

Surprising Similarities: Recent Monetary Regimes of Small Economies

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In contrast to earlier recessions, the monetary regimes of many small economies have not changed in the aftermath of the global financial crisis of 2007–09. This is due in part to the fact that many small economies continue to use hard exchange rate fixes, a reasonably durable regime. However, most of the new stability is due to countries that float with an inflation target. Though a few countries have left to join the euro zone, no country has yet abandoned an inflation targeting regime under duress. Inflation targeting now represents a serious alternative to a hard exchange rate fix for small economies seeking monetary stability. Are there important differences between the economic outcomes of the two stable regimes? I examine a panel of annual data from more than 170 countries from 2007 through 2012 and find that the macroeconomic and financial consequences of regime choice are surprisingly small. Consistent with the literature, business cycles, capital flows, and other phenomena for hard fixers have been similar to those for inflation targeters during the global financial crisis and its aftermath.

1. Introduction

The global financial crisis (hereafter “crisis”) of 2007–09 began and was felt most keenly in the rich Northern countries. Nevertheless, much of its effect was felt abroad: The Great Recession of 2008–09 was a global affair. Small economies were indirectly affected as the shock waves spilled out from New York and London, most dramatically in the form of contractions in the international flow of capital and trade. My interest in this paper is comparing how the outcomes for small economies varied by their choice of monetary regime.

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I am particularly interested in contrasting two monetary regimes: hard fixed exchange rates and floating exchange rates with an inflation target. Both are well-defined monetary regimes widely used by small economies around the world. The two regimes are also quite different, potentially providing a sharp contrast. The question I raise is, Did one monetary regime provide more insulation from the crisis than the other?

The Great Recession associated with the crisis was the most dramatic macroeconomic event in generations; as Imbs (2010) convincingly demonstrates, it was also the first truly global recession in decades. Historically, recessions have frequently caused monetary upheaval; change in monetary regime has been strongly countercyclical. Yet this time was different, at least for the two monetary regimes of concern here. Most countries with hard fixed exchange rates in 2006 (before the onset of the crisis) still retained them in 2012. More striking though was the performance of inflation targeters. While the tactics of flexible inflation targeting regimes have varied with quantitative easing and forward guidance, the fundamental monetary strategy has not: No country abandoned inflation targeting.¹

Interest in academic studies of currency crises (typically when a fixed exchange rate is abandoned) has greatly diminished over the past 15 years. A number of small economies whose experiences spawned important academic research are now sufficiently stable as to be boring, including Brazil, Chile, Korea, Mexico, Sweden, Thailand, and Turkey. The common element in the transition to stability is the adoption of a floating exchange rate monetary regime with an inflation target. While before 2007 there were legitimate questions about the durability of inflation targeting, it has now withstood a substantial trial by fire.² Between the hard fixers and inflation targeters, most of the international monetary system has withstood the pressures of the crisis and its aftermath in at least one critical aspect: It has preserved itself.

My analysis in this paper is broad in the sense that I analyze a number of macroeconomic phenomena for more than 170 small economies. My focus is also narrow: I am most interested in the period since 2006, and I am interested in the effects of the *monetary* regime, primarily the way international capital flows were handled.³ My quantification of the monetary regime relies on a comprehensive classification of de facto behavior, gathered by the International Monetary Fund (IMF).

I have two major results. First, monetary regimes have remained stable and unchanged during the crisis and its aftermath for a large number of countries that were hard fixers and inflation targeters. The recent finding of monetary stability contrasts with earlier periods; historically, countries have

switched their regimes countercyclically, that is, especially during recessions. Since small economies now have two reasonably stable monetary regime options that appear to be starkly different, it is natural to ask which has performed better, especially during the turbulent period since 2006. In practice this question is hard to answer: While both hard fix and inflation targeting countries have experienced, for instance, lower inflation than other countries, the behavior of business cycles, capital flows, current accounts, government budgets, real exchange rates, and asset prices do not seem to vary significantly between the two regimes. Thus my second major result is that the recent macroeconomic and financial performance of small countries with hard fixed exchange rates is similar to that of countries that float with an inflation target. At first blush, this seems surprising, since a hard commitment to a fixed exchange rate seems quite different from the constrained discretion of an inflation target. However, the result is actually quite consistent with the literature, which has generally been unable to find strong consequences of inflation targeting regimes, except for exchange rate volatility.

2. A Broad Data Set on the Monetary Regime

One of my goals in this work is to be as comprehensive as possible. I begin with the entire sample of countries available in the World Bank's *World Development Indicators* (WDI). In all, I have at least some data for 214 countries, though there are many gaps.⁴ However, the focus of this study is on small economies; accordingly, for much of the following analysis I define small as “not large” and simply remove all large economies.⁵ Adopting the taxonomy of the IMF's *Spillover Report*, I exclude from the sample the five systemically important economies of China, the euro zone, Japan, the United Kingdom, and the United States.⁶

One key variable of interest missing from the WDI is the national monetary regime. In the past, researchers have resorted to using the formal de jure exchange rate regime as declared by the national monetary authorities. This information was provided in the IMF's *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER), and was thus available for all members of the Fund. It is now widely accepted that de facto measures of what national authorities actually do are of greater relevance; Rose (2011) provides more details. Two of the most popular de facto classifications are those of Levy-Yeyati and Sturzenegger (2003, hereafter LYS), and Reinhart and Rogoff (2004, hereafter RR). One issue with both classifications is the limited span of the data set. RR has now been extended through 2010, giving one year of data for the aftermath of the Great Recession; LYS has only been extended

through 2004. In any case, there is a more serious problem; both LYS and RR are *exchange rate regime* rather than *monetary regime* classifications. While a fixed exchange rate constitutes a well-defined monetary policy, a float does not. If the central bank doesn't fix the exchange rate, it has to do something else, but what?

This problem has long been recognized, and can be solved by classifying countries by their monetary regime. Stone and Bhundia (2004, hereafter SB) propose a taxonomy of monetary regimes by the choice and clarity of the nominal anchor. I use their classification below; it covers 85 countries, though unfortunately only from 1990 through 2005.

To augment this, I need some way to classify countries by monetary regime in the aftermath of the crisis. To its credit, the IMF long ago switched to a de facto classification of monetary regimes in AREAER. The Fund provides an official series available back through 2001 for each of its members; I use this classification through 2012.⁷ The IMF divides country-years into an exhaustive taxonomy with 44 cells that vary by exchange rate rigidity, the orientation of the fix (most countries peg their currency to either the dollar or the euro), and the objective of floating rate regimes (countries target either inflation or a monetary aggregate, though some also use other frameworks). I use this monetary classification extensively below; for sensitivity and historical analysis, I also employ the LYS, RR, and SB schemes.

3. Monetary Regimes During and After the Global Financial Crisis

Monetary regimes have remained remarkably stable from the run-up to the crisis through its aftermath. This paper focuses on the experiences of small economies during this period. I contend that the monetary regimes of small economies—like those of large economies—have exhibited stability since before the crisis. This stability is new and contrasts with the historical countercyclicality of monetary regime switches.⁸ It also is remarkable compared with the size of recent macroeconomic and financial shocks.⁹

Table 1 groups the small economies by monetary regimes in 2006 (the calm immediately before the beginning of the financial crisis in 2007–08) and 2012 (the most recent period available for most data). I focus on two extreme monetary regimes of particular interest. In 2006, 26 countries were classified by the IMF as floating exchange rates with an inflation target; only one country had switched regimes by 2012, that is, Slovakia left to join the European Monetary Union (EMU).¹⁰ Clearly, inflation targeting has shown its resilience through a trying period of macroeconomic turmoil; it is manifestly a durable monetary regime. No country has ever dropped out of an inflation targeting regime under

TABLE 1
Small Economies by Type of Monetary Regime, 2006–12

A. Countries with Inflation Targeting				
Continuous, 2006–12 (25)				
Armenia	Australia	Brazil	Canada	Chile
Colombia	Czech Republic	Guatemala	Hungary	Iceland
Indonesia	Israel	Korea, Republic	Mexico	New Zealand
Norway	Peru	Philippines	Poland	Romania
South Africa	Sweden	Switzerland	Thailand	Turkey
Targeted in 2006, exited by 2012 (1), by country (type of regime)				
Slovak Republic (euro)				
B. Countries with Hard Fixed Exchange Rate				
Continuous between 2006 and 2012 (60)				
Antigua/Barbuda	Aruba	Bahamas	Bahrain	Barbados
Belize	Benin	Bhutan	Bosnia/ Herzegovina	Brunei
Bulgaria	Burkina Faso	Cameroon	Cape Verde	Central African Rep.
Chad	Comoros	Congo, Rep.	Côte d'Ivoire	Denmark
Djibouti	Dominica	Ecuador	El Salvador	Equatorial Guinea
Eritrea	Fiji	Gabon	Grenada	Guinea-Bissau
Hong Kong	Jordan	Kiribati	Latvia	Lesotho
Libya	Lithuania	Mali	Marshall Islands	Micronesia
Montenegro	Morocco	Namibia	Nepal	Niger
Oman	Palau	Panama	Qatar	Samoa
San Marino	Saudi Arabia	Senegal	St. Kitts/Nevis	St. Lucia
St. Vincent/ Grenadines	Swaziland	Timor-Leste	Togo	United Arab Emirates
Both 2006 and 2012, but not continuous (3)				
Kuwait		Turkmenistan		Venezuela
Fixed in 2006, exited by 2012 (20), by country (type of regime)				
Azerbaijan (float, other)		Belarus (float, other)		Cyprus (euro)
Egypt (float, other)		Estonia (euro)		Honduras (soft fix)
Lebanon (soft fix)		Macedonia (soft fix)		Maldives (soft fix)
Malta (euro)		Mauritania (float, other)		Pakistan (float, mon. target)
Seychelles (float, mon. target)		Slovenia (euro)		Solomon Islands (float, other)
Syria (soft fix)		Trinidad/Tobago (soft fix)		Ukraine (float, mon. target)
Vanuatu (soft fix)		Vietnam (soft fix)		

stress; the only exiters have adopted the euro. This holds true using classifications other than the IMF's. Mishkin (2008) lists five components of inflation targeting: a medium-term numerical target for inflation; an institutional commitment to price stability as a primary goal of monetary policy; an information-inclusive strategy to set instruments; central bank transparency; and central bank accountability. Mishkin's criteria lead to the same conclusion.

TABLE 1 (CONTINUED)
Small Economies by Type of Monetary Regime, 2006–12

C. Countries with Various Other Regimes: Sloppy Center

Continuous between 2006 and 2012 (32)

Afghanistan	Algeria*	Botswana	Burundi*	Cambodia*
Congo, Dem. Rep.*	Costa Rica*	Gambia, The	Guinea*	Haiti*
India	Iraq*	Jamaica*	Kenya	Kyrgyz Rep.*
Lao PDR*	Liberia*	Madagascar	Malaysia	Mauritius*
Mozambique	Myanmar*	Nicaragua	Papua New Guinea*	Paraguay*
Singapore*	Somalia	Sudan*	Tanzania	Tonga
Uganda	Zambia			

Both 2006 and 2012, but not continuous (21)

Angola	Argentina	Bangladesh	Bolivia	Croatia
Ethiopia	Guyana	Iran	Kazakhstan	Malawi
Mongolia	Nigeria	Russia	Rwanda	Sierra Leone
Sri Lanka	Suriname	Tajikistan	Tunisia	Uzbekistan
Yemen				

Sloppy Center in 2006, exited by 2012 (9), by country (type of regime)

Albania (inflation target)	Dominican Republic (inflation target)	Georgia (inflation target)
Ghana (inflation target)	Moldova (inflation target)	Sao Tome/Principe (hard fix)
Serbia (inflation target)	Uruguay (inflation target)	Zimbabwe (hard fix)

*Indicates switched IMF de facto monetary regime between 2006 and 2012.

By way of contrast, 83 small economies maintained a hard fix in 2006. I define a hard fixer as a monetary regime with either (a) no separate legal tender, (b) a currency board arrangement, or (c) a conventional peg.¹¹ Of these hard fixers, 60 were maintained continuously through the end of the sample in 2012 and thus proved to be durable; I address these in more detail later.¹² The 2012 monetary regimes for the other 23 countries are listed in Table 1; a number left to join the euro, but most switched to less rigorous monetary regimes.¹³

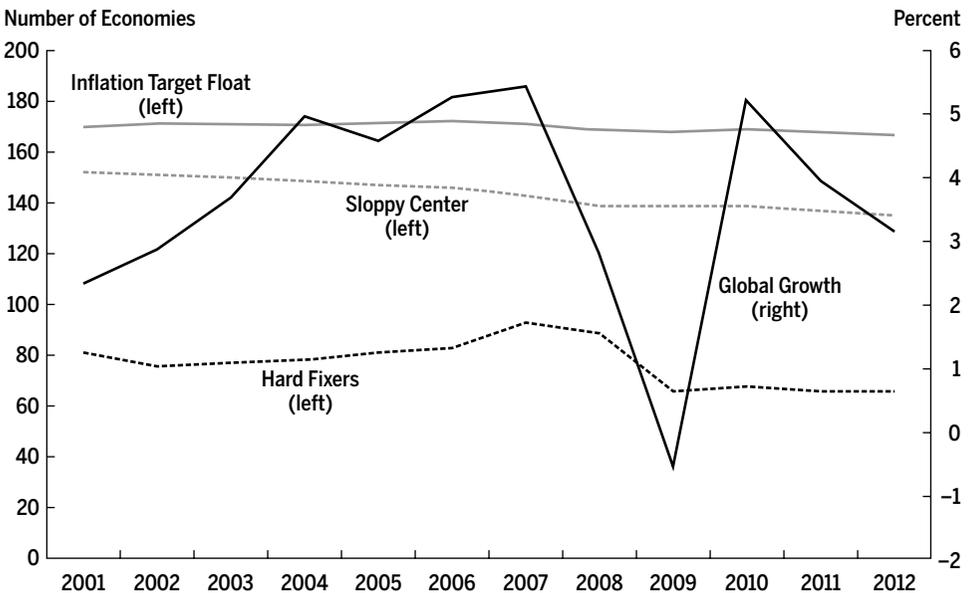
The last group of countries collectively maintains a variety of other monetary regimes. These include (a) soft fixers (the IMF lists a number of variants such as stabilized arrangement, crawling peg, crawling band, and pegged exchange rate within horizontal bounds); (b) floating with a monetary target (variants include crawl-like, managed, or free floats); and (c) floating with an “other” framework (like their large counterparts the EMU, Japan, and the United States). I will refer to these other regimes collectively as the “sloppy center.” Between 2006 and 2012, 32 countries were in this category; of the countries that began in the sloppy center, 30 had switched out at least once by 2012. Even this overstates the degree of stability in the sloppy center, since it is a coarse, ill-defined grouping, containing dozens of finer IMF de facto monetary

regimes. Seventeen of the 32 countries that remained in the sloppy center throughout switched among variant monetary regimes between 2006 and 2012.

Simply counting countries understates the stability of monetary regimes through this period of time (see Figure 1). While the number of inflation targeters is considerably smaller than those in other regimes, they are, on average, larger and richer. In 2011, inflation targeting countries represented some 20 percent of global output.¹⁴ By way of contrast, the more numerous stable fixers are small, poor, or both; they represent only 4 percent of 2011 global GDP, while the sloppy center constitutes some 7 percent of the world's output. This is clearly visible in Figure 2, which portrays the fraction of global GDP in each of these three monetary regimes. It is striking that inflation targeting regimes make up such a large and stable fraction of global GDP, even through the crisis and its aftermath.

Table 2 summarizes the stability of the monetary regimes for small countries between 2006 and 2012. Of the countries that targeted inflation in 2006, 96 percent were still doing so in 2012; almost three-quarters of the hard fixers also survived. By way of contrast, less than a quarter of the sloppy center maintained the same monetary regime during the crisis and its aftermath.

FIGURE 1
Monetary Regimes by the Numbers: Counting Countries
Grouping Small Economies by Monetary Regime



Note: Large economies excluded: China, EMU, Japan, United Kingdom, and United States.

FIGURE 2
Monetary Regimes by the Numbers: Sizing Up the Economies
 Global GDP of Small Economies by Monetary Regime

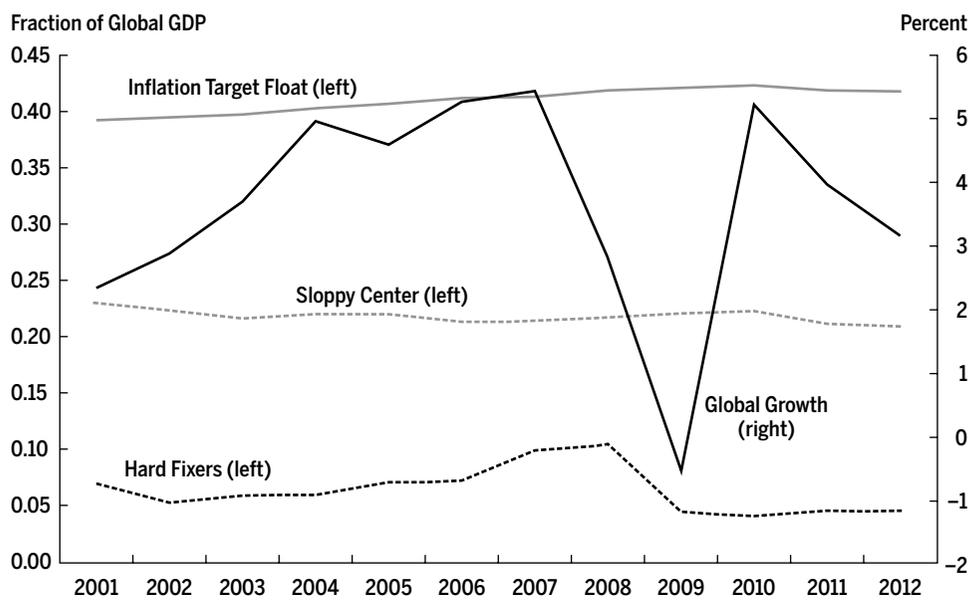


TABLE 2
Durability of Monetary Regimes, Small Economies

	Inflation targeting	Hard fix	Sloppy center
Monetary regime in 2006	(26)	(83)	(62)
Monetary regime in 2012			
Inflation targeting	25	0	7
Hard fix	0	63 ^a	2
Sloppy center	0	16	53 ^b
EMU entrants	1	4	0
Percent continuously in same regime since 2006	96%	72%	23%
Percent of 2011 global GDP	20%	4%	7%

Note: Excludes China, European Monetary Union, Japan, United Kingdom, and United States.

a Three of these countries both started and ended in hard fixes but strayed between 2006 and 2012. The Netherlands Antilles exited the sample upon its split.

b Of these countries, 21 both started and ended in the sloppy center but strayed between 2006 and 2012. Of the 32 countries that remained continuously in the sloppy center, 18 changed their de facto IMF monetary arrangement, leaving only 14 in the same monetary regime throughout.

4. The Countercyclical Nature of Monetary Regime Shifts: Historical Evidence

Monetary regimes for many economies, both large and small, have been stable through the crisis and its aftermath. This stability is a relatively new phenomenon. Historically, turnover in monetary regimes has been frequent during recessions. The monetary turmoil during the Great Depression of the 1930s is well known and helped motivate the creation of the postwar Bretton Woods system.¹⁵ Still, it is hard to quantify this cyclicity because there are no long-lived measures of monetary regimes. The SB classification only goes back to 1990. Both LYS and RR go further back in time, but they classify *exchange rate* rather than *monetary* regimes.¹⁶

Table 3 presents historical data analogous to Table 2, but for two important historical episodes: the global slowdowns of the early 1970s and the early 1980s. Where Table 2 compares *monetary* regimes six years apart (2006–12), Table 3 compares *exchange rate* regimes six years apart (for 1970–76 and 1980–86); both tables exclude large economies, although the definition of these countries changes somewhat over the two periods. Just over half of small economies remained in the same exchange rate regime continuously between 1970 and 1976 according to RR, though these constitute only one-eighth of global GDP.¹⁷ Since all of the large economies switched their exchange rate regimes during this period, the 1970s are appropriately remembered as a period of international monetary turbulence. Small economies experienced more stability in the 1980s according to the RR classification, with over one-quarter of global GDP being produced in small economies with stable monetary regimes. However, the LYS analog is lower by a factor of three. Both schemes agree that at least a quarter of fixed exchange rate regimes failed and that the stable fixers produce little global output.

TABLE 3
Durability of Monetary Regimes, Small Economies: Historical Evidence

	All countries	Fixers
Percent continuously in same Reinhart-Rogoff regime, 1970–76	55%	59%
Percent of 1976 global GDP	12.3%	6.4%
Percent continuously in same Reinhart-Rogoff regime, 1980–86	60%	75%
Percent of 1986 global GDP	28.4%	3.3%
Percent continuously in same Levy-Yeyati-Sturzenegger regime, 1980–86	53%	58%
Percent of 1986 global GDP	9.1%	9.1%

Note: Excludes Germany, Japan, United Kingdom, and United States.

I conclude from this analysis that monetary regime transitions have historically been countercyclical. The stability of national monetary regimes is not only a recent phenomenon; it is unexpected given the size of the Great Recession.

5. Effects of Monetary Regimes

5.1. Statistical Evidence

I next examine the recent consequences of monetary regimes for small economies. One might reasonably expect floating with an inflation target to be diametrically opposed to a durable hard fix, especially for handling the shock waves that spilled out from the large economies as a consequence of the crisis. How did actual performance under the two regimes differ?

For comparison, I split my sample into three groups: (a) inflation targeters such as Brazil, Korea, Mexico, and Canada; (b) the 60 small economies that maintained hard fixes continuously from 2006 to 2012, including Saudi Arabia, Hong Kong, and Denmark; and (c) the observations from the remaining sloppy center, including India, Russia, and Iran.¹⁸ The first two of these monetary regimes are long-lived and durable, often predating the crisis significantly. It is difficult to find systematic determinants of the monetary regime. Beyond the persistent effects of size and democracy, monetary regimes seem to be almost random. Accordingly, in this analysis I initially treat the choice of monetary regime as plausibly exogenous to estimate the effects of the monetary regime on outcomes of interest without further econometric hassles. I address two questions: Should we care about which monetary regime a small country chooses? And has the monetary regime made a substantial difference to the macro-economies of small economies in the period since the onset of the crisis?

Tables 4 and 5 contain regression evidence for 2007–12. Each row presents results from a panel regression of the regressand (first column) on dummy variables for both inflation targeting and hard fix regimes. The omitted regime is the sloppy center so that the coefficients in the inflation targeting column represent the difference between inflation targeters and the sloppy center. Test results for two hypotheses of interest are tabulated at the right: (a) the hypothesis that the hard fix and inflation targeting regimes have the same effect compared with the sloppy center, and (b) that the two regimes have no effect. The equations are estimated via least squares with fixed time- and random country-specific effects.¹⁹ While there is little reason to believe that hard fix and inflation targeting regimes are chosen endogenously because of their relevance to the variables of interest, I address this issue more directly in the longer version of this paper with two more sophisticated econometric techniques.

TABLE 4
Effects of Monetary Regimes 2007–12: Regression Evidence

Regressand	Inflation Targeting	Hard Fix	IT = H Fix? (P-value)	IT = H Fix = 0? (P-value)
BK-filtered GDP	0.006 (0.004)	-0.003 (0.004)	0.04*	0.10
HP-filtered GDP	-0.002 (0.001)	-0.004* (0.001)	0.13	0.04*
CF-filtered GDP	-0.02 (0.02)	0.00 (0.04)	0.77	0.76
Demeaned growth	-1.9* (0.8)	-1.4 (0.8)	0.56	0.04*
Time-detrended GDP	-0.04 (0.03)	-0.08** (0.02)	0.16	0.01**
Gross capital inflows	3.2 (3.2)	-4.1 (6.4)	0.90	0.57
Gross capital outflows	-0.0 (3.2)	-3.2 (6.7)	0.61	0.87
Net capital flows	3.2 (1.9)	0.8 (1.6)	0.03*	0.09
Std dev capital inflows (c/s)	5.5 (4.2)	5.5 (6.9)	1.0	0.38
Std dev capital outflows (c/s)	5.1 (4.2)	7.0 (7.4)	0.82	0.36
Current account	1.6 (1.4)	3.4 (5.5)	0.73	0.49
Export growth	0.01 (0.01)	0.00 (0.01)	0.70	0.85
Import growth	-0.00 (0.01)	0.00 (0.01)	0.76	0.94
Chinn-Ito capital mobility	-0.1 (0.4)	-0.5 (0.3)	0.41	0.24
Financial freedom change	0.01 (0.01)	0.00 (0.01)	0.16	0.16
Investment freedom change	0.03** (0.01)	0.01 (0.01)	0.01**	0.01**
M2 growth (% GDP)	-0.01 (0.01)	0.00 (0.01)	0.18	0.41
International reserve growth	-0.4 (0.4)	-0.5 (0.4)	0.26	0.44
Government budget	0.3 (0.8)	0.7 (0.9)	0.70	0.74
Change in budget	0.5 (0.7)	-0.4 (0.5)	0.30	0.57

Notes: Coefficients displayed for monetary regime dummy variables on regressand; default regime is sloppy center. Standard errors in parentheses; coefficients significantly different from zero at 0.05 (0.01) marked with one (two) asterisk(s). Each row estimated by panel least squares estimation with fixed time and random country effects (except for cross-sections). Annual data span 2007–12, 167 countries (with gaps).

Using a number of variables, I examine a range of consequences of capital flows from large economies. I look at output consequences, the capital flows themselves, and the mechanisms through which a small economy can adjust to capital flows.

TABLE 5
Effects of Monetary Regimes 2007–12: Regression Evidence

Regressand	Inflation Targeting	Hard Fix	IT = H Fix? (P-value)	IT = H Fix = 0? (P-value)
CPI inflation	-4.4** (0.7)	-5.2** (0.6)	0.15	0.00**
GDP inflation	-4.7** (0.8)	-5.2** (0.7)	0.41	0.00**
Real effective exchange rate	-15.0 (9.8)	-20.1* (9.6)	0.13	0.05*
Change in real effective exchange rate	-3.9 (3.4)	-5.4 (3.5)	0.06	0.07
Growth in stock prices	-4.5 (3.5)	-11.8** (3.3)	0.01**	0.00**
Bond yields	-1.0 (0.8)	-1.0 (1.0)	0.96	0.43
Growth in property prices	2.3 (4.8)	-1.1 (5.1)	0.35	0.63

Notes: Coefficients displayed for monetary regime dummy variables on regressand; default regime is sloppy center. Standard errors in parentheses; coefficients significantly different from zero at 0.05 (0.01) marked with one (two) asterisk(s). Each row estimated by panel least squares estimation with fixed time and random country effects (except for cross-sections). Annual data span 2007–12, 78 countries (with gaps).

The top of Table 4 lists business cycle effects as measured by real GDP detrended in the five ways discussed earlier; this is one of the most important consequences of policy choice. Since this paper is concerned with the effects of monetary regimes on small economies through the tumultuous period of the crisis, it is also important to examine capital flows.²⁰ I use the series constructed by Forbes and Warnock (2012) to examine gross capital inflows and outflows, as well as net capital flows.²¹ Since the volatility of capital flows is of interest, I also construct the country-specific standard deviation of both inflows and outflows (over time) to examine the effect of monetary regimes on the cross-country variation of capital flows.²²

When capital starts to flow into a small economy, it can be handled in a variety of different ways.²³ These include (a) encouraging an offsetting change in the current account; (b) restricting capital inflows or promoting outflows; (c) accumulating reserves, possibly implying an increase in the money supply; (d) fiscal contraction; or (e) real exchange rate appreciation. Real appreciation, in turn, can be achieved via nominal exchange rate if the latter is flexible, or inflation induced by a monetary expansion.²⁴ Since I am interested in how economies in different monetary regimes have reacted to the capital flows since 2007, I examine measures for each of these channels. I include the current account and the growth of exports and imports (all relative to GDP). Capital inflows can be countered by capital controls, so I look at the Chinn-Ito measure of capital

mobility as well as measures of financial and investment freedom taken from the *Economic Freedom of the World* data set. Near the bottom of the table, I also look at different measures of policy: the growth of international reserves and broad money, the government's budget position relative to GDP, and how the budget has changed. Table 5 is analogous to Table 4, but examines prices. I include two conventional measures of goods and services domestic inflation—consumer price inflation (CPI) and GDP inflation—as well as the real effective exchange rate and its change. The effect of the monetary regime on asset prices is the subject of much recent debate. Accordingly, I examine three important assets: the yield on long-term bonds and growth in both stock and property prices.²⁵ Jointly, these variables cover a wide range of potential responses to international capital inflows.

What do the data show about the consequences of monetary regime choice? Very little. Perhaps most importantly, Table 4 shows that the magnitude of the business cycle does not seem to have varied significantly between inflation targeters and hard fixers over the period since 2007; there is weak evidence that countries in both regimes suffered somewhat worse than the sloppy center. I do not dwell on this result since it does not stand up to further econometric scrutiny, as I show below. This weak result is consistent with the fact that capital flows and their volatility seem not to vary across monetary regimes; the exception is that inflation targeting regimes received larger net capital flows. Neither the current account nor the growth of either exports or imports varies consistently with the monetary regime. Inflation targeting regimes increased the ability of their residents to invest freely, but the other two measures of capital mobility show no significant differences across regimes. Perhaps most strikingly, there are also no significant differences across regimes in the growth of international reserves, the money supply, or broad measures of fiscal policy.

It turns out that the weak results in Table 4 do not stem from the methodology or the fact that the data set is limited to six annual observations (admittedly for up to 167 countries). As Table 4 shows, both CPI and GDP inflation are about 5 percent lower for *both* hard fixers and inflation targeters compared with the sloppy center, an economically and statistically significant result.²⁶ Since one of the chief tasks of a monetary regime is to deliver low inflation, this is an important and comforting result. Interestingly, both the level and the rate of change in real exchange rates over this period are lower (more depreciated) for *both* hard fixers and inflation targeters compared with the sloppy center, though these results are only on the verge of statistical significance. Stock prices have fallen more for hard fixers than the sloppy center. Growth rates for property prices and bond yields are insignificantly different across monetary regimes.

5.2. The Visual Story

A visual version of the weak results from Tables 4 and 5 is presented in Figures 3 to 5. These are quantile plots, which compare the distribution of some of the most important variables from Tables 4 and 5 for hard fixers and inflation targeters.²⁷ In Figure 3, panel A graphs the quantiles of real GDP growth for fixers since 2007 (on the vertical axis) to growth over the same period for inflation targeters on the horizontal axis). For reference, a diagonal line shows where the data would be plotted if growth were distributed similarly across the two regimes. With the exception of a few outliers at both ends of the distribution, most of the data are scattered close to the diagonal line, consistent with the notion that growth for most hard fixers is similar to that for inflation targeters (though hard fixers experience more outliers, both positive and negative). The pattern for CPI inflation (panel B) and the government budget (panel D) are similar, while the distribution of current accounts (panel C) is more extreme for hard fixers. In general though, the distributions for key variables in Figure 4 seem similar across monetary regimes for capital inflows (panel A) and outflows

FIGURE 3
Key Differences across Monetary Regimes
 Quantile Plots for Small Economies, 2007–12

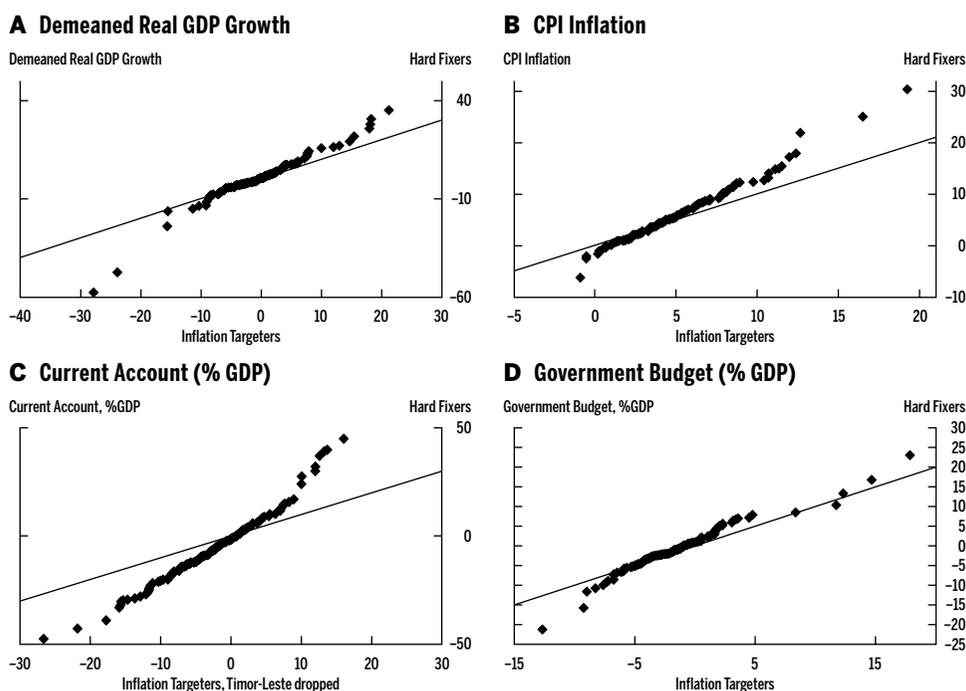
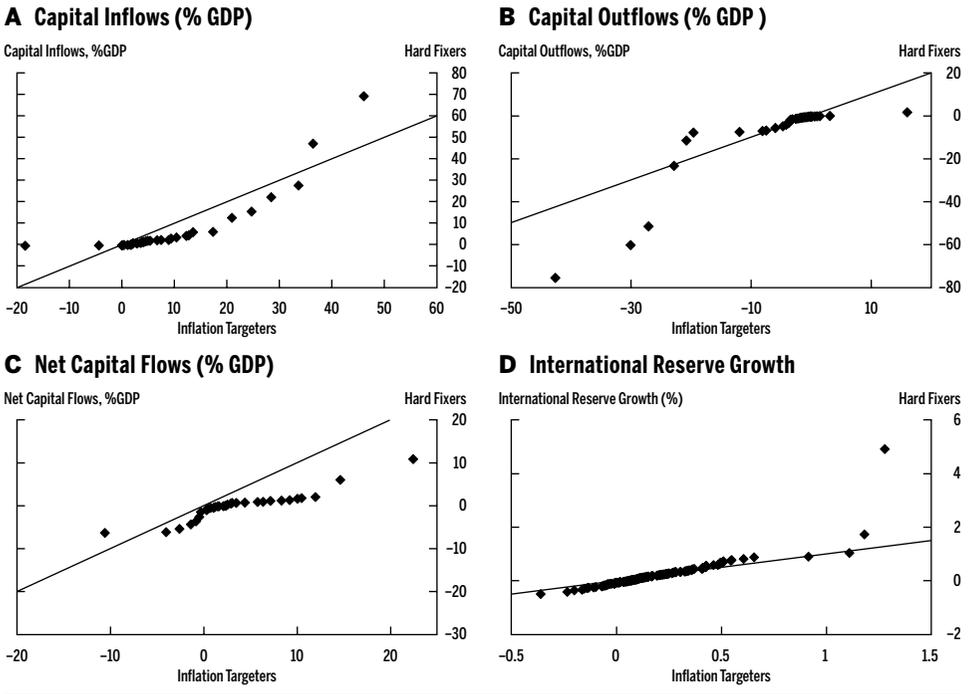


FIGURE 4
Key Differences across Monetary Regimes
 Quantile Plots for Small Economies, 2007–12

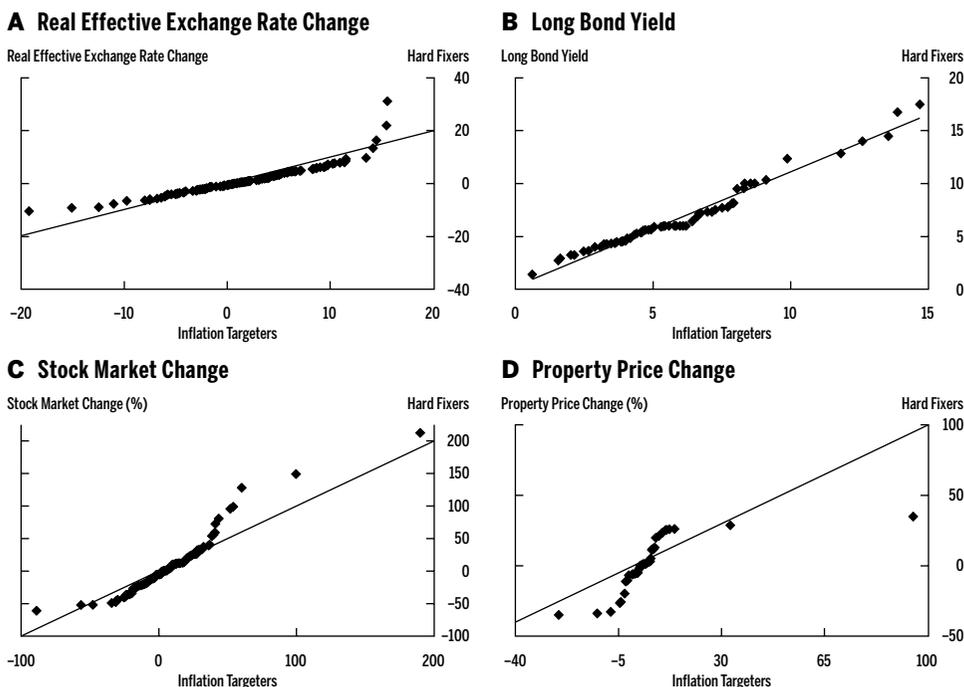


(panel B), and international reserve growth (panel D), and in Figure 5 for the change in the real effective exchange rate (panel A), and asset price changes (panels B, C, and D). One exception is net capital flows, shown in Figure 4, panel C, which are systematically higher for inflation targeters.

5.3. Summary

There is rarely any significant difference between the effects of inflation targeting and hard fixes for the variables I examine. Three exceptions are net capital flows, the change in investment freedom, and stock prices. This is a striking result that essentially runs throughout the statistical analysis. Initially it seems implausible; after all, these monetary regimes differ radically. Hard fixers have severely limited monetary autonomy, while inflation targeters are not directly constrained by the exchange rate. Hard fixers with open capital markets would seem to have substantially less ability than inflation targeters to insulate themselves from the spillover effects of foreign capital flows. Still, this finding is actually quite consistent with the literature, which has been unable to find strong

FIGURE 5
Key Differences across Monetary Regimes
 Quantile Plots for Small Economies, 2007–12



effects from the monetary (or, more commonly, the exchange rate) regime. Rey (2013, pp. 19–20) recently wrote (*italics added for emphasis*):

Analyses suggest monetary conditions are transmitted from the main financial centre to the rest of the world through gross credit flows and leverage, *irrespective of the exchange rate regime*. This puts the traditional “trilemma” view of the open economy into question. *Fluctuating exchange rates cannot insulate economies from the global financial cycle*, when capital is mobile.²⁸

The notion that the monetary regime matters surprisingly little is not new; see, for example, the recent book by Klein and Shambaugh (2010) and references therein.²⁹ The abstract of Baxter and Stockman (1989) concludes, “Aside from greater variability of real exchange rates under flexible than under pegged nominal exchange-rate systems, we find little evidence of systematic differences in the behavior of macroeconomic aggregates or international trade flows under alternative exchange-rate systems.”³⁰ While an absence of any large detectable

differences across monetary regimes might seem bizarre to a monetary economist, it is almost folk wisdom inside international finance.

To summarize, small economies that float with an inflation target have, in many respects, behaved similarly to hard fixers over the post-bubble period. This might be an artifact of the econometric methodology I have employed or the size of the data set. But that seems unlikely. The literature has been unable to find many significant differences across monetary regimes; perhaps there simply are few. It seems that the trade-offs between hard fixers and inflation targeters lie more in the operation of monetary policy than in their manifestations in real economic outcomes.

I conclude that small economies interested in stable monetary regimes now have a real alternative to a hard fix. Floating with an inflation target seems to have few quantifiable macroeconomic or financial trade-offs for small economies compared with a hard fix, and it is at least as durable.³¹

6. Conclusion

Bulgaria is a small open emerging market, with membership in the European Union, reasonable and improving institutions, and GDP per capita of around \$12,000. Its neighbor Romania is roughly comparable in size, income, institutions, and openness. Bulgaria prides itself on having rigorously maintained a fixed nominal exchange rate since 1997 through its currency board arrangement. Romania, on the other hand, has operated an inflation targeting regime with a flexible exchange rate since 2005. Manifestly, similar economies choose different approaches to monetary policy. Denmark has stayed fixed to the euro (earlier, the deutsche mark) at the same rate since 1987; Sweden has changed its regime a number of times since then, and installed an inflation targeting regime with a flexible exchange rate in 1993. Yet Denmark and Sweden are broadly comparable in size, income, institutions, and openness. The examples are legion: Ecuador, El Salvador, Côte d'Ivoire, and Bosnia-Herzegovina are hard fixers while their neighbors Colombia, Guatemala, Ghana, and Albania are similar in many respects but target inflation. Roughly similar countries are happy to maintain radically different monetary regimes. In this paper, I have found that this decision has been of little consequence for a variety of economic phenomena, at least lately. Growth, the output gap, inflation, and a host of other phenomena have been similar for hard fixers and inflation targeters during and since the global financial crisis. That is, the “insulation value” of apparently different monetary regimes is similar in practice. Since the international finance literature has found few substantive macroeconomic differences across monetary regimes, I expect this result to be banal for some. Since this stylized fact

is not well known outside international economics, I expect it to seem implausible to others.

For small economies interested in monetary stability, there are now two options: a hard fixed exchange rate and inflation targeting. The alternative to the rigors of a hard fix used to be limited, essentially consisting of muddling along in a sloppy center of crawling bands, adjustable pegs, monetary targets, and considerable discretion. But two monetary regimes have withstood the rigors of the global financial crisis and its aftermath. The fact that the constrained discretion of inflation targeting poses no quantifiable trade-off vis-à-vis a hard fix is a theoretical puzzle, but it is quite consistent with the literature.

It is natural to think that a big shock—like the global financial crisis and the Great Recession—will put the system to the test and reveal which is the best monetary regime. We've now had the big shock and it appears that now—as opposed to during the Great Depression or the early 1970s—the current system can indeed survive a serious crisis. That said, the shock has not provided any clear guidance as to which monetary regime is preferable for small economies. One caveat is that I've only examined one shock, even if it was a monster. More importantly though, the experiences of countries in hard fixes during and after the crisis have been similar to those of inflation targeters.

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NOTES

1 Except to enter the European Monetary Union; I discuss that caveat below.

2 This is consistent with much of the analysis in Reichlin and Baldwin (2013) who agree with Charles Wyplosz, that flexible inflation targeting has survived the test of a major financial crisis well.

3 As Svensson (2010) argues, "financial-stability policy and monetary policy are quite different, with different objectives, instruments, and responsible authorities, the latter with considerable differences across countries. This does not mean that there is no interaction between them."

4 For the purposes of this paper, I use "country" interchangeably with the more precise and appropriate term "economy"; some of the economies in my sample are territories, colonies, or special administrative regions without full political sovereignty.

5 The fact that I can do so has much to do with my Canadian identity.

6 I exclude the countries inside the EMU from my analysis as they are parts of a large economy, so this work has essentially nothing to say about the euro crisis.

7 AREAER is published by the Fund in the autumn.

8 An easy comparison is provided by the 1990–2005 Stone-Bhundia data set, in which approximately 10 percent of monetary regimes change each year.

9 My argument is consistent with the contention I made some years ago that much of the new stability in the international monetary system derives from the emergence of inflation targeting. In Rose (2007), I described the emerging "Bretton Woods reversed" system, driven primarily by inflation targeting administered by independent and transparent central banks. These countries place few restrictions on capital mobility and allow their exchange rates to float. This system was not planned and does not rely on international coordination. In 2007 I argued that there was no role for an anchor country (a claim I would now weaken, given the success of the swap lines provided by the Federal Reserve), the IMF, or gold. Succinctly, it is the diametric opposite of the postwar system; Bretton Woods, reversed. My central claim concerned the durability of the system; in contrast to other monetary regimes, no country has been forced to abandon an inflation targeting regime. The crisis has now provided the experiment to put Bretton Woods reversed to the test, and the system has proved, at least thus far, resilient.

10 While the IMF classifies Slovakia otherwise, I follow conventional wisdom and classify the national bank of Slovakia as an inflation targeter in 2006; http://www.nbs.sk/_img/Documents/MPOL/mprog/2008a.pdf

11 The inclusion of countries that the IMF classifies as “conventional peg” may raise the eyebrow here. Examples of these countries include Caribbean peggers (Aruba, Bahamas, Barbados, and Belize), Euro peggers (Denmark and Latvia), Gulf peggers (Bahrain and Saudi Arabia), the CFA franc zone (Benin and Burkina Faso), and South African peggers (Lesotho and Namibia). The vast majority of these pegs were in fact quite hard, making it inappropriate to place them in another bin.

12 Of the hard fixers in 2012, most had been hard fixers for many years. It is hard to be definitive, since there is currently no continuous measure of the de facto monetary regime available historically, as discussed earlier.

13 Much of this analysis compares the features of the 60 durable hard fixers with the inflation targeters.

14 The last year for which I have a broad sample of comparable real GDP data is 2011.

15 Eichengreen and Sachs (1985) is one important paper in a large literature.

16 Masson and Ruge-Murcia (2005) analyze the determinants of exchange rate regime transitions. Note also that the considerable literature on choice of exchange rate regime (as opposed to transitions between regimes), rarely focuses on business cycle events; see, for example, Poirson (2001).

17 The LYS classification only begins in 1974 and is hence unusable for this purpose.

18 Since some countries in the last group are in hard fixes for some of the period (and thus not in a sloppy center monetary regime each year), I use this taxonomy at the risk of some confusion.

19 Since the *countries* in the hard fixes and inflation targeting regimes are chosen because of their durability, country fixed-effects would render regime effects inestimable.

20 An alternative strategy would be to follow the methodology of Klein and Shambaugh (2013) and directly examine the strength of interest rate linkages across monetary regimes.

21 I thank Kristin Forbes and Frank Warnock for providing me with their data set.

22 For the cross-sectional analysis, I do not include either country or time effects.

23 Montiel (1998) provides a convenient taxonomy.

24 I ignore intervention that is effective, permanent, and sterilized; Engel (2013) writes in his recent survey, “Very few studies have found significant evidence of a sustained effect of sterilized intervention on the level of the exchange rate.”

25 Series on the bond yield and stock index are taken from the IMF’s *International Financial Statistics*, while property prices are taken from the Bank for International Settlements.

26 Zimbabwe is a serious outlier because of its recent hyperinflation and has been excluded from CPI inflation estimation.

27 Quantiles are points taken at regular intervals from the cumulative distribution function of a random variable. Dividing ordered data into q essentially equal-sized data subsets is the motivation for q quantiles; the quantiles are the data values marking the boundaries between consecutive subsets.

28 It should be noted that Rey does not actually test the relevance of the exchange rate regime.

29 My earlier paper (Rose 2011) concludes, “The fact that similar economies make completely different choices might lead one to despair; as a profession, we have collectively made little progress in understanding how countries choose their exchange rate regimes. Still, before panicking, one should first remember that such choices often seem to have remarkably little consequence. Exchange rate regimes are flaky: eccentric and unreliable.”

30 In their survey, Frankel and Rose (1995, p. 1,706) write, “The more general point is that the volatility of macroeconomic variables such as money, output, and prices (appropriately parameterized) does not vary much across exchange rate regimes, certainly not enough to rationalize the large cross-regime differences in exchange rate volatility.” These negative results are also consistent with those in related literature. For instance, in its 2012 *Spillover Report*, the IMF uses three approaches to pin down spillover effects (event studies, examination of U.S. portfolio flows, and vector autoregressions) and sums up the findings as indicating that the “results do not permit any easy generalization about advanced country monetary policy as the main driver of asset price pressures in emerging markets.”

31 A number of countries that engage in hard fixes have characteristics—the critical ones being size and polity—similar to those of inflation targeters, including Bulgaria, Republic of Congo, Denmark, Ecuador, Panama, and El Salvador. It seems reasonable to expect more such countries to adopt inflation targeting in the decades to come, and the stability of the international monetary system to expand accordingly.