

*The EMU, The Euro, The Bipolar International
Monetary System and The Sub-Saharan Africa
Economies: “A Primer”*

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Motivation

One of the most important events related to the world economy during the eighties and nineties decades is the formation of the European Monetary Union (EMU) and the creation of the euro. From this arrangement a new economy — as large as the United States economy — has emerged. Moreover, the euro is expected to compete with the dollar. This implies the advent of a bipolar international monetary system.

Before the completion of the process that led to the EMU creation, open macro-economics researchers have focused their analyses on the probable implications of this important change in the international economic architecture. Besides the literature on the internal aspects of the functioning of the European monetary area, many studies have analyzed the external implications of the EMU and the birth of the euro. Prospective analyses of the EMU implications were performed for Eastern and Central Europe, Asia, Latin America and the world economy. But as far as we know, there are no published research papers devoted either to a rigorous analysis of the relationships between EMU and African countries or to the implications of the euro for African monetary policies. Nevertheless, as stressed below, the EMU is the main trading partner of many African countries and the euro is currently the nominal anchor of the domestic currency in a good number of African countries. Our main contribution to the economic literature is to fill this gap.

It seems to us useful to investigate, on the one hand, the implications of the economic activity and the monetary policy in EMU for Africa and, on the other, the consequences of the functioning of a bipolar international monetary system. This dissertation deals

with two main issues. First, we want to provide a theoretical basis to analyze the implications of either the functioning of the bipolar international monetary system or the European Central Bank monetary policy on African economies. Second, we carry out an empirical investigation of the relationship between the economic activity in EMU and some Sub-Saharan Africa's economies as well as between the euro-dollar exchange rate and the trade balances of some Sub-Saharan Africa countries.

Plan of the Thesis and Methodology

We divide this dissertation in two parts. The first one is devoted to the theoretical issues while the second one contains the empirical investigation of the relationships between the EMU and African economies. Each of the two parts has in turn two chapters that treat different aspects of our study. We provide below the plan of the thesis jointly with the specific methodology related to each chapter.

Chapter 1 treats the implications of the monetary interdependence of large economies on small economies which are affected by the actions of the large economy policy-makers. The tool of analysis is the Canzoneri-Henderson (1991)–like model of monetary interdependence. It focuses on the issue of cooperation in monetary policy design in a theoretical game approach.

This model and its variants have been largely used to address the issues induced by the EMU or the euro advent. Canzoneri and Henderson (1991), Benassy-Quéré et al. (1997) and Ghironi and Giavazzi (1997, 1998) are some relevant examples that summarize the evolution of use of the model. The authors deal with various types of strategic monetary policies by means of three country models that help to draw some insights. For instance, Canzoneri and Henderson (1991) use a symmetric model to conclude that the cooperation between two of the three policymakers may be counterproductive, while Benassy-Quéré et al. (1997) explore the possible behavior of the euro as two of the three countries choose to form a monetary union. A symmetric framework is assumed to get analytical solutions of the model; on the one hand, the symmetry is assumed for two small countries that play a cooperative game by setting up a monetary union, on the other hand the size of two countries taken together is identical to the size of the large country. In addition, all the behavioral equations of these models are identical.

Ghironi and Giavazzi (1997; 1998) introduce a very interesting feature in their model. They assume an asymmetry in the country sizes in order to stress the impacts of the size on the policymaker welfare under various monetary and exchange rate regimes. The combination of two size parameters allows them to build up a model that

helps to generalize the results of symmetric models. Of course, analytical solutions of these models are difficult to interpret. Numerical solutions are then used. Despite the interesting model's feature of asymmetry in size, a weakness persists; especially the assumption of identical behavioral equations in all countries. The fact is that developing countries are structurally different from developed countries.

In this chapter we extend the monetary interdependence discussion by including the case of a very small developing country that does not have any impact on its large trading partners. Hamada (1998) uses a similar framework to study the implications of different exchange rate regimes in a bipolar international system in which two currencies dominate. A departure of our model from his is that we explicitly introduce particular developing country features like the lack of wage bargaining and the commodity-biased composition of exports. Moreover, we use for the small country a loss function that expresses the concern of insulating the domestic economy from the externalities of large economy monetary policies in order to avoid disturbances in the domestic financial sector. The real world situation we have to analyze through this model is the implication of the EMU versus US monetary game for a typical small developing, especially a Sub-Saharan African country.

In sum, we focus on the financial sector stability concern of a small developing country policymaker. This small country is imperfectly integrated into international financial markets but its trading flows are invoiced in the two leading currencies. We show that given the kind of shocks that affect large economies, cooperation between their policymakers could be either a counterproductive or a good contingency for the small country. Nevertheless, the cooperation between them turns out to be the best solution for a small developing country when both the bilateral exchange rate of the large countries is affected by disturbances and this exchange rate is the main channel through which the asymmetric shock is transmitted to the small country.

Of course, we cannot omit to particularly address the issue of pegging a currency to the euro. We wonder whether the differences between the monetary policy design in the EMU and in Africa and the political instability that affects African countries are compatible with the use the euro as a nominal anchor to gain credibility in monetary policy design. This issue is very interesting as the fixed exchange rate regime is still largely used in Africa. It is dealt with in the following chapter.

Chapter 2 tackles the issue of EMU advent and the anchorage of African currencies. As a country sets a peg for its currency, the monetary policy credibility it expects to gain implies that its anti-inflationary performance has to be as similar as possible to that of the anchor country. Failing to attain this goal can lead to speculative attacks

against the currency parity (Obstfeld, 1996, 1997; Daniel, 2001; Rasmussen, 2002). This is an insight from models of credibility in monetary policy through fixed exchange rates regimes. In addition, multiple equilibria embedded in these models may cause speculative attacks rendering the efficiency of fixed exchange rate regimes questionable.

Contrary to this theoretical insight, the franc zone continues to work despite the disinflation process in the European Union. This process is likely to have increased the level of the constraints related to the use of the euro as an anchor. In this chapter, we look for an answer to this issue before treating the implications of various structural asymmetries.

The tool of analysis is an extension of an open economy credibility model initiated by Obstfeld (1996) and also used by Rasmussen (2002). It belongs to a class of fixed exchange rate regime models in which credibility follows from an exogenous cost of reneging (see Flood and Isard, 1989; Obstfeld, 1996, 1997; Rasmussen, 2002). This class departs from another class of models in which the cost of reneging is endogenously determined¹ (de Kock and Grilli, 1993; Andersen, 1998). Obstfeld (1996) and Rasmussen (2002) show that a multiplicity of equilibria features the peg of a domestic currency and the higher the cost of reneging the more stable the fixed exchange rate regime will be. They implicitly suggest an infinite aversion to inflation in the anchor country. Using an extended model, we provide the first attempt to formally shape the CFA zone “operations account” mechanism in a monetary model.

One consequence of this mechanism is the confidence of private agents in the ability of the French Treasury to provide the needed external reserves to African central bankers as foreseen in the related agreements. We assume that the private agents always expect that the peg will be maintained and they set their expected inflation to zero. Relying on the infinite aversion to inflation in the anchor country and the zero expected inflation in a typical CFA country, we show how the existence of this particular arrangement in the CFA zone allows to get a framework without multiple equilibria. This insures the stability of the system.

Next, we relax the implicit assumption of infinite aversion to inflation in the anchor country and that of zero expected inflation in a typical CFA country. We introduce two kinds of structural asymmetry relative to African economies to show, firstly, that when the African central banker pursues an optimal monetary policy, without the “operations account” mechanism, the EMU advent is likely to have increased the constraint related

¹For example, Andersen (1998) suggests a framework in which the credibility of the ex-ante fixed exchange rates regime is state-dependent and depends on the future losses induced by inflation bias that is related to future exchange rate expectations.

to a currency peg to the euro, leading to a more restraining peg. Then, we also show that a more instable general economic and political environment that features African countries makes the peg to the euro more difficult to sustain.

Finally, we adapt the *optimal contracts* argument of Walsh (1995) by introducing the extent of a devaluation as an intermediate target of monetary policy to suggest a way to dampen the additional restraints of the currency peg that stem from the presence of structural asymmetries.

It follows from the results of our framework that the “operations account” and the virtual convertibility it offers to the CFA franc is the main factor of the long lasting existence of the CFA zone. Without this mechanism, the advent of the euro and the very conservative European Central Bank policy on the one hand, and the bad economic and political environment faced by some African countries, on the other, make the peg to the euro more restraining. These insights also hold for the planned monetary union of West Africa. If the peg to the euro is adopted for the future single currency of this monetary union, a possible way to address the consequences of the invoked asymmetries will be to institute the independence of the future central banker and an intermediate target for monetary policy, namely the extent of devaluation if it occurs.

The second part of the thesis contains the third and the fourth chapters which cover the empirical investigation of the economic and monetary links between EMU and Sub-Saharan Africa.

Chapter 3 is devoted to the extent to which the economic activity in EMU can affect the African economies, mainly the economies of Central and Western African countries and Madagascar. After identifying possible theoretical channels of transmission, we test whether the relevant economic variables in Africa are sensitive to the fluctuations of European economic activity. We use a bivariate time series analysis to deal with correlation between different variables of interest.

To capture the cyclical component of EMU economic activity, we attempt to build composite indexes proposed by Stock and Watson (1989) for European countries’ GDP, wholesale prices and consumer prices. In fact, we attempt to build a Stock & Watson-like coincident index with a single type of variable but belonging to the various EMU country members².

²Originally, Stock and Watson (1989) used a linear dynamic factor model to build a composite index with different type of variables, especially industrial production, real personal income, manufacturing and trade sales index and employment. They retained these variables to estimate a single unobserved variable called “the state of the economy”. Thus, by the term *composite* used below in this dissertation we do not mean “constructed with various types of national economic variables”, but “constructed with similar variables of various European countries”.

Because we managed to construct such indexes only for wholesale and consumer prices, EMU GDP series appearing to be cointegrated, the EMU business cycle is simply captured through the cyclical component (the first differences) of the real GDP series of EMU provided by the OECD. This is a common practice as it is admitted in the business cycle literature that business cycles can be designed from a single series of either GDP or industrial production (Artis et al., 2003; Massman and Mitchell, 2003). The first differences of the indexes obtained with wholesales and consumer prices are respectively interpreted as the indicators of the production prices convergence and that of monetary policy integration in the Euro area. Indeed, there is an empirical evidence of business cycles and monetary convergence in the EMU area, even if the converse is also found in the literature.

In the next step we use EMU indicators of cyclical economic activity and monetary policy to perform a bivariate analysis, using African country variables of interest. In fact, we empirically investigate a possible transmission of the European business cycle to Sub Saharan African countries. This analysis includes Granger causality tests that complement the analysis of cross-correlation coefficients.

We find that, as regards the real economy, there is a limited transmission of European economic fluctuations to Sub-Saharan Africa despite the appealing theoretical linkages between the two regions. Conversely, in the monetary sphere we manage to disentangle a robust link between the European and African inflation rates. In particular, we find that inflation in CFA countries is led by the European monetary policy by more than one quarter in some cases. This is the empirical evidence of the “operation account” mechanism implication we theoretically treat in the second chapter.

Chapter 4 tackles the behavior of the euro and its implications on the trade balances of some African countries. This essay makes the link between two kinds of literature. The first literature is devoted to the prospective study of the euro before its advent. The debate on the behavior of the euro was inconclusive because some studies argued that the euro was expected to be a volatile currency in comparison to the former European monies (see for example Benassy-Quéré et al., 1997; Cohen, 1997), while others concluded that the coming euro would be less volatile than the preceding European currencies (Martin, 1998; Benassy-Quéré and Mojon, 2000). Thus, an interesting issue arises: Is the behavior of the euro meaningful for African trade balances?

Our typical African country is assumed to have its exports mostly invoiced in dollar while its imports are mostly invoiced in euro. This specification rests on the second kind of literature we consider, namely the literature on trade invoicing. In sum, this

literature argues that trade of primary goods is in general invoiced in dollar while trade in general is invoiced in the currency of the biggest partner (see for example ECU Institute, 1995; Bacchetta and van Wincoop, 2002; Donnenfeld and Haug, 2003).

We begin our analysis by providing an analytical framework of our typical Sub-Saharan Africa's country trade balance. Considering two periods, i.e., before and after the euro, we show how the behavior of the euro can directly affect the trade balance of our typical country and we argue that a more volatile euro could therefore make this trade balance more volatile.

We perform a bivariate analysis using the transfer function model methodology as we assume that an African country trade balance cannot have in turn any impact on the behavior of the euro vis-à-vis the dollar. Our aim is then to look for a possible transmission of the euro behavior on African trade balances.

An important challenge for our study is to perform an econometric analysis despite the weakness of the African country data. A reason why only a few studies focus on African countries is the scarcity and the doubtful quality of data which make empirical investigations difficult to undertake. Nevertheless, we can follow Hoffmaister et al. (1998a) by tackling this problem and attempting to draw some interesting information from existing data. The trade balances we consider are those of the bilateral trade between EMU and each of the studied African countries.

We find that, among the ten African countries for which appropriate data are available, the impact of the euro-dollar exchange rate on the trade balance is significant only for Benin. The result is robust when we fit data with the multivariate Vector Error Correction Model methodology. We conclude that the behavior of the euro against the dollar is likely to affect typical Sub-Saharan African countries, but only a limited number of these can be affected. A more volatile euro will not necessarily imply greater volatility for all African trade balances.

In summary, this dissertation brings together various theoretical and empirical tools to undertake an innovative analysis of Sub-Saharan Africa's economies. It takes into account the context of a bipolar international monetary system and asymmetric economic relationships with the European Monetary Union. Through four chapters, theoretical implications of a bipolar world and the euro behavior are highlighted for Sub-Saharan Africa's countries, as well as the constraints of pegging a currency to the euro. The empirical investigation we carried out supplements the theoretical analysis and achieves to confirm that analytical tools can be used in order to spread out the economic literature devoted to African economies, as the international economic architecture is evolving.

