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**Article**

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## Berichte

### **Credibility of Monetary Policy in a Currency Area: The Case for the Franc Area\***

By Samuel Ngogang,\*\* Yaoundé/Kamerun

#### **I. Introduction**

The eighties are characterized by an increasing impact of the policy credibility issue on macroeconomic models. The credibility issue raised by *Fellner* (1976), is immediately linked to the problem of rules versus discretion in macroeconomic policies. It has been argued by many economists that discretion, particularly in monetary policy, is an anomaly since such a policy strategy seemed to be synonymous with flexibility leading to a destabilization of the economic process. Arguments for rules first were motivated by liberal ideas according to which discretionary policies may not improve the survival of an economic system based on free private sector [*Simons* (1948); see also *Fischer* (1988)].

In fact, it seemed to these liberal economists to be the case that policymakers have only an imperfect knowledge about the economy, and that they further unknown goals, possibly motivated by political or other interest groups pressures [*Friedman* (1969)]. Under such a regime of discretion the criteria for judging the performance of monetary policymakers ought to be more than imprecise so that the public opinion will be unable to scrutinize the political outcomes. *Kydland* and *Prescott* (1977) changed the perspective on rules versus discretion, looking at rules as a form of commitment of policymakers, where a commitment is considered as a binding contract [*Barro* (1986a)] which specifies ex ante the actions to be taken in a way to make the ex post outcomes time consistent. The debate about rules versus

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discretion in monetary policy raises the problem of alternative policy rules for monetary management, in which the credibility of policymakers becomes a crucial element of a sound monetary policy.

These issues will be discussed in the 3<sup>rd</sup> section in connection with the implementation of monetary policy in Central Africa, which in the present context corresponds to the so-called BEAC-Zone. But it seems advisable to give first an overview on the institutional framework underlying the monetary policy within this area, a monetary union comprising Cameroon, Central Africa Republic (CAR), Chad, Equatorial Guinea and Gabon. This overview will be taken up in the 2<sup>nd</sup> section. The last section will summarize up the major findings of the analysis.

## II. The Institutional Framework

The so-called BEAC-Zone is a monetary union which can be defined according to two criteria [Nsouli (1981)]:

- The central Bank issues a common currency for all member countries of the monetary union;
- It determines the common monetary policy.

These criteria are well understood by looking at the effective structure of this monetary union.

### 1. The Structure of the BEAC-Zone

In this area the Bank which is in charge of the common monetary policy is the “Banque des Etats de l’Afrique Centrale – BEAC –” created in November 1972.<sup>1</sup> The BEAC is (forerunner of) the former Central Bank of Equatorial Africa’s States and of Cameroon (Banque Centrale des Etats de l’Afrique Equatoriale et du Cameroun – BCEAEC). Up to 1955 the “Caisse Centrale de la France et d’Outre-Mer-CCFOM –” issued the currency in the French territories of Equatorial Africa whereas the coins were issued till 1957 by the French Treasury. The BCEAEC obtained the full monetary power (prerogatives) in 1959.<sup>2</sup> All BEAC’s member countries are also mem-

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<sup>1</sup> The member countries of the BEAC-Zone are: Cameroon, Central African Republic (CAR), Chad, Congo, Equatorial Guinea, Gabon, Equatorial Guinea is member since 1. 1. 1985.

<sup>2</sup> For a more extensive discussion of the historical evolution of the Franc area in general, see Bloch-Laine et al. (1956); La Fousnière (1970); Guillaumont / Guillaumont (1984), Neurisse (1987).

bers of the Central Africa's Customs and Economic Union (Union Douanière et Economique de l'Afrique Centrale – UDEAC –) created in 1965.

A main characteristic of the BEAC-Zone is the fact that this monetary union is together with the West African Monetary Union (Union Monétaire Ouest-Africaine – UMOA) the two monetary unions of the Franc area. Although they are supposed to pursue the same policy as members of the franc area the two monetary unions are quite different with respect to the instruments.

In fact, the Franc area is characterized by three central features [see also *Guillaumont / Guillaumont* (1984)]:

- The convertibility
- The fixed parity
- The pooling of international reserves in the so-called “operations account”.

This will not be an extensive study of the functioning of this monetary area. Only those features referred to the notion of credibility seem to be worth analyzing in the present paper. This is particularly the case with the exchange rate system and the monetary role of the operations account. Before looking at both features it is worth characterizing the BEAC-Zone as a monetary union.

The BEAC-Zone has been created by the convention of monetary co-operation between the member states (Cameroon, Chad, Congo, Central African Republic, Gabon) in November 1972. Later on (1985) Equatorial Guinea joined the five founding members. The two organs which must execute the convention are the monetary committee and the Banque des Etats de l'Afrique centrale (BEAC).

The monetary committee is composed by the Ministers in charge of Finance and Economic Affairs (art. 4). This committee has to supervise the execution of the convention's dispositions. The main executive body is nevertheless the BEAC itself. This institution is ruled by a governing board (conseil d'administration) of 13 members (Cameroon 4, Gabon 2, CAR 1, Chad 1, Congo 1, Guinea 1 and France 3) – art. 34. The governing board takes the major monetary policy decisions such as the determination of the rediscount rate, the rediscount ceilings and other term credit facilities allowed to each member state. These decisions are implemented by an executive board represented by a governor and a deputy-governor of the BEAC appointed for 5 years by the governing board.



At the level of each member state the BEAC is represented by the National Monetary Committee (*Comité Monétaire National*) ruled by a Director also appointed by the governing Board of the BEAC. Its main function consists in assessing the financing needs of the economy as far as short, medium and long term credits are concerned.

The last body concerned with the ruling of the Central Bank is the so-called “Collège des Censeurs” (auditors) comprising three members, 1 from Cameroon, 1 from Gabon (representing the other member states) and 1 from France.

## 2. Targets and Instruments of Monetary Policy

The implementation of monetary policy in Central Africa follows three major principles as has already been mentioned the illimited convertibility of FCFA into French Franc (FF), the pegged exchange rate and the pooling of reserves.

All these features are imbedded in each other. The “operations account” held with the French Treasury is the fundament for the external FCFA convertibility, and the pegged exchange rate (1 FF = 50 FCFA) is seen as a means to insure monetary stability. As it is officially stated, the BEAC’s major function is “to preserve the internal and external value of its currency” (see *BEAC* 1983, *Talom* 1986). This can be seen either as an ultimate target or a basis for an operating rule for monetary policy. The BEAC usually makes a difference between two sets of instruments used in the attempt to realize its ultimate target. The BEAC names them quantitative and qualitative instruments (see *BEAC* 1983; see also *Talom* 1986).

Among the quantitative measures there are:

- The determination of refinancing credit ceilings for each member country and the allocation of global quotas to individual banks;
- The so-called “encadrement du crédit”, which means that the Central Bank fixes for every year a “norm of progression” for credit expansion;
- Required reserves, which have been applied in the BEAC Zone only in 1978 in Gabon.
- Another worth mentioning quantitative measure are the “advances” of the Central Bank to the Treasuries of the members states. Such advances must be backed up by ordinary budgetary receipts up to 20% of the last fiscal year’s receipts.

The qualitative measures used by the BEAC operates through the following instruments:

- The selectivity through discount rates, among which one can distinguish between the normal rate, the privileged rate, the rate for advances to the treasuries and the penalty rate.
- The selectivity through individual credit ceilings, following both analysis of the firm's financial structure and its economic relevance.
- Some required ratios such as:
  - the so-called “coefficient d'emploi des dépôts et crédits non réescomptable” (a maximum of 25% from demand deposits and 50% from time deposits can be allocated to non-rediscountable credits);
  - the liquidity coefficient (coefficient de liquidité), which is a ratio between liquid assets and short-term liabilities. This ratio is 70% for Cameroon, 75% for CAR, Congo, Gabon and 80% for Chad;
  - the ratio of own resources; this is a ratio of Bank's own resources and expanded credits.
  - the control of risks of non-reimbursements; this is done through the publication of a “Centrale of risks” for each member state, aimed at sampling all firms' and individuals' liabilities with banks.

As has already been assessed, this set of instruments except the case of exchange control which is the responsibility of each member state – is aimed at stabilizing the internal and external value of the FCFA issued by the BEAC. In other words, internally the purchasing power of the FCFA, i.e. a low inflation rate, is a target for monetary policy. At the external level the BEAC must insure, if ever, the convertibility of its issued FCFA. This last requirement is in fact the core of the agreement on monetary co-operation between the BEAC's state members and France, and relies heavily on the agreement on the operations account. The pooling of international reserves is the necessary condition for the “unlimited” convertibility of FCFAs into FF. The major elements of the agreement on the operations account with respect to monetary management are the following [see BEAC 1988; pp. 19 - 21]:<sup>3</sup>

When there is a debit balance of the operations account the BEAC will pay on this balance interests according to the following scheme:

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<sup>3</sup> This is in fact the supplementary agreement signed in Libreville (Gabon) in 1975, and is a modification of article 6 of that agreement.

- A 1 %-rate for an amount between 0 and 5 Mio. FF;
- a 2 %-rate for an amount between 5 and 10 Mio. FF;
- for an amount over 10 Mio. FF the corresponding rate is the arithmetic mean rate of short-term money market rates set by the Banque de France for public bills during the current quarter;
- In the case of credit balance of the operations account the corresponding rate is the above-mentioned short-term market rate.
- The BEAC will pay in to the account its whole international reserves acquired outside its issue area except for the amount necessary for its cash management ... (art. 3).

According to article 11 of the BEAC's statutes, [see BEC (1988)], a share of these international reserves can be deposited with foreign central banks or used to acquire negotiable bonds expressed in convertible currencies, with a maximum of two-year-term issued by international financial institutions ... The accumulated sum of such operations cannot exceed 35% of the BEAC's net foreign assets, aside from the gold share and the special drawing rights (SDR) at the International Monetary Fund (IMF). A set of measures has been provided for in the case where a member country runs a debit balance in the operations account [see art. 1: BEAC (1988)]. Another worth mentioning point is the exchange guarantee applied in the case of a credit balance of the operations account [see also *Guillaumont / Guillaumont* (1984; pp. 72 - 75)].

According to the described institutional framework, however related to the BEAC-Zone as an example for the CFA-countries, the question arises as to what extent the BEAC, as well as the BCEAO<sup>4</sup>, can promise to "preserve the internal value of its currency issued in six different member countries". On the other hand, the Central Bank must preserve the external value of its currency (convertibility through the mechanism of the operations account) within a fixed parity-exchange rate system. For all these reasons it seems obvious that the central banks in the CFA-countries, as some concrete examples will enhance below, must rely on discretionary policies to further their targets.

This issue raises the so-called time-inconsistency problem, which is directly related to the credibility problem for such central banks in convincing their respective public of their commitment to the announced policy, i. e. in fact a constant quantity of purchasing power [see also *A. Sibert / S. E. Weiner* (1988)]. The related theoretical background and its implications for

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<sup>4</sup> BCEAO = Banque Centrale des Etats de l'Afrique de l'Ouest.



the analysis of monetary policy in the CFA-countries build the subject of the next section.

### III. The Credibility Approach to Monetary Policy-Making

#### 1. Theoretical Foundations

The credibility concept explicitly introduced in the theory of macroeconomic stabilization policy by *Fellner* (1976) [see also *Fellner* (1982); *Harberler* (1980)] relied heavily on one of the most widely accepted assessments of monetary theory, namely that persistent inflation is a monetary phenomenon. In this sense it becomes necessary to know the reasons for persistent increases in the money stock, i.e. to investigate the motives and constraints facing central bankers who decide the increases in the money stock.

One of these motives explained within the traditional framework developed by *Phillips* (1958) or its much more modern version, the so-called expectations augmented Phillips curve. Here, there is a trade-off between expected inflation and unemployment, and the policymakers are tempted to use inflation surprises in order to reduce unemployment [see also *Lucas* (1979)].

The concept of policy credibility becomes a fundamental one because “the ability of monetary policymakers to achieve their future objectives depends on the inflationary expectations of the public” [*Cukierman*; (1986 p. 5)]. But such inflationary expectations depend, in turn on the public’s evaluation of the credibility of the central bankers. So, “the less credible disinflationary policies are, the longer and the more severe their interim adverse economic effects will be” [see also *Cukierman* (1986; p. 5)]. The theoretical literature defines credibility in different ways. One of the definitions stresses “credibility as the extent to which the public believes that a shift in policy has taken place when, indeed, such a shift has actually occurred [*Cukierman* (1986; p. 6)]. Some define credibility more clearly in the sense of ex post optimal policy [*Persson* (1988)]. The understanding of this type of definition supposes an understanding of the link between three types of concepts: credibility, time-inconsistency and rules vs discretion.

The concept of time inconsistency was brought to macroeconomics in the rules versus discretion by *Kydland* and *Prescott* (1977) as it appeared that discretionary monetary policies dominated policies under rules, insofar as any good rule could be adopted by discretion [see *S. Fischer* (1988; p. 23)]. The time inconsistency problem then occurs when a future policy decision that is part of an optimal plan formulated in an early period is no longer optimal



after decisions have been implemented, even though there was no new information in the meantime. To put it in another way [see also *Alesina / Tabellini*, 1988]; at some point in time the monetary policymaker “announces” his optimal policy plan, i.e. his ex ante optimal plan. The policymaker would make a binding precommitment if he could. In any case, the public chooses a specific course of action following the announcement of the policymaker who is then “tempted” (or has an incentive) to adopt a different policy. If there are no costs associated with deviating from the ex ante plan, then the optimal policy is time inconsistent, and rational economic agents, i.e. agents whose expectations are in average correct (rational expectations hypothesis)<sup>5</sup> would not believe it. Thus, the policies that seemed credible are suboptimal. In order to achieve an ex post optimal (credible, time-consistent) policy it has been proposed to “enforce” the policymaker to make binding precommitment which can take the form of a specific rule, even though the monetary policy under rule seems to be a 2<sup>nd</sup> best solution as shown in game theoretic models [*Barro* (1986a, b), *Barro / Gordon* (1983), *Loef* (1988)].

By specifying the monetary rules within a context of open economies there are two related problems to be addressed:

- the alternative rules
- the problem of international policy coordination and the related credibility issue.

In the literature there are alternative monetary rules that have been proposed [see for instance *Barro* (1986), *S. Fischer* (1988)]: the constant Growth Rate Rule, the Interest Rate Rule, the Nominal GNP targeting, Price Rules including exchange Rate based Rules. It would be too exhaustive to review the content of all these rules. However, it seems advisable to say some words on some of these rules as far as their understanding is important for the later propositions related to BEAC's policy. This will be the case with the Constant Growth Rate Rule, the Interest Rate Rule and Price Rules.

The Constant Growth Rate Rule, advocated particularly by *Friedman* (1960), proposed a  $k\%$ -rule (for instance a 4%-growth of the money stock per year) for monetary authorities. The rule is that no matter what happens, the money supply will grow at  $k\%$ . The general argument for such a rule rather than discretion is that it enables the monetary authority to withstand political pressures, provides criteria for judging the central bank's performance, and enhances the flow of more accurate information on the current

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<sup>5</sup> To the rational expectations concept and its implications for macroeconomics see *Muth* (1960), *Mishkin* (1963), *Begg* (1983), *Lucas* (1973).

course of monetary policy to the private agents. One of the weaknesses of the Constant Growth Rate Rule is the possible velocity instability as a consequence of the instability of the demand for money as has been documented in many countries during the seventies [see for instance *Judd / Scadding* (1982) for a survey]. Another problem in a context of open economies could be the integration of financial markets which implies a link between monetary aggregates, and therefore a type of spillover effect from the bigger into the smaller country.

The Interest Rate Rule in an international setup is easily understood in a simple *Mundell / Fleming's* framework<sup>6</sup>. The smaller country has to peg its interest rate to that of the dominant country in order to avoid wide capital movements due to interest rate differentials. However, interest rate pegging as a target for monetary policy is a difficult task as shown in *Poole* (1970).

One of the discussed rules in the last time has been the Price Rule. In this framework many schemes have been proposed [see *Hall* (1982); (1984); *Barro* (1986b); *Fischer* (1988)]. In this context it is worth mentioning particularly two proposals:

1. *Fisher's* "compensated dollar" [*Fisher* (1920); see also *Monissen* (1989)] in *Hall's* modified version called "Elastic Price Rule" [*Hall* (1984)]. The proposal, imbedded in the simple Gold standard, assesses that the dollar be exchangeable into Gold. However, the value of gold that is exchanged for a dollar must be set in real terms, defined by a suitable price index. This scheme allows a framework for price stability [see also *Fisher* (1988; p. 20)]. There are some problems related to this proposal, e.g. the possibility of destabilizing speculation against the standard, the problem of wage flexibility that must be needed if price level stability has to be achieved.
2. *Barro's* proposal also deals with a modified Fisherian regime, but in which open-market operations instead of the price of gold, are considered as a means to achieve a desired path for a general price index [see *Barro* (1986b)]. In order to monitor easily the system, as well as to prevent discretionary adjustments of the price level, it is proposed to specify the target as a constant price level which allows for non zero inflation.<sup>7</sup> It is also argued that such a scheme would produce "a convenient monetary unit, which is one that maintains a nearly constant purchasing power" [*Barro* (1986a; p. 34)].

<sup>6</sup> See *Mundell* (1962); *Fleming* (1962).

<sup>7</sup> In game-theoretic based reputational models it is shown that the zero inflation case which is the optimal inflation rate is in fact a 2<sup>nd</sup> best solution; see for instance *Barro / Gordon* (1983); *Barro* (1986b).

A credible rule of this type is supposed to stabilize prices insofar as people will know the course of future monetary actions and behave accordingly. This proposal which allows for a moving target path of prices might have the same difficulties as in *Fisher's* plan. Within an international framework it is worth noting how credibility problems might arise in the context of international policy coordination. The major points in this setup rely on the externalities related to the choice of macroeconomic policies by individual governments due particularly to international spillover effects. By considering the interaction of two governments' policies, as is the case in the franc area, it is usually shown that *ex ante*, i.e. before one of the governments sets its policy instruments, a pareto-optimal coordinated policy internalizes the externalities by maximizing a weighted sum of both governments targets. Then the choices implied by the coordinated policy are *ex post* 2<sup>nd</sup> best for each government, and the credibility problem, in the absence of binding commitments, arises [see for instance *Persson* (1988)].

In order to formulate operational aspects of the coordination problem it is worth putting forward some major issues also discussed in the theoretical literature.

a) It is usually supposed that there is a game between each of the two governments and their respective private sectors. Such a game may be a one-shot game which may or may not be repeated over time.

b) The Nash Equilibrium imposes *ex post* optimality, and the result is compared to one of precommitment possibilities, particularly when one or both governments can commit to each other and/or to their respective private sector.

c) There is the possibility that each government is not only a Dominant Player vis-à-vis its own private sector, but also that one government is a Dominant Player vis-à-vis the other.

d) In general, the evaluation of the possible solutions proceed by simulations.

These theoretical issues enable a coherent formulation of the credibility problem within the Franc area and particularly in a monetary union of this area.

## 2. *The Analytical Framework for the Implementation of a "Credible" Policy in Central Africa*

According to the central principles of the franc area as well as the statutes of the BEAC-Zone and the above-discussed theoretical issues, it seems pos-



sible to formulate a simple model which can take into account the major elements of a credible monetary policy in an international framework. To this end it will be assumed that the BEAC follows a specific monetary rule which is in line with a “Fisher-like compensated dollar”-scheme, i. e. the BEAC has to maintain the convertibility of the FCFA, a rule that must be followed by any other CFA-country, as it has already been clearly stated, namely “the preservation of the internal and external value of the currency”. Although the dynamics of this scheme, which seems to insure price level stability, are not easily understood, the implied rule appears easy to follow: The FCFA is exchangeable into FF, but the FF value that is exchanged for a FCFA must be fixed in real terms. Therefore, maintaining convertibility means that the central bank furthers a (nearly) constant quantity of purchasing power. Any deviation from this target will thus mean a “loss of convertibility”. In such a fixed exchange rate system a loss of convertibility may lead to conflicting goals, the achievement of the internal balance (for instance full-employment) and the external balance (referred to the balance of payments or when the current account balance is zero). Such imbalances lead to so-called policy dilemmas which involve the use of expenditure switching or expenditure reducing (increasing) policies [see *Johnson* (1958)].

In any case, a loss of convertibility may induce welfare losses which, in the BEAC-Zone, can analytically be formulated as follows [see for instance *Barro / Gordon* (1983); *Barro* (1986 a); *Cukierman* (1986)].

$$(1) \quad C_t = \sum_{t=0}^{\infty} \beta^t \left[ \frac{1}{2} \dot{e}_t^2 - b (\dot{e}_t - \dot{e}_t^*) \right]$$

with

$$(2) \quad e_t = \frac{FCFA}{FF^r}$$

In this setup the variables have the following meaning:

$e_t$  = convertibility rate or convertibility ratio defined as the value (the price) of FCFA for one real French franc.

$e_t^*$  = the optimal value of the convertibility rate

$FF^r$  = real French franc (real FF)

$\beta$  = discount factor applied to future welfare in the policymaker's (social) welfare function

$b$  = a constant, which represents the marginal rate of substitution between economic stimulation and convertibility achievement

$t$  = time period

“Dots” on variables refer to growth rates.



The “Banque de France”, on the other side, defines its (social) welfare function as usual, in terms of economic stimulation and inflation prevention, e.g.

$$(3) \quad \hat{C}_t = \sum_{t=0}^{\infty} \hat{\beta}^t \left[ \frac{1}{2} \hat{\pi}_t^2 - \hat{b} (\hat{\pi}_t - \hat{\pi}_t^*) \right]$$

where

$\hat{\pi}_t$  = current rate of inflation in France,

$\hat{\pi}_t^*$  = optimal rate of inflation in France,

and the other parameters being defined in the above sense. All variables with a “hat” refer to France.

Under the hypothesis that France is a “Dominant Player” in the game between both parties, France imposes the rules of the game to the CFA-countries, and so to the Central African countries. In this sense, France minimizes its loss function autonomously in each period, say in  $t = 0$ :

$$\frac{\partial \hat{C}_t}{\partial \hat{\pi}} = \hat{\pi}_t - \hat{b} = 0 ; (t = 0) .$$

Therefore, the optimal rate of inflation for France is

$$(4) \quad \hat{\pi}_t^* = \hat{b} \quad (t = 0)$$

The second order condition is fulfilled.

Now, according to the above definition of convertibility and to the principles underlying the functioning of the Franc area, we can put forward the following points:<sup>8</sup>

– The FCFA serves within the African member countries as a medium of exchange (MOE), i.e. “an asset generally acceptable in payment for any commodity” [McCallum (1985; p. 16)].

– The FCFA is also a unit of account in these countries, i.e. “a specified quantity of the asset that serves as the medium of account” (MOA) [McCallum (1985; p. 16)], which in this case is the real value of the standard or the real value of FF.

In this sense a MOA or “numéraire” is “a good in terms of which accounts are kept” [Niehans (1978; p. 118)]. Niehans (1978; p. 18) states this clearly in the following form:

“In most cases, and for good reasons ... the same good serves both as medium of exchange (MOE) and as medium of account (MOA) ... It is logi-

<sup>8</sup> For a historical evolution of the following features see also Cowen / Kroszner (1987).

cally conceivable, however, that the two functions are performed by different goods, and such cases have actually occurred. For example, bank notes may serve as medium of exchange while accounts are kept in terms of ounces of gold. It is even possible that the MOA, at first sight, appears to be no good at all, being purely abstract in nature."

These features characterize the Franc area as: a *monetary payments system*, i.e. "one in which the vast majority of transactions involve money on one side" [McCallum (1985; p. 16)], and an *accounting system of exchange*, as proposed by Black (1970), Fama (1980, 1983), i.e. one in which "transactions are effected by means of signals to an accounting network, with these signals resulting in appropriate credits and debits to the wealth accounts of sellers and buyers" [McCallum (1985; p. 16)]. In this case, the accounting network works through the operations account held with the French Treasury.

Under these conditions the convertibility rate may also be defined as follows:

$$(5) \quad e = \frac{\hat{r}}{e_1}$$

where

$$\hat{r} = \frac{FF}{FF^r}$$

$$e_1 = \frac{FF}{FCFA}$$

In terms of growth rate the convertibility ratio will be:

$$(6) \quad \dot{e} = \dot{\hat{r}} - \dot{e}_1$$

to complete the whole system it is useful to define two relations: First, the real value of the French franc, and this can be done by using the concept of effective real exchange rate of FF [see for instance Maciejewski (1983)], simplified to a two countries-case:

$$(7) \quad r = \left[ \frac{2}{i=1} \right] \left[ \frac{e_i P_i}{\hat{p}} \right]^{w_i} \sum_{i=1}^2 w_i = 1$$

or

$$(7a) \quad r = \left[ e_1 \frac{P_1}{\hat{p}} \right]^{w_1} \left[ e_2 \frac{P_2}{\hat{p}} \right]^{w_2}; w_1 + w_2 = 1$$

In terms of growth rate this becomes:

$$(8) \quad \dot{r} = w_1 (\dot{e}_1 + \pi_1 - \hat{\pi}) + w_2 (\dot{e}_2 + \pi_2 - \hat{\pi})$$

where

$e_1$  = the nominal exchange rate of FF for one FCFA

$e_2$  = the nominal exchange rate of FF for one representative foreign currency (e.g. a dollar)

$\pi_1$  = the inflation rate in the CFA-countries

$\pi_2$  = the inflation rate in the representative foreign country

$w_i$  = France's trade share with the country  $i$ .

By substituting  $e_1$  from (6) in (8) a relationship is established between  $\dot{r}$ ,  $\dot{\hat{r}}$  and  $\dot{e}$  as follows:

$$(9) \quad \dot{r} = w_1 (\dot{\hat{r}} - \dot{e}) + w_2 \dot{e}_2 + w_1 (\pi_1 - \pi_2) + (\pi_2 - \dot{\hat{\pi}}).$$

The second relation to be defined is the convertibility rate in terms of the rates of inflation in France and in the CFA-countries by making use of the purchasing power parity (PPP) theory, i.e.:

$$(10) \quad \dot{\hat{\pi}} = \dot{e}_1 + \pi_1$$

and by substituting  $e_1$  from (6) in (10):

$$(11) \quad \dot{e} = \dot{\hat{r}} - (\dot{\hat{\pi}} - \pi_1).$$

It is now possible to formulate the optimal "credible" policy for the CFA-countries, and therefore for the BEAC-Zone.

By minimizing the cost function in (1) the optimal (growth rate of the) convertibility rate is:

$$(12) \quad \dot{e}_t^* = b,$$

which is in fact equivalent to

$$(13) \quad \dot{e}_t^* = \dot{\hat{r}} - (\dot{\hat{\pi}}^* - \pi_{1t}^*),$$

when the PPP in the fixed rate system must hold, and relying on the hypothesis that the unit of account must be stable in value, which means that the optimal rate of inflation in the CFA-countries relative to the "imposed" French one must be achieved. This is a solution compatible with a non-cooperative game.

All elements are now put together in order to express some policy considerations with respect to the implementation of a credible monetary policy within the CFA-countries, and therefore within the BEAC-Zone.

### 3. *Some Policy Implications*

Although the current structure of the Franc-Zone involves both a monetary payments system and an accounting system of exchange (ASE) the actual implementation of monetary policy in the area, and particularly in the CFA-countries is incompatible with the objective of convertibility included in the agreement of monetary cooperation between France and the African countries. In fact, the weight has been put only on the features of a monetary payments system. There is no link between this system and the ASE insofar as there exists no defined relation between the unit of account (the nominal value of FCFA) and the MOA (the standard) directly related to the functioning of the operations account. Without this separation of money functions in the monetary area the relation (9) cannot work because  $(\hat{r} - \hat{e})$  amounts to zero. What remains is a monetary policy based on a discretionary framework that can allow the "Dominant Player" to "cheat", as far as the backing of FCFA's issues is concerned. This is documented by a series of unilateral monetary decisions taken by France since 1958 and which had a very strong (negative) impact on the economy of the CFA-countries.<sup>9</sup>

What all this means is that even in the current system, there is a need for the setup of a mechanism that insures a "credible" (ex post optimal) policy for the CFA-countries as developed in the present paper. If this is not done, the CFA-countries will try to resort to distortionary government revenues in order to achieve the external as well as the internal balance. On the external side such distortionary revenues will take the form of import restrictions, export duties and restrictions, capital controls, etc. On the internal side there may be a huge of administrative expenses for changing prices (prices of goods and services, wages, rates of interest) in order to be in line with the French prices. This may lead to "hidden" government expenditures and also to "hidden" inflation.

Accordingly, the solution obtained in this paper for the optimal convertibility rate of the FCFA will at least reduce some of the distortionary government revenues insofar as the relation (13) sets up a rule to be followed. According to that relation,

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<sup>9</sup> France changed 1958 the "old francs" by the "new francs"; instaured a flexible exchange rate system in Dezember 1966, and re-instaured capital controls in November 1969, etc. All this came about without any concertation. Since March - April 1975 the value of international reserves held in the operations account has been defined with reference to the SDR, but on a nominal basis. Since 1980 a new computation method has been adopted, however based on compensating balances, following the evolution of FF with respect to SDR. See [Guillaumont / Guillaumont (1984; pp. 72 - 75)].



$$\dot{e}_t^* = \dot{\hat{r}}_t - (\dot{\hat{\pi}}_t^* - \pi_{1t}^*),$$

the rule to insure convertibility will be:

- increase  $\dot{\hat{r}}$  whenever France's optimal rate of inflation exceeds the optimal rate of inflation in the CFA-countries.
- decrease  $\dot{\hat{r}}$  whenever France's optimal rate of inflation tends to be lower than the optimal rate of inflation in the CFA-countries.

Within this “social welfare approach” the solution obtained for the convertibility rate of the FCFA will obviously not fulfill the two equilibrium conditions set up in *Barro and Gordon* (1983), [see also *Barro* (1986 a); p. 25] i.e.: First the rational-expectations condition, which means that people's expectations of inflation are correct on average, and second the marginal cost of inflation will equal the marginal benefit from inflation surprises (credibility condition).

Whereas the first condition may be satisfied in the CFA-countries, the second cannot be fulfilled insofar as the chosen rate of inflation in these countries is “incentive-compatible” only with French interests in the sense of according with the French policymaker's desire to maximize their social welfare at each point in time. In fact, by imposing externalities to the CFA-countries, e.g. a “hidden” inflation, CFA-countries' residents improve France's trade balance as the value of their currency will fall, and there is not capital market to enable a substitution of FCFA for national securities.

Therefore, the solution derived in this paper seems to be a third best, not the ideal solution, which is better than the current discretionary case but worst than the first best solution (zero inflation). The second best and ideal solution may be one which is incentive-compatible in the sense of according with the desire of CFA-countries' policymakers to maximize their own social welfare at each point in time. This may then lead to a coordinated policy between France and its African partners, which means that the game must be cooperative. Along these lines the french optimal rate of inflation may not enter the relation determining the optimal convertibility rate of the FCFA, because  $\dot{\hat{\pi}}^*$  will be a given, not imposed parameter.

The relation (1) will then turn out to be:

$$(14) \quad \dot{e}_t^* = \dot{\hat{r}}_t - (\dot{\hat{\pi}}_t - \pi_{1t}^*)$$

$$(15) \quad \dot{e}_t^* = \dot{\hat{r}}_t - (\pi_t^* - \pi_{1t})$$

Therefore, the CFA-countries as well as France determine autonomously their own optimal rates of inflation.

By equating the relations (14) and (15), this leads to the following condition that insures convertibility and a “credible” policy in the CFA-countries:

$$(16) \quad \pi_{1t}^* - \pi_{1t} = \hat{\pi}_t - \hat{\pi}_t^*$$

or

$$(16a) \quad \pi_{1t}^* = \pi_{1t} - (\hat{\pi}_t^* - \hat{\pi}_t).$$

The rule for the policymakers in the CFA-countries is then easy to apply:

- decrease the rate of inflation in the CFA-countries whenever France’s actual rate of inflation exceeds its optimal rate, i. e. increase the purchasing power of the currency whenever  $\hat{\Pi}_t > \Pi_t^*$
- increase the rate of inflation in the CFA-countries whenever France’s actual rate of inflation tends to be below its optimal rate, i. e. decrease the purchasing power of currency whenever  $\hat{\Pi}_t < \Pi_t^*$ .

The rule is intended to maintain convertibility or a stable purchasing power of the currency in the sense of maintaining a stable relation between the unit of account and the MOA. Such a rule seems best enforceable within a scheme proposed by *Fama* (1983), which stresses the variation of the quantity of currency in circulation by the monetary authority. Our proposal makes the fact clear that it is not necessary for the FCFA to be linked to a given currency, e. g. the FF, in order to achieve a “credible” monetary policy in the concerned countries, as long as the relation (16) continues to hold.

#### IV. Concluding Remarks

In this paper the mechanisms of the Franc area and the actual implementation of monetary policy in the so-called BEAC-Zone have been described.

With respect to the existing agreements between France and the CFA-countries as well as to the underling credibility analysis it has be shown that the African monetary unions cannot pursuit a ‘credible’ monetary policy insofar as the Franc area is in fact a monetary payments system as well as an accounting system of exchange. The agreements didn’t take these features into consideration so that the actual policymaking can only be time-inconsistent, not credible.

A credible policy in these countries calls for a clear definition of what is meant by convertibility. Based on theoretical considerations a practical definition has been proposed in this paper, and an optimal convertibility rate

has been determined following the so-called “social welfare approach” to the credibility problem, as opposed to the so-called “political approach” [see *Cukierman* (1985; *Cukierman / Meltzer* (1986)]. The proposed solution, which relies on a clear distinction between the concepts of unit of account and that of medium of account, seems to be only third best as long as the “standard” enables the issuing country to be a “Dominant Player”. The resulting outcome will continue to generate a huge of externalities in the CFA-countries, although they are reduced by the proposed rule for maintaining convertibility.

The 2<sup>nd</sup> best outcome is obtained under the hypothesis of coordinated policies so that there further exists no “Dominant Player”. Each party is committed to maintain convertibility. A failure to do this will lead to welfare losses in the concerned country (area). Under the stated rule the welfare losses will be lower than under the preceding rule with a “Dominant Player”, but still much lower than under the current system of discretionary policy. The “rule under coordination” will lead to welfare losses higher than those under the 1<sup>st</sup> best. However, the “rule under coordination” is the ideal rule in the sense of being incentive-compatible, and therefore insuring a credible, i.e. ex post optimal, monetary policy. Such a credible policy is definitively independent of a given monetary area as long as the proposed rule continues to hold.

The results obtained within this scheme may be confronted with two problems: First, it is not clear on what price index the rate of inflation must be computed. Second, the analysis is performed within the social welfare approach where the problem of multiple equilibria remains unsatisfactorily solved [see e.g. *Rogoff* (1987)]. However, the proposed setup clearly shows the shortcomings of the current structure and functioning of the Franc area and calls for further analyses in the perspective of the European Common market of 1993 where capital movements will be free.

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## **Zusammenfassung**

### **Eine glaubwürdige Währungspolitik im Franc-Währungsgebiet**

In dieser Arbeit werden die im Franc-Währungsgebiet geltenden Mechanismen und die tatsächliche Währungspolitik im Geltungsbereich der sogenannten Bank Zentralafrikanischer Staaten dargestellt.

Bezüglich der zwischen Frankreich und den Ländern der ehemaligen französischen Kolonien in Afrika bestehenden Vereinbarungen sowie der diesen Vereinbarungen zugrundeliegenden Glaubwürdigkeitsanalysen wird aufgezeigt, daß eine afrikanische Währungsunion insoweit keine ‚glaubwürdige‘ Währungspolitik betreiben kann, als es sich bei dem Franc-Währungsgebiet de facto um ein Zahlungs- und Devisenbilanzierungssystem handelt. Dieser Besonderheit wird von den Vereinbarungen nicht Rechnung getragen, so daß die Politik als solche im Zeitablauf nicht konsistent und damit nicht glaubwürdig sein kann.

Eine glaubwürdige Politik in diesen Ländern erfordert eine klare Definition dessen, was unter Konvertibilität zu verstehen ist. Auf der Grundlage theoretischer Erwägungen schlägt diese Arbeit eine praktische Definition vor und bestimmt in bezug auf das Glaubwürdigkeitsproblem eine optimale Konvertibilitätsrelation gemäß dem sogenannten „gesellschaftlichen Wohlfahrtsansatz“ im Gegensatz zu dem sogenannten „politischen Ansatz“ (vgl. Cukierman [1985]; Cukierman / Meltzer [1986]).

Das vorgeschlagene Vorgehen zeigt klar die Mängel der derzeitigen Struktur und Funktionsweise des Franc-Währungsgebiets auf und erfordert weitere Analysen aus der Perspektive des Europäischen Binnenmarktes nach 1993, der ohne Kapitalmarktbeschränkungen sein wird.

## Summary

### **Credibility of Monetary Policy in a Currency Area: The Case for the Franc Area**

In this paper the mechanisms of the Franc area and the actual implementation of monetary policy in the so-called BEAC-Zone have been described.

With respect to the existing agreements between France and the CFA-countries as well as to the underlying credibility analysis it has been shown that the African monetary unions cannot pursue a 'credible' monetary policy insofar as the Franc area is in fact a monetary payments system as well as an accounting system of exchange. The agreements didn't take these features into consideration so that the actual policymaking can only be time-inconsistent, not credible.

A credible policy in these countries calls for a clear definition of what is meant by convertibility. Based on theoretical considerations a practical definition has been proposed in this paper, and an optimal convertibility rate has been determined following the so-called "social welfare approach" to the credibility problem, as opposed to the so-called "political approach" [see *Cukierman* (1985); *Cukierman / Meltzer* (1986)].

The proposed setup clearly shows the shortcomings of the current structure and functioning of the Franc area and calls for further analyses in the perspective of the European Common Market of 1993 where capital movements will be free.

## Résumé

### **La crédibilité de la politique monétaire dans une zone monétaire: le cas de la zone franc**

Dans ce travail, l'auteur décrit les mécanismes de la zone franc et la mise en oeuvre actuelle de la politique monétaire dans la dite zone BEAC.

En considérant les accords existants entre la France et les pays CFA ainsi que les analyses de crédibilité subalternes, il a été montré que les unions monétaires africaines ne peuvent poursuivre une politique monétaire «crédible» pour autant que la zone franc soit en fait un système monétaire de paiements ainsi qu'un système comptable des changes. Les accords n'ont pas tenu compte de ces particularités de sorte que la politique actuelle ne peut qu'être instable et non crédible.

Une politique crédible dans ces pays exige une définition claire de la notion de convertibilité. En se basant sur des considérations théoriques, l'auteur de cet article propose une définition pratique et détermine un taux optimal de convertibilité, suivant la dite «approche de bien être social» du problème de crédibilité, en opposition à «l'approche politique» (voir *Cukierman* [1985]; *Cukierman / Meltzer* [1986]).

L'examen proposé montre clairement les lacunes de la structure courante et du fonctionnement de la zone franc et en appelle à faire d'autres analyses dans la perspective du Marché Commun Européen de 1993, où les mouvements de capitaux seront libres.