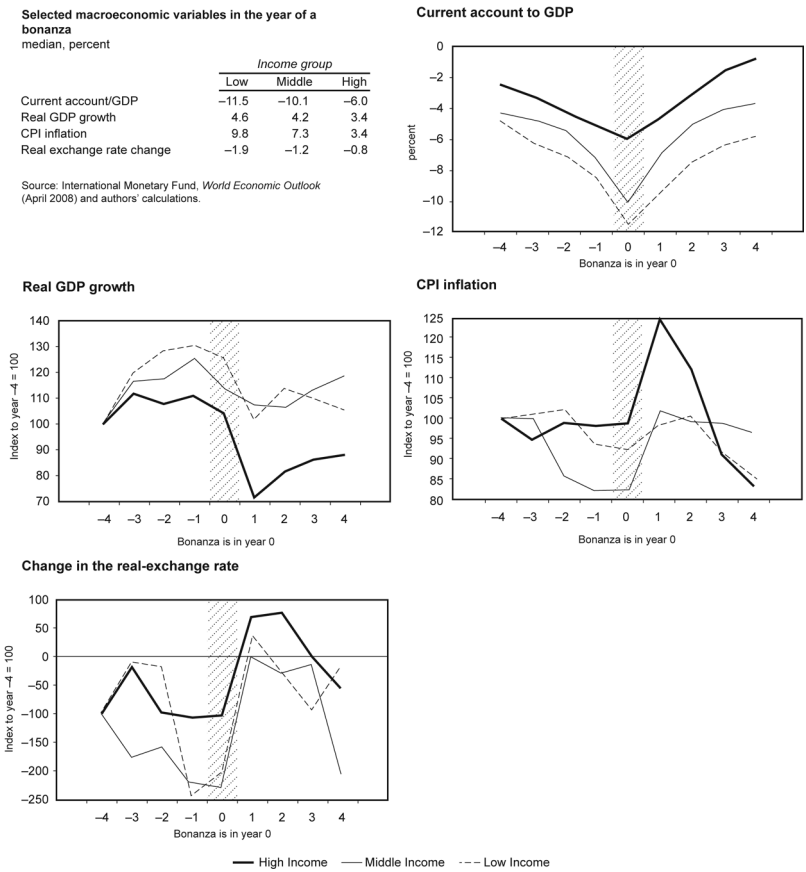


Fig. 10. Growth, inflation, the current account, and real exchange rate around bonanzas, 181 countries, 1980–2007. Sources: International Monetary Fund, *World Economic Outlook* (April 2008), and authors' calculations.

indicators: real GDP growth, inflation, the current account balance/GDP ratio, and the real exchange rate. We plot each series from 4 years (–4) before the bonanza (year 0) to 4 years (4) after. Because of the enormous diversity in our 181-country sample, the medians are plotted separately for high-, middle-, and low-income countries (denoted by solid, dashed, and dotted lines, respectively). In line with the findings of several papers on capital account reversals and sudden stops, the average path of the current account balance to GDP (top-right panel) is distinctly V-shaped, with the current account deteriorating into the bonanza year and improving steadily thereafter. Note that this is not an artifact of our selection criteria. We do not select for big changes, only big levels. Current account deficits are, on average, largest for the low-income countries and smallest for the advanced economies, consistent with the evidence reported earlier on cutoff values. The path of the real exchange rate (bottom-left panel) shows that there is a cumulative appreciation (a decline denotes an appreciation) up to the bonanza year and a sharp depreciation afterward. The analysis of Goldfajn and Valdes (1999) presents compelling evidence that in the overwhelming majority of cases, the cumulative real appreciation unwinds through a swift nominal depreciation (perhaps through a full-fledged currency crisis) rather than through a downward adjustment in prices.

GDP growth rises into the bonanza but then slows, settling back to a roughly prebonanza growth rate for middle- and low-income countries and a markedly lower growth rate for high-income economies. As to inflation, the trajectory is so diverse across the three income groups that it is impossible to draw any conclusion as to a fixed behavioral pattern. This suggests that the efforts of central banks in anchoring expectations are more important than the stage of the capital-flow cycle.

This association holds across individual countries as well. Figure 11 provides reinforcing cross-episode evidence via scatter plots that compare the real GDP growth and inflation performance for the year before and after the bonanza. Observations above the 45-degree ray indicate that growth (inflation) is higher 1 year after the bonanza than the year before the bonanza episode; the converse is true for observations below the diagonal. Taken together, these scatter plots confirm that for the most part (63% of the episodes) growth is lower after the capital inflow boom, whereas no clear pattern emerges for inflation.

The narrative illustrated in figure 12 for the core 66 countries for the longer sample spanning 1960–2007 intimately mirrors the broader post-1980 experience; the current account registers a V-shaped pattern, inflation is markedly different for the wealthy and not-so-wealthy countries,

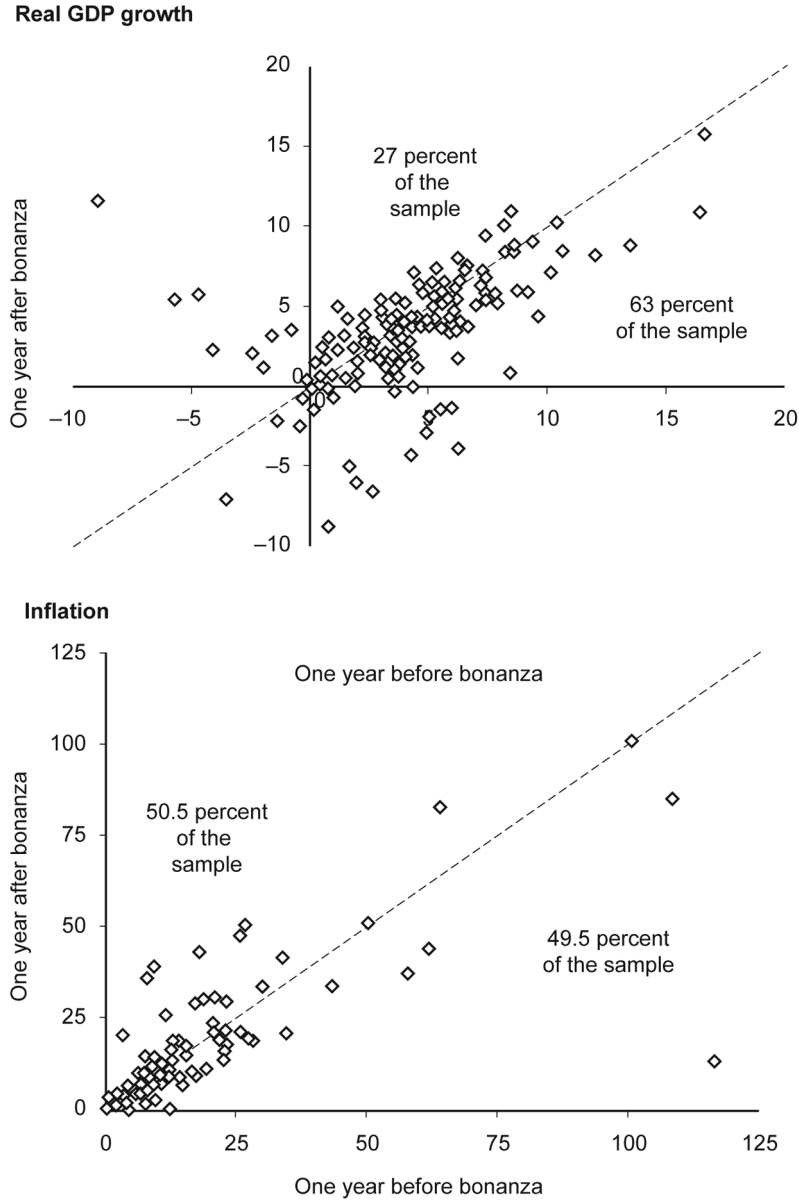


Fig. 11. Before and after: growth and inflation around bonanzas, 181 countries, 1980–2007. Sources: International Monetary Fund, *World Economic Outlook* (April 2008), and authors' calculations.

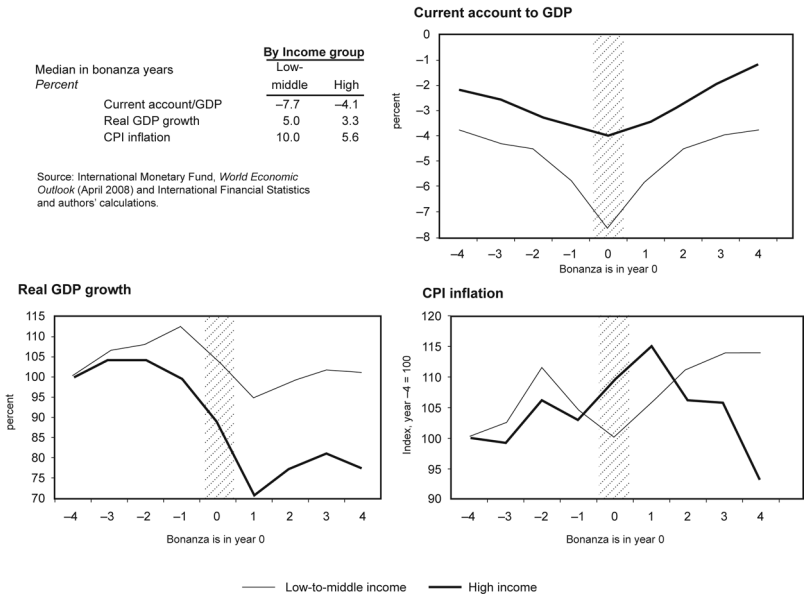


Fig. 12. Growth, inflation, and the current account around bonanzas, 66 countries, 1960–2007. Sources: International Monetary Fund, *World Economic Outlook* (April 2008), *International Financial Statistics*, and authors' calculations.

and real growth picks up in the run-up to the bonanza but does worse in the aftermath—particularly for high-income countries. Whatever growth benefits accrue during the bonanza phase are but short lived.

B. External Sector: Reserves, Exchange Rates, and Trade

There is a blossoming recent literature trying to explain why many emerging market countries have been amassing international reserves at an unprecedented clip. Some studies have stressed a "precautionary" motive in which countries build their war chests in good times to provide liquidity if need be in bad times (see, e.g., Bastourre, Carrera, and Ibarlucia 2008; Carroll and Jeanne 2008). What the upper panel of figure 13 makes plain is that the practice of accumulating reserves, especially in developing countries during capital inflow years (which characterizes the current juncture for many emerging markets), is far from new, since the episodes depicted in this figure span 1960 to the present. Reluctance to allow for a sustained nominal or real exchange rate appreciation is a constant that has withstood the test of time in emerging markets. Tendencies to lean against the wind are seldom more pronounced than when there

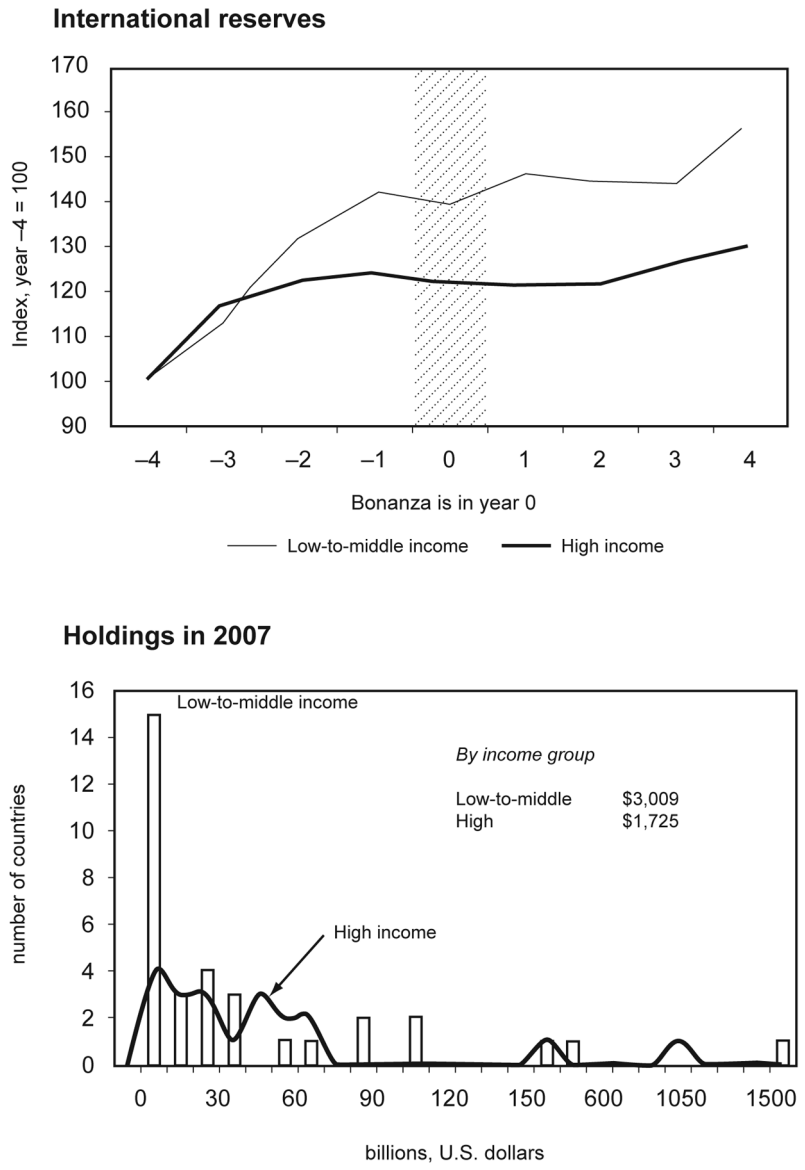


Fig. 13. International reserves around bonanzas, 66 countries, 1960–2007: Sources: International Monetary Fund, *World Economic Outlook*, and authors' calculations.

is a capital inflow bonanza under way. The 40% plus increase in reserves in the run-up to the bonanza is no trivial change for the middle- and low-income countries, which as of 2007 held about twice as much in reserves as their high-income counterparts (bottom panel).

There is little surprising in figure 14, which displays the same graphs for the external indicators (trade balance, exports, imports, and real exchange rate) for the 66-country sample. The trade balance follows the same path of the current account, since imports expand more rapidly than exports at the outset of the bonanza. The real exchange rate initially appreciates and subsequently depreciates in the years immediately following the capital flow bonanza. The only incremental evidence revealed by figure 14 is that the real depreciation shown in the bottom-right panel is noticeably smoother than that shown in figure 9 for the 181-country average after 1980; possibly this difference may reflect that crises are more severe (Kaminsky and Reinhart 1999) and reversals more acute (Eichengreen and Adalet 2005) in the more recent period or that the addition of lower-income countries in the larger sample adds to volatility.

C. *Fiscal Policy: Amplifier or Stabilizer*

Managing surges in capital inflows poses nontrivial policy challenges, particularly if the inflows are persistent and/or if the orders of magnitude

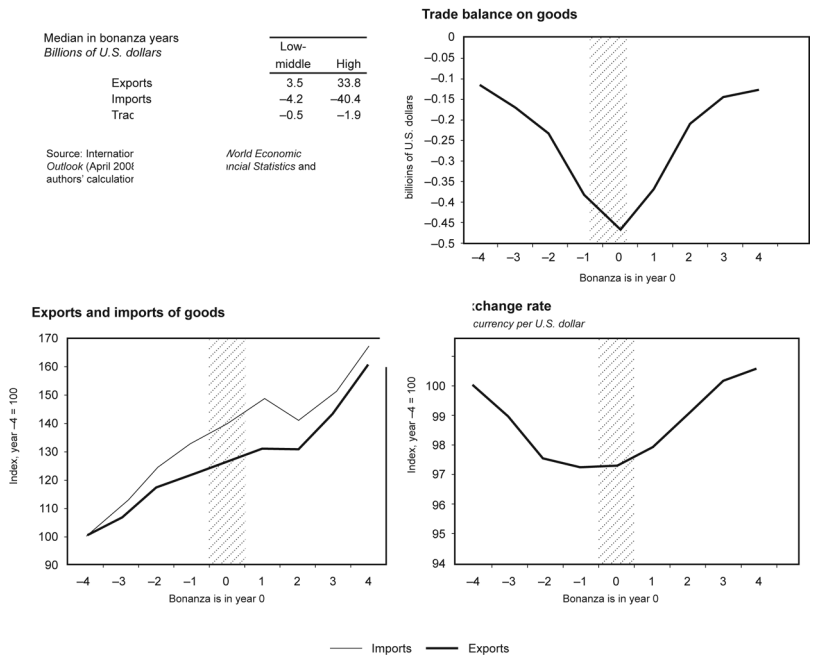


Fig. 14. External indicators and bonanzas, 66 countries, 1960–2007. Sources: International Monetary Fund, *World Economic Outlook* (April 2008), *International Financial Statistics*, and authors' calculations.

are staggering; these policy challenges are discussed in detail and examples provided in Reinhart and Reinhart (1998). Policy responses can mitigate the downside of capital flow bonanzas (recall that the main conclusion from the preceding section is that bonanzas are historically associated with higher odds of a financial crisis) or amplify their more worrisome tendencies. The mismanagement of capital flow bonanza/commodity price boom episodes (see Cuddington 1989) more often than not has its roots in the authorities' premise that the "good times" are permanent and, as such, can fully support a full-fledged expansion in real fiscal spending. This is the essence of fiscal procyclicality as documented by Gavin and Perotti (1997) and Kaminsky et al. (2004).

Figure 15 presents, in a comparable format, the evolution of real government spending and revenues and the fiscal balance (all indexed to the level 4 years prior to the bonanza). The deeply entrenched pattern of procyclical fiscal behavior by middle- and low-income countries emerges unambiguously from the three panels that make up the figure. Government spending from 2 years prior to the year of the bonanza rises by about 20% in real terms at a time during which growth is accelerating, as discussed. Despite even faster growth in government revenues (than in expenditures),

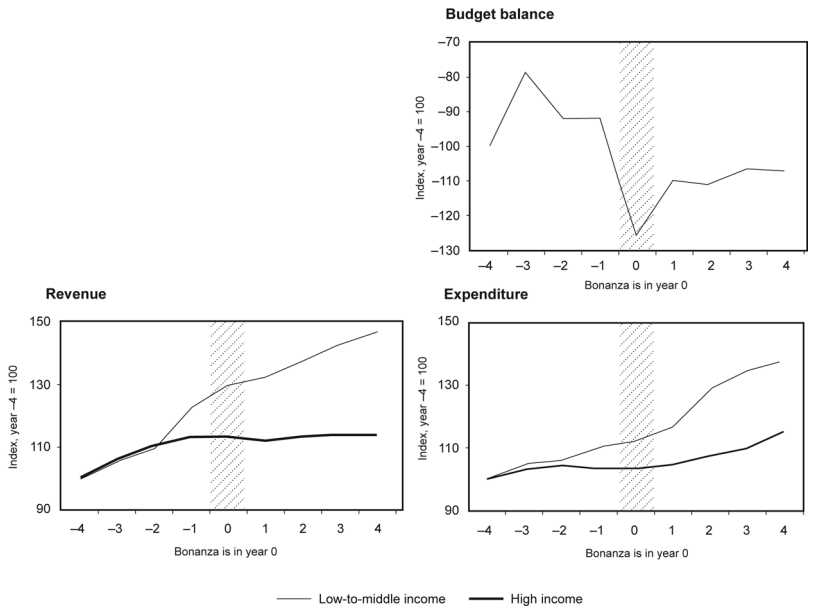


Fig. 15. Fiscal indicators and bonanzas, 66 countries, 1960–2007. Sources: International Monetary Fund, *World Economic Outlook* (April 2008), *International Financial Statistics, Government Financial Statistics*, and authors' calculations.

the fiscal balance deteriorates markedly into the bonanza year. (This deterioration materializes because, while revenues are growing more rapidly, they are doing so from a lower base than expenditures 4 years prior to the bonanza.) The lax expenditure during the boom phase (and the associated deterioration in the fiscal balance) sets the stage for a "nonvoluntary" fiscal tightening when the economic downturn sets in. Hence, as Kaminsky et al. (2004) illustrate, the magnitude of the swing in real fiscal spending during the cycle from boom to bust can be as large as 25–35 percentage points (as in the case of Uganda and Liberia, respectively).[19]

Kaminsky et al. rank the government's procyclicality propensity by two measures: the correlation between the cyclical component of real GDP and real fiscal spending (if positive, it implies procyclicality) and the amplitude of the swing in real spending (as described). Using these two indicators, we conducted a simple exercise to shed light on the plausible conjecture that the procyclical nature of government spending may help explain why the odds of a financial crisis increase around capital flow bonanzas, as illustrated in the preceding section. On a cross-country basis, we correlated the difference between the conditional, $P(\text{Crisis}_i|\text{Bonanza})$, and unconditional, $P(\text{Crisis}_i)$, probability for each of the four types of crises (as shown for selected countries in figs. 4–8) and the two Kaminsky et al. measures of fiscal procyclicality (one at a time). The eight correlations were positive, ranging from 0.25 to 0.46; six of the correlations were statistically significant. The results of these preliminary exercises are, thus, consistent with our conjecture about the destabilizing role of fiscal policy around capital flow bonanzas—and possibly more generally.

D. Asset Markets

The last indicators we examine around bonanza periods are asset prices, specifically, real equity prices for the 66-country sample and real house prices for a subset of 18 high-income countries for the period 1970-2007. There has been discussion and some anecdotal evidence to suggest that asset prices boom during some famous capital inflow bonanzas (as in Calvo, Izquierdo, and Talvi [2003]). Such a phenomenon appears reasonable, since a capital inflow represents an increased demand (by the rest of the world) for a particular country's assets, which would include equity and real estate. As to asset prices and crises, one cannot read Kindleberger (1989) without drawing a tight link between the two.

Kaminsky and Reinhart (1999) present evidence to suggest that equity price bubbles are systematically present on the eve of banking crises;

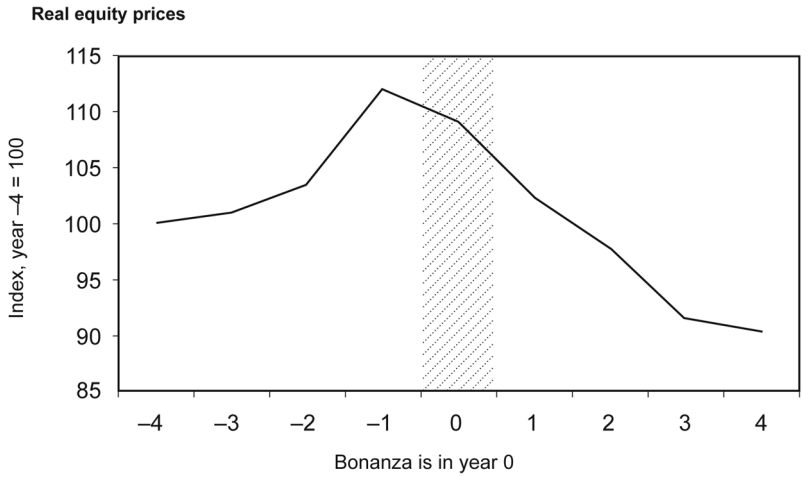


Fig. 16. Equity prices and bonanzas, 66 countries, 1960–2007. Sources: International Monetary Fund, *World Economic Outlook* (April 2008), *International Financial Statistics*, and authors' calculations.

indeed, they are a good leading indicator of these. Reinhart and Rogoff (2008a) present evidence that real house prices boomed on the eve of the worst post–World War II banking crises in emerging market economies.

Figures 16 and 17 suggest a three-way link between capital inflow bonanzas, asset price booms, and financial crises. For both asset markets (for equities in fig. 16 and houses in fig. 17), there is a marked rise in inflation-adjusted prices that peaks at the time of the bonanza and is followed by a sustained decline during the 4 years following the bonanza. When the evidence on the higher likelihood of a sovereign default in particular (and other types of financial crises in general), the slowdown in real GDP growth, and the protracted decline in asset values following the capital bonanza are taken together, the swift corrections in the twin deficits (current account and fiscal) observed after the bonanza may likely be a matter of necessity rather than choice.

VI. Conclusion

Conversations revolving around international financial adjustment sometimes have an aspect similar to the climactic scene in a few Hollywood crime movies in which the villain lures the hero into a hall of mirrors. It is not clear which is the originating action and which is the reflection, so that left can be right, or right left. Invariably, the initial target turns out to be glass. In international finance, one country's current account

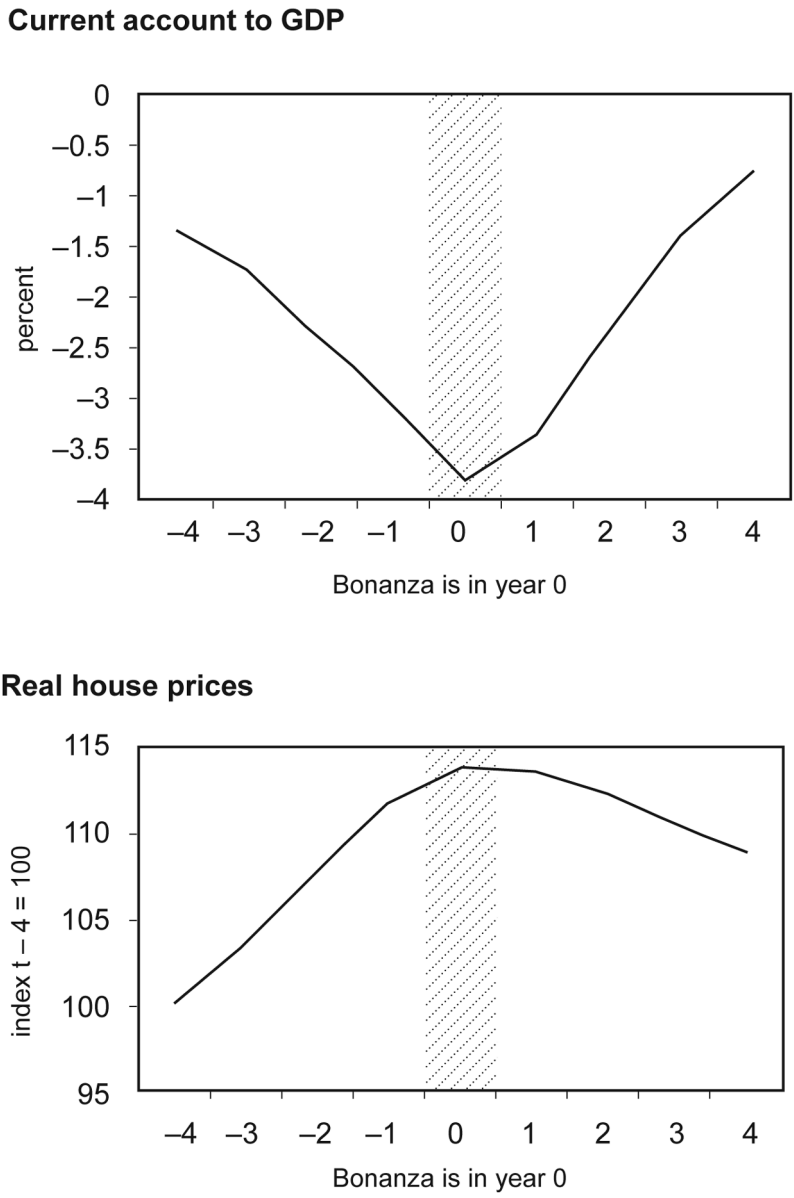


Fig. 17. House prices and bonanzas, 18 advanced countries, 1970–2006. Sources: International Monetary Fund, *World Economic Outlook* (April 2008), *International Financial Statistics*, Bank for International Settlements, and authors' calculations.

surplus can correspond to many countries' deficits, and a surplus is mirrored in a deficit in the capital account. As a consequence, the considerable literature on international adjustment overlaps to a significant degree, even though the studies adopt different selection criteria for what constitutes an event.

We have adopted a back-to-basics approach toward understanding some of the features of episodes of heavy capital inflows that, given double-entry bookkeeping, have usually meant periods of large current account deficits by historical standards. By focusing squarely on the perspective of the recipient of capital inflows (wherever or however poor or wealthy that country may be), our analysis does not extend to issues pertaining to lending countries or the broader and currently popular discussion of global imbalances. Nearly all the areas we have touched on, as to both the causes and consequences of the bonanzas, merit further scrutiny, particularly as relating to the links between asset prices, bubbles, crises, and capital flows.

As to the policy responses to capital inflow bonanzas, our analysis has been silent in all dimensions but one. Namely, we present evidence on the infamously procyclical and destabilizing reaction of fiscal policy (specifically, government spending) to the capital flow bonanza in nearly all but the high-income countries.[20] The expansionary fiscal policy unfolds against a backdrop of higher growth in output and government revenues associated with the bonanza. It is not unreasonable to conjecture that these government spending practices in "good times" set the stage for a multidecade pattern of serial default.

During the past few years, international interest rates have remained low (by historical standards), and real interest rates have turned negative on a sustained basis for the first time since the late 1970s. Commodity prices have surged. Once again, investors in the financial centers of the world and elsewhere are tripping over themselves in the eternal quest for higher yields in emerging markets and other higher-risk investments. From an emerging market perspective, the external scenario of the past few years can be best characterized as "benign." Yet, as of 2007, 85% of countries in our core sample have recorded increases in real government expenditures. Perhaps once again authorities view the favorable global environment as permanent. Fully two-thirds of the 181 countries covered in the IMF's latest *World Economic Outlook* recorded higher inflation in 2007 than in 2006, and an equal share recorded even higher inflation on a year-end basis in 2007 than on a year-average basis—pointing to even higher readings for 2008. If this is what is to be expected in good times, where capital bonanzas are plentiful, it is perhaps time to start rereading Kindleberger.

Appendix

Table A1
66 Countries, 1960–2007

Low Income (8)	Middle-Low Income (20)	Middle-High Income (16)	High Income (22)
Central African Republic	Algeria	Argentina	Austria
Côte d'Ivoire	Angola	Brazil	Australia
India	Bolivia	Chile	Belgium
Kenya	China	Costa Rica	Canada
Myanmar	Colombia	Hungary	Denmark
Nigeria	Dominican Republic	Malaysia	Finland
Zambia	Ecuador	Mauritius	France
Zimbabwe	Egypt	Mexico	Germany
	El Salvador	Panama	Greece
	Guatemala	Poland	Hong Kong SAR
	Honduras	Romania	Italy
	Indonesia	Russia	Japan
	Morocco	South Africa	Korea
	Nicaragua	Turkey	Netherlands
	Paraguay	Uruguay	New Zealand
	Peru	Venezuela	Norway
	Philippines		Portugal
	Sri Lanka		Singapore
	Thailand		Spain
	Tunisia		Sweden
			United Kingdom
			United States

Note: Income classification from the World Bank. Number of countries in each category is shown in parentheses.

Table A2
Country Coverage: 181 Countries, 1980–2007

Low Income (50)	Middle-Low Income (51)	Middle-High Income (37)	High Income (40)
Afghanistan, Republic of	Albania	Argentina	Bahamas
Bangladesh	Algeria	Belize	Bahrain
Benin	Angola	Botswana	Barbados
Burkina Faso	Armenia	Brazil	Belgium
Burundi	Azerbaijan	Bulgaria	Brunei Darussalam
Côte d'Ivoire	Belarus	Chile	Canada
Cambodia	Bhutan	Costa Rica	Cyprus
Central African Republic	Bolivia	Croatia	Czech Republic

(continued)

Table A2
Continued

Low Income (50)	Middle-Low Income (51)	Middle-High Income (37)	High Income (40)
Chad	Bosnia and Herzegovina	Dominica	Denmark
Comoros	Cameroon	Equatorial Guinea	Estonia
Congo, Democratic Republic of	Cape Verde	Gabon	Finland
Eritrea	China	Grenada	France
Ethiopia	Colombia	Hungary	Germany
Gambia	Congo, Republic of	Kazakhstan	Greece
Ghana	Djibouti	Latvia	Hong Kong SAR
Guinea	Dominican Republic	Lebanon	Iceland
Guinea-Bissau	Ecuador	Libya	Ireland
Haiti	Egypt	Lithuania	Israel
India	El Salvador	Malaysia	Italy
Kyrgyz Republic	Fiji	Mauritius	Japan
Lao People's Democratic Republic	Georgia	Mexico	Korea
Liberia	Guatemala	Montenegro, Republic of	Kuwait
Madagascar	Guyana	Oman	Luxembourg
Malawi	Honduras	Panama	Malta
Mali	Indonesia	Poland	Netherlands
Mauritania	Iran, Islamic Republic of	Romania	New Zealand
Mongolia	Jamaica	Russia	Norway
Mozambique	Jordan	Serbia	Portugal
Myanmar	Kenya	Seychelles	Qatar
Nepal	Kiribati	Slovak Republic	Saudi Arabia
Niger	Lesotho	South Africa	Singapore
Nigeria	Macedonia, Former Yugoslav Republic of	St. Kitts and Nevis	Slovenia
Pakistan	Maldives	St. Lucia	Spain
Papua New Guinea	Moldova	St. Vincent and the Grenadines	Sweden
Rwanda	Morocco	Turkey	Switzerland
Senegal	Namibia	Uruguay	Taiwan Province of China
Sierra Leone	Nicaragua	Venezuela	Trinidad and Tobago
Solomon Islands	Paraguay		United Arab Emirates
Sudan	Peru		United Kingdom
São Tomé and Príncipe	Philippines		United States
Tajikistan	Samoa		

(continued)

Table A2
Continued

Low Income (50)	Middle-Low Income (51)	Middle-High Income (37)	High Income (40)
Tanzania	Sri Lanka		
Timor	Suriname		
Togo	Swaziland		
Uganda	Syrian Arab Republic		
Uzbekistan	Thailand		
Vietnam	Tonga		
Yemen, Republic of	Tunisia		
Zambia	Turkmenistan		
Zimbabwe	Ukraine		
	Vanuatu		

Table A3
List of Variables

Variable	Units
GDP, IMF *World Economic Outlook*:	Billions
Nominal GDP	
Real GDP	
External accounts, IMF *World Economic Outlook*:	Billions of U.S. dollars
Total capital flows, net	
Current account balance	
Financial account balance	
Trade balance	
Foreign reserves	
Imports of goods and services	
Exports of goods and services	
Prices:	
Consumer price index, IMF *World Economic Outlook*	Indices
Inflation	Percent
Equity prices, IMF *International Financial Statistics*	Indices
House prices, Bank for International Settlements	Indices
Exchange rate, *International Financial Statistics*	National currency per U.S. dollar
Fiscal and national accounts, IMF *World Economic Outlook* and *Government Financial Statistics*:	Billions of national currency
Central government balance	
Central government expenditure	
Central government revenue	
Other variables:	
Crises indicators, Reinhart and Rogoff (2008b)	Indices
Commodity prices, Boughton (1991) and IMF *World Economic Outlook*	Index
Short-term interest rates, OECD and IMF *International Financial Statistics*	Percent

Table A4
Dates of Capital Flow Bonanzas and External Debt Crises: Extended Sample, 1980–2007

Country	Years of Bonanzas	Years of External Default
High income, OECD:		
Australia	1986, 1989, 2004–5, 2007	
Austria	1980–81, 1995–97, 1999	
Belgium	1980–84	
Canada	1981, 1989–93	
Denmark	1981–82, 1984–87	
Finland	1982–83, 2005–7	
France	1980, 1988–92	
Germany	1980, 1991, 1994–95, 1999–2000	
Greece	1983, 1985, 2000, 2006–7	
Iceland	1982, 2000, 2004–7	
Ireland	1980–84, 2007	
Italy	1980–82, 1991–92	
Korea	1980–83, 1991, 1996	1998[a]
New Zealand	1982, 1984–85, 2005–7	
Norway	1986–89, 1998	
Portugal	1981–82, 2000–2001, 2005	
Spain	2000, 2004–7	
Sweden	1980–82, 1990–92	
United Kingdom	1988–90, 2005–7	
United States	2002–7	
High income, non-OECD:		
Antigua and Barbuda	1981–82, 1986–89	1996–2006
Bahamas	1997–98, 2005–7	
Bahrain	1987, 1989, 1991–93, 1998	
Barbados	1981, 2004–7	
Cyprus	1980, 1983–84, 1991–92	
Czech Republic	1996–97, 2001–4	
Estonia	2004, 2006–7	
Georgia	1994–95, 2007	
Hong Kong, SAR	1980–81, 1994–97	
Israel	1981–84, 1995–96	
Kuwait	1993, 1995–96, 1998	
Malta	1995–96, 2000	
Qatar	1992, 2004–7	
Saudi Arabia	1983–84, 1986, 1991–93	
Singapore	1980–84, 1987	
Slovenia	1999, 2006–7	
Trinidad and Tobago	1982–84, 1986, 1997–98	1988–89
Middle-high income:		
Argentina	1982, 1987, 1994, 1997–99	1982–93, 2004–5
Belize	2000–2005	
Botswana	1980–84, 1990	
Brazil	1980–83, 1999, 2001	1983–84
Bulgaria	1990–93, 2005–7	1990–94
Chile	1980–82, 1984–86	1983–90
Costa Rica	1980–83, 1989–90	1981–90

(continued)

Table A4
Continued

Country	Years of Bonanzas	Years of External Default
Croatia	1997, 2002, 2007	1992–96
Dominica	1980–81, 1989–90, 2005	2003–5
Equatorial Guinea	1980–82, 1995–96, 1998	
Gabon	1986–89, 1992, 1998	1986–94, 1999–2004
Grenada	2001–3, 2006–7	
Hungary	1986–87, 1993–94, 1998–99, 2003–4	
Latvia	2004, 2006–7	
Lebanon	1983, 1990–92, 1997–98	
Malaysia	1981–83, 1991, 1994–95	
Mauritius	1980–82, 2006–7	
Mexico	198-–81, 1991–94	1982–90, 1995[a]
Oman	1986, 1992–95, 1998	
Panama	1980–82, 1997–98, 2007	1983–96
Poland	1980–81, 1985–89	1981–94
Romania	1992, 2004–7	1981–83, 1986
Russia	1992, 1997	
Serbia	2007	1992–2004
Seychelles	1982, 1999, 2001, 2005, 2007	2000–2002
Slovak Republic	1996–98	
South Africa	1981–82, 2005–7	1985–87, 1989, 1993
St. Kitts and Nevis	1989, 2003–3, 2007	
St. Lucia	1980, 1983, 2003, 2006–7	
St. Vincent and the Grenadines	1997–98, 2004, 2006–7	
Turkey	1980, 2000, 2004–7	1982
Uruguay	1980–84, 2001	
Venezuela	1982, 1987–88, 1992–93, 1998	1983–88, 1990, 1995–97, 2004–5
Middle-low income:		
Albania	1991–92, 1997, 2002, 2007	1991–95
Algeria	1969, 1973, 1975–79, 1986, 1988–89, 1994–95, 1998	1991–96
Angola	1982, 1995, 1997–99, 2001	1985–2003
Armenia	1992, 1996–98	
Azerbaijan	1996, 1998, 2003–4	
Bhutan	1982–87	
Bolivia	1981, 1985–87, 1993, 1998	1980–84, 1986–97
Bosnia and Herzegovina	2003, 2005	1992–97
Cameroon	1980–81, 1987–88, 1993, 2002	1987–2003
Cape Verde	1980–81, 1999, 2003–4	1981–96
China	1985–86, 1988–89, 1993	
Colombia	1982–83, 1995, 1997–98	
Congo, Republic of	1994–96, 1998–99, 2007	1983–2007
Djibouti	2000, 2006–7	
Dominican Republic	1980–82, 1987	1982–94, 2005

(continued)

Table A4
Continued

Country	Years of Bonanzas	Years of External Default
Ecuador	1981–82, 1987, 1989, 1991, 1998	1982–95, 1999–2000
Egypt	1981–85, 1998	
El Salvador	1989, 1990, 2003, 2005, 2007	
Fiji	1981, 2004–7	
Guatemala	1981, 1987, 1992–93, 1994, 1999, 2001	1986, 1989
Guyana	1980–83, 1985–86	1982–86
Honduras	1980–81, 1984, 2003–4, 2007	1981–2007
Indonesia	1982–83, 1986–87, 1991, 1995	1998–2001, 2002
Iran, Islamic Republic of	1980–81, 1986, 1991–93	1980–95
Jamaica	1981–82, 1985, 2007	1981–85, 1987–93
Jordan	1990–92, 2005, 2007	1989–93
Kiribati	1992, 1996, 2005–7	
Lesotho	1991–93, 1996–98	
Macedonia	1994, 1997–98, 2002	1983–99
Maldives	1980, 1993, 2005–7	
Moldova	1993, 1997–98, 2006	1998, 2002
Morocco	1981, 1983–87	1983, 1986–90
Nicaragua	1988, 1990–94	
Paraguay	1980–82, 1986–87, 1996	1986–92, 2003–4
Peru	1981–83, 1993, 1995, 1998	1980, 1983–97
Philippines	1980, 1982–83, 1990, 1993, 1997	1983–92
Samoa	1980–81, 1991–93, 2003	
Sri Lanka	1979–84, 1986, 1988	1981–83
Suriname	1983, 1991, 1998–99, 2001, 2003	
Swaziland	1980–85	
Syrian Arab Republic	1980, 1983, 1994, 2006–7	
Thailand	1981–83, 1990–91, 1995–96	
Tonga	1990–91, 1994–95, 1998	
Tunisia	1981–84, 1986, 1993	1980–82
Turkmenistan	1995, 1997–99	
Ukraine	1994–95, 2007	1998–2000
Vanuatu	2002–3, 2005–7	
Low income:		
Benin	1981–83, 1988, 2002–3	
Burkina Faso	1999–2001, 2004–5	1987–96
Burundi	1982–83, 1987, 1990, 2006–7	
Cambodia	1988–89, 1996, 1998	
Central African Republic	1980, 1982–84, 1992–95	1981, 1983–2007
Chad	1986, 2000–2004	
Comoros	1984–85, 1987, 1994, 1997	
Congo, Democratic Republic of	1987, 1989, 1991–92, 2005	1980–2007
Côte d'Ivoire	1980, 1988–92	1983–98, 2000–2007

(continued)

Table A4
Continued

Country	Years of Bonanzas	Years of External Default
Ethiopia	1999, 2002, 2005–7	1991–99
Gambia	1980–81, 1996, 2005	1986–90
Ghana	1993, 1997, 1999, 2006–7	1968, 1970, 1974, 1987
Guinea	1988–90, 1996, 2007	1985–88, 1991–98
Haiti	1980–81, 1990–93	1982–99
India	1984, 1987–90	
Kenya	1980–81, 1987, 1989, 1995	1994–98, 2000
Lao People's Democratic Republic	1988–89, 2004–5, 2007	
Madagascar	1980–81, 1990, 2005, 2007	1981–2002
Malawi	1980, 1992, 1994, 1997, 2002, 2005	1982, 1988
Mali	1980, 1996, 1999–2001, 2004	
Mauritania	1980–83, 2004–5	1992–96
Mongolia	1998, 2002–3	
Mozambique	1987–89, 1993–95	1983–92
Myanmar	1981–82, 1990–92, 1998	2002–7
Nepal	1982–84, 1989–91	
Niger	1980–82, 2005–6	
Nigeria	1981–83, 1986, 1993, 2002	1987–94, 2004–5
Pakistan	1993, 1996–97, 2007	1981, 1998–99
Papua New Guinea	1980–84, 1997	
Rwanda	1991–93, 1997–98	
São Tomé and Príncipe	1982, 1991–92, 2007	1987–94
Senegal	1980–84	1981–85, 1990, 1992–96
Sierra Leone	1980–82, 1990–91, 1996	1983–84, 1986–96
Solomon Islands	1985, 1991, 2005–7	
Sudan	1981–82, 1992–95	1980–2007
Tanzania	1994–95, 1998–99	1980, 1982–84, 1988, 1991–97
Togo	1980, 1982–83, 1987	1980–93
Uganda	1991, 1993, 1998–2001	1981, 1985–93
Vietnam	1993–96, 2007	1985–98
Zambia	1981–82, 1998, 2000–2001	1983–94
Zimbabwe	1981–82, 1992, 2004–5	2000–2007

Note: The dates shown are those picked up by the algorithm described in the preceding section. Consecutive years (e.g., Greece 2000, 2001) are treated as a single episode.
[a]A near default episode.

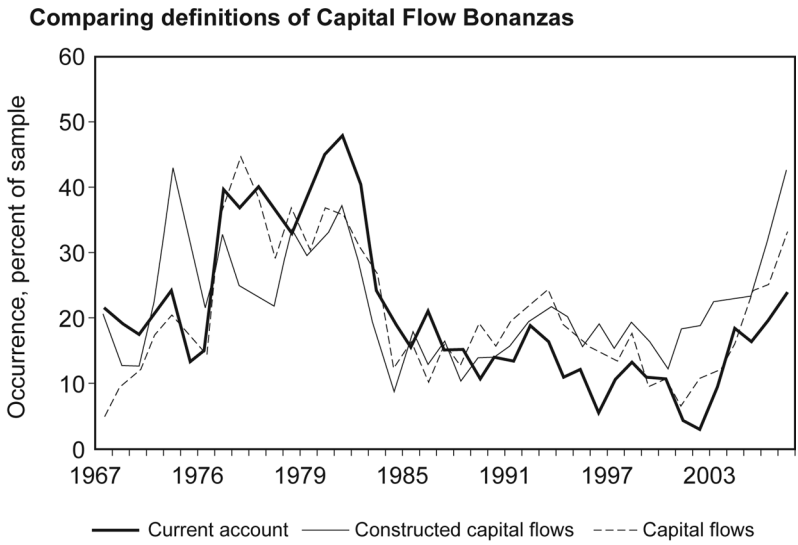


Fig. A1. Comparing definitions of capital flow bonanzas, 66 countries, 1960–2007. Sources: Authors' calculations and sources listed in app. table A3.

Endnotes

This paper was prepared for the NBER's 2008 International Seminar on Macroeconomics, Ljubljana, Slovenia. It was presented there and at the 15th Congress of the International Economic Association in Istanbul, Turkey. The authors wish to thank Jeff Frankel, Francisco Giavazzi, Alejandro Izquierdo, Frank Warnock, and other participants for helpful comments. Meagan Berry, Adam Paul, and Anna Stumpf provided excellent research assistance.

1. Gourinchas, Landerretche, and Valdes (2001) perform a similar exercise to assess which credit booms end in crises and credit crunches and which do not. Edwards (2004) is particularly careful in trying to consider both abrupt reversals and more gradual adjustment.

2. We would also like to thank Gian Maria Milesi-Ferretti for pointing out that the financial account figures have to be interpreted with care during years in which there is debt forgiveness, which show up as large debt repayments (i.e., capital outflows).

3. We also impose a nonnegativity constraint, so countries that are capital exporters throughout the sample never record a bonanza.

4. The interested reader is referred to app. fig. A1, which provides a comparison among three definitions of bonanza episodes: using the current account, the financial account, and capital flows.

5. The income group classification is that provided by the World Bank.

6. For example, Sarno and Taylor (1999), using standard time-series techniques, decompose the various components of international capital flows into their permanent and transitory components.

7. Lucas (1990) suggested that human capital differentials might account for this "paradox," whereas Reinhart and Rogoff (2004) and Alfaro, Kalemli-Ozcan, and Volosovych (2008) point to the high incidence of sovereign default and weak institutions, respectively.

8. The link between capital flow bonanzas and debt crises will be the focus of Sec. IV.

9. Discussions of the earlier wave of capital to central and eastern Europe and the former Soviet Union include Claessens, Oks, and Polastri (1998) and Lankes and Stern (1998); the more recent experience is covered in Lane and Milesi-Ferretti (2007).

10. It is important to note that the middle-income group comprises middle-low and middle-high income (the latter constitutes the largest single group), so our analysis bears on many developing countries beyond the largest emerging markets.

11. See Fernandez-Arias and Montiel (1996) for a survey of a literature that flourished in the early 1990s.

12. As is conventionally done, the nominal commodity price index is deflated by an index of the price of manufactures (see, e.g., Boughton 1991).

13. The missing two are Japan and the Netherlands, which are creditor countries.

14. There are, however, many instances in which the now-advanced economies defaulted in their earlier incarnations; see Reinhart and Rogoff (2008b) for a full chronology of these episodes.

15. It is important to reiterate that the incidence of sovereign default during the period in question owes to emerging markets.

16. On the basis of the historical track record, it is plausible to expect a higher chance of a sovereign default after a bonanza even in cases in which government debt is not increasing. The reason is that the government sooner or later has usually ended up guaranteeing private-sector debts.

17. See Reinhart and Reinhart (1998) and the references cited therein for a discussion of the stylized facts.

18. See Reinhart and Reinhart (2008) for evidence of fear of floating or, in the recent context, fear of an appreciation.

19. To be clear, the amplitude of the swing is calculated as the percentage growth in real government spending during an expansion minus the growth in government spending in downturns. In the case of an extremely procyclical government, real spending would grow during good times (as shown in fig. 15), perhaps by 15%, and in downturns it would contract by about 10%. Thus the amplitude of the swing during the business cycle would be 25%.

20. It is important to recall that there is a positive association between the degree of fiscal procyclicality and the incremental odds of a financial crisis around capital flow bonanzas.

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