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Have a Break, Have a ... National Currency: When Do Monetary Unions Fall Apart?

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HAVE A BREAK, HAVE A ...NATIONAL CURRENCY: WHEN DO MONETARY UNIONS FALL APART?

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HAVE A BREAK, HAVE A ... NATIONAL CURRENCY: WHEN DO MONETARY UNIONS FALL APART?

Abstract

Historically, dissolutions of currency unions are not unusual. I use an annual panel data set covering 245 country pairs that use a common currency (of which 128 are dissolved) from 1948 through 1997 to characterize currency union exits. I find that departures from a currency union tend to occur when there is a large inflation differential between member countries, when the currency union involves a country which is closed to international trade and trade flows dry up, and when there is a change in the political status of a member. In general, however, macroeconomic factors have only little predictive power for currency union dissolutions.

JEL Classification: F31, F33, F36.

Keywords: monetary union, sovereign currency, dissolution, exit.

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I. Introduction

In recent years, monetary integration has become fashionable again. Twelve European countries have formed a monetary union, giving up their national currencies for the euro. Other countries have dollarized, adopting the currency of another country on a unilateral basis. After some decades in which almost all countries, except for some small and geographically remote territories, strongly preferred to have their own monies, more than two-thirds of the sovereign countries in the world are either considering to abandon their national money or already have done so.¹

One of the main reasons for the countries' growing willingness to enter a currency union is the credibility of these arrangements. In contrast to other hard currency pegs (such as fixed exchange rates or currency boards), the abandonment of a country's own currency is often assumed to be permanent; it cannot be easily reversed and, thus, appears to be a more serious commitment than any other fixed-rate regime. For Europeans, the use of a common currency implies a degree of integration that goes much beyond the elimination of exchange rate volatility. For dollarized countries, the adoption of another country's currency means that monetary policy is delegated directly to a foreign authority.

Historically, however, dissolutions of currency unions are not unusual. Reuven Glick and Andrew Rose (2002) even find that for the period from 1948 through 1997 currency union exits clearly outnumber currency union entries. Of the 146 regime transitions (for which they have data), there were 130 switches out of but only 16 switches into currency unions.

In this paper, I examine why some monetary unions fall apart, while others remain in existence for a long period of time. In particular, I ask when does a country leave a currency union. By comparing the behavior of countries in currency unions shortly before their dissolution with that of sustained currency unions, I am able to identify potential causes of

¹ Alberto Alesina and Robert Barro (2001, p. 381) note that "roughly 60 small countries or territories [of the 193 independent countries] have for some time been members of currency unions or have used a large country's money", including the 15-member CFA franc zone in Africa and the 7-member Eastern Caribbean Currency Area. In terms of GDP, however, this group of countries (excluding anchor countries) makes up less than 1 percent of world GDP. If one adds to this list the 12-member European Monetary Union, the accession countries in Europe, the countries in West Africa, Southern Africa and the Arab Gulf region that have declared their intention to form a currency union as well as the Latin American countries that seriously consider dollarization, the number of countries without a national currency is easily doubled and the combined GDP is increased by several orders of magnitude.

currency union break-ups.² My empirical results suggest that departures from a currency union tend to occur when there is a large inflation differential between member countries, when the currency union involves a country which is relatively closed to international trade and trade flows fall, and when there is a change in political status of a member. In general, however, macroeconomic factors have only little predictive power for currency union dissolutions.

This paper adds to an already large and again rapidly growing literature on currency unions. Most of the recent (empirical) studies, however, explore the degree of integration in currency unions relative to countries *with different national monies*. Rose and Charles Engel (2002), for instance, measure several economic characteristics for currency union members and compare them to non-currency union countries. Alesina, Barro and Silvana Tenreyro (2002) rank country pairs by their degree of integration and attempt to identify optimal currency areas. Here, however, I focus exclusively on *existing* currency unions which then may or may not have been sustained; countries with separate currencies are ignored.

This paper is also related (and close in style) to the rich empirical literature on the determinants of changes in exchange rate regimes. Turbulences in foreign exchange markets (like regime transitions and currency crashes) have attracted much attention, and numerous studies attempt to link these episodes to macroeconomic and political variables. Examples include Barry Eichengreen, Rose and Charles Wyplosz (1995), Jeffrey Frankel and Rose (1996), and Graciela Kaminsky and Carmen Reinhart (1999); Kaminsky, Saul Lizondo and Reinhart (1998) provide a survey. To my knowledge, however, there is no study that focuses on the break-ups of currency unions.

The remainder of the paper is as follows. The next section provides some analytical background. I then describe the data and their characteristics, followed by a presentation of the results of multivariate analyses. After presenting some more illustrative details, the paper ends with a brief summary.

II. Background

In order to determine factors that may help to explain why countries leave a currency union, the large theoretical literature on fixed exchange rates offers at least two different analytical frameworks. The first is based on Robert Mundell's (1961) concept of an "optimum currency area". This concept emphasizes the costs and benefits of monetary integration and

² In future work, I intend to explore the (short-term) macroeconomic effects of currency union dissolutions.

argues that the (net) gains from sharing a single currency increase with the degree of economic integration. The dissolution of a currency union can then be viewed as evidence that the members were not part of an optimum currency area; the benefits of using the same money (e.g., lower transaction costs in trading goods and services) were (ex post) smaller than the costs (e.g., the loss of an independent monetary policy). In empirical work, typically four criteria (or a subset) are examined to identify an optimum currency area: the intensity of trade, the symmetry of shocks and cycles, the degree of labor mobility, and the mechanism of fiscal transfers. For dissolved currency unions then, I would expect to find, based on these criteria, a lower degree of integration than for sustained unions.

The alternative framework is provided by the literature on currency crises and speculative attacks. The idea here is that a country may be forced to leave a currency union even if the currency union members generally exhibit the desirable degree of economic integration. Of course, the credibility of the commitment to use the same money makes members of a currency union less vulnerable (and maybe even immune) to a speculative attack. However, similar to other fixed exchange rate arrangements, inconsistencies between domestic economic fundamentals and the exchange rate commitment may arise. Poor policies, for instance, can rapidly increase the costs of monetary integration so that, at some point, a country may decide that it is no longer willing to bear these costs; Roberto Chang and Andrés Velasco (2002) provide a recent formalization of this time inconsistency problem. To identify empirically when a currency link becomes unsustainable, the literature on currency crises has used a large variety of indicators; Kaminsky et al.'s (1998) summary of 28 selected studies lists alone 105 indicators.³ It follows that also a much broader set of macroeconomic and financial variables may be relevant in explaining currency union break-ups.

A third (intuitively plausible) view is that currency union dissolutions are mainly the result of changes in the political status of a territory; many departures from a currency union link indeed occurred when a colony gained independence and subsequently left the currency area of the former colonizer.⁴ Most recently, the break-up of federations in Eastern Europe (the Soviet Union, Yugoslavia, Czechoslovakia) has illustrated the importance of political ties for monetary integration; the dissolution of the political union was also accompanied by a

³ Kaminsky et al. (1998, p. 2) conclude: "The results indicate that an effective warning system [of currency crises] should consider a broad variety of indicators, since currency crises seem to usually be preceded by a broad range of economic problems."

⁴ William Bomberger (2002) argues that the decline in trade after currency union dissolution is mainly the result of a reorientation of trade flows after former colonies gained independence rather than reflecting the change in the currency union status.

dissolution of the monetary union.⁵ This view then implies that currency union exits are largely unrelated to economic fundamentals.

In the empirical analysis, I try to account for these different explanations. Based on the literature on optimum currency areas, I examine the intensity of the ties between currency union members. In particular, I enter explanatory variables not only in absolute levels or rates of change (reflecting the economic conditions in a country) but also relative to the same variable in a partner country using the same currency; this allows to identify the effect of asymmetries and differentials on the likelihood of currency union break-up. Similar to other empirical studies on transitions in the exchange rate regime, I also explore the impact of a wide range of potential indicators. The list of variables can be broadly grouped into five categories and also includes a measure of change in the political status; the remaining groups are: 1) macroeconomic indicators; 2) financial variables; 3) fiscal measures; and 4) openness variables. The next section describes the data set in more detail.

III. Data

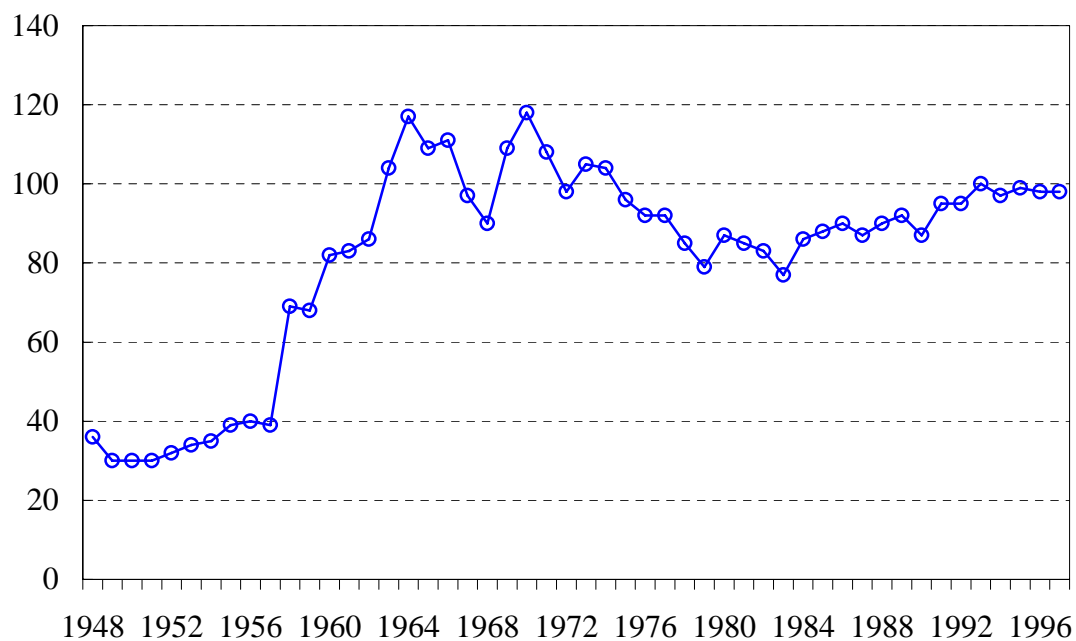
The data used in this paper come essentially from two sources. Most of the data are obtained from Glick and Rose (2002); they have compiled a data set of macroeconomic variables for 217 countries and territories, covering the period from 1948 through 1997 on an annual basis. This data set has, for my purposes, several useful features. First, it is extremely comprehensive; the data set covers most of the post-war period and virtually all political entities in the world (i.e., countries, territories, colonies, dependencies and so on). Assembled in pairwise form, it comprises more than 400,000 observations although there are many observations missing.⁶ Second, the data are extracted from standard sources such as the World Bank's World Development Indicators or the IMF's International Financial Statistics; they have been checked and corrected for mistakes. Finally, and most notably, the data set contains information on whether a pair of countries shares the same currency. Based on this currency union dummy, I construct a binary variable for a break-up of the currency union in the following year that will serve as regressand in my analysis (as a robustness check, I also construct a dummy variable for currency union break-up in one of the following three years). More details are discussed in Glick and Rose (2002).

⁵ As Charles Goodhart (1995, p. 449) puts it: "Political, not economic, events have caused the monetary changes in Central and Eastern Europe; economic considerations, although important, have been secondary."

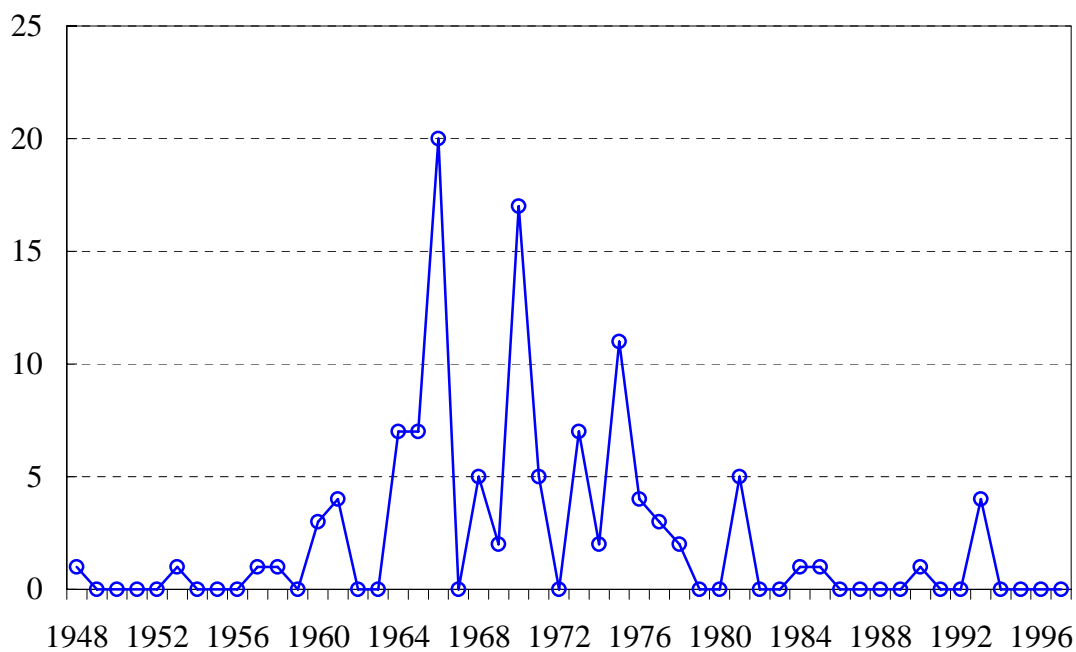
⁶ For instance, Glick and Rose's sample includes only observations for country pairs with positive bilateral trade.

Figure 1: Description of the Data

a) Number of (Currency Union) Observations



b) Number of Currency Union Dissolutions



In the actual implementation, I extract a subset from this large panel data set, containing the observations of currency union pairs. This leaves 4,625 observations for 245 currency unions (or, more precisely, country pairs in a currency union) of which 128 are dissolved during the sample period; the currency unions and the exits are tabulated in the appendix. Figure 1 displays the distribution of observations over time. While the number of observations has a slight tendency to increase over time (mostly due to a better availability of data), currency union exits most often occurred in the 1960s and 1970s⁷; some of these currency union dissolutions are related so that the observations probably should not be treated as independent observations.

To this data set, I add a number of other macroeconomic and financial variables, taken from Rose and Engel (2002). This data set covers a broad set of indicators typically employed in empirical studies on currency crises. Rose and Engel have used these variables to characterize currency unions, I utilize them to characterize currency union exits. In particular, I apply all of their macroeconomic, financial, fiscal and openness variables.⁸ The exact list of variables is in table 1 which also shows some descriptive statistics.

IV. Results

4.1 Univariate Evidence

In table 1, I report separate means and standard deviations for sustained currency unions (defined to exist for at least the next three years) and dissolved currency union links⁹; this allows to compare (in univariate fashion) the average behavior of the variable of interest for broken and non-broken currency unions. I also include a *p*-value for a *t*-test of equality of means; differences in means that are statistically significant at the 5 percent level are in bold.

⁷ None of the results changes when the analysis is confined to this period.

⁸ I ignore their measures of educational attainment and geographic remoteness.

⁹ For broken currency union links, I tabulate the results for the period up to three years prior the break and the (one) year immediately preceding the break. The motivation is that an exit from a currency union (i.e., the introduction and circulation of a country's own new national money) may require some time for preparations (e.g., the establishment of a central bank, the design and printing of banknotes). Therefore, economic conditions a few years before a currency union dissolution may be more relevant in explaining this event than the situation shortly before the break. As shown in the table, however, there are only minor differences in the results.

Table 1: Descriptive Statistics

	Sustained			Three Years Before Break				One Year Before Break			
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Test of Equal. (p-val.)	Obs.	Mean	Std. Dev.	Test of Equal. (p-val.)
A. Macroeconomic Variables											
Real GDP Growth (%)											
minimum, pair-wise	2603	0.5	8.2	237	0.3	5.8	0.77	83	-1.3	6.5	0.05
difference, pair-wise	2603	7.4	10.6	237	8.8	14.2	0.05	83	8.4	6.5	0.36
Real GDP per Capita (\$)											
minimum, pair-wise	1036	1818	2710	20	1554	764	0.66	10	1359	689	0.59
difference, pair-wise	1036	1495	2568	20	4386	6171	0.00	10	3243	5807	0.04
Private Consumption Growth (%)											
minimum, pair-wise	1603	-1.8	8.5	115	-1.3	7.0	0.47	45	-2.0	6.8	0.93
difference, pair-wise	1603	10.3	10.9	115	10.0	8.8	0.78	45	13.8	10.5	0.04
Total Consumption Growth (%)											
minimum, pair-wise	1510	-1.3	7.1	64	-1.1	7.0	0.82	25	-2.5	7.6	0.40
difference, pair-wise	1510	8.9	9.0	64	10.2	7.6	0.24	25	13.7	8.5	0.01
Inflation (%)											
maximum, pair-wise	1419	9.1	8.2	129	12.3	14.7	0.00	45	16.6	22.1	0.00
difference, pair-wise	1419	4.5	4.5	129	7.1	13.5	0.00	45	11.0	21.2	0.00
B. Financial Variables											
M2/GDP (%)											
maximum, pair-wise	1558	31.1	16.5	51	31.7	16.7	0.80	22	33.4	16.4	0.51
difference, pair-wise	1558	8.8	8.3	51	12.1	13.2	0.01	22	12.8	12.8	0.03
M2/GDP Growth (%)											
minimum, pair-wise	1398	-2.8	8.2	41	-3.7	9.4	0.49	13	-3.7	14.4	0.71
difference, pair-wise	1398	9.7	9.0	41	8.8	9.6	0.54	13	13.8	14.4	0.10
Interest Rate Spread (%)											
maximum, pair-wise	956	5.0	4.4	12	5.1	4.6	0.99	5	4.8	4.3	0.91
difference, pair-wise	956	1.3	1.5	12	3.4	3.0	0.00	5	3.3	2.2	0.00
Credit to Private Sector (%GDP)											
maximum, pair-wise	1586	31.9	18.2	60	37.7	23.2	0.02	28	37.7	23.2	0.09
difference, pair-wise	1586	12.4	12.9	60	19.5	18.5	0.00	28	20.6	18.6	0.00
Credit to Priv. Sector Growth (%)											
minimum, pair-wise	1425	-6.3	14.1	45	-2.9	12.0	0.11	15	-5.7	14.8	0.89
difference, pair-wise	1425	14.8	14.2	45	26.1	94.0	0.00	15	59.7	160	0.00
Domestic Banking Credit (%GDP)											
maximum, pair-wise	1584	37.9	23.0	60	45.8	27.2	0.01	28	47.2	26.7	0.04
difference, pair-wise	1584	15.2	22.0	60	20.5	22.2	0.07	28	23.1	22.9	0.06
Dom. Banking Credit Growth (%)											
minimum, pair-wise	1423	-5.3	13.1	45	-3.1	16.6	0.27	15	-6.2	24.2	0.77
difference, pair-wise	1423	17.7	19.2	45	29.1	75.0	0.00	15	54.0	128	0.00
C. Fiscal Variables											
Current Revenue (%GDP)											
maximum, pair-wise	302	23.7	6.9	22	22.7	6.5	0.53	5	23.0	6.7	0.83
difference, pair-wise	302	7.6	5.8	22	6.7	5.5	0.47	5	6.2	5.2	0.59
Tax Revenue (%GDP)											
maximum, pair-wise	353	20.1	4.7	25	20.0	5.0	0.88	6	20.2	5.3	0.97
difference, pair-wise	353	5.5	4.3	25	6.0	3.7	0.60	6	5.9	3.7	0.84
Trade Taxes (%Revenues)											
maximum, pair-wise	340	38.8	12.8	34	34.2	14.0	0.05	10	34.0	15.3	0.25
difference, pair-wise	340	17.9	15.2	34	22.3	13.8	0.11	10	25.1	13.3	0.14

Table 1 continued

	Sustained			Three Years Before Break				One Year Before Break			
	Obs.	Mean	Std. Dev.	Obs.	Mean	Std. Dev.	Test of Equal. (p-val.)	Obs.	Mean	Std. Dev.	Test of Equal. (p-val.)
C. Fiscal Variables (continued)											
Expenditures (%GDP)											
maximum, pair-wise	313	30.0	8.9	18	30.9	8.6	0.68	6	32.5	11.4	0.50
difference, pair-wise	313	10.0	8.3	18	10.6	5.6	0.78	6	12.9	6.7	0.39
Budget Deficit (%GDP)											
maximum, pair-wise	286	-0.8	2.3	18	-2.1	2.5	0.03	6	-1.2	2.6	0.70
difference, pair-wise	286	4.9	5.5	18	2.7	1.7	0.09	6	3.6	1.4	0.56
Central Government Debt (%GDP)											
maximum, pair-wise	61	47.8	34.2	7	23.4	15.9	0.07	3	29.9	8.5	0.37
difference, pair-wise	61	20.7	25.4	7	8.9	6.4	0.23	3	14.1	5.4	0.65
D. Openness Variables											
Current Account (%GDP)											
minimum, pair-wise	1188	-11.4	9.6	36	-9.0	5.2	0.14	15	-7.6	5.2	0.13
difference, pair-wise	1188	7.9	9.2	36	5.2	3.8	0.08	15	5.3	4.2	0.27
Exports/GDP (%)											
maximum, pair-wise	1971	39.1	16.3	151	36.5	19.4	0.05	58	34.7	17.7	0.04
difference, pair-wise	1971	16.9	13.7	151	18.3	14.8	0.22	58	16.9	14.0	0.99
Export Growth (%)											
minimum, pair-wise	1442	-3.5	12.2	63	-4.8	13.7	0.42	25	-11.6	14.0	0.00
difference, pair-wise	1442	17.5	17.4	63	21.4	23.7	0.09	25	27.8	26.4	0.00
Export Duties (%Exports)											
maximum, pair-wise	280	4.3	3.2	19	15.7	14.4	0.00	4	23.5	12.4	0.00
difference, pair-wise	280	2.6	2.9	19	13.1	13.5	0.00	4	18.6	11.0	0.00
Imports/GDP (%)											
maximum, pair-wise	1971	46.0	20.3	151	39.4	20.5	0.00	58	38.0	19.0	0.00
difference, pair-wise	1971	16.0	16.2	151	17.2	16.0	0.39	58	16.6	14.9	0.78
Import Growth (%)											
minimum, pair-wise	1442	-4.0	11.4	63	-7.1	15.0	0.03	25	-15.6	17.7	0.00
difference, pair-wise	1442	16.0	15.6	63	26.3	24.8	0.00	25	31.4	20.6	0.00
Import Duties (%Imports)											
maximum, pair-wise	326	22.2	7.0	30	15.1	6.5	0.00	8	11.7	6.3	0.00
difference, pair-wise	326	8.5	6.9	30	6.1	4.9	0.07	8	6.9	6.9	0.52
Trade/GDP (%)											
maximum, pair-wise	1011	38.7	44.6	20	26.0	18.3	0.21	10	21.8	7.7	0.23
difference, pair-wise	1011	21.7	41.0	20	13.2	17.7	0.36	10	9.2	7.3	0.34
Gross FDI (%GDP)											
maximum, pair-wise	859	2.0	3.0	20	1.0	0.7	0.14	10	0.7	0.5	0.18
difference, pair-wise	859	1.4	2.4	20	0.9	0.6	0.37	10	0.6	0.4	0.30
Gross Private Capital Flows (%GDP)											
maximum, pair-wise	865	17.4	43.6	20	10.0	5.2	0.44	10	8.4	3.9	0.51
difference, pair-wise	865	12.5	43.1	20	4.2	4.0	0.39	10	4.2	4.0	0.54
Bilateral Trade Growth (%)	3393	1.2	26.3	289	-0.7	12.3	0.22	102	-1.2	18.5	0.37
E. Institutional Variable											
Change in Political Union											
Dummy	3531	0.01	0.12	301	0.05	0.22	0.00	105	0.05	0.21	0.00

Notes: "Sustained" currency unions are defined to exist for at least the following three years. The p-values refer to a comparison of means between broken and sustained unions; differences significant at the 5% level are in bold.

I begin with macroeconomic variables. The first two lines of table 1 display the results for real GDP growth. They show that the minimum growth rate¹⁰ for each country pair averages about 0.5 percent for a typical (sustained) currency union, is on average only slightly below this level (0.3 percent) in the three years before a currency union dissolution, but falls to –1.3 percent in the year immediately preceding the break. The results also indicate that a currency union exit is often preceded by a (negative) idiosyncratic shock to one of the members. Broken currency unions display a considerably larger difference in pair-wise growth rates than sustained currency unions (although the deviation just misses statistical significance at the 5 percent level). This is consistent with the literature on optimum currency areas where countries whose business cycles are imperfectly synchronized with others’ benefit the most from the potential stabilization of a *national* monetary policy.

The results for other macroeconomic variables confirm this finding. Broken currency unions are characterized by a particularly large difference in the members’ GDP per capita; this differential is a crude indication of a large asymmetry in shocks and cycles, but may also support the hypothesis that many currency union exits followed decolonization. Also consumption growth varies widely in dissolved currency unions shortly before the break.

The most convincing piece of evidence, however, is the economically and statistically large difference in the behavior of inflation between sustained and broken currency unions. Country pairs in dissolved currency unions tend to have a much higher rate of inflation and display also a much larger difference in inflation rates than country pairs in sustained currency unions. Moreover, the deviation from a typical currency union pair seems to accelerate during the run-up to the currency union break. The average (maximum) rate of inflation increases from 12.3 percent in the three years before a break to 16.6 percent immediately before the break (compared with 9.1 percent in tranquil, non-break periods); the inflation differential rises from 7.1 to 11 percentage points (compared with 4.5 percentage points in periods of tranquillity).

Next, I consider financial variables; these variables often feature prominently in studies of banking and exchange rate crises (see, for instance, Kaminsky and Reinhart [1999]). Most of the measures show statistically significant differences across financial systems in dissolved currency unions relative to sustained ones. For instance, the ratio of M2 to GDP, a measure of financial depth, varies by about 12 percentage points in the run-up to a regime switch compared with an average of less than 9 percentage points in sustained

¹⁰ The minimum growth rate is the lower value in GDP growth for each country pair/year observation.

currency unions. There is no clear evidence, however, that the absolute values of these variables (neither in levels nor in growth rates) differ substantially across broken and sustained currency unions. While banking and exchange rate crises have been typically linked to rapid growth in credit and monetary aggregates, there is no measurable difference in the M2 to GDP ratio (or its growth rate), and also the interest rate spread (defined as the lending rate minus LIBOR) is no different (although this result may suffer from the small number of observations). The exceptions are the credit measures which show a pattern consistent with the theory; dissolved currency unions tend to involve countries with a particularly large domestic credit/GDP ratio (well above the ratio recorded for tranquil periods) so that the dissolution of the currency link may be the result of a boom (and bust cycle) in domestic lending.

For fiscal measures, I can only rarely reject the null of no difference in the behavior of these variables between countries that keep a currency union link and countries that depart from a common currency, but (again) many observations are missing. The only notable difference is in budget deficits; countries that leave a currency union tend to have less budgetary discipline.

Turning to openness indicators, there are at least three noteworthy observations. First, the behavior of current account balances does not vary substantially between broken and sustained currency unions¹¹; if anything, the current account deficits are smaller before a break and there are smaller differences in pair-wise current account balances. Second, countries in dissolved currency unions tend to be less open (as measured by both the exports-to-GDP and the imports-to-GDP ratios), and they also experience a considerable decline in trade prior the break (as measured by both exports and imports growth). This decline in trade, however, is mostly confined to one of the currency union members; there is a large differential in trade growth across broken currency unions. There is also no significant decline in bilateral trade. Third, countries that exit a currency union receive on average smaller capital inflows (relative to GDP), but the difference to tranquil periods is not statistically significant.

Finally, a measure refers to the decolonization hypothesis that (in the past) currency union dissolutions mainly occurred when a colony gained independence and subsequently left the currency area of its former colonizer. As shown in the table, there is some evidence for the intuition. The mean of a dummy on a change in political status is larger for dissolved currency unions than for sustained ones and the difference is statistically highly significant. The

¹¹ Eichengreen et al. (1995) report similar findings for currency crises.

average value of 0.05, however, indicates that switches in political status preceded only about one-twentieth of the exchange rate regime transitions in the sample.¹²

4.2 Multivariate Results

The preceding comparisons are univariate. I now turn to multivariate analysis. More precisely, I estimate multinomial logit models (by maximum likelihood), linking a binary variable of currency union dissolution to a set of explanatory regressors. As noted above, I employ two measures of currency union exit: a binary variable which is defined as unity if the currency union link is dissolved in the following year (and zero otherwise), and a binary variable which is defined as unity if the link is broken in one of the next three years.

My exact empirical strategy is dictated by the limited availability of macroeconomic data which often reduces the number of usable observations. Combining the effects of the variables together into a single model would reduce sample size dramatically. Therefore, I apply a two-step procedure.

In a first step, I estimate a baseline regression that includes only a small set of potentially important explanatory variables. In particular, I use as standard regressors: GDP growth, inflation, bilateral trade growth and change in political union. This specification is not the result of extensive pre-testing. Rather, it ensures that, on the one hand, a broad range of potential explanations for the break-up of currency unions is covered, while, on the other hand, the cost of lost observations is minimized. In a later stage, I add the remaining variables to this fixed set of controls, one at a time.¹³

The benchmark results are reported in the first column of table 2. Results are tabulated for a currency union dissolution in the following year; results are similar for a break in the following three years. Since logit coefficients are not easily interpretable, I am particularly interested in the direction of the link. Associated z -statistics which test the null hypothesis of no effect are in brackets.

The estimates are not especially encouraging in the sense that there do not appear to be tight links between currency union dissolutions and their posited determinants. As shown, only one variable has a statistically significant coefficient, the pair-wise difference in inflation. The positive coefficient implies that a large difference in inflation performance

¹² Another promising approach would be to divide the sample of currency unions by the reasons for their initial adoption. One would expect that economic factors primarily explain the dissolution of voluntarily adopted currency unions, while political factors may be of overwhelming importance for the break-up of colonial and federal country currency unions. I am grateful to Charles Goodhart for pointing this out to me.

Table 2: Baseline Results

	(1)	(2)	(3)
Real GDP Growth, minimum	-0.039 (-1.614)	-0.027# (-1.798)	
Real GDP Growth, difference	0.014 (0.807)	0.001 (0.082)	
Inflation, maximum	0.014 (0.721)		0.018 (0.939)
Inflation, difference	0.094** (3.006)		0.074** (2.611)
Bilateral Trade Growth	-0.001 (-0.137)	-0.003 (-0.838)	-0.001 (-0.211)
Change in Political Union, dummy	0.404 (0.384)	0.993# (1.855)	0.455 (0.439)
# of observations	1449	2840	1548
McFadden R ²	0.06	0.01	0.06

Notes: Multinomial logit estimation. z-statistics are in parentheses. Constant not reported. Explanatory variables refer to the year before the currency union dissolution.

**, * and # denote significant at the 1%, 5% and 10% level, respectively.

across currency union members is associated with a significant increase the likelihood of a currency union dissolution, holding all else constant.¹⁴ All the other variables have correctly signed, but insignificant coefficients, though some (like the minimum GDP growth rate) are close to significance. This somewhat weak result is not too surprising, however, given the large number of failed attempts to link exchange rates (in general) and currency crises (in particular) to macroeconomic fundamentals. Eichengreen et al. (1995, pp. 254-55), for instance, summarize their detailed analysis of causes and consequences of foreign exchange market turbulences by noting that “regime transitions such as exchange rate flotations ... are difficult to distinguish systematically from periods of tranquillity ... [so that] ... there do not appear to be clear early warning signals which precede changes in exchange rate regimes.”

In the remaining columns of table 2, I report the results of two alternative specifications. Dropping the inflation measures almost doubles the number of observations and (slightly) raises the statistical significance of the coefficients on real GDP growth and on a change in political union, but the coefficients remain insignificant on the conventional 5 percent level of confidence. The benchmark results are basically unaffected when measures of GDP growth are dropped.

Table 3 performs the extensions. In the upper half of the table, I report the results for the baseline variables. More specifically, I tabulate the range of the estimated coefficients, the maximum/minimum absolute value of the z-statistics and the number of times in which the coefficient enters a regression statistically significantly (at the 5 percent level).

Although the estimates vary substantially across specifications, the results are generally reassuring. As before, the inflation differential has the most precisely estimated impact on the likelihood of a currency union dissolution; a large difference in inflation performance is consistently strongly and significantly associated with the incidence of a currency union break.¹⁵ In some specifications, also other baseline variables have significant coefficients, most notably the dummy on a change in political union (which enters significantly in about one-fourth of the regressions).¹⁶ Thus, there is some evidence that a split in political union is often quickly followed by currency union dissolution.

In the lower half of the table, the results for the other (additionally entered) variables are shown. Broadly, the results from univariate analyses are confirmed. The coefficients on

¹³ Grace Juhn and Paolo Mauro (2002) follow a similar approach.

¹⁴ Barro (1996, pp. 65-68) argues that prior colonial status (by colonizer) may be an useful instrument for inflation.

¹⁵ The inflation differential is the only baseline variable that does not change sign in any of the perturbations.

per capita income take on the expected sign but just miss statistical significance. Similarly financial measures are often just little below conventional significance levels; only a large difference in the interest rate spread is significantly associated with a higher probability of a currency union, perhaps in anticipation of this event. Fiscal measures are, as before, mostly insignificant (including the budget deficit), while a small degree of openness (especially in one of the countries) and low trade growth both coincide with an increased probability of a currency union dissolution.

To summarize, with the possible exception of inflation differentials, there are only few clearly significant links between macroeconomic fundamentals and currency union dissolutions.¹⁷ On the positive side, trade openness appears to matter. Currency unions that include countries which trade only very little (as a share of GDP) are likely to dissolve, especially at a time when the countries experience a decline in external trade.¹⁸ Also changes in political status appear to be important; a break-up in political union is often accompanied by a break-up of the currency link. On the negative side, there is little evidence that the co-movement of output and the symmetry of shocks has a measurable effect on the sustainability of a currency union. Similarly, fiscal aspects that play an important role in the design of the European Monetary Union (in the form of the stability and growth pact) have no predictive power for currency union dissolution.

V. More Details

The previous results are derived from a large sample of very diverse experiences. For many economic variables, differences between broken and sustained currency unions are masked by large variances; economic conditions often vary considerably across currency union break-ups.¹⁹ In this section, I therefore present some more illustrative details of the data set.

¹⁶ If significant, coefficients have the expected sign.

¹⁷ I have performed extensive robustness checks. For instance, I have: used probit models; split the sample into pre- and post-1975; excluded politically motivated currency union break-ups (i.e., when a colony gained independence); and distinguished between membership in bilateral and multilateral arrangements. In all of these cases, the estimates were basically identical with the baseline results. As expected, economic factors appear to be somewhat stronger for currency union dissolutions unrelated to political events, and multilateral arrangements seem to be more robust. There is also some evidence that the (pair-wise) minimum GDP growth rate might have an effect.

¹⁸ Additionally controlling for country size has no measurable effect.

¹⁹ This result basically confirms the findings of Benjamin Cohen (2001). After examining seven case studies, Cohen concludes (similar to Goodhart) that economic variables (or organizational characteristics) are only second order issues; the sustainability of currency

Table 3: Extensions

Baseline Variables		max. coeff.	min. coeff.	max. z -stat.	min. z -stat.	number significant
Real GDP Growth	minimum	0.024	-1.169	2.47	0.12	5
	difference	0.103	-0.229	2.62	0.01	2
Inflation	maximum	0.423	-0.049	2.31	0.03	3
	difference	0.455	0.036	3.03	0.29	15
Bilateral Trade Growth	pair-wise	0.015	-0.061	1.01	0.03	0
Change in Political Union	dummy	6.218	-33.035	3.10	0.00	6
Additional Variables		coeff.	z-stat.	McFadden R ²	number obs.	number cu breaks
<u>A. Macroeconomic Variables</u>						
Real GDP per Capita	minimum	-0.009	-1.87	0.82	695	6
	difference	0.002	1.86			
Private Consumption Growth	minimum	0.003	0.07	0.11	1104	25
	difference	-0.053	-1.81			
Total Consumption Growth	minimum	0.041	0.86	0.20	941	15
	difference	-0.027	-0.74			
<u>B. Financial Variables</u>						
M2/GDP	maximum	0.040	1.68	0.20	1071	14
	difference	0.038	1.22			
M2/GDP Growth	minimum	0.060	1.53	0.09	972	9
	difference	-0.002	-0.04			
Interest Rate Spread	maximum	-0.058	-0.46	0.13	682	4
	difference	0.440	2.30			
Credit to Private Sector	maximum	0.002	0.09	0.13	1100	18
	difference	0.041	1.66			
Credit to Priv. Sector Growth	minimum	0.011	0.57	0.10	999	11
	difference	0.013	1.83			
Domestic Banking Credit	maximum	0.019	1.27	0.11	1099	18
	difference	0.011	0.56			
Dom. Banking Credit Growth	minimum	0.003	0.14	0.10	997	11
	difference	0.014	2.25			
<u>C. Fiscal Variables</u>						
Current Revenue	maximum	0.097	1.08	0.14	265	4
	difference	-0.197	-1.37			
Tax Revenue	maximum	0.031	0.29	0.12	315	5
	difference	-0.044	-0.33			
Trade Taxes	maximum	-0.246	-2.42	0.29	303	7
	difference	0.209	2.18			
Expenditures	maximum	0.066	0.85	0.20	285	5
	difference	0.035	0.47			
Budget Deficit	maximum	-0.100	-0.43	0.20	261	5
	difference	0.001	0.01			
Central Government Debt	maximum	-0.642	-1.04	0.66	62	3
	difference	0.871	0.98			

Table 3 continued

Additional Variables		coeff.	z-stat.	McFadden R ²	number obs.	number cu breaks
<u>D. Openness Variables</u>						
Current Account	minimum	0.007	0.10	0.39	846	10
	difference	-0.226	-1.93			
Exports/GDP	maximum	-0.041	-2.13	0.10	1273	32
	difference	0.025	1.17			
Export Growth	minimum	-0.037	-1.70	0.18	953	14
	difference	-0.013	-0.72			
Export Duties	maximum	0.245	1.77	0.51	291	4
	difference	-0.070	-0.50			
Imports/GDP	maximum	-0.078	-3.66	0.14	1273	32
	difference	0.083	3.84			
Import Growth	minimum	-0.065	-2.16	0.23	953	14
	difference	0.020	1.35			
Import Duties	maximum	-0.488	-2.66	0.36	279	6
	difference	0.373	2.11			
Trade/GDP	maximum	-0.017	-0.19	0.59	677	6
	difference	-0.148	-1.31			
Gross FDI	maximum	-0.548	-0.28	0.51	612	6
	difference	0.490	0.24			
Gross Private Capital Flows	maximum	0.156	0.68	0.65	616	6
	difference	-0.887	-1.69			

Notes: Multinomial logit estimation. The six baseline variables (and an unreported constant) are included in all regressions. Additional variables are (pair-wise) entered as seventh/eighth regressor; coefficients significant at the 5% level are in bold. For the baseline variables the minimum and maximum absolute values of the z statistic in any of the regressions are reported, and the number of cases in which the variable is significant at the 5% level. Explanatory variables refer to the year before the currency union dissolution.

A large fraction of the currency unions in the sample are country pairs in which a dependent territory uses the currency of the colonizing country; these currency union links were often dissolved after the colonies gained independence. However, while many of these countries established a national central bank immediately after (or even before) independence, the date when the peg was given up varies markedly. Figure 2 plots a histogram of the time period between political independence and currency union exit. Excluding transitive cases, the sample comprises 69 currency union dissolutions. Of these 69 exits, four involve still existing dependencies (Bermuda, Djibouti, Reunion, St. Pierre et Miquelon); another five links were dissolved before the territory gained independence (The Bahamas, Brunei Darussalam, Qatar, Vanuatu, Zimbabwe). The remaining 60 cases spread over time, with about two-thirds of the exits (37 cases) occurring within ten years after political independence. Examples for long-lasting currency unions between sovereign nations include the link of the Irish pound to the British pound and the peg of the Malagasy franc to the French franc.²⁰

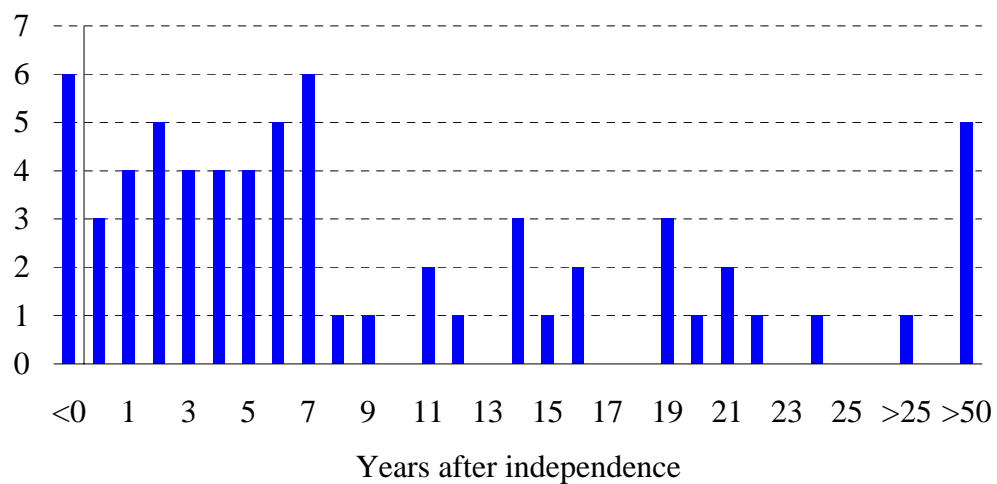
Figures 3 and 4 present some case study evidence for economic measures for which I find significant differences between broken and sustained currency unions. Figure 3 focuses on the inflation differential; the figure provides 8 time-series plots of the difference in national inflation rates before (and immediately after) currency union dissolution (an event marked with a vertical line). As the graphs clearly show, broken currency unions tend to display considerable differences in consumer price inflation before exit, often sizably above the average for sustained currency unions (marked with a horizontal line). Further, it is mainly the country that leaves the union that experiences high inflation, often caused by severe fiscal imbalances.

Figure 4 provides analogues for differences in import growth. Illustrating previous regression results, large differences in import growth often preceded currency union dissolutions, with especially the departing country experiencing a sometimes dramatic decline in trade.

unions primarily depends on the “political will”. However, while giving up a currency union is ultimately a political decision (as is the decision to establish or join a monetary union), my regression results show that economic issues are not completely irrelevant.

²⁰ Ireland departed from its sterling link in 1979, 58 years after independence from the United Kingdom. Madagascar was a member of the French franc zone from independence in 1960 until 1973. After withdrawal in 1973, the Malagasy franc remained pegged to the French franc for another nine years until April 2, 1982.

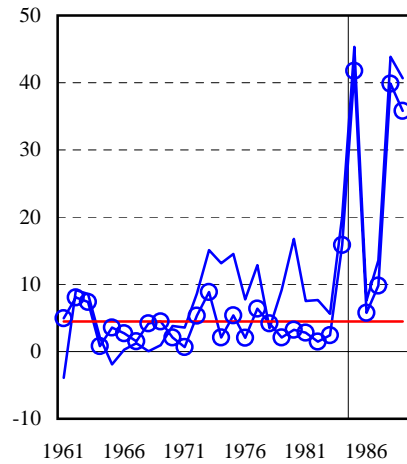
Figure 2: Currency Union Dissolutions and Political Independence



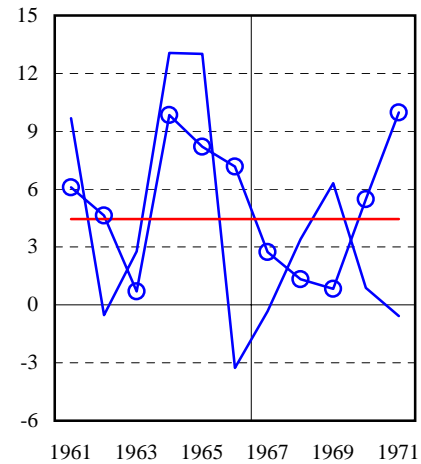
Notes: The columns give the number of switches out of a currency union for the year after political independence. The total sample comprises 69 currency union dissolutions; four of these exits involve still dependent territories.

Figure 3: Inflation Differentials — Selected Country Pairs

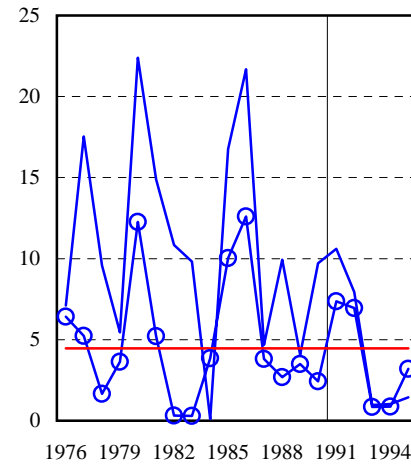
United States — **Dominican Rep.**



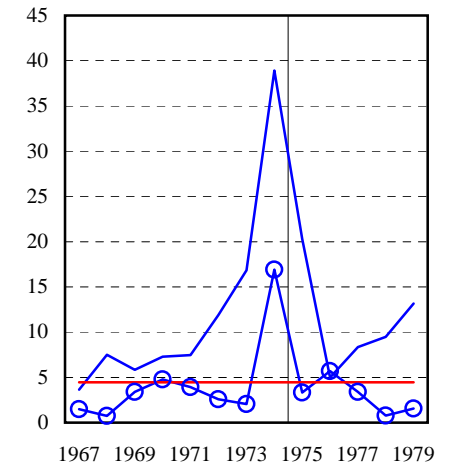
United Kingdom — **Somalia**



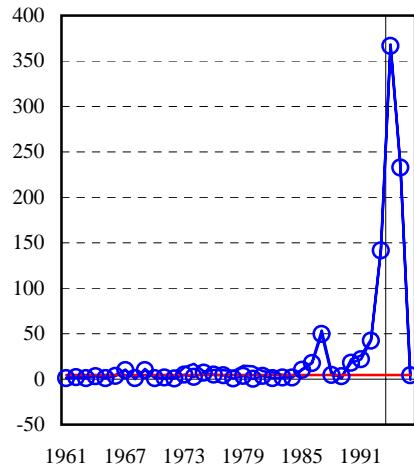
Australia — **Tonga**



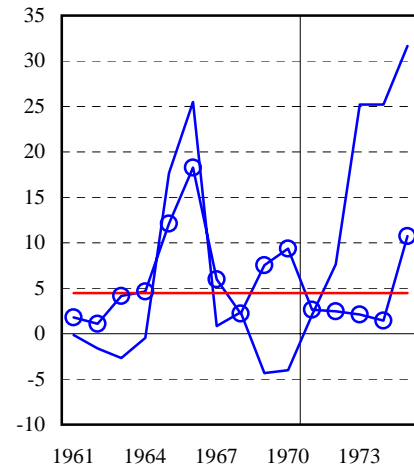
Barbados — Trinidad & Tobago



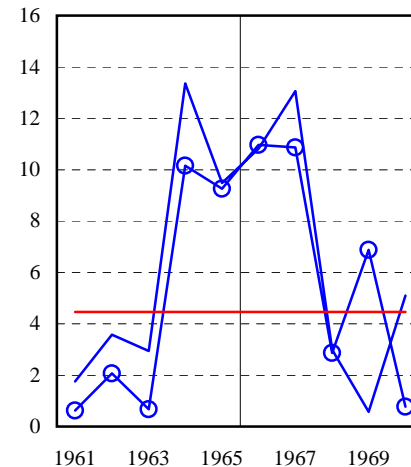
Netherlands Antilles — **Suriname**



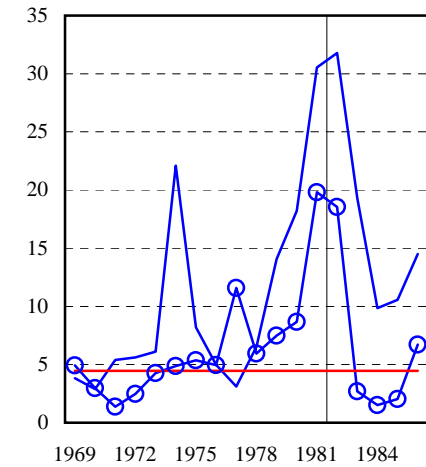
Burma (Myanmar) — **Pakistan**



Sri Lanka — **India**



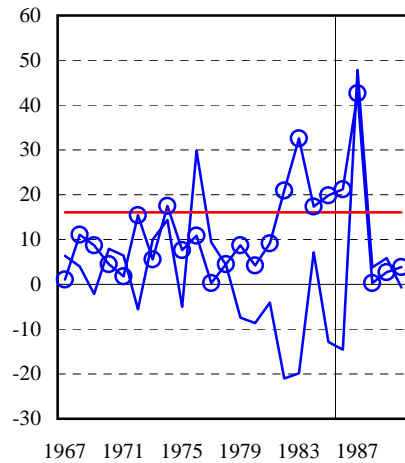
Cameroon — **Madagascar**



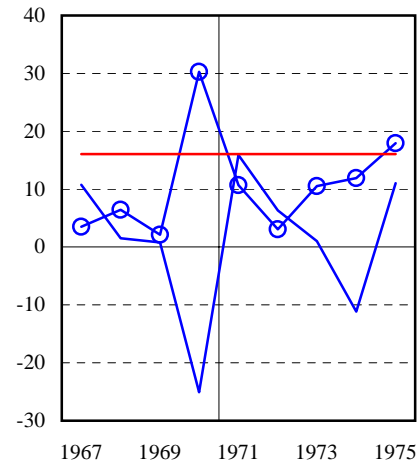
Notes: The graphs show the inflation differential for selected country pairs (circled line), the average inflation differential for sustained currency unions (horizontal line), and inflation rates for the country that leaves the currency union (indicated in bold). The date of currency union exit is marked with the vertical line.

Figure 4: Import Growth Differentials — Selected Country Pairs

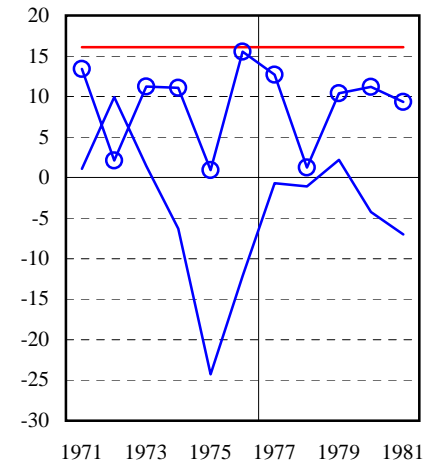
United States — **Guatemala**



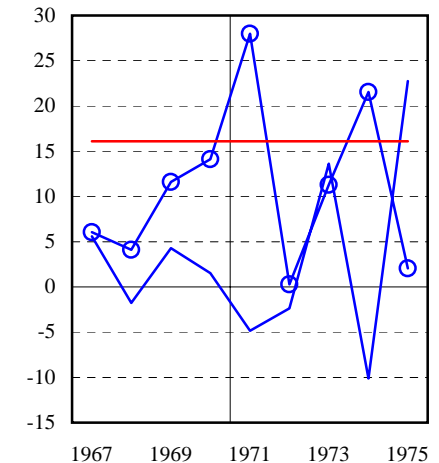
United Kingdom — **Gambia**



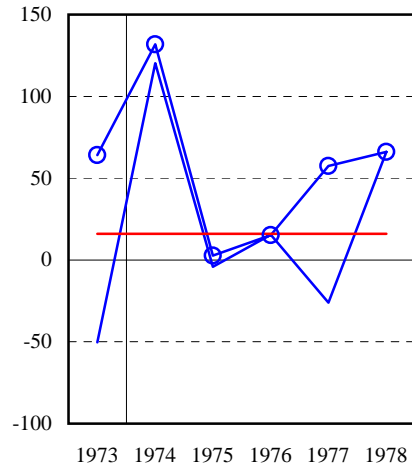
Portugal — **Guinea-Bissau**



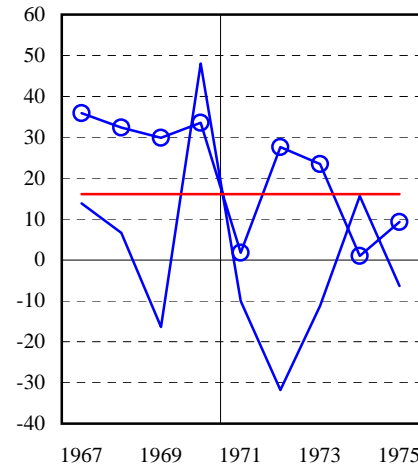
Guyana — Trinidad & Tobago



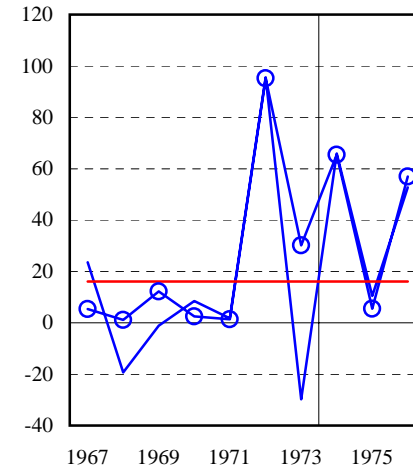
Bangladesh — India



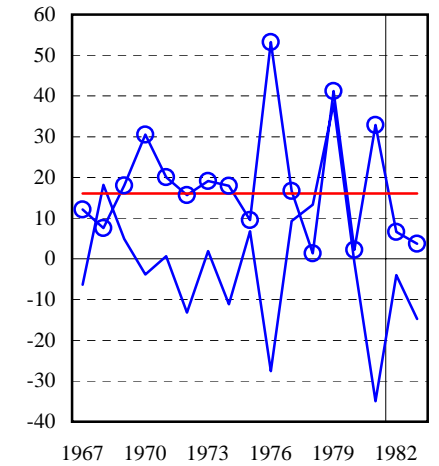
Burma (Myanmar) — **Pakistan**



Congo, Rep. of — **Mauritania**



Cote d'Ivoire — **Madagascar**



Notes: The graphs show the import growth differential for selected country pairs (circled line), the average import growth differential for sustained currency unions (horizontal line), and import growth for the country that leaves the currency union (indicated in bold). The date of currency union exit is marked with the vertical line.

VI. Conclusions

A growing number of countries actively considers to abandon its national currency and to enter a monetary union. The motives for the adoption of a foreign currency (which implies the loss of some national independence and sovereignty) range from the desire for closer economic integration to the introduction of external discipline.

Since sharing a common currency involves not only benefits but also comes with some costs, much of the literature on currency unions focuses on the pros and cons of monetary integration; many empirical studies discuss this trade-off in the context of proposed monetary unions.

In this paper, I follow another route. In particular, I search for stylized facts associated with the break-up of currency unions; a characterization of currency union exits allows to answer the question of when does a common currency link become unsustainable. I examine annual data for 245 country pairs that share the same money from 1948 through 1997.

I find that a large inflation differential between currency union members is consistently associated with a high likelihood of a currency union dissolution; an obvious extension would be to search for potential causes of this divergence in inflation performance. Many departures from a currency union link also occurred when a political union is dissolved. Somewhat surprisingly, neither asymmetries in output nor fiscal variables matter for a typical break of a currency union.

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Appendix: Currency Unions in Sample

# cu	break	Currency Union Members	End	# cu	break	Currency Union Members	End
1		Antigua & Barbuda Dominica	ongoing	56		Central African Repu Cote d'Ivoire	ongoing
2		Antigua & Barbuda Grenada	ongoing	57		Central African Repu Equatorial Guinea	ongoing
3		Antigua & Barbuda St. Vincent & the Gr	ongoing	58		Central African Repu Gabon	ongoing
4		Aruba Netherlands Antilles	ongoing	59	21	Central African Repu Madagascar	1982
5		Australia Kiribati	ongoing	60		Central African Repu Mali	ongoing
6		Australia Nauru	ongoing	61		Central African Repu Niger	ongoing
7	1	Australia Solomon Islands	1979	62		Central African Repu Senegal	ongoing
8	2	Australia Tonga	1991	63		Central African Repu Togo	ongoing
9		Australia Tuvalu	ongoing	64		Chad Benin	ongoing
10	3	Bangladesh India	1974	65		Chad Burkina Faso	ongoing
11	4	Barbados Grenada	1975	66		Chad Congo, Rep. of	ongoing
12	5	Barbados Guyana	1971	67		Chad Cote d'Ivoire	ongoing
13	6	Barbados Trinidad & Tobago	1975	68		Chad Gabon	ongoing
14	7	Belgium-Luxembourg Congo, Dem. Rep. of	1961	69	22	Chad Madagascar	1982
15	8	Belgium-Luxembourg Rwanda	1966	70		Chad Niger	ongoing
16		Benin Burkina Faso	ongoing	71		Chad Senegal	ongoing
17		Benin Cote d'Ivoire	ongoing	72		Chad Togo	ongoing
18		Benin Equatorial Guinea	ongoing	73	23	Comoros Burkina Faso	1994
19		Benin Gabon	ongoing	74	24	Comoros Cote d'Ivoire	1994
20	9	Benin Guinea	1969	75	25	Comoros Madagascar	1982
21		Benin Guinea-Bissau	ongoing	76	26	Comoros Niger	1994
22	10	Benin Madagascar	1982	77	27	Comoros Reunion	1976
23		Benin Mali	ongoing	78	28	Comoros Senegal	1994
24	11	Benin Mauritania	1974	79		Congo, Rep. of Benin	ongoing
25		Benin Niger	ongoing	80		Congo, Rep. of Burkina Faso	ongoing
26	12	Benin Reunion	1976	81		Congo, Rep. of Cote d'Ivoire	ongoing
27		Benin Senegal	ongoing	82		Congo, Rep. of Gabon	ongoing
28		Benin Togo	ongoing	83	29	Congo, Rep. of Madagascar	1982
29		Bhutan India	ongoing	84		Congo, Rep. of Mali	ongoing
30	13	Brunei Darussalam Malaysia	1971	85	30	Congo, Rep. of Mauritania	1974
31		Brunei Darussalam Singapore	ongoing	86		Congo, Rep. of Niger	ongoing
32	14	Burma (Myanmar) India	1966	87	31	Congo, Rep. of Reunion	1976
33	15	Burma (Myanmar) Pakistan	1971	88		Congo, Rep. of Senegal	ongoing
34		Cameroon Benin	ongoing	89		Congo, Rep. of Togo	ongoing
35		Cameroon Burkina Faso	ongoing	90		Cote d'Ivoire Burkina Faso	ongoing
36		Cameroon Central African Repu	ongoing	91	32	Cote d'Ivoire Madagascar	1982
37		Cameroon Chad	ongoing	92	33	Cote d'Ivoire Mali	1962/ong.
38	16	Cameroon Comoros	1994	93	34	Cote d'Ivoire Mauritania	1974
39		Cameroon Congo, Rep. of	ongoing	94		Cote d'Ivoire Niger	ongoing
40		Cameroon Cote d'Ivoire	ongoing	95	35	Cote d'Ivoire Reunion	1976
41		Cameroon Equatorial Guinea	ongoing	96		Cote d'Ivoire Senegal	ongoing
42		Cameroon Gabon	ongoing	97		Cote d'Ivoire Togo	ongoing
43	17	Cameroon Guinea	1969	98		Denmark Faeroe Islands	ongoing
44		Cameroon Guinea-Bissau	ongoing	99		Denmark Greenland	ongoing
45	18	Cameroon Madagascar	1982	100	36	Djibouti Madagascar	1949
46		Cameroon Mali	ongoing	101		Dominica Grenada	ongoing
47	19	Cameroon Mauritania	1974	102		Dominica Montserrat	ongoing
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50		Cameroon Togo	ongoing	105		Dominica St. Vincent & the Gr	ongoing
51		Central African Repu Benin	ongoing	106		Equatorial Guinea Burkina Faso	ongoing
52		Central African Repu Burkina Faso	ongoing	107		Equatorial Guinea Cote d'Ivoire	ongoing
53		Central African Repu Chad	ongoing	108		Equatorial Guinea Mali	ongoing
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111	37	France	Algeria	1969	166	Mali	Senegal	ongoing
112		France	French Guiana	ongoing	167	Mali	Togo	ongoing
113		France	Guadeloupe	ongoing	168	71 Mauritania	Niger	1974
114		France	Martinique	ongoing	169	72 Mauritania	Senegal	1974
115	38	France	Morocco	1959	170	73 Mauritania	Togo	1974
116		France	Reunion	ongoing	171	74 Mauritius	Seychelles	1976
117		France	St. Pierre & Miquelon	ongoing	172	Montserrat	St. Vincent & the Grenadines	ongoing
118	39	France	Tunisia	1958	173	75 Netherlands Antilles	Suriname	1994
119		Gabon	Burkina Faso	ongoing	174	New Caledonia	French Polynesia	ongoing
120		Gabon	Cote d'Ivoire	ongoing	175	76 New Caledonia	Vanuatu	1971
121	40	Gabon	Guinea	1969	176	New Caledonia	Wallis & Futuna	ongoing
122	41	Gabon	Madagascar	1982	177	77 New Zealand	Samoa	1967
123		Gabon	Mali	ongoing	178	Niger	Burkina Faso	ongoing
124	42	Gabon	Mauritania	1974	179	Niger	Senegal	ongoing
125		Gabon	Niger	ongoing	180	Niger	Togo	ongoing
126	43	Gabon	Reunion	1976	181	78 Nigeria	Sierra Leone	1965
127		Gabon	Senegal	ongoing	182	79 Oman	India	1970
128		Gabon	Togo	ongoing	183	80 Pakistan	Mauritius	1967
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139	50	Grenada	Trinidad & Tobago	1976	194	Senegal	Togo	ongoing
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141	52	Guinea	Mali	1962	196	90 Somalia	Uganda	1971
142	53	Guinea	Mauritania	1969	197	91 Sri Lanka	India	1966
143	54	Guinea	Senegal	1969	198	92 Sri Lanka	Pakistan	1967
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145		Guinea-Bissau	Cote d'Ivoire	ongoing	200	93 St. Pierre & Miquelon	Cote d'Ivoire	1976
146		Guinea-Bissau	Senegal	ongoing	201	94 St. Pierre & Miquelon	Gabon	1976
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148	55	India	Mauritius	1966	203	96 St. Pierre & Miquelon	Togo	1976
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152	59	Kenya	Uganda	1978	207	98 United Kingdom	Bahamas	1966
153	60	Kuwait	India	1961	208	99 United Kingdom	Bermuda	1970
154	61	Madagascar	Burkina Faso	1982	209	100 United Kingdom	Cyprus	1972
155	62	Madagascar	Mauritania	1974	210	United Kingdom	Falkland Islands	ongoing
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160	67	Malawi	Zambia	1967	215	104 United Kingdom	Ireland	1979
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235	123	United Kingdom	Zambia	1967
236	124	United Kingdom	Zimbabwe	1967
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238		United States	Bermuda	ongoing
239	125	United States	Dominican Republic	1985
240		United States	Guam	ongoing
241	126	United States	Guatemala	1986
242		United States	Liberia	ongoing
243		United States	Panama	ongoing
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