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Currency Union Entries and Trade*

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Abstract
Recent research suggests that adopting a common currency increases bilateral trade. In this paper, I explore experiences of currency union entry in the post-war period and find no effect on trade. Previous results derived from a large panel data set (covering more than 200 countries from 1948 through 1997) appear to depend crucially on the assumption of symmetry between currency union exits and entries: While countries leaving a currency union experience significant declines in trade, currency union entry appears to have no measurable effect on trade. Also, in a detailed analysis of the enlargement of the CFA franc zone, I find no consistent results on changes in the pattern of trade.

JEL Code: F02, F14, F15, F33, F36

Keywords: accession, adoption, common currency, monetary integration

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I. Introduction

Andrew Rose's (2000) observation that the use of a common currency is typically associated with a disproportionately large volume of bilateral trade between two countries has recently attracted considerable attention. At least three stylized facts have emerged from the rapidly growing and by now sizable literature on the "Rose effect". First, the finding that common currencies appear to promote trade is extremely robust. Despite a number of serious attempts to downsize (and possibly eliminate) the linkage, perturbations to the basic regression framework had surprisingly little effect on the overall result. Rose (2004), for example, provides a meta-analysis of 19 studies and finds that in all but three of these studies the common currency effect on trade (as measured by the preferred estimate of the respective author[s]) is economically large and statistically significant; the pooled estimate suggests that, holding other things constant, two countries sharing a single currency trade about two times more with each other than countries with separate currencies.

Second, there appears to be considerable heterogeneity in the trade effect across different currencies. If one divides currency unions along various lines and examines these subgroups separately, the magnitude and significance of the estimate varies substantially; disaggregated results are provided, among others, in Eduardo Levy Yeyati (2001) and Nitsch (2002, 2004a). Torsten Persson (2001) is also concerned with potential nonlinearities and possible problems of non-random selection. Using a (non-parametric) matching technique to identify country pairs that share the same characteristics (except membership in a currency union), he finds a much less dramatic effect of a common currency.

Third, it is hard to identify a strong and robust *causal* relationship between the adoption of a common currency and an increase in bilateral trade. Rodney Thom and Brendan Walsh (2002) and Nitsch (2004b), for example, provide detailed case studies of switches into and out of a currency union and find no measurable change in bilateral trade, after accounting for other factors.[1] Reuven Glick and Rose (2002) argue that this case study evidence is not representative. Taking a broader view and exploring a panel of all post-World War II experiences of currency union transitions (for which they have data), they find that a pair of countries which switches currency union status experiences a large change in trade. Since their sample mainly comprises currency union dissolutions, however, they assume symmetry between exits and entries which may be problematic in view of the circumstances under

[1] Thom and Walsh (2002) explore the trade effect of Ireland's break of the pound sterling link in 1979. Nitsch (2004b) discusses the formation of the Belgium-Luxembourg economic union in 1921.

which many currency union exits occurred.[2] Alejandro Micco, Ernesto Stein and Guillermo Ordoñez (2003) examine evidence from the introduction of the euro and find a moderate trade effect for the first four years, but see Helge Berger and Nitsch (2004) for a discussion.

This short paper aims to contribute to the recent controversy about the causality of the common currency effect on trade. It is intended to make two (modest) points. First, I explore the effect of currency union entry on trade in a large panel data set. Previous studies have either used a panel approach to analyze the combined effect of currency union entries and exits (Glick and Rose [2002]) or provided case study examinations of currency union entries (e.g., Micco, Stein and Ordoñez [2003]). Second, I explore the trade effect of the gradual enlargement of the CFA franc zone in Africa, thereby adding to recent case study evidence for other currency unions (most notably the European Monetary Union). Previewing the main results, I find no convincing support for the hypothesis that the adoption of a common currency leads to an increase in bilateral trade.

The remainder of the paper is organized as follows. Section 2 provides some additional background, followed by a description of the empirical approach. The results are presented in section 4, and section 5 offers some concluding comments.

II. Background and Motivation

One of the most notable innovative contributions of Rose's research agenda on currency unions is the compilation of data sets on countries that are members in a currency union.[3] Empirical research on currency unions was, for a long time, not only unattractive because of the fact that most countries never seriously considered to give up their national currency. Rather, the main limitation was the unavailability of relevant data. Only very few independent countries have adopted a foreign currency and since most of them were extremely small, they were typically not included in standard international data sets.[4] Moreover, if data was available, it was often of poor quality, many observations were

[2] Many currency union dissolutions involved colonies which have gained political independence and then also gave up the currency of their former colonizer. This process of decolonization was typically associated with a number of developments, ranging from a gradual dissolution of economic links to the former colonizer (including a redirection of trade flows) to military conflicts and civil war, which may have the potential to affect the estimation results. See Thom and Walsh (2002) for a discussion.

[3] Given the immense effort to compile the data, Andrew Rose's policy to make the data sets publicly available on his website is extremely generous and helpful.

[4] Examples in Europe include Andorra, Liechtenstein, Luxembourg, San Marino, Vatican City and territories such as the Faroe Islands and Gibraltar.

missing, or the available information covered only a few variables and was therefore insufficient for the empirical analysis.

In view of these problems, pooling all the available data in a database appears to be a useful remedy. In fact, Jeffrey Frankel (2002, footnote 3) notes that the finding of a statistically significant currency union effect on trade "only arose when Rose put together a large enough data set for it to show up, [so that] there is little information gained in reducing the data set sharply and then noticing the loss in statistical significance." Moreover, Rose is very careful in performing sensitivity analyses and extensions, suggesting that the (pooled) estimate is robust to a large variety of perturbations (such as the partial exclusion of observations). Given the much smaller and less precise estimates from disaggregated analyses and detailed case studies, however, the problems of pooling may be non-negligible; in view of these differences, serious concerns arose.

In this paper, I deal directly with two of these potential complications (in the discussion of the issue of causality). For one thing, I focus explicitly on changes in trade for countries that have joined a currency union and thereby drop the Glick-Rose assumption of symmetry between currency union dissolutions and formations.[5] While exits have outnumbered entries by a large amount, some few examples of currency union entry in the post-war period are, fortunately, available. These include the decisions of the Bahamas and Bermuda to switch from a pound sterling link to the US dollar in the late 1960s/early 1970s and, more importantly, the accession of Mali and Equatorial Guinea to the CFA franc zone in 1984, followed by Guinea-Bissau in 1997; a detailed list of all (country pair-wise) switches into currency union in the Glick-Rose data set is provided in the appendix. These experiences, then, will provide the basis of the empirical analysis in the paper.

Second, I address the possible problem of aggregation bias in even greater detail. Following Nitsch (2002), I allow for differences in the trade effect of currency union entry across currencies/countries; that is, I provide disaggregate estimates. Moreover, I deal with potential nonlinearities in the data by exploiting a reduced (more homogeneous) sample. In particular, I examine (intraregional) trade flows within the CFA franc zone and compare the trade patterns of existing currency union members with (the evolution of) trade for late

[5] It should be noted that Glick and Rose (2002, p. 1134), defending their assumption, provide a short discussion on the symmetry of entries and exits. They find that the exit effect on trade is larger than the entry effect, but note that for some specifications the estimated coefficients are not statistically different from each other and, in addition, argue that entries tended to take place late in the sample which might have biased the estimated effect downwards (due to lags).

coming entrants; this approach is basically similar to Nitsch (2004a) and Micco, Stein and Ordoñez's (2003) case study of the formation of the European Monetary Union.

III. Empirical Methodology

To identify the common currency effect on trade, Rose (2000) applies a gravity model, a standard tool in the empirical analysis of trade flows, augmented with a dummy variable for country pairs that use the same currency. The equations to be estimated take the form:

$$(1) \qquad \ln(T_{ijt}) = \alpha + \beta_1 \ln(Y_i Y_j)_t + \beta_2 \ln(D_{ij}) + \gamma\, CU_t + \Sigma_k \delta_k\, X_{ijkt} \{+ \phi_{ij}\}\{+ \eta_t\} + \varepsilon_{ijt}$$

where T_{ijt} is the volume of trade between country i and j at time t in real US dollars; Y and D are the standard gravity variables, real GDP and distance, respectively; X is a set of other conditioning variables (that are typically found to affect bilateral trade flows), including (the log product of) real GDP per capita, dummy variables for a common language, a common land border, common membership in a regional free trade agreement, a common colonizer, current colonial status, previous colonial status, and territories that are part of the same nation (e.g., Guadeloupe and Réunion) as well as some geographic factors such as the number of islands and landlocked territories in the pair and the (log product of the) land area; $\{\phi_{ij}\}$ and $\{\eta_t\}$ are a comprehensive set of country pair- and time-specific fixed effects; and ε is a well-behaved residual.[6] The coefficient of interest is γ, the coefficient on the common currency dummy (CU).

In the actual implementation of this framework, I proceed in several steps. First, I estimate equation (1) for a large panel data set (taken from Glick and Rose [2002] and covering more than 200 countries for the period from 1948 through 1997 on an annual basis) using conventional OLS.[7] By including (only) year-specific intercepts, this specification essentially captures the cross-country variation in the sample so that γ gives the extent to which trade within currency unions deviates from trade between (otherwise identical) countries with separate currencies. If I then divide currency unions into those that were in

[6] Most of the explanatory variables are constant over time; these time-invariant factors are dropped (or, more precisely, subsumed in country-pair dummies) when the regression includes country pair fixed effects.

[7] The data set is obtained from Andrew Rose's website at http://faculty.haas.berkeley.edu/arose; see Glick and Rose (2002) for a detailed description of the data.

existence before 1948 and others that were established after that date, I am able to explore possible differences in the trade effect of common currencies for long-time currency union members and recent currency union entrants.

Next, I (additionally) allow for country pair-specific intercepts. This fixed-effects "within" estimator explores the time series variation around country-pair averages and therefore captures the effects of changes in currency union status on trade. The estimated coefficient on the currency union dummy now identifies the difference in trade, for a given pair of countries that has experienced a change in the common currency linkage, before and after the regime change. As Glick and Rose (2002) rightly note, this is the policy question of interest.

Finally, I repeat these analyses for a smaller subset of countries, focusing on the trade performance of countries that have entered the CFA franc zone. For this exercise, I no longer rely on the Glick and Rose (2002) data set, but compile the relevant data from original sources such as the IMF's Direction of Trade Statistics and International Financial Statistics.

IV. Results

I begin, as noted above, with a standard cross-section framework for the large panel data set taken from Glick and Rose (2002); the results are presented in table 1. In the first column, I replicate, for comparison, the (benchmark) regression results from Glick and Rose's table 2. Since the gravity coefficients take on the expected signs with (generally high) levels of significance that are standard in the literature, I focus my attention exclusively on the variable of interest, the currency union dummy. Glick and Rose define this variable to take the value of one for all country pairs in the sample that share a common currency; the estimated coefficient on this (pooled) variable indicates that trade between currency union members is about 2.7 (=exp[1.3]-1) times larger than trade between countries with different currencies, holding other things constant.

In the next column, I depart from Glick and Rose (2002) and replace the common currency dummy by a dummy variable for recent currency union entrants; this binary variable, which comprises a subgroup of the pooled currency union dummy, takes the value of one only for those country pairs in the sample which have (newly) adopted a common currency during the sample period (i.e., after 1948). As one would expect, the estimated coefficient on this variable is somewhat smaller in magnitude than the estimate of γ for the pooled currency union dummy since the common currency link has been in existence for a

shorter period of time.[8] Nevertheless, the estimates appear to be strikingly robust. In fact, economically, the trade effect is virtually indistinguishable between these two groups of currency unions. The effect falls somewhat if one explores the effect for (late) entries to the CFA franc zone and dollarizers separately (columns 3 and 4), but also for those cases the estimates of γ remain generally economically large and statistically highly significant.

The main shortcoming of this regression specification using conventional OLS with (only) year-specific intercepts is that it completely ignores the time series variation in the data. For instance, it is, in principle, easily possible that the γ estimates suffer from endogeneity bias, where trade between pairs of countries that form a currency union is already disproportionately large before the single currency is adopted (with intense trade relations possibly providing an incentive for the establishment of a monetary union). To avoid this bias and to fully exploit the panel features of the data set, I therefore add country pair specific fixed effects.[9] The results are reported in table 2. The first column, again, reproduces the results from Glick and Rose (2002); this time the common currency dummy captures the (pooled) effects of currency union entries and exits on trade. The γ estimate of 0.65 then implies that a change in currency union status is typically associated with a 90 percent (=exp[0.65]-1) change in trade. Based on their symmetry assumption, Glick and Rose (2002) conclude that this result "implies that joining a currency union leads bilateral trade to […] almost double."

The results change dramatically, however, if I (again) explore the effects for currency union entrants independently. As shown in columns 2 to 4, with this perturbation, the estimates of γ become essentially zero; the trade effect vanishes completely. This result suggests that Glick and Rose's pooled estimate is completely driven by the experience of currency union exits. There is, in contrast to Glick and Rose's claim, no evidence that currency union entry promotes trade.[10]

In a next step, I explore in more detail the trade effects of the adoption of the CFA franc by three independent countries. Equatorial Guinea and Guinea-Bissau, which were not

[8] Adding a separate dummy variable for the remaining currency unions in the sample, i.e., splitting up the original common currency dummy into to separate dummy variables, leaves the results unaffected.

[9] I have also experimented with a random effects specification. The results were basically unchanged.

[10] In view of the two findings that a pair of countries which has recently joined a currency union shares a disproportionate amount of trade, but experiences no measurable increase in trade intensity after the adoption of the common currency, estimation problems such as endogeneity and nonlinearities may be indeed a serious problem.

former French colonies, joined the CFA franc zone in 1984 and 1997, respectively; Mali rejoined in 1984, after it had left the arrangement in 1962. Given the already large number of member countries in the CFA franc zone, on accession, the acceding countries entered a monetary union vis-à-vis many countries simultaneously so that these episodes provide the overwhelming majority of observations on currency union entry in the Glick and Rose data set.

I begin, then, with an inspection of the raw data. Table 3 lists the shares of intra-regional trade by country. Interestingly, there is enormous variation; the shares range from a minuscule 1.5 percent for the Republic of Congo to 23.3 percent for Mali. Moreover, the intra-regional trade shares are generally low since most of the countries's trade is with industrial countries.

Figure 1 plots for the joining countries the evolution of bilateral trade with other countries in the CFA franc zone.[11] At least three observations are noteworthy. First, there is large cross-country variation in the availability of data. For some country pairs, there is no data at all available; for others, many observations are missing. Second, the quality of the data appears to be poor; there are some large fluctuations over time. Third, and most importantly, currency union entry (marked by a vertical line) generally had no visible impact on the bilateral volume of trade.

Tables 4 and 5 repeat the previous regression analyses for the CFA franc zone. To avoid that nonlinearities affect the results, the sample consists exclusively of CFA franc zone members. Hence, the entry dummy captures the extent to which trade of the countries that join the CFA franc zone deviates from trade between established currency union members. As shown in table 4, the γ estimate is slightly negative but close to zero and statistically insignificant for the pooled variable, while the results for individual entrants vary considerably. Most strikingly, the estimate for Mali, which was already a member of the CFA franc zone until 1962, is negative and highly significant; that is, Mali trades considerably less with other countries in the CFA franc zone than existing currency union members (and this despite the relatively high share of intra-regional trade in Mali's total trade). On the other hand, Equatorial Guinea appears to have very strong trade linkages with other member countries of the CFA franc zone. Bilateral trade involving Guinea-Bissau is not statistically different from average intra-CFA franc zone trade.

[11] Following Glick and Rose (2002), the volume of bilateral trade is the mean of the reported export and import values of the two countries and, thus, is derived from (in principle) four observations.

Table 5 basically confirms these (individual country) results for the fixed-effects specification. Mali's trade with other CFA franc zone members declines sizably after its re-entry to the currency union (holding other effects constant), while Equatorial Guinea experiences a dramatic increase in trade (by factor 18), and Guinea-Bissau's trade remains largely unchanged (possibly due to its very recent accession). Most notably, however, the joint estimate of γ for all three late entrants to the CFA franc zone is negative and statistically significant; the coefficient implies a decline in trade by about 26 percent (=exp[-0.31]-1). Although I do not intend to interpret this finding too literally (since it is possibly dominated by the experience of Mali), the result clearly adds to the skepticism about the trade-enhancing effects of currency union entry.

V. Summary

Current research on the "Rose effect", the finding that common currencies appear to promote bilateral trade, is mainly concerned with two (controversial) issues, namely: To what extent is the "Rose" finding affected by problems of the estimation procedure such as problems of pooling? And, to what extent does the finding suffer from problems of endogeneity; that is, what is the real effect on trade after the adoption of a common currency? A promising approach to deal with these two issues simultaneously is to analyze the recent formation of the European Monetary Union.

In this paper, I follow a different approach. I explore all currency union entries in the post-war period, and put a special emphasis on the experiences of the three African countries that have joined the CFA franc zone. The results generally confirm skeptic views about the "Rose effect". There is considerable heterogeneity in the trade effect across different countries, and there is no consistent evidence that the adoption of a common currency promotes trade.

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Table 1: Cross-Country Evidence on the Common Currency Effect on Trade

Currency union	1.30** (0.13)			
Currency union entrant		1.29** (0.31)		
CFA entrant			1.24* (0.60)	
Dollarizer				0.93* (0.41)
Log distance	-1.11** (0.02)	-1.12** (0.02)	-1.11** (0.02)	-1.11** (0.02)
Log product real GDP	0.93** (0.01)	0.92** (0.01)	0.93** (0.01)	0.93** (0.01)
Log product real GDP per capita	0.46** (0.02)	0.46** (0.02)	0.46** (0.02)	0.46** (0.02)
Common language	0.32** (0.04)	0.34** (0.04)	0.32** (0.04)	0.32** (0.04)
Common border	0.43** (0.12)	0.44** (0.12)	0.43** (0.12)	0.43** (0.12)
FTA	0.99** (0.13)	1.04** (0.13)	0.99** (0.13)	0.99** (0.13)
Landlocked	-0.14** (0.03)	-0.14** (0.03)	-0.14** (0.03)	-0.14** (0.03)
Island	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)	0.05 (0.04)
Log product area	-0.09** (0.01)	-0.09** (0.01)	-0.09** (0.01)	-0.09** (0.01)
Common colonizer	0.45** (0.07)	0.45** (0.07)	0.45** (0.07)	0.45** (0.07)
Current colony	0.82** (0.25)	0.82** (0.25)	0.82** (0.25)	0.82** (0.25)
Ever colony	1.31** (0.13)	1.31** (0.13)	1.31** (0.13)	1.31** (0.13)
Same nation	-0.23 (1.05)	-0.23 (1.05)	-0.23 (1.05)	-0.23 (1.05)
Year effects?	Yes	Yes	Yes	Yes
Country pair effects?	No	No	No	No
R^2	0.64	0.64	0.64	0.64
Root MSE	2.02	2.03	2.03	2.03

Notes:
Dependent variable is the log of real bilateral trade.
OLS. Clustering robust standard errors in parentheses.
**, * and # denotes statistically robust at the 1%, 5% and 10% level, respectively.
Number of observations = 219,558.

Table 2: Panel Evidence on the Common Currency Effect on Trade

Currency union	0.65** (0.05)			
Currency union entrant		0.08 (0.13)		
CFA entrant			-0.01 (0.16)	
Dollarizer				0.17 (0.30)
Log product real GDP	0.05** (0.01)	0.04** (0.01)	0.04** (0.01)	0.04** (0.01)
Log product real GDP per capita	0.79** (0.01)	0.80** (0.01)	0.80** (0.01)	0.80** (0.01)
Year effects?	Yes	Yes	Yes	Yes
Country pair effects?	Yes	Yes	Yes	Yes
R^2 (within)	0.12	0.12	0.12	0.12
R^2 (between)	0.23	0.22	0.22	0.22
R^2 (overall)	0.22	0.22	0.22	0.22

Notes:
Dependent variable is the log of real bilateral trade.
OLS. Clustering robust standard errors in parentheses.
**, * and # denotes statistically robust at the 1%, 5% and 10% level, respectively.
Number of observations = 219,558.
Controls not reported: FTA membership; current colony.

Table 3: CFA Franc Zone: Intra-Zone Trade, 1970-93

CFA franc countries

	Share of Intra-CFA Franc Zone Trade
Benin	5.1
Burkina Faso	22.0
Cameroon	6.1
Central African Republic	3.5
Chad	14.5
Congo, Republic of	1.5
Cote d'Ivoire	7.6
Equatorial Guinea	16.6
Gabon	2.6
Mali	23.3
Niger	6.3
Senegal	9.0
Togo	6.5
Average for CFA franc countries	*8.9*

West African CFA franc countries

	Share of Intra-CFA Franc Zone Trade
Benin	5.1
Burkina Faso	22.0
Cote d'Ivoire	7.6
Equatorial Guinea	16.6
Mali	23.3
Niger	6.3
Senegal	9.0
Togo	6.5
Average for West African CFA franc countries	*10.6*

CFA franc countries

	Share of Intra-CFA Franc Zone Trade
Cameroon	6.1
Central African Republic	3.5
Chad	14.5
Congo, Republic of	1.5
Equatorial Guinea	16.6
Gabon	2.6
Average for Central African CFA franc countries	*8.9*

Note: Data on Guinea-Bissau is missing.
Source: Hadjimichael and Galy (1997)

Table 4:
Cross-Country Evidence on the CFA Franc's Effect on Trade of Entering Countries

CFA entrant	-0.10 (0.14)			
CFA entry Mali		-0.42* (0.17)		
CFA entry Equatorial Guinea			0.76** (0.23)	
CFA entry Guinea-Bissau				-0.05 (0.28)
Log distance	-0.22** (0.08)	-0.23** (0.08)	-0.23** (0.08)	-0.22** (0.08)
Log product real GDP	1.29** (0.04)	1.31** (0.04)	1.35** (0.04)	1.29** (0.04)
Log product real GDP per capita	-0.47** (0.05)	-0.48** (0.05)	-0.51** (0.05)	-0.48** (0.05)
Common border	2.34** (0.12)	2.34** (0.12)	2.31** (0.12)	2.34** (0.12)
Landlocked	-1.41** (0.08)	-1.37** (0.08)	-1.38** (0.08)	-1.41** (0.08)
Year effects?	Yes	Yes	Yes	Yes
Country pair effects?	No	No	No	No
R^2	0.56	0.56	0.56	0.56
Root MSE	1.63	1.63	1.63	1.63

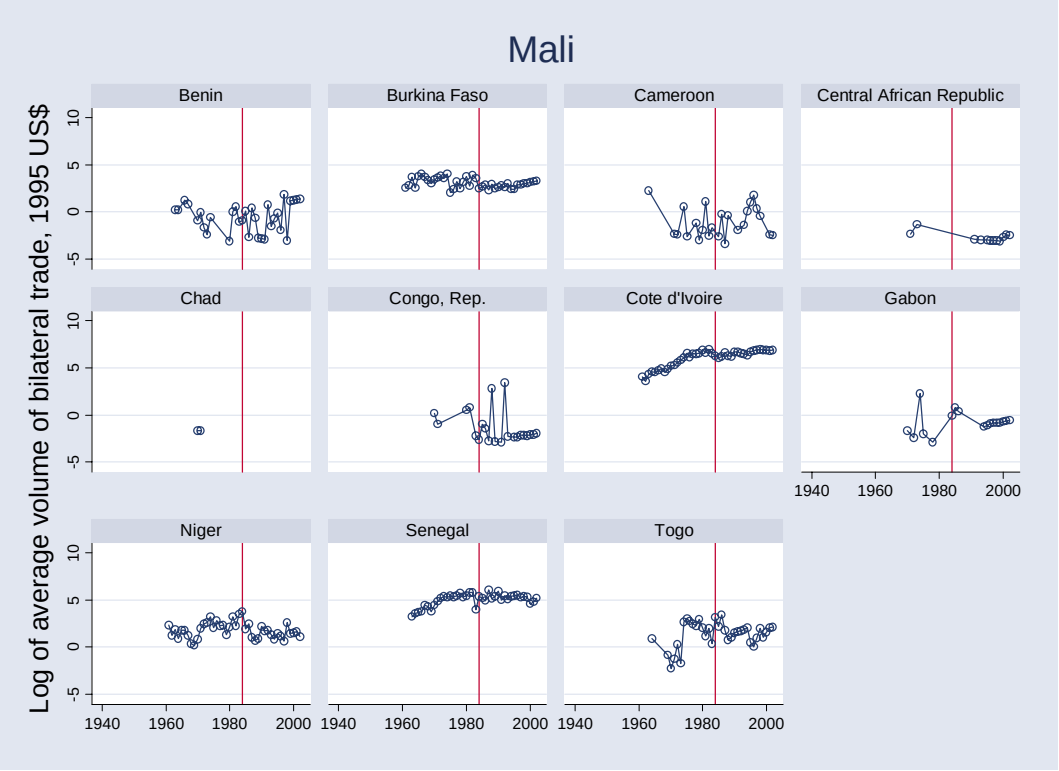
Notes:
Dependent variable is the log of real bilateral trade.
OLS. Clustering robust standard errors in parentheses.
**, * and # denotes statistically robust at the 1%, 5% and 10% level, respectively.
Number of observations = 2,078.

Table 5:
Panel Evidence on the CFA Franc's Effect on Trade of Entering Countries

CFA entrant	-0.31* (0.12)			
CFA entry Mali		-0.46** (0.13)		
CFA entry Equatorial Guinea			2.91** (0.56)	
CFA entry Guinea-Bissau				-0.39 (0.30)
Log product real GDP	0.46** (0.08)	0.47** (0.08)	0.38** (0.08)	0.43** (0.08)
Year effects?	Yes	Yes	Yes	Yes
Country pair effects?	Yes	Yes	Yes	Yes
R^2 (within)	0.14	0.14	0.15	0.14
R^2 (between)	0.32	0.35	0.04	0.33
R^2 (overall)	0.21	0.21	0.08	0.20

Notes:
Dependent variable is the log of real bilateral trade.
OLS. Clustering robust standard errors in parentheses.
**, * and # denotes statistically robust at the 1%, 5% and 10% level, respectively.
Number of observations = 2,109.

Figure 1: The Evolution of Trade for CFA Franc Zone Entering Countries



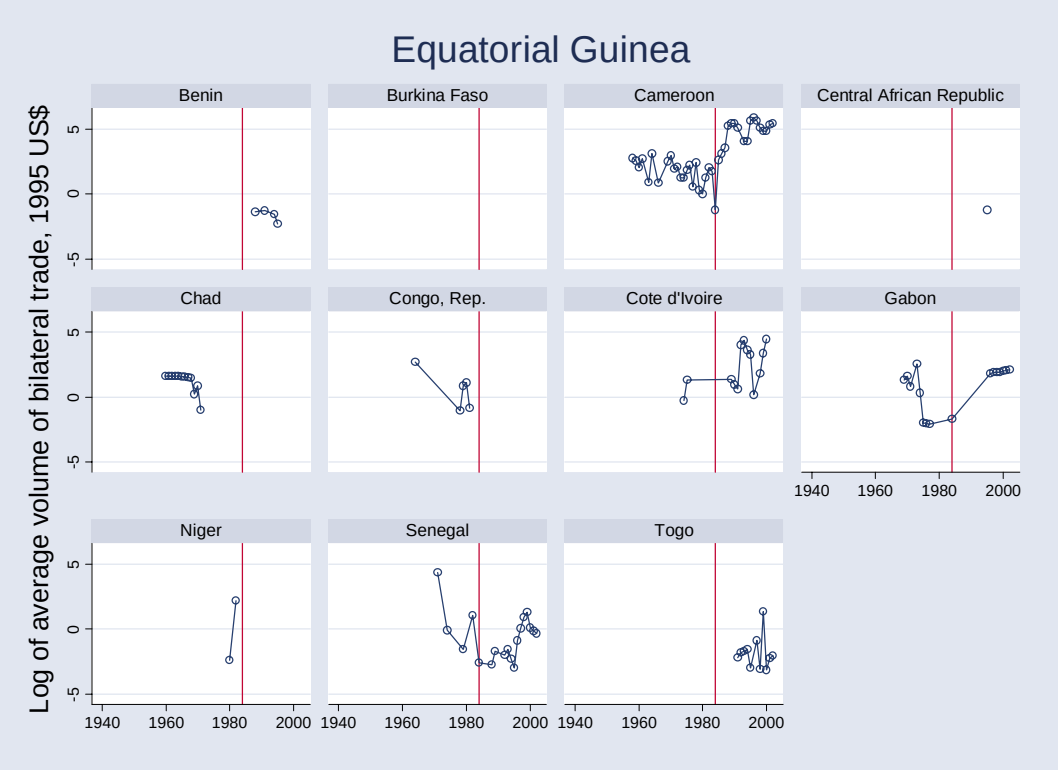
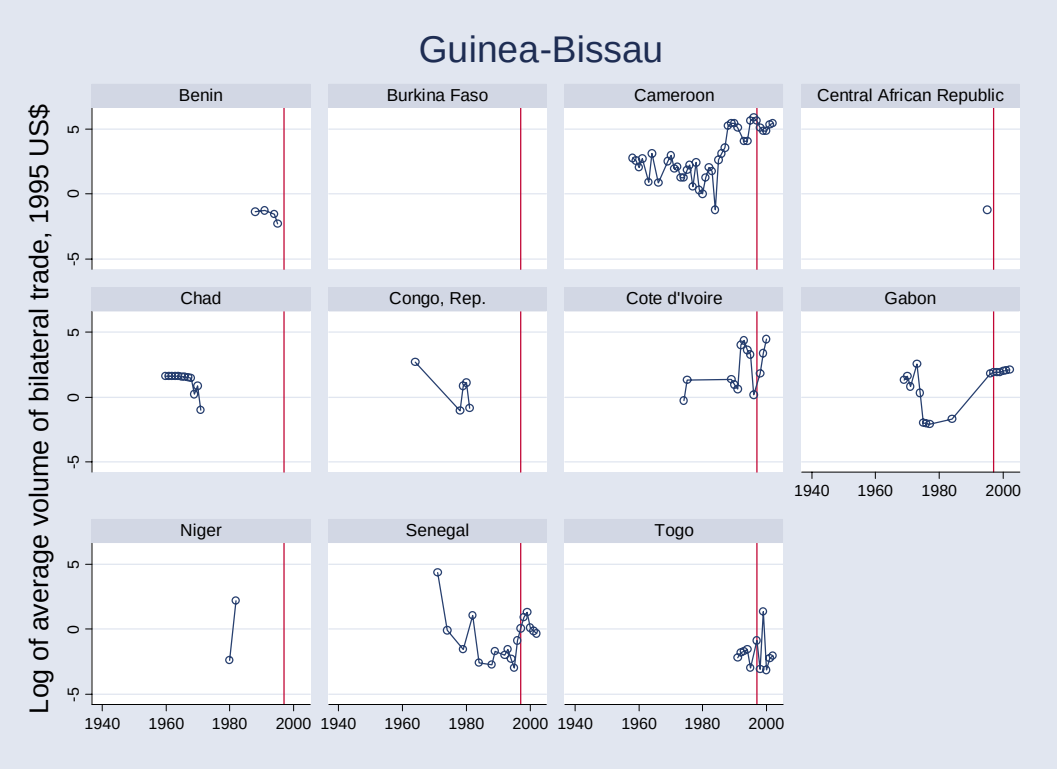


Figure 1 (continued):



Note: The vertical line marks the entry date.

Source: Direction of Trade Statistics.

Appendix: Switches into Currency Union in the Glick and Rose (2002) Data Set

Currency union members		First year in currency union (in the sample)
Benin	Guinea-Bissau	1997
Benin	Mali	1984
Benin	Togo	1963
Cameroon	Equ. Guinea	1985
Cameroon	Guinea-Bissau	1997
Cameroon	Mali	1984
Central Afr. Rep.	Mali	1991
Congo, Rep.	Mali	1984
Congo, Rep.	Togo	1964
Cote d'Ivoire	Mali	1984
Cote d'Ivoire	Togo	1963
Equ. Guinea	Cote d'Ivoire	1989
Equ. Guinea	Senegal	1985
France	Reunion	1976
France	St. Pierre & M.	1976
Gabon	Mali	1984
Guinea-Bissau	Cote d'Ivoire	1997
Guinea-Bissau	Senegal	1997
Guinea-Bissau	Togo	1997
Guinea-Bissau	Burkina Faso	1997
Mali	Niger	1984
Mali	Senegal	1984
Mali	Togo	1984
Mali	Burkina Faso	1984
Niger	Togo	1963
Senegal	Togo	1963
Togo	Burkina Faso	1966
Qatar	U.A.E.	1981
United Kingdom	Kuwait	1961
United Kingdom	Oman	1970
United States	Bahamas	1966
United States	Bermuda	1970

Notes: The total number of observations in the data set is 426,792, but about one-half of these observations are not used in the regressions because relevant information is missing. Also note that the listing of Togo as a currency union entrant is largely for technical reasons. As a member of the CFA franc zone, Togo introduced a national currency on January 1, 1963 but resumed using the CFA franc on November 27, 1963. The Togolese franc was equal to the CFA franc and existed only as a unit of account, not as notes or coins (see Kurt Schuler's website at http://users.erols.com/kurrency/africa.htm).