Fiscal Reform and Monetary Union in West Africa

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ABSTRACT

The paper explores the interaction between the proposed monetary union for ECOWAS and structural reforms of fiscal policy. The effects depend to a large extent on the degree of similarity of member countries. In a monetary union of similar countries, member states run a more distortive fiscal policy, while their structural reform efforts will fall. This is also the case for countries that unilaterally peg to an anchor currency or introduce a foreign currency. In an monetary union with dissimilar countries the reverse can happen for those member states that are confronted with high distortion countries. This result implies that current WAEMU members will run a less distortive fiscal policy after the inclusion of other members of ECOWAS.

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1. Introduction

In 1999, it was decided that a monetary union between the West African Economic and Monetary Union (WAEMU) and six additional anglophone countries should be created to comprise almost all member states of the Economic Community of West African States (ECOWAS) members by 2004.[1] In 2000, in the so-called Accra Declaration, it was decided that by 2003 a second monetary union, the West African Monetary Zone between the non-WAEMU, should commence before the unions would be merged in 2004.[2] Part of the process of monetary integration between the two areas are several convergence criteria with respect to fiscal policy. In Accra, countries committed themselves to restrict central bank financing of budget deficits to 10 percent of previous year's government revenue, to reduce budget deficit to 4 percent of GDP, to set up a convergence council to help coordinate macroeconomic policy, and to set up a common central bank. Despite attempts to coordinate these criteria with those applying to WAEMU members, some differences remain (see Masson and Patillo 2001a). WAEMU members for instance aim for a balanced budget, an average annual inflation rate of 3 percent and an overall debt to GDP ratio of less than 70 percent. While, in general, WAEMU countries are much closer to fulfill the criteria than the other countries, probably due to the much longer experience of regional

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[1] WAEMU comprises Benin, Burkina Faso, Cote d' Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo, which is itself part of the larger CFA-Franc Zone. Other members of ECOWAS are Cape Verde, Gambia, Ghana, Guinea, Liberia, Nigeria and Sierra Leone. Cape Verde has a peg to the euro and has not signed the declaration. Mauritania, a founding member of ECOWAS has withdrawn from the organization. For institutional details, see Hernandez-Cata et al. (1998) and Masson and Patillo (2001 a). On the CFA-Zone, see e.g. Fielding (2002).

[2] In 2000, a West African Monetary Institute was assigned the task of preparing the second monetary union. Since prospective member states (with the exception of Ghana) have not fulfilled the convergence criteria, the second monetary union has been postponed to give more time to fulfill the criteria. The monetary union for ECOWAS is now scheduled to begin by July 2005. For details, see Ghanian Chronicle, February 7, 2003.

cooperation and mutual surveillance, the process of convergence has stalled in recent years (Doré and Masson 2002).[3]

Several studies have questioned that a monetary union between the two areas is a good idea since most of the standard criteria along the optimum currency area lines are not fulfilled. It has in particular been pointed out that monetary union in West Africa is problematic because mechanisms that ensure a prudent fiscal policy are absent. There are several countries that have large fiscal deficits of up to more than 10 percent of GDP (Masson and Patillo 2001 b), reflecting distortions that lead to excessive deficits because rulers have an interest to benefit certain groups in the economy (Debrun et al. 2002). As Guillaume and Stasavage (2000) argue, African countries lack the institutions that ensure financial and fiscal stability. And although there are the fiscal convergence requirements for prospective members of the monetary union there is no procedure how failures to meet the criteria should be treated.

The discussion about the desirability of fiscal targets accompanying a movement towards a common currency is, of course, well known from the discussion about the European Monetary Union (EMU). In Africa, however, one could sensibly argue that problems of spillovers from an excessive fiscal policy on the monetary policy are a much more salient problem because the independence of central bank is much less secured (Fouda and Stasavage 2000). Rates of seigniorage are considerably higher than, for instance, in the European Monetary Union and it is feared that, unless significant structural fiscal adjustments are undertaken by the member countries, uncoordinated fiscal policy will have negative externalities on the common money. Thus, even fulfilling nominal convergence criteria in fiscal policy could not be considered as being adequate to put fiscal policy on a sound base because insufficiently developed fiscal system and high budgetary needs will

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[3] France has had a significant influence on the workings of the CFA-France Zone. This includes the problems the Zone has had with reaching fiscal discipline since France was not willing to use its authority to this end, see Stasavage (1997).

sooner or later develop which might could have a negative spillover on the monetary policy. A simple reduction of deficits or government spending is not enough to ensure sustainable government finance (Easterly 1999). In addition, there is the problem of creative accounting that allows to officially meet fiscal targets by pushing certain items off budget (Milesi-Feretti 2000). Thus, apart from institutional arrangements that separate monetary and fiscal policies structural reforms would be needed to ensure a smooth working of a larger monetary union in West Africa.

So far, theoretical discussions about the interaction between fiscal policy and monetary union have derived inconclusive predictions about potential spillovers from fiscal policy to monetary policy. Part of the literature cautions that a distortive monetary policy might force the central bank into a more expansive monetary policy. This can only be avoided if fiscal policy is coordinated among member states (Beetsma and Uhlig 1999), requiring not only entry conditions but rules for the working of fiscal policy in the monetary union.[4] Others instead argue that fiscal competition might actually put the central bank into a better position vis-à-vis the member states' governments, reducing pressure on the monetary authority and thus potentially keeping inflation low. A coordinated fiscal policy instead would shift bargaining power to governments (Beetsma and Bovenberg 1998a).[5] Fatas and Rose (2001) consider the relation between monetary regimes and fiscal policy from an empirical point of view and find that unilateral currency pegs usually imply a less restrictive fiscal policy than full monetary unions or a currency board.

While this literature is mostly concerned with the monetary and fiscal policy mix, only few papers deal with monetary integration and structural policies which is the focus of

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[4] There are several possibilities discussed why expansive monetary policy could lead to higher inflation. Either the central bank might be forced to directly monetized budget deficits or increase money supply to negative interest effects from higher budget deficits.

[5] Dixit and Lambertini (2000) present yet another view and argue that a first best solution can be achieved, despite that fact that fiscal policy will push inflation higher, and that this is independent of who of the two players has the first move.

this paper. Calmfors (2001) and Sibert and Sutherland (2000) have asked how the introduction of a common currency might change the incentives of government to implement labor market reforms, while Ozkan et al. (1997) and Beetsma and Jensen (1999) analyze the incentives a country has to implement structural reforms if it aims to join a monetary union. Obviously, a country has higher incentives to implement reforms if these are necessary for being admitted to the union. Once inside the union, this incentive is reduced and it might even happen that reforms are rolled back.

This paper combines the two issues. I ask how a monetary union influences governments' incentives to implement structural reforms in their fiscal systems and how the policy mix is affected. This is analyzed for a group of symmetric countries first which can be taken to reflect a monetary union among similar countries which provides the benchmark for the later results. The second setup turns to monetary cooperation and union among heterogeneous countries with different fiscal needs and output gaps. This is particularly relevant for the envisaged enlargement of WAEMU to include countries beyond the current union, as the fiscal situation is much worse for the non-WAEMU members. I consider the case of a unilateral peg of an outside country to a monetary union, either in the case of a simple pegged exchange rate or, alternatively, with the introduction of that union's currency. This should reflect possible intermediate regimes or a monetary union where the joining countries does not have voting power in the common central bank. This can also provide lessons for the desirability of different institutional setups of a larger monetary union and the transition towards it as they are currently discussed (see Masson and Patillo 2001a).

The basic results are that it makes a significant difference what type of a monetary union is considered. In particular, a symmetric monetary union will always lead to more fiscal distortions and less structural reforms because any single countries perceives that its trade-off between reforms and inflation has improved. These results can be even strengthened if there is a unilateral peg or the introduction of a foreign currency (be it the euro or the adoption of some existing currency). In particular, a unilateral peg of the

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countries to the euro can have negative effects on structural fiscal deficits. In all three cases, there is an increase in fiscal distortions, whereas the change in structural reforms is ambiguous. Allowing for asymmetries in terms of fiscal needs and output distortions, the negative result is no longer universal. Some countries will instead switch to a less distortive fiscal policy when paired with countries featuring large fiscal needs. Under certain circumstances, detailed below, it is possible that monetary union will actually increase reform efforts in some countries. In light of the different fiscal position of the countries involved, this would be the present WAEMU members.

The remainder of the paper is structured as follows. Section 2 derives the benchmark case of monetary autonomy, while section 3 looks at a symmetric monetary union. Section 4 discusses an unilateral peg by an outside country. Section 5 discusses the case of a full monetary union among asymmetric countries. Section 6 concludes by applying the theoretical results to the case of the planned West African monetary union.

2. The Model

2.1. The Basic Structure

Output in country i is given as

$$y_i = \bar{y}_i + \pi_i - \pi_i^e - x_i \tag{1}$$

where x_i denotes a fiscal package that could either have negative supply effects because of the negative effects of taxation, or a positive influence on output if x_i denotes subsidies. Output is increasing in monetary surprises $\pi_i - \pi_i^e$, where I assume that the central bank has full control over the rate of inflation and that the expected rate of inflation is formed rationally.

The government's budget is

$$bx_i + d\pi_i = F_i - cs_i \qquad (2)$$

where s_i denotes a reform package that captures all the different measures that have a direct impact of the efficiency on public finances. As argued above, it is unlikely that simple reductions in spending or deficits will have much effect on the real fiscal position of the government (Easterly 1999). Structural reforms like privatization, the reduction of subsidies, the reform of the public sector and administration more generally, and the reduction of corruption are instead needed.[6] Moreover, they should imply that the economy works more efficiently. Therefore, it could be understood as having a direct impact on the budget by reducing financing needs. It is thus appropriate to speak about structural reforms and not only about fiscal discipline which could also be understood as choosing a different fiscal policy and not as reducing fiscal needs.

The parameters measure the efficiency of the tax system (b), d measures the holdings of base money as a share of output so that $d\pi_i$ is the contribution of seigniorage to the budget, and the impact of structural reforms on the budget of the government (c). Note that d is assumed to be a constant which seems a reasonable assumption for moderate rates of inflation.[7] Finally, F_i is some (exogenous) financing requirement of the government. This may comprise debt service as in Beetsma and Bovenberg (1998a) or the operating costs of government, fixed subsidies to interest groups, personal income of politicians, or some minimum social payments.

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[6] For evidence on corruption and institutional quality more generally in ECOWAS, see Debrun et al. (2002).

[7] It is wellknown that inflation rates have to reach considerable height before currency substitution and major reductions in money demand are observable.

The government's objective function is

$$L_i^G = \frac{1}{2}\left[\theta^G \pi_i^2 + \left(y_i - y_i^*\right)^2 + \lambda s_i^2\right]$$
(3)

which is an augmented Barro and Gordon (1983) utility function. The government wishes to minimize inflation π, reduce the gap between given and desired output $\left(y_i - y_i^*\right)$, and is averse to structural reforms s_i. Because governments are politically constrained in structural reform they must fear to lose political support through liberalizing labor markets, privatizing enterprises, reducing subsidies to certain industries, or constraining possibilities of appropriating rents. Too many reforms may risk losing elections or being otherwise forced out of office.

The other national decision maker is the central bank. Its preferences are

$$L_i^B = \frac{1}{2}\left[\theta^B \pi_i^2 + \left(y_i - y_i^*\right)^2\right]$$
(4)

which is the standard assumption about monetary policy makers' preferences (Barro and Gordon 1983). It can be reasonably assumed that the central bank does not care about structural reforms (and in particular one would not assume that they, like governments, oppose reform). In addition, I assume $\theta^B \geq \theta^G$ which captures the fact that central banks usually put more relative weight on avoiding inflation than unemployment, if it can pursue its own preferences. As indicated above, the status of central banks in West Africa is not clear, meaning that their independence can be doubted (Fouda and Stasavage 2000; Masson and Patillo 2001b). Where important, I will discuss the influence of differences between government and central bank preferences. Notice, however, that the relative weights the authorities put on the several aims (θ^B, θ^G, λ) are not indexed and are assumed to be equal across countries. There are hence internal conflicts but not across countries. This assumption allows to abstract from effects that stem mainly from the fact that policy

changes in a monetary union arise from preference aggregation. Here, structural policy changes are important and therefore only structural differences across economies are allowed. This, of course, abstracts from many effects that have been discussed in the literature, focusing on differences in preferences in the creation of fixed exchange rates and monetary unions (see e.g. Berger et al. 2001).

2.2. The Situation before Monetary Union

As a benchmark, I begin with the situation before monetary union where countries have monetary autonomy. Assuming that exchange rates follow purchasing power parity ensures that exchange rate movements have no influence on output, and that the rate of inflation is determined by domestic monetary policy only.

The game structure used is Stackelberg where the fiscal authority is the Stackelberg leader; the solution concept is subgame-perfect equilibrium. The time structure is as follows: (i) the government decides about the structural reform package s_i implying a certain fiscal policy package x_i, (ii) having observed this, the private sector forms expectations about the rate of inflation π_i^e, (iii) the central bank sets the rate of inflation π_i, and (iv) output is determined. The model is solved by backward induction.

Since the government is Stackelberg leader it takes the reaction of the central bank into account when making its policy choices. The central bank's best response is

$$\pi_i^N = \frac{\pi_i^e + \left(y_i^* - \overline{y}_i\right) + x_i}{1 + \theta^B} \tag{5}$$

which, with rational expectations, becomes

$$\pi_i^N = \frac{\left(y_i^* - \overline{y}_i\right) + x_i}{\theta^B} \tag{6}$$

where the superscript N refers to the national case with full policy autonomy. Given this reaction function and the expectations of the private sector, the government decides about its reform efforts by taking the respective budget constraint (2) into account. The rate of inflation (6) is plugged into the budget constraint and solved for x_i which yields

$$x_i = \frac{\theta^B(F_i - cs_i) - d(y_i^* - \bar{y}_i)}{v_1}.$$

(7)

The parameters used throughout are defined in table 1.

Table 1: Definitions

$v_1 = b\theta^B + d$	$\omega_1 = (\theta^B)^2 + \theta^G$
$v_2 = b\theta^B + d/n$	$\omega_2 = (\theta^B)^2 + \theta^G/n$
	$\omega_3 = (\theta^B)^2 + \theta^G/n^2$

Taking this constraint into account and optimizing the government's objective function with respect to s_i yields

$$s_i^N = \frac{c\omega_1[F_i + b(y_i^* - \bar{y}_i)]}{\lambda v_1^2 + c^2\omega_1}$$

(8)

which can then again be used in the budget constraint to yield fiscal policy as

$$x_i^N = \frac{F_i\lambda\theta^B v_1 - (y_i^* - \bar{y}_i)(\lambda d v_1 + c^2\omega_1)}{\lambda v_1^2 + c^2\omega_1}.$$

(9)

Not surprisingly, given the budget constraint of the government, the higher the exogenous fiscal requirements, the higher structural reforms will be. They will also increase

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as the difference between actual and desired output increases. The higher this gap is, the more incentive the government has not to increase it further by pushing fiscal deficits higher. Hence, x_i will be lowered which, ceteris paribus, will require that s_i increases (given the budget constraint). There is hence a positive relation between structural reforms and the output distortions in economy i (equation 8). However, fiscal revenue increases if there is a large financial need and therefore (9) is increasing in F_i but falling in $\left(y_i^* - \overline{y}_i\right)$.

3. Monetary Union Among Symmetric Countries

3.1. Government Policy

Having derived the national case, I now turn to monetary union and begin with the case of symmetric countries, which is thought of as capturing a monetary union among similar countries. This can be thought to reflect a group of countries such as the present WAEMU members which are relatively similar in comparison to the differences that are displayed by the larger group of ECOWAS members (Debrun et al. 2002).

While the governments' objective functions do not change, the utility function of the central bank becomes

$$L^{CCB} = \frac{1}{2}\left[\theta^{CCB}\pi^2 + \frac{1}{n}\sum_{i=1}^{n}\left(y_i - y_i^*\right)^2\right] \tag{10}$$

where n is the number of participants to the monetary union. As argued above, it is henceforth assumed that $\theta^B = \theta^{CCB}$.

Given these preferences, the ECB's reaction function is

$$\pi^M = \frac{\pi_i^e + \frac{1}{n}\sum_{i=1}^{n}\left[\left(y_i^* - \overline{y}_i\right) + x_i\right]}{1 + \theta^B} \tag{11}$$

which, with rational expectations, becomes

$$\pi^M = \frac{\frac{1}{n}\sum_{i=1}^{n}\left(y_i^* - \overline{y}_i\right) + \frac{1}{n}\sum_{i=1}^{n}x_i}{\theta^B}. \tag{12}$$

Given this changed central bank reaction function the government's budget constraint is changed as well. Using this altered budget constraint in the objective function yields structural reform efforts of

$$s_i^M = \frac{c\omega_2\left[F_i + b\left(y_i^* - \overline{y}_i\right)\right]}{\lambda v_1 v_2 + c^2\omega_2} \tag{13}$$

and leads to a fiscal policy of

$$x_i^M = \frac{F_i\lambda\theta^B v_2 - \left(y_i^* - \overline{y}_i\right)\left(\lambda d v_2 + c^2\omega_2\right)}{\lambda v_1 v_2 + c^2\omega_2}. \tag{14}$$

A comparison of the results in (9) and (14) leads to

Result 1:

A monetary union among symmetric countries will lead to a more distortive fiscal policy in all countries iff $b\theta^G > d\theta^B$. In this case, structural reform efforts will fall in the member countries. The union wide rate of inflation will be higher than the rate of inflation before unification while the output level falls.

Proof: See the Appendix.

Whether $x_i^M > x_i^N$ and all further results depend upon whether $b\theta^G > d\theta^B$ holds. Unless the central bank's aversion against inflation is considerably larger than that of the government, this inequality will be fulfilled. Since b is the contribution of tax policy to the

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government's budget, it is generally much larger than the contribution of seigniorage to the budget d, hence $b > d$.[8] Thus, even in this case that the central bank simply executes the wishes of the government and adopts its (or their) preferences, this result will hold. Only for unreasonable values for the inflation aversion of the government this condition will not be fulfilled.

The intuition for this result is that single governments do no longer fully internalize the inflationary impact a distortive individual fiscal policy has on the common rate of inflation. Before monetary union governments had an incentive to pursue a disciplined fiscal policy to avoid an increase in the rate of inflation, and to increase the output gap. At the same time, it forced the government to implement structural reforms to make up for lower fiscal revenue and inflation. The trade off between inflation, fiscal revenue and reforms changes with monetary union since the government needs no longer fear that an expansive fiscal policy has a strong inflationary impact. The disciplinary influence on the policy choices from the government's inflation aversion is reduced. This effect is stronger the more members the monetary union has.

The discussion of the symmetric case has shown that a monetary among such countries would have a strong impact on their fiscal policy and their reform efforts. Cooperation among them would basically restore the national case. Viewed from this perspective, rules for cooperation are an attempt to internalize negative spillovers that arise through the introduction of a common central bank and a justification for fiscal policy rules in the monetary union.

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[8] It is clear that b>1 because the effects from fiscal policy on output are normalized to unity (eq. 1). If fiscal policy is distortive, b<1 would imply that the revenue from taxes is lower than the negative effects it has. This is not very reasonable, not even for highly distortive fiscal systems. The contribution of seigniorage to the overall budget instead is certainly much smaller than unity. Masson and Patillo (2001b) estimate values between 0.6 percent of GDP (for WAEMU) and 3.9 percent (for Liberia).

3.2. Government Utility

Having established how the optimal policies change through the introduction of monetary union obviously raises the question of how the governments' utilities change. This is mainly a function of the output effects that changes in fiscal policy have and the aversion of governments to structural reform.

Losses under national monetary policy are given as

$$L_i^G(N) = \left[-\left(y_i^* - \overline{y}_i\right)_i - x_i^N\right]^2 + \theta^G\left[\frac{x_i^N + \left(y_i^* - \overline{y}_i\right)}{\theta^B}\right]^2 + \lambda s_i^N \tag{15}$$

where N refers to the case of national autonomy and x_i^N and s_i^N are the values expressed in (8) and (9) respectively. The loss under monetary union (M) follows from (13) and (14) as

$$L_i^G(M) = \left[-\left(y_i^* - \overline{y}_i\right) - x_i^M\right]^2 + \theta^G\left[\frac{x_i^M + \left(y_i^* - \overline{y}_i\right)}{\theta^B}\right]^2 + \lambda s_i^M \tag{16}$$

Comparing the losses under the two regimes, government i will decide to enter the (symmetric) monetary union if $L_i^G(N) > L_i^G(M)$. This is equivalent to

$$\lambda\left[s_i^{N^2} - s_i^{M^2}\right] > \frac{\theta^G + \theta^{B^2}}{\theta^{B^2}}\left[\left(\left(y_i^* - \overline{y}_i\right) + x_i^M\right)^2 - \left(\left(y_i^* - \overline{y}_i\right) + x_i^N\right)^2\right]. \tag{17}$$

A high aversion to structural reforms (measured as λ) makes the monetary union attractive because these fall under monetary union. Therefore, they enter on the left hand side. The RHS of the inequality measures the negative effects of a higher distortionary taxation. Since $x_i^M > x_i^N$ there will be an output loss associated with the entry into monetary union. Whether government i gains or loses from entering the monetary union is thus

basically a function of its relative preferences for avoiding reform and for having a high output level. Quite generally, changes in the level of distortions that affect the output have to be traded off against structural reforms. This will always be the case, irrespective of the particular exchange rate chosen, as the following section demonstrates.

4. The Effects of a Unilateral Peg

An alternative to joining a monetary union is a unilateral peg. Irrespective of the particular arrangement, its main characteristic is that the anchor currency does not react to developments in the country that has adopted its currency or pegged to it. Since it is not clear what arrangement will be chosen between the WAEMU members and the other ECOWAS members, it is conceivable that the ECOWAS countries just peg unilaterally to the policy of the BCAEO, at least in the transition period.[9] Alternatively, it is also possible that the larger monetary union pegs to the euro and mimicks the policy of the European Central Bank (see Honohan and Lane 2000; Fouda and Stasavage 2000).[10] This would at least solve any possible credibility problems for the new monetary union, and it would have that advantage that no new institutions would have to be build. Such one-sided pegs (or adoption of a foreign currency), however, will also have negative implications for the fiscal policy of the pegging countries, as this section will demonstrate.

Let the monetary policy of the country to which country i pegs be given as

$$\pi_j = \frac{\left(y_j^* - \bar{y}_j\right) + x_j}{\theta^B} \tag{18}$$

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[9] The Banque Central des Etats de l' Afrique de l' Ouest is the long-standing central bank of WAEMU. For details, see Masson and Patillo (2001a).

[10] It is however unlikely that the euro-area and the ECB would assume responsibilities for the monetary union in Africa such as France did for the CFA zone.

where country i knows that central bank j will not react to developments in economy i. Given that this is a unilateral peg, $\pi_j = \pi_i$. But not only is the rate of inflation exogenous, so is seigniorage. Although it would be possible with a currency board to deposit currency reserves with the issuing central bank and thus earn some (modest) seigniorage, these revenues would necessarily be zero in case of an introduction of a foreign currency.[11] In that case, such a unilateral peg would imply less seigniorage than with the own currency. I therefore present the effects of the two forms of fixed exchange rates separately.

With the unilateral peg (indexed P), the government in country i will its set structural reform efforts as

$$s_i^P = \frac{c\left[F_i + b\left(y_i^* - \overline{y}_i\right)\right]}{\lambda b^2 + c^2} \qquad (19)$$

and its fiscal policy will be

$$x_i^P = \frac{\lambda b F_i - c^2\left(y_i^* - \overline{y}_i\right)}{\lambda b^2 + c^2} - \frac{d\frac{1}{n}\sum_j \left[x_j^N + \left(y_j^* - \overline{y}_j\right)\right]}{b\theta^B}. \qquad (20)$$

The last term in (20) captures the seigniorage gain for country i. There are j member in the monetary union whose average distortions in output and fiscal policy determine the inflation rate set by the common central bank.

With the one-sided peg, the government's structural reform efforts would not change in comparison to a unilateral peg. It would be given as expressed in (19). Its fiscal policy,

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[11] In fact the opposite is true. The anchor currency would, with full dollarization, be able to increase its seigniorage revenue. I abstract from this here, assuming that this does not enter the calculation of the anchor country. See Calvo (1999) on possibilities to share seigniorage revenue.

however, would be different due to the fact that with euroization there would be no seigniorage gains. Fiscal policy would hence be

$$x_i^E = \frac{\lambda b F_i - c^2 \left(y_i^* - \overline{y}_i \right)}{\lambda b^2 + c^2}.$$

(21)

How would these two cases compare with a full monetary union? First, I compare the unilateral peg with monetary union and monetary autonomy, before I do the same for a country that adopts a foreign currency.

Result 2:

Compared with monetary union, fixed exchange rate with an own currency implies that the level of distortive taxation depends on the foreign monetary policy. If the anchor currency inflates strongly, taxation under the one-sided peg is less distortionary than under full monetary union. A sufficient condition for structural reforms to be higher under the one-sided peg is $d\theta^B > b\theta^G / n$.

If the anchor currency inflates strongly, distortions will be lower under the peg than under full monetary autonomy. Structural reforms will be higher under the peg if d is sufficiently large.

Proof: See the Appendix.

In both cases will the distortion under a unilateral peg be lower than with full monetary union and with monetary autonomy if the inflation imported from the anchor currency is sufficiently high. In this case, seigniorage is high and therefore, there is less need for taxation to cover expenditures. Under certain circumstances, irrespective of this high seigniorage revenue the government will be induced to even increase structural

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reforms. This is independent from whether distortions in the pegging country are higher or lower than in the anchor country. The reason why this is the case is the fact that the government has no longer an influence on the behavior of the central bank. No longer can the government as a Stackelberg-leader force the central bank into its desired behavior. The government now takes the rate of inflation as given and instead uses structural reforms to avoid that output reducing taxation x_i will have to be too high. Again, this result can even obtain if the government imposes its own preferences on the central bank (so that $\theta^B = \theta^G$) because $d > b/n$ if n is large.

Thus, in comparison to full monetary union and to monetary autonomy, the unilateral peg can be reform inducing in pegging countries. In addition, if the pegging country pegs to an anchor currency that is less inflationary than the home currency, which is the typical case, distortive taxation will be lower than under the alternative case. Thus, a unilateral peg will have unambiguously positive effects on output for the pegging country, and this is even the case when compared with monetary union. A unilateral peg can thus be even "better" than full membership in a monetary union.[12]

But what happens if a foreign currency is introduced is chosen instead of a unilateral peg?[13] The difference here would be that there are no seigniorage gains.

Result 3:

Fiscal policy under the adoption of a foreign currency will be more distortive than under monetary autonomy while structural reform efforts will fall. However, fiscal policy will be

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[12] Whether increased output is valued sufficiently higher by the government to actually choose this arrangement depends mainly on the weight that governments assign to this goal.

[13] This is the option of "dollarization" as it is called on the literature, irrespective of the currency that is unilaterally adopted.

less distortive than under full monetary union. Therefore, structural reform efforts will also be higher in this case than with full monetary union.

Proof: See the Appendix.

Because there is no influence of fiscal policy on inflation in this case, there is a reduced incentive to implement these reforms. In addition, there is no seigniorage revenue at all. Lower revenue would seem to imply that there will be more structural reforms but this is not the case. Compared to monetary autonomy, this is because although it lowers output, the constraint from inflation aversion is improved. Thus, fiscal policy can become more distortive without any inflationary reaction. Given that inflation does not react to x_i, the budget constraint is not altered, and more fiscal revenues mean automatically less fiscal reforms. Therefore, the unilateral adoption of a foreign currency is only advisable for countries that assign a high value to keeping inflation low. They will have to pay for zero inflation with lower output and less structural reforms.

This is different, however, when compared to the case of full membership in a symmetric monetary union. Fiscal policy would be more distortive under monetary union because the government anticipates the central bank's reaction. This is not the case here, hence fiscal policy must not become too expansive in order to keep unemployment low. Therefore, the unilateral adoption is preferable to full monetary union for output. Also, there will be more structural reforms in this case than with full monetary union. There is hence a change in the optimal behavior of the government. The non-reaction of inflation to fiscal policy is an incentive to implement a more distortive policy. But this negative reaction will be less strong than with monetary union. At some point, the aversion to output falls becomes dominant.

5. Monetary Union Among Asymmetric Countries

The reaction function of the central bank, obviously, would still be given as in (11). But the policy choices of government i would take into account how the central bank reacts to the other countries which are structurally different from the own economy.

The structural reforms and fiscal policy are respectively

$$s_i^A = \frac{c\omega_3\left[F_i + b\left(y_i^* - \overline{y}_i\right)\right]}{\lambda v_2^2 + c^2\omega_3}$$

$$- c\frac{\frac{1}{n}\sum_{j=1}^n\left(x_j^A + \left(y_j^* - \overline{y}_j\right)\right)\left(d\theta^B - b\frac{\theta^G}{n}\right)}{\lambda v_2^2 + c^2\omega_3}$$

(22)

and

$$x_i^A = \frac{F_i\lambda\theta^B v_2 - \left(y_i^* - \overline{y}_i\right)\left(\lambda\frac{d}{n}v_2 + c^2\omega_3\right)}{\lambda v_2^2 + c^2\omega_3}$$

$$- \frac{\frac{1}{n}\sum_{j=1}^n\left(x_j^M + \left(y_j^* - \overline{y}_j\right)\right)\left(\lambda d + c^2\frac{\theta^G}{n}\right)}{\lambda v_2^2 + c^2\omega_3}$$

(23)

where the superscript A denotes the case of an asymmetric monetary union. Thus, again the fiscal policy becomes more distortive if the need for paying off debt is high, and it falls in the difference between target and given output. Now, however, there is a different spillover from country j's fiscal policy than before. The more distortive the fiscal policy of country j the less so the fiscal policy of i will be. This is obviously due to the fact that such a policy leads to higher inflation which government i aims to avoid. Given that country j's output gap will also increase the rate of inflation of the common central bank, country i will discipline its fiscal policy to avoid too high an increase in inflation. The stronger the inflationary response of the common central bank is to the developments in all other economies, the more i will avoid to put further pressure on the bank by running a less distortive fiscal policy.

At the same time, however, the high rate of inflation induced by the other countries implies that country i participates with high seigniorage gains (particularly if d is high). Therefore, the budget constraint is less tight and the government uses this favorable situation to lower the opposed structural reforms.

Result 4:

If the average fiscal policy and output distortions of the other union members are sufficiently smaller than the fiscal needs and the output distortions of country i, fiscal policy will become more distortive than under a symmetric monetary union in country i. In this situation, structural reform efforts will nevertheless increase if $d\theta^B - b\theta^G / n > 0$.

Proof: See the Appendix.

The introduction of asymmetry among the member countries of the monetary union implies that the change in the behavior is asymmetric as well. Those countries with lower distortions in fiscal policy and a lower output gap than the average will be faced with relatively more inflationary pressure than before. To counter this, they are induced to implement even more reforms, which has positive effects on their output. If the condition stated in the proposition is fulfilled, however, they will lower their structural reform efforts. They can "afford" this since although their fiscal revenues have fallen, their seigniorage revenue has increased. This, however, depends on seigniorage being a sufficiently large contributor to the budget.

Those with more distortions than the average will instead use the fact that some inflationary pressure is taken from them to run a more distortive fiscal policy, hence output falls. This is the same result as in the symmetric monetary union. But since inflation is reduced, they (if the condition in the proposition is fulfilled) will nevertheless have to increase their structural reform efforts. A monetary union among asymmetric countries in

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terms of fiscal policy and output gaps will thus magnify the differences between these countries.

6. Conclusion

The present paper has aimed to establish the connection between fiscal policy and structural reform efforts by a government in a monetary union or with a unilateral peg. It could be shown that a symmetric monetary union, in the sense of relatively similar economic structures in the participating countries, leads governments to adopt a more distortive fiscal policy while their reform efforts are reduced. This is because governments do no longer fully internalize the negative inflationary implications of such a fiscal policy. In such a situation one can obviously make a case for some kind of fiscal cooperation to accompany the introduction of monetary union. This is no longer necessarily the case if a monetary union is formed among asymmetric countries. A monetary union including diverse countries will induce those that are below average in terms of financing needs and distortions to adopt a more restrictive fiscal policy. This is because they realize that the average inflationary pressure on the central bank has increased. To compensate for this, and to keep the rate of inflation down, they themselves work to reduce these pressures by pursuing a less distortive fiscal policy. However, structural reforms will still be lower in these countries than before the monetary union. Thus, the composition of the monetary union has a strong influence on changes of the policy mix brought about by the introduction of a common money. It also implies that a fiscal cooperation is no longer necessarily useful in terms of avoiding that fiscal policy becomes too distortive. An asymmetric monetary union may be more effective in achieving this, at least for some countries, than cooperation. A unilateral peg with fixed exchange rates or with euroization will imply as well that the pegging country has a lower incentive to correct fiscal distortions because there will be no inflationary response. However, such a unilateral peg can still yield even for these countries a better policy mix than a full monetary union. This might rationalize why some countries

are actually better off with pegging or euroization than with monetary union. For them, a full membership might imply even worse results than pegging.

The results derived have important implications for the planned monetary union for ECOWAS. Starting from an existing monetary union between WAEMU members, an enlargement to comprise another six members should be implemented by 2004. Despite convergence requirements and some common rules on fiscal policy, the two groups of countries are still characterized by a considerable degree of divergence particularly in fiscal policy. Especially the non-WAEMU members of ECOWAS are still characterized by high inflation and large fiscal distortions. And although there are some nominal fiscal convergence criteria they are not particularly binding, since there is no provision how to treat countries that fail to fulfill them. Therefore it is important to analyze how a monetary union without binding fiscal rules will influence fiscal policy. Proceeding with the planned union without structural changes is likely to have strongly diverse effects on fiscal policy which will further push countries apart. Instead of a convergence, a further divergence in fiscal policies can be expected from a monetary union for West Africa.

Appendix

Proof of Result 1:

A comparison of fiscal policy (9) and (14) and structural reforms (8) and (13) shows that $x_i^M > x_i^N$ and $s_i^N > s_i^M$ are both fulfilled if $\left(b\theta^G - d\theta^B\right) > 0$. Given symmetry, this increase in fiscal burden will result in an increase in the rate of inflation, because inflation is a function of the average x_i. Since y_i is falling in x_i (eq. 1) monetary union implies that the expected output (disregarding any positive output shock) in country i falls.

Proof of Result 2:

The condition for $x_i^M - x_i^P > 0$ is

$$\frac{d\frac{1}{n}\sum_j\left(x_j^N + \left(y_j^* - \overline{y}_j\right)\right)}{b\theta^B}\left[\left(\lambda b^2 + c^2\right)\left(\lambda v_1 v_2 + c^2 \omega_2\right)\right] > \lambda\left(F_i + b\left(y_i^* - \overline{y}_i\right)\right)\left(\lambda b v_2 d + c^2 \tfrac{1}{n}\left(b\theta^G - d\theta^B\right)\right).$$

$s_i^P - s_i^M > 0$ is fulfilled if $\left[\tfrac{d}{n}v_1 + b\left(d\theta^B - \tfrac{1}{n}b\theta^G\right)\right] > 0$. Although, by assumption, $\left(b\theta^G - d\theta^B\right) > 0$, $\left(d\theta^B - \tfrac{1}{n}b\theta^G\right) > 0$ can be fulfilled if d and/or n are large.

The condition for $x_i^N - x_i^P > 0$ is

$$\frac{d\frac{1}{n}\sum_j\left(x_j^N + \left(y_j^* - \overline{y}_j\right)\right)}{b\theta^B}\left[\left(\lambda b^2 + c^2\right)\left(\lambda v_1^2 + c^2 \omega_1\right)\right] > \lambda\left(F_i + b\left(y_i^* - \overline{y}_i\right)\right)\left(\lambda b v_1 d + c^2\left(b\theta^G - d\theta^B\right)\right).$$

$s_i^P - s_i^N > 0$ is fulfilled if $\left[dv_1 - b\left(b\theta^G - d\theta^B\right)\right] > 0$ which could be positive if d is sufficiently large.

Proof of Result 3:

The condition for $x_i^E - x_i^N > 0$ is $\left(F_i + b\left(y_i^* - \overline{y}_i\right)\right)\lambda\left[\lambda b v_1 d + c^2\left(b\theta^G - d\theta^B\right)\right] > 0$ which is fulfilled as long as $\left(b\theta^G - d\theta^B\right) > 0$. Because there is no seigniorage revenue, an increase in x_i implies a decrease in s_i. Hence, $s_i^N - s_i^E > 0$.

The condition for $x_i^M - x_i^E > 0$ is $\left(F_i + b\left(y_i^* - \overline{y_i}\right)\right)\lambda\left[\lambda b v_2 d + c^2 \frac{1}{n}\left(b\theta^G - d\theta^B\right)\right] > 0$ which is also fulfilled as long as $\left(b\theta^G - d\theta^B\right) > 0$. Again, because there is no seigniorage, $s_i^E - s_i^M > 0$.

Proof of Result 4:

The condition for $x_i^A - x_i^M > 0$ is that

$$\lambda\theta^B v_2 \tfrac{n-1}{n}\left(F_i + b\left(y_i^* - \overline{y}_i\right)\right)\left(\lambda d v_2 + c^2 \tfrac{\theta^G}{n}\right) > \tfrac{1}{n}\sum_j\left(x_j^A + \left(y_j^* - \overline{y}_j\right)\right)\left(\lambda d + \tfrac{\theta^G}{n}\right)\left(\lambda v_1 v_2 + c^2 \omega_2\right).$$

The condition for $s_i^A - s_i^M > 0$ is that

$$\left(F_i + b\left(y_i^* - \overline{y}_i\right)\right)\lambda\theta^B v_2 \tfrac{n-1}{n}\left(d\theta^B - b\tfrac{\theta^G}{n}\right) > \tfrac{1}{n}\sum_j\left(x_j^A + \left(y_j^* - \overline{y}_j\right)\right)\left(\lambda v_1 v_2 + c^2 \omega_2\right)\left(d\theta^B - b\tfrac{\theta^G}{n}\right).$$ Notice that

if $\left(\tfrac{1}{n}b\theta^G - d\theta^B\right) > 0$ the inequality reverses its sign. Hence, the comparison about structural reforms depends not only on the distortions of country i vis-à-vis the average of the other countries but also on the size of d.

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