From Preferences to Reciprocity
General Equilibrium Effects of a Free Trade Area Between the EU and the UEMOA

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Abstract:

After the signing of a new agreement between the EU and the ACP states, negotiations about regional free trade agreements (FTA) should start between the UEMOA and the EU. Therefore its impact on exports, income, investment and growth is of special interest for the UEMOA members. A computable general equilibrium (CGE) model was used to analyse the impact of an FTA where mainly the UEMOA countries have to reduce tariffs as the EU grants them already almost free market access. As a reaction to declining tariff revenues, that are reduced by ca. 50% and that leads to a decline in real GDP, the governments of the UEMOA countries could raise other taxes or increase the budget deficit and the EU has promised to compensate the poorer ACP countries. The implications of these alternatives are discussed.

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Practical Policy Analysis

A. Introduction

One principle aim of the EU policy towards developing countries stated in the treaty of Maastricht as well as in the current Lomé convention with countries in Africa, the Caribbean and the Pacific (ACP) is the smooth and gradual integration of these countries into the world economy. There are different reasons for the promotion of exports. First of all the revenue from exports is needed for imports of investment and capital goods (and debt service). Secondly the domestic markets in most developing countries are too small to make use of economies of scale or scope. Therefore access to other markets is a precondition for investments.

The trade provisions of the past Lomé Conventions (1975-2000) have allowed for free market access to the EU for almost all products (except some CAP products) originating in the ACP countries. Overall 97 % of all ACP products enter the EU market tariff free.[1] These non-reciprocal tariff preferences have been a pillar of the Lomé Conventions so far as the ACP still have better market access than under the Generalised System of Preferences (GSP) that is available for all developing countries.

Because of various reasons the EU commission wanted to change the trade provisions significantly in the future. In the new agreement it is stated that the ACP States either enter into negotiations of economic partnership agreements that include the establishment of free trade areas between the EU and groups of ACP states or other WTO compatible trade provisions have to be found, that will most likely incorporate some differentiation with respect to the level of development.[2]

On the one hand one can argue that the existing trade provisions have had little impact on ACP exports and that they eventually will erode anyway because of the decisions made in the Uruguay Round and future WTO negotiations. But on the other hand for specific agricultural products where the EU protection is still high and therefore significant preferences exist for products like vegetables and flowers. Several ACP countries benefited from improved competitiveness and raised their exports in these products.[3]

Against this background it is the objective of this study to investigate whether the implementation of an FTA between the EU and the UEMOA will have beneficial effects for the latter. The basic question is whether the gains through liberalisation will compensate for the loss in tariff revenue that is likely to occur. A second aim of the analysis is to find out whether the reciprocal liberalisation in the UEMOA will contribute to the process of diversification and the promotion of exports of manufactures and services as reduced costs for imports are assumed to increase competitiveness.

B. The development of the UEMOA

The West African Economic and Monetary Union (UEMOA) is made up of eight member countries: Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal and Togo. Only Côte d'Ivoire and Senegal are countries that are least developed (LLDC). The UEMOA was created on January 10 1994, succeeding the UMOA. So far it is the most well advanced integration scheme in Africa with a relatively well-built institutional and organisational structure. The total population of the UEMOA group countries is well over 60 million inhabitants and covers an area of almost 3.5 million sq. kilometres. The economic characteristics of member countries tend to be significantly different. Countries in the humid zone (Ivory Coast, Togo, and Benin) produce mainly coffee, cocoa, and bananas. Those countries in the in the sub-humid

1 Calipel et al. (1998).
2 Wolf (1999).
3 Wolf (1999).

coastal zones produce cotton, and cereals as well as animal husbandry. The industrial structure is very uneven among countries. Only Côte d'Ivoire and, to some extent, Senegal have a relatively significant industrial sector that goes back to the colonial period. But even in these two countries, the industrial sector is highly protected, less competitive and of a small size compared to other ACP countries (see Table 2).

Côte d'Ivoire is the wealthiest member of the UEMOA with a per capita GNP of US$ 690 followed by Senegal at US$ 550. Other member countries are very poor. Niger, Guinea-Bissau and Burkina Faso, for example, have a per capita GNP of less than US$ 240, which is far below the average group income of US$ 350. Côte d'Ivoire is also the largest exporting country in the region with almost 47 percent of its GDP are for exports. The poorest countries in the sahel region, that are also land-locked, are also the least exporting countries. In fact they are significant importers of goods from the more advanced countries in the UEMOA (see Table 5 in the Appendix).

Table 1: Economic characteristics of UEMOA countries

	Benin	*Burkina Faso*	*Mali*	*Côte d'Ivoire*	*Niger*	*Senegal*	*Guinea Bissau*	*Togo*
Population (million)	5.8	10.9	10.3	14.7	9.7	8.8	1.1	4.3
GDP (US $ Billion)	2.1	2.4	2.5	10.3	1.9	5.2	0.27	1.5
GDP annual growth	5.3	5.5	7.0	5.7	3.4	4.9	5	4.7
per capita GNP (US$)	380	240	240	690	200	550	240	330
Total debt/GDP	69.9	334	132	171.8	88.6	74.6	334.8	89.6
Exports/GDP	24.7	13.8	25.0	46.6	16.2	32.6	21	32.9

Source: World Bank, 1998 figures.

The relative good trade infrastructure in the West African region has facilitated trade among UEMOA countries. Land-locked countries such as Mali and Burkina Faso benefit from their link with the coastal countries. Natural trade barriers such as prohibitive transportation costs are lower among UEMOA countries than elsewhere in sub-Saharan Africa. Railway links exist between Senegal and Mali as well as between Côte d'Ivoire and Burkina Faso. There is also very high factor mobility among UEMOA countries. This is facilitated by the region's monetary union,[4] which allows free mobility of capital and labour. Factor mobility in the region has lowered costs of information and transaction in inter-regional trade and thus encouraging trade among partner states.

However, the integration of the UEMOA with the rest of Sub-Saharan Africa is rather weak (see Table 3). One reason for this general low intra-African trade is an insufficient transport infrastructure with links only to overseas transport facilities. But the main reason is probably the similar trade structure. An export of cocoa from Ivory Coast to Ghana or vice versa is obviously meaningless. Hence especially exporters of commodities, tourism, etc. are heavily dependent on access to markets of industrial countries.

[4] The common currency FCFA was devalued by 50 % in 1994 against the Euro, which caused significant adjustment pressure but was also a precondition for the relatively high growth rates afterwards.

Table 2: Characteristics of UEMOA members compared to the rest of sub-Saharan Africa, 1994

	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other
GDP at market prices (current US$, Mio)	7,932	11,548	3,999	74,406
Agriculture, value added (% of GDP)	37.54	24.57	35.44	30.92
Industry, value added (% of GDP)	19.56	17.92	24.75	31.69
Services, etc., value added (% of GDP)	42.90	57.51	39.81	37.39
Private consumption, etc. (% of GDP)	80.45	69.71	76.02	64.58
General government consumption (% of GDP)	13.36	12.81	16.68	14.07
Gross domestic investment (% of GDP)	17.81	12.92	20.71	18.78
Exports of goods and services (% of GDP)	20.96	39.51	24.33	35.29
Imports of goods and services (% of GDP)	32.58	35.09	38.92	32.79
Gross domestic savings (% of GDP)	6.19	17.34	6.06	21.28
Aid (% of GDP)	20.74	15.20	18.64	3.72

Source: World Bank, own calculations.

For most UEMOA countries the European Union is both the region's major supplier as well as the regions major market. The European Union accounted for more than 50 percent of the region's total imports (see Table 3). The region's leading EU importer for 1997 was Côte d'Ivoire, which imported more than 58 percent of its imports from the European Union. Senegal, Benin and Togo also have the EU as their major source of imports being 55, 52, and 49 percent respectively. Mali had the least percentage of imports coming from EU, that is, only 26 percent of its total imports.

A significant percentage of UEMOA's imports from the European Union are in the food sector. However, most of UEMOA's manufactured and industrial products come from the European markets (see Table 5 in the Appendix). When looking closely at individual products we find that more than 90 percent of pharmaceuticals are imported from the EU and more than 60 percent of all imported meat, milk products, sugar and tobacco into UMEOA come from the European Union. Machine products are (58 percent) also mainly supplied by the European Union.[5]

Table 3: Matrix of total trade between different regions in the model, 1994

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA	Rest of world	Total exports	Total supply
EU	33,212,041	2,350	4,877	12,603	13,186	1,758,709	1,791,724	35,003,765
UEMOA-LLDC	1,755	10,484	34	0	16	1,023	2,828	13,312
UEMOA-Other	2,927	837	15,111	0	415	3,603	7,211	22,893
Rest of SSA-LLDC	12,544	0	48	32,740	471	5,424	16,961	51,227
Rest of SSA-Other	14,068	22	21	8	94,908	10,953	25,072	119,980
Rest of world	1,614,442	1,000	3,112	9,943	14,043	19,148,655	1,644,637	20,791,195
Total imports	1,645,736	4,210	8,092	20,552	28,131	1,781,713		
Total demand	34,857,777	14,694	23,203	55,293	123,039	20,928,366		

Source: UNCTAD, 1998 and Yeats, 1998.

[5] See Calipel et al. (1998).

Most of the exports from UEMOA to the EU benefit from lower tariffs as agreed upon in the Lomé Convention. However, the tariffs for competitors that are subject to the general system of preference are also low for the main exports of the region. Coffee for example, is duty free on the European Market for low income countries regardless whether they are ACP or not. Duties for GSP countries are also very low for cocoa and cotton at 1.1 percent and 2.2 percent respectively. The region's products that face market entry barriers in the European Union are mainly fruits and vegetables. Fruits, vegetables and fish from UEMOA are still subject to tariffs. These are areas where there is still room for improving market access by future regional arrangements.

The question is how fast the UEMOA countries are able to respond to the improved market access. Because the investment climate is unfavourable, at least in the poorer countries, they are unlikely to be able to take full advantage of further liberalisation in the short run. Until now mostly the more advanced ACP countries have been able to take advantage of the possibilities created by the current system of Lomé trade preferences. This will also mean that an extension of non-reciprocal preferences to all least developed countries is likely to have only little impact on EU imports. Scope for further liberalisation especially of non-tariff barriers exists also in the service sector that is of growing importance for the economies of the ACP states. It represents now the fastest growing business sector in sub-Saharan Africa. Trade liberalisation in both directions will therefore have a direct effect on tradable services. But it will also have an indirect effect on non-tradable services as intermediary inputs like transport or through the changes in consumption.

The UEMOA is one of the most advanced regional integration scheme in Sub-Saharan Africa for several reasons. It has the advantage of having members who are using the same official language and currency the CFA that is backed by the French central bank and has a fixed rate against the Euro. The main objectives of the union are:[6]

- To reinforce the competitiveness of the economic and financial activities of member states in the context of an open and competitive market and a rationalised and harmonised juridical environment.
- To ensure the convergence of the macro-economic performances and policies of member states with the establishment of multilateral control procedures.
- To create a common market among member states based on the free circulation of people, goods, services, and capital. Therefore a common external tariff as well as a common commercial policy has been agreed to be implemented from 2000 onwards.
- To harmonise the legislation, especially the fiscal system of the member states if the necessity arose for the proper functioning of the common market.

The institutional structure of the UEMOA is similar to that of the European Union with a Council of Ministers, a Commission, a Court of Justice etc. However, the region has yet to make progress in the harmonisation of national trade policies of member states. The very diverse levels of development also put some obstacles to the process of liberalisation as they lead to diverging interests. Furthermore the UEMOA encounters difficulties with respect to mobilising sufficient resources for the costs of integration, such as the common institutions and intra-regional transfers.[7]

For well over fifteen years, the structural adjustment programmes informed significant trade policy reforms with the aim not only to lower tariffs and non-tariff barriers but also to simplify the tariff system. However still for UEMOA, as a whole, customs revenue represent about 48 percent of the total fiscal revenue and about 7.3 percent of combined GDP. Bound tariff rates

6 See M'Bet, 1999.
7 See Calipel et al. 1998.

under the WTO reach up to 260 % but actual average tariff rates are in the range of 5% for minerals and energy to 16.7% for simple manufactures (see Table 6 in the Appendix).

The UEMOA customs union that is to be effective from January 2000 involves the setting up of a common external tariff (CET). The Common External Tariff designates four categories of products with four tariff rates of 0, 5, 10 and 20 percent. Category 0 stands for social goods (pharmaceuticals, school books, brochures, etc.); Category 1 (5%) stands for strategic goods (cereals, crude oil, cotton, wood, leather, natural gas, etc); Category 2 (15 percent) stands for intermediary goods and raw materials not classified as strategic goods); Category 3 (30 percent)stands for goods for final consumption (textiles, tobacco, leather, luxury goods).

C. Deciding on future trade relations

In recent years a number of studies of North-South Free Trade agreements have been carried out, most of them on NAFTA but also a number on the EU-Mediterranean FTA. In principle the same effects of trade creation and diversion occur but the distribution of gains depends on the differences in the level of development of the partners before the integration starts.[8] Especially with respect to investment not only costs of production play a role but also agglomeration benefits and the macroeconomic and policy environment. The biggest worry of many developing countries is that the concurrence for domestic producers will increase through an FTA so they might have to cut down their production. But on the other hand, prices for consumer goods and for intermediaries will decline so there will occur an increase of production in some other sectors. This will lead to a restructuring of the economy and a more efficient allocation of resources. Until now the bulk of manufactured products are made from imported inputs. The competitiveness of the manufactures sector will therefore improve through a liberalisation. But because the backward and forward linkages between the major sectors of the African economies are small the effects of export growth on the total GDP are limited. However, the EU producers will be able to increase their exports immediately and take advantage of economies of scale. For them the percentage rise will be relatively small because of the small share of ACP imports in total trade. For the ACP countries, in the contrary, the rise in imports will be relatively high because almost half of their imports originates in the EU even without preferential treatment. For those goods which the ACP countries can't produce on their own and which are necessary for investment or as intermediary goods a liberalisation of ACP markets will have advantages for all participants in this trade.[9]

A detailed study of likely effects of an economic partnership agreement between the EU and the UEMOA was commissioned by the European Union during the preparation for the negotiations of a new EU-ACP agreement.[10] The main findings of this study are the following:

- total EU exports to the UEMOA will rise between 195 and 2064 bn. FCFA,
- tariff revenue will decline between 8 % for Niger and 16 % for Côte d'Ivoire (14 % on average),
- for most countries and products consumer surplus will increase but mainly only in the range of 1 to 2 percent if goods from different origin are assumed to be imperfect substitutes and up to 10 percent if goods are assumed to be perfect substitutes
- no changes of exports of UEMOA members are calculated as the scope for tariff reduction on the EU side is judged to be negligible.

However, as these effects were calculated by using a static partial equilibrium model they don't take into account income effects and dynamic effects on investment etc. Therefore with a CGE

8 Lewis/Robinson/Thierfelder (1999).
9 See Wolf (1997) and Wolf (1999).
10 See Calipel et al. (1998).

model we can also cover changes in exports of the UEMOA countries due to increased competitiveness. In the analysis the focus will lie on the effects of the introduction of a regional economic partnership agreement for the EU and the UEMOA. Besides the effects on bilateral trade, the effects on investment will be of special interest. Because investment is determined by various conditions such an analysis will always be limited. The improved market access, the lower import prices and a change in domestic demand can be included in the model but factors like the credibility of reforms can hardly be quantified. Whit a CGE model the interlinkages between the different regions can be investigated. If the liberalisation takes place only in one region they might attract more investment and have better marketing possibilities than in a situation where the liberalisation takes place simultaneously in several regions.

Special emphasis will also be put on the different effects in the less developed UEMOA countries versus the more advanced countries Senegal and Côte d'Ivoire. The effects for least developed countries are of special interest, because they have an option to retain the current non-reciprocal preferences without liberalising themselves. One question is whether the benefits of taking part in an area of enhanced economic integration with the EU will outweigh the interim costs of liberalisation and what flanking measures and financial help are necessary. For this purpose different reactions to the decline in tariff revenue are investigated. One possibility is that the UEMOA governments just cut down expenditures as they get lower revenues. Another option would be to raise other taxes. Finally the EU promised to increase aid at least for the less developed countries. As tariff revenue plays such an important role in the discussion only tariffs and not NTB are taken into account as they do loose importance because of the establishment of a customs union in the UEMOA anyway.

D. The UEMOA trade model

Non-technical overview of the CGE model

The CGE model used for the analysis of alternative trade relations between the EU and the UEMOA is based on an existing one in the tradition of Brown (1984) and Whalley (1985) which contains the ACP group only as a single region and was updated in terms of the system of equations (see appendix) and data.[11]

The CGE model is used to analyse the effects of increased competition for import competing industries as well as the benefits for consumers and users of imported inputs that result from different trade regulations. The analysis includes some dynamics especially with respect to investment behaviour. Domestic investment is endogenous in this model but the reaction of foreign investment is exogenous because it depends on factors like credibility of trade reforms, which are difficult to measure.

The model includes the following regions: UEMOA (least developed countries and others), other Sub-Saharan-African countries, EU, and rest of world, as well as the following sectors: agricultural produce (staple foods, export crops), minerals and energy, simple manufactures, industrial goods, and services. Data from Eurostat trade statistics, Worldbank, UNCTAD and others are used for the update of the database. The SAMs for UEMOA is based on a SAM for Côte d'Ivoire.[12] For the rest of sub-Saharan Africa as well as for other lacking data the GTAP 1995 data set was used.[13] The tariffs for the UEMOA and the EU versus UEMOA are taken from Calipel et al. (1998) as the tariff data the EU raises against sub-Saharan countries in the GTAP database seem to be much too high. Elasticities were taken from Bakoup and Tarr (1999) as Cameroon is relatively similar in its economic structure to the UEMOA countries. With these

11 Wolf (1996) and Wolf (1997).
12 Chia/Whaba/Whalley (1992).
13 As published in Lewis/Robinson/Thierfelder (1999).

data a new equilibrium was calibrated. The base year is 1994 and the time horizon is 15 years. The structure of the SAM is shown in Table 9 in the Appendix.

The assumptions of the model

The production function is based on Input-Output tables and a Leontief technology is assumed. From the production function the intermediary demand of inputs is calculated. The production sectors are characterised as being perfectly competitive with constant returns to scale. That means there is a sufficient number of suppliers, not an oligopoly. Already invested capital is immobile between sectors and countries. Employment is mobile between sectors but internationally immobile. Excess supply of labour exists and therefore wages are set exogenously. This assumption is plausible because unemployment is generally high in most Sub-Saharan African countries.[14] That means that there is sufficient labour supply but labour market imperfections exist.

A single representative household maximises utility and owns all primary factors. The share of expenditure for one kind of goods is held constant through the demand function. Consumers and producers buy at world market prices plus tariffs. The income in a country is defined by the value added through domestic production plus state transfers less tax payments. It is sub-divided into consumption expenditures and savings according to a fixed savings ratio.

In this model as in most CGE trade models traded goods are distinguished by their country of manufacture. A two-stage demand function with constant elasticity of substitution is built into the model, and imports are subdivided according to Armington's assumption.[15] That means that goods of different origin are considered heterogeneous with respect to quality, composition etc. This allows empirical estimates of elasticities of substitution to be used, so that trade flows do not need to be determined solely by relative factor endowments, as in the Hecksher-Ohlin model, but also by historical links and consumer preferences. With this construction it is also possible to include intra-industrial trade into the analysis.

Total household income after taxes is split between consumption and savings that will be turned into investment. It is assumed that investment in every sector is allocated in accordance with the return to capital, which is determined endogenously. Investment also leads to demand of investment goods in the same period. Because of a lack of data it is assumed that the same investment goods will be purchased by each sector. FDI are dependant on the changes of relative prices caused by the changing trade provisions. Domestic investment is therefore endogenous in this model but the reaction of foreign investment is exogenous because it depends on factors like credibility of trade reforms etc, which are very difficult to measure. In the next period the investment in each sector is added to the fixed capital stock.

The state gets its revenues from tariff revenue, taxes (VAT and income tax) and foreign aid and can also run a deficit. The government income is spend for consumption in the service sector (that is mainly infrastructure and social expenditures), transfers to the household and interest payments on debt. As a reaction to declining tariff revenues, which are a major problem of the REPAs according to previous studies[16] the government could raise other taxes, decrease expenditures or increase the deficit, which will crowd out private investment. Another possibility would be that foreign donors, especially the EU would at least temporarily increase aid to compensate for losses of tariff revenues as they have indicated during the negotiations of a post-Lomé agreement. The different tax and aid scenarios will have quite different effects on the

14 See Lewis/Robinson/Thierfelder (1999).
15 See Armington (1969).
16 See Calipel et al. (1998).

macroeconomic performance as different incentives on the factors of production and consumption will occur.

The UEMOA region is not only linked to the rest of sub-Saharan Africa, the EU and the rest of the world through trade and tariffs but also through foreign direct investment, aid and the possibility of a budget deficit, which has to be financed by the developed countries. A budget deficit in the current period will be added to the total amount of debt in the next period and will then lead to interest payments. The EU and the rest of the world are only modelled with respect to supply of exports and demand for imports. It is assumed that their economies will grow independently from the trade with the Sub Saharan countries with a constant rate and that demand will grow with the same rate for each sector.

The closure of the model includes some standard assumptions made in CGE modelling of trade liberalisation. Obviously demand equals supply for every good in every country. No extra profits occur – that means production is at the break-even point, because of the assumption of perfect competition. Savings equal investment because of the functional form of the investment equation. The trade balance is adjusted to changes in transactions with other countries like the value of FDI inflows, the amount of aid, the government deficit and tariff revenues.

The model is based on a Walrasian equilibrium. A more period model is used to capture the adjustment process of different scenarios. For each period some of the exogenous variables like capital stock of a sector are updated with endogenously determined investment and selected behavioural parameters are changed. The model is set up in real terms without asset markets and money is assumed to be neutral. As the FCFA used by all UEMOA countries has a fixed exchange rate with the Euro this assumption will not restrict the analysis. The agents make decisions on the basis of relative prices. The wage rate serves as a nummeraire. The counterfactual simulation calculates the impact a change in one sector will have on other sectors, other regions, and on overall economic welfare.

Interpretation of simulation results

The main option in the new EU-ACP agreement the UEMOA has to consider is the establishment of a free trade area with the EU. In the calculation[17] for simulation I it was assumed that trade in goods will be totally liberalised by both sides as only single products but not a whole group can be excluded according to WTO rules (see Table 4, 7 and 8). As the UEMOA tariffs are much higher than the tariffs for the agricultural sector of the EU the liberalisation is in fact asymmetrical. Trade between the EU and the UEMOA rises for almost all products in both directions but faster on the EU side, except for manufactures where EU exports actually decline. Especially in industry the rise in exports is much higher for the EU because here initial tariffs were relatively high and these inputs basically have to be imported.

Total imports remain almost constant as compared to the base run. The fact that also exports for UEMOA products that don't enjoy a tariff reduction increase faster than in the base run is due to the decline in internal prices that make inputs cheaper and therefore domestic production more competitive. Because of the small proportion of ACP exports in total EU demand prices in the EU remain unchanged.

As tariff revenues decline by 50 % (UEMOA-LLDC) and 31 % (UEMOA-Other) respectively total government revenue also declines. This leads to a reduction in transfers to households and government spending and therefore to an overall decline in demand. The occurring loss of real GDP is therefore mainly due to the loss in tariff revenue and only to a lesser extend to

[17] A sensitivity analysis has so far not been carried out. However, the sensitivity analysis of the previos model shows that changes appear only in the magnitude of effects not in their sign (see Wolf, 1996).

deteriorating terms of trade. As domestic production in all sectors declines the same holds for employment. It is an interesting observation that for the more advanced UEMOA countries total employment declines first and than raises again whereas for the least developed UEMOA countries a decline in employment occurs only in the first period (see Figure 1).

Table 4: Main simulation results after 15 years

(% change from base run)

Main Simulation Results for UEMOA-LLDC

	Base run	**Simulation I**	**Simulation II**	**Simulation III**
	Mio US$	%	%	%
Tariff Revenue	*392*	*-49.7*	*-48.0*	*-49.5*
Gov. Income	*2165*	*-9.6*	*-1.4*	*-2.2*
Transfers	*762*	*-9.2*	*-1.8*	*-1.4*
Real GDP	*14792*	*-3.3*	*-0.1*	*-2.5*
Employment	*14749*	*-5.1*	*-0.3*	*-3.3*
Total Exports	*15061*	*-4.0*	*-0.8*	*-3.2*
Total Imports	*4585*	*0.8*	*4.2*	*0.8*
Imports from EU	*2590*	*5.3*	*9.0*	*5.3*
Exports to EU	*1969*	*1.8*	*1.8*	*1.8*

Main Simulation Results for Rest of UEMOA

	Base run	**Simulation I**	**Simulation II**	**Simulation III**
	Mio US$	%	%	%
Tariff Revenue	*1165*	*-31.3*	*-29.4*	*-31.4*
Gov. Income	*4619*	*-9.2*	*-1.9*	*-1.4*
Transfers	*576*	*-9.6*	*-1.4*	*-2.3*
Real GDP	*30665*	*-2.9*	*-0.3*	*-2.2*
Employment	*11659*	*-4.3*	*-0.8*	*-2.5*
Total Exports	*31456*	*-3.4*	*-0.9*	*-2.8*
Total Imports	*10322*	*0.1*	*3.0*	*0.0*
Imports from EU	*6338*	*3.6*	*6.7*	*3.6*
Exports to EU	*4142*	*1.4*	*1.4*	*1.4*

Source: Own calculations.

In simulation II it was assumed that the EU will compensate the UEMOA countries for a loss in tariff revenue. As a proxy the loss of the previous simulation was taken. This assumption changes the results of the calculation significantly. The prices are approximately the same as in the previous scenario. Through the aid transfer domestic demand can be maintained and therefore the real GDP is almost the same as in the base run. Especially in Food, agricultural exportables, minerals and simple manufactures production increases whether it declines in industry and services relative to the situation with no liberalisation. This structural change is mainly in line with the expected comparative advantages of the UEMOA countries and is also reflected in employment and investment. Imports from the EU increase more than in the previous simulation whereas imports of the EU roughly remain constant so that it can be assumed that the aid flows are partly returned through trade.

In simulation III the UEMOA governments themselves try to compensate the loss in tariff revenues through higher value added taxes. As the VAT rate realistically cannot be increased by 1/3 in one step we assume an increase over 5 years (see Figure 1). Therefore in the beginning the development is similar to the first simulation without compensation, whereas in the end real

GDP is higher but still lower than in the second simulation with increased aid. However, imports are lower in the third scenario due to reduced demand, except for services where the increased government demand compensates for the reduction in private demand. In the service sector the decline in domestic production is also lower than in the first simulation whereas the changes in trade and production for the other sectors are similar. This scenario shows that a moderate increase in taxes does not necessarily harm the economy.

E. Conclusion

With the multi-regional UEMOA trade model different liberalisation scenarios from which the UEMOA has to choose have been analysed. The most important option is the establishment of a FTA between the UEMOA and the EU. In the analysis the results of previous studies are mostly confirmed. Especially the loss in tariff revenue will be significant and real GDP and employment will decline especially for the poorer countries. This is partly due to the fact that the trade liberalisation is asymmetrical in two respects: the share of trade that is involved is asymmetrical, and the tariff reduction is also asymmetrical because of the higher level of protection in the UEMOA countries.

As a reaction to declining tariff revenues, that are reduced by ca. 50 % for the least developed UEMOA countries, the government could raise other taxes, decrease expenditures or increase the budget deficit, which will crowd out private investment. If the EU will increase its aid to compensate for the losses of tariff revenue as proposed during the Post-Lomé negotiations the decline in real GDP will be almost totally reduced. The simulations also show that it is difficult for the UEMOA countries to compensate for the loss of tariff revenue through an increase in taxes. As Dawkins and Whalley (1997) show for Côte d'Ivoire even the type of tax that is raised makes a big difference and especially collecting a VAT is not as simple as it is always assumed because it can increase the volatility of revenues considerably.

The calculations show that the terms of trade losses through liberalisation are a much smaller problem of the liberalisation but that the income losses are driven by the loss in tariff revenue. However, as total exports of the UEMOA countries decrease by a higher percentage than exports from the EU increase trade diversion is higher than trade creation which also has a negative welfare effect. It is obvious that the establishment of a FTA between the EU and regions of ACP countries will create new distortions in world trade. Therefore further analysis should also include the option of liberalisation against all UEMOA trading partners instead of only towards the EU. Only through an overall liberalisation the consumers and producers in the ACP states will gain access to the cheapest source of supply and many studies show that multilateral liberalisation is favourable for all participants.[18] Moreover, when the UEMOA members open their markets on a unilateral basis for all suppliers they can decide on the timetable on their own. This is favourable for them because import liberalisation without macroeconomic stability could widen the gap of the current account deficit because imports will raise immediately whereas investment in the export sector will be insufficient due to uncertainty.

The analysis has clearly shown that a free trade area between the EU and the UEMOA is not the most favourable option for the latter but that a more careful review of the different liberalisation scenarios has to be undertaken. It can also be expected that if dynamic effects of liberalisation like improved productivity through increased FDI, are also taken into account, the losses of liberalisation will be reduced. If the EU sees however the establishment of FTA as the only WTO compatible option it should consider a compensation for losses of tariff revenue more seriously than at the moment, at least for an adjustment period.

[18] E.g. Dessus/Fukasaku/Safadi (1999).

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Appendix

Table 5: Export Matrix

A. Food

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world	Total exports	Total supply
EU	3,791,279	1,000	1,000	2,500	1,000	157,525	163,025	3,954,304
UEMOA-LLDC	7,955	725	16	0	8	300	1,119	1,844
UEMOA-Other	1,000	124	1,036	0	147	1,102	2,373	3,409
Rest of SSA-LLDC	2,000	0	18	1,536	176	987	3,181	4,717
Rest of SSA-Other	2,500	4	4	2	13,587	2,098	4,608	18,195
Rest of world	161,985	135	979	2,500	2,326	2,583,462	167,925	2,751,387
Total imports	168,280	1,264	2,017	3,000	3,656	164,013		
Total demand	3,959,559	1,989	3,053	6,538	17,243	2,745,473		

B. Agricultural export goods

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world	Total exports	Total supply
EU	347,716	100	200	10	150	22,837	23,297	371,013
UEMOA-LLDC	215	645	16	0	8	294	532	1,177
UEMOA-Other	500	8	1,366	0	3	23	535	1,901
Rest of SSA-LLDC	500	0	23	3,552	224	1,122	1,869	5,421
Rest of SSA-Other	1,000	0	0	0	11,689	110	1,111	12,800
Rest of world	36,520	172	100	20	340	259,804	37,152	296,957
Total imports	38,735	281	339	30	724	24,387		
Total demand	386,451	926	1,705	3,582	12,413	284,191		

C. Minerals and energy

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world	Total exports	Total supply
EU	219,376	50	250	500	500	102,465	103,765	323,141
UEMOA-LLDC	100	485	1	0	0	264	365	850
UEMOA-Other	100	207	497	0	78	586	400	1,468
Rest of SSA-LLDC	4,000	0	2	1,408	24	500	3,000	5,934
Rest of SSA-Other	4,400	11	10	4	5,923	3,232	7,656	13,579
Rest of world	156,109	75	13	699	750	413,842	159,743	571,488
Total imports	164,709	343	276	1,203	1,352	107,047		
Total demand	384,085	828	773	2,611	7,275	520,888		

D. Simple manufactures

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world	Total exports	Total supply
EU	5,936,173	500	2,000	4,500	4,500	605,862	617,362	6,553,535
UEMOA-LLDC	500	1,450	1	0	1	26	528	1,978
UEMOA-Other	1,000	415	2,791	0	156	1,172	2,742	5,533
Rest of SSA-LLDC	3,000	0	3	3,653	33	700	3,737	7,390
Rest of SSA-Other	3,000	6	6	2	11,762	2,981	5,995	17,757
Rest of world	561,000	216	737	1,417	2,054	4,874,353	565,425	5,439,778
Total imports	568,500	1,137	2,748	5,919	6,744	610,741		
Total demand	6,504,673	2,587	5,539	9,572	18,506	5,485,094		

E. Industry

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world	Total exports	Total supply
EU	3,569,621	500	1,000	2,000	3,000	568,209	574,709	4,144,330
UEMOA-LLDC	50	1,373	0	0	0	6	57	1,430
UEMOA-Other	100	83	2,367	0	31	234	448	2,815
Rest of SSA-LLDC	200	0	1	6,874	14	300	516	7,390
Rest of SSA-Other	300	1	1	0	12,173	442	744	12,917
Rest of world	497,862	378	1,100	2,280	5,546	3,871,504	507,167	4,378,670
Total imports	498,512	962	2,103	4,280	8,592	569,191		
Total demand	4,068,133	2,335	4,470	11,154	20,765	4,440,695		

F. Services

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world	Total exports	Total supply
EU	19,347,875	200	427	3,093	4,036	301,811	309,566	19,657,441
UEMOA-LLDC	95	5,806	0	0	0	132	227	6,033
UEMOA-Other	227	0	7,054	0	0	486	713	7,767
Rest of SSA-LLDC	2,844	0	0	15,717	0	1,814	4,658	20,375
Rest of SSA-Other	2,868	0	0	0	39,774	2,090	4,958	44,732
Rest of world	200,966	23	182	3,027	3,027	7,145,690	207,225	7,352,915
Total imports	207,000	223	609	6,120	7,063	306,334		
Total demand	19,554,875	6,029	7,663	21,837	46,837	7,452,023		

Source: UNCTAD and Yeats (1998), own calculations.

Table 6: Tariff structure of the model

A. Food

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world
EU		0.091	0.090	0.148	0.148	n.a.
UEMOA-LLDC	0.005		0.000	0.098	0.098	0.158
UEMOA-Other	0.005	0.000		0.098	0.098	0.158
Rest of SSA-LLDC	0.005	0.091	0.090		0.098	0.158
Rest of SSA-Other	0.005	0.091	0.090	0.098		0.158
Rest of World	0.200	0.091	0.090	0.156	0.158	

B. Agricultural export goods

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world
EU		0.052	0.066	0.192	0.192	n.a.
UEMOA-LLDC	0.006		0.000	0.170	0.170	0.279
UEMOA-Other	0.006	0.000		0.170	0.170	0.279
Rest of SSA-LLDC	0.006	0.052	0.066		0.170	0.279
Rest of SSA-Other	0.006	0.052	0.066	0.170		0.279
Rest of World	0.047	0.052	0.066	0.161	0.161	

C. Minerals and energy

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world
EU		0.050	0.050	0.133	0.133	n.a.
UEMOA-LLDC	0.000		0.000	0.428	0.428	0.083
UEMOA-Other	0.000	0.000		0.428	0.428	0.083
Rest of SSA-LLDC	0.000	0.050	0.050		0.133	0.083
Rest of SSA-Other	0.000	0.050	0.050	0.133		0.083
Rest of World	0.000	0.050	0.050	0.126	0.126	

D. Simple manufactures

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world
EU		0.167	0.148	0.223	0.223	n.a.
UEMOA-LLDC	0.000		0.000	0.179	0.179	0.165
UEMOA-Other	0.000	0.000		0.179	0.179	0.165
Rest of SSA-LLDC	0.000	0.167	0.148		0.179	0.165
Rest of SSA-Other	0.000	0.167	0.148	0.179		0.165
Rest of World	0.026	0.167	0.148	0.223	0.223	

E. Industry

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world
EU		0.101	0.103	0.157	0.157	n.a.
UEMOA-LLDC	0.000		0.000	0.142	0.142	0.130
UEMOA-Other	0.000	0.000		0.142	0.142	0.130
Rest of SSA-LLDC	0.000	0.101	0.103		0.142	0.130
Rest of SSA-Other	0.000	0.101	0.103	0.142		0.130
Rest of World	0.041	0.101	0.103	0.193	0.193	

F. Services

	EU	UEMOA-LLDC	UEMOA-Other	Rest of SSA-LLDC	Rest of SSA-Other	Rest of world
EU		0.089	0.097	0.000	0.000	n.a.
UEMOA-LLDC	0.000		0.000	0.000	0.000	0.000
UEMOA-Other	0.000	0.000		0.000	0.000	0.000
Rest of SSA-LLDC	0.000	0.089	0.097		0.000	0.000
Rest of SSA-Other	0.000	0.089	0.097	0.000		0.000
Rest of World	0.010	0.089	0.097	0.059	0.059	

Source: Calipel et al. (1998), Worldbank and GTAP95.

Table 7: Changes of Production per sector

(% change from base run)

for UEMOA LLDC

	Base run	**Simulation1**	**Simulation2**	**Simulation3**
	Mio US$	%	%	%
Food	*2124*	*-1.1*	*0.1*	*-1.3*
Agricultural Exports	*1413*	*-1.1*	*0.4*	*-1.2*
Minerals and Energy	*942*	*0.2*	*1.6*	*0.1*
Simple Manufactures	*2231*	*-1.3*	*1.0*	*-1.3*
Industry	*1493*	*-6.0*	*-2.8*	*-5.6*
Services	*6589*	*-5.1*	*-0.3*	*-3.3*
Total	*14792*	*-3.3*	*-0.1*	*-2.5*

for Rest of UEMOA

	Base run	**Simulation1**	**Simulation2**	**Simulation3**
	Mio US$	%	%	%
Food	*4218*	*-1.1*	*0.1*	*-1.3*
Agricultural Exports	*2602*	*-1.1*	*0.4*	*-1.2*
Minerals and Energy	*1743*	*0.2*	*1.6*	*0.1*
Simple Manufactures	*6571*	*-1.3*	*1.0*	*-1.3*
Industry	*2872*	*-6.0*	*-2.8*	*-5.6*
Services	*12660*	*-5.1*	*-0.3*	*-3.3*
total	*30666*	*-3.3*	*-0.1*	*-2.5*

Table 8: Changes in Imports from EU

(% change from base run)

for UEMOA-LLDC

	Base run	**Simulation1**	**Simulation2**	**Simulation3**
	Mio US$	%	%	%
Food	*1091*	*6.8*	*10.4*	*6.1*
Agricultural Exports	*112*	*4.5*	*7.1*	*4.5*
Minerals and energy	*55*	*9.1*	*12.7*	*9.1*
Simple Manufactures	*558*	*-4.1*	*-0.9*	*-4.1*
Industry	*553*	*11.0*	*14.8*	*11.4*
Services	*221*	*6.8*	*12.2*	*9.0*

for Rest of UEMOA

	Base run	**Simulation1**	**Simulation2**	**Simulation3**
	Mio US$	%	%	%
Food	*1258*	*8.0*	*10.9*	*7.2*
Agricultural Exports	*285*	*6.7*	*9.1*	*6.3*
Minerals and Energy	*316*	*6.0*	*9.2*	*6.0*
Simple Manufactures	*2698*	*-3.4*	*-0.9*	*-3.5*
Industry	*1092*	*11.8*	*15.1*	*11.7*
Services	*689*	*7.8*	*12.9*	*10.0*

Source: own calculations.

The CGE model equations

Variables

final demand of HH	$Xfin_i^l$
intermediary demand	$Xint_i^l$
investment demand	$Xinv_i^l$
government demand	$Xgvt_i^l$
total aggregate demand	$Xtot_i^l$
demand, region of origin	X_i^{kl}
production	Y_i^k
value added	VA_i^k
labour	Lab_i^k
savings	Sav^l
income	Inc^l
VAT revenue	VAT^l
government income	$GovI^l$
consumption	$Cons^l$
investment expenditures	Inv_i^k
world market price	pw_i^k
aggregated. price	p_i^l
return to capital	i_i^l
interest rate	in^l
transfers	$Trans^l$
tax revenue	$Taxr^l$
tariff revenue	$Trev^l$
trade deficit	$TDef^l$

Parameters

wage	wg_i^k
input coefficients	a_{ij}^k
va coefficients	$a0_i^k$
investment coefficient	b_i^k
savings ratio	sr^l
production coefficient	α_i^l
production coefficient	β_i^l
demand coefficient	ny_i^{kl}
demand elasticity	d_i^l
demand coefficient, private	$ep_i^l, \sum ep_i^l = 1$
demand coefficient, govt.	$eg_i^l, \sum eg_i^l = 1$
agg. prices in EU, ROW	p_i^{EU}, p_i^{ROW}
government debt	$Gdebt^l$
interest rate on GDebt	id^k
foreign direct investment	FDI^l
foreign aid (policy change)	Aid^l
tariff (policy change)	tar_i^{kl}
transfer rate (policy change)	tr^l
VAT rate (policy change)	tva^l
income tax (policy change)	$taxi_i$
capital	Cap_i^k
government deficit	$GDef^l$
demand in EU,ROW	$Xtot_i^{EU}, Xtot_i^{ROW}$
supply in EU,ROW	Y_i^{EU}, Y_i^{ROW}
world market prices for goods from EU, ROW	pw_i^{EU}, pw_i^{ROW}

The model equations

$$Inc^l = \sum_{i=1}^{m} wg_i^l Lab_i^l + \sum_{i=1}^{m} i_i^l Cap_i^l + Trans^l - Taxr^l$$

$$Sav^l = sr^l Inc^l$$

$$Cons^l = Inc^l - Sav^l$$

$$TRev^l = \sum_{k=1}^{n} \sum_{i=1}^{m} tar_i^{kl} pw_i^k X_i^{kl}$$

$$Xtot_i^l = Xfin_i^l + Xint_i^l + Xinv_i^l + XGvt_i^l$$

$$Xinv_i^l = b_i^l \left(\frac{Sav^l + FDI^l}{p_i^l} \right)$$

$$Xfin_i^l = \frac{Cons^l ep_i^l}{p_i^l}$$

$$Xint_i^l = \sum_{j=1}^{m} Y_i^l a_{ij}^l$$

$$XGvt_i^l = \frac{\left(GovI^l - Trans^l - id^l \quad Gdebt^l\right) eg_i^l}{p_i^l}$$

$GovI^l = Taxr^l + VAT^l + Trev^l + GDef^l + Aid^l$ GovI fixed or Gdef fixed

$$Trans^l = tr^l GovI^l$$

$$Taxr^l = taxi_i \left(\sum_{i=1}^{m} wg_i^l Lab_i^l + \sum_{i=1}^{m} i_i^l Cap_i^l \right)$$

$$VA_i^l = a_{0i}^l Y_i^l$$

$$VA_i^l = \beta_i^l \left(Lab_i^l\right)^{\alpha_i^l} \left(Cap_i^l\right)^{\left(1-\alpha_i^l\right)}$$

$$\left(1 - tva^l\right) VA_i^l = wg_i^l Lab_i^l + i_i^l Cap_i^l$$

$$VAT^l = \sum_{i=1}^{m} tva^l VA_i^l$$

$$in^l = \sum_{i=1}^{m} \left(\frac{i_i^l Cap_i^l}{\sum_{i=1}^{m} Cap_i^l} \right)$$

$$Inv_i^l = \frac{i_i^l Cap_i^l \left(Sav^l + FDI^l\right)}{in^l \sum_{i=1}^{m} Cap_i^l}$$

$$p_i^l Xtot_i^l = \sum_{k=1}^{n} X_i^{kl} pw_i^k \left(1 + tar_i^{kl}\right)$$

$$X_i^{kl} = \left(ny_i^{kl}\right)^{d_i^l} Xtot_i^l \left[\frac{pw_i^k \left(1 + tar_i^{kl}\right)}{p_i^l} \right]^{-d_i^l}$$

$$Y_i^k = \sum_{l=1}^{n} X_i^{kl}$$

$$Xtot_i^l = \sum_{k=1}^{n} X_i^{kl}$$

$$Y_i^l pw_i^l = VA_i^l + \sum_{j=1}^{m} p_j^l Y_i^l a_{ji}^l$$

$$\sum_{i=1}^{m} \sum_{k=1}^{n} X_i^{kl} pw_i^k = \left(\sum_{i=1}^{m} \sum_{k=1}^{n} X_i^{lk} pw_i^l \right) + TDef^l$$

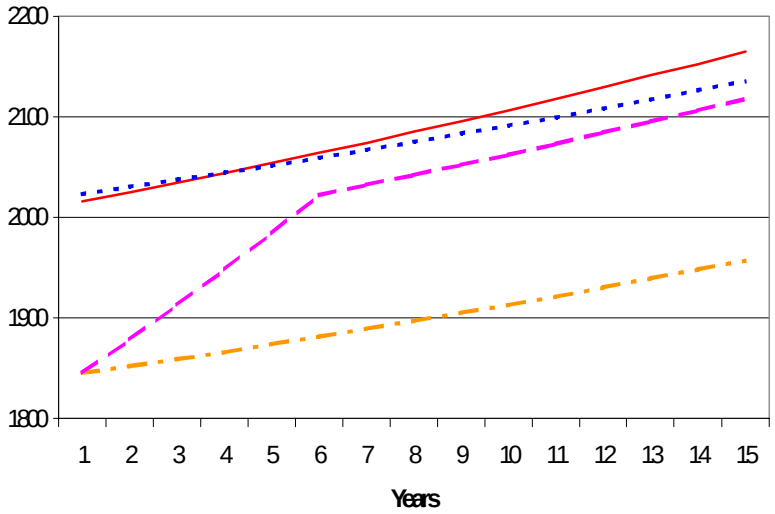
$$TDef^l = GDef^l + Aid^l + FDI^l - id^l \quad Gdebt^l$$

Table 9: Structure of the Social Accounting Matrix

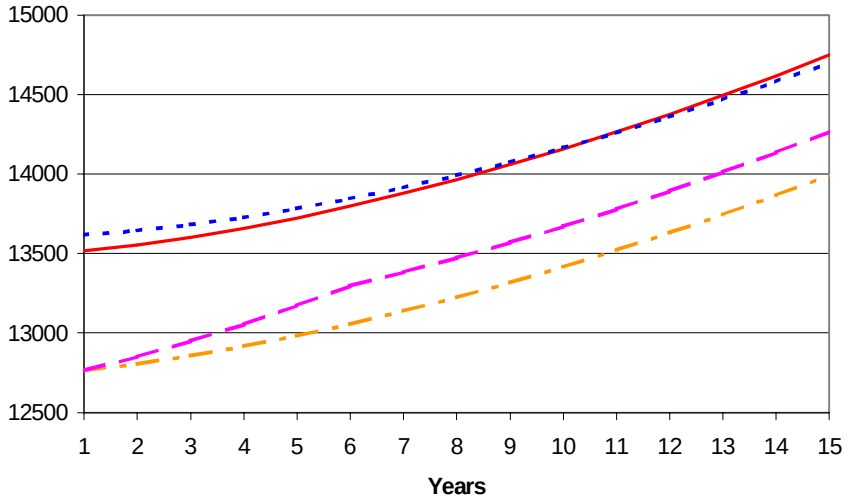
	Agriculture	**Manufacturing**	**Service**	**Capital**	**Labour**	**Households**	**Investment**	**Government**	**ROW**	**Total**
Agriculture	Input matrix					Consump-tion	Demand	Govt consumption	Exports	Total demand
Manufacturing										
Service										
Capital	Value added									Value added
Labour										
Households				Factor income				Transfers		HH Income
Investment						Savings			FDI	Investment
Government	Value added tax					Income tax			Tariff revenue + Aid - GovtDeficit	Govt Income
ROW	Imports + Tariff revenue							Interest on Govt. Debt		External balance
Total	Production (domestic and imported)			Value added		HH Expenditure	Investment expenditure	Govt Expenditure	External Balance	

Figure 1: Time path of Liberalisation Scenarios

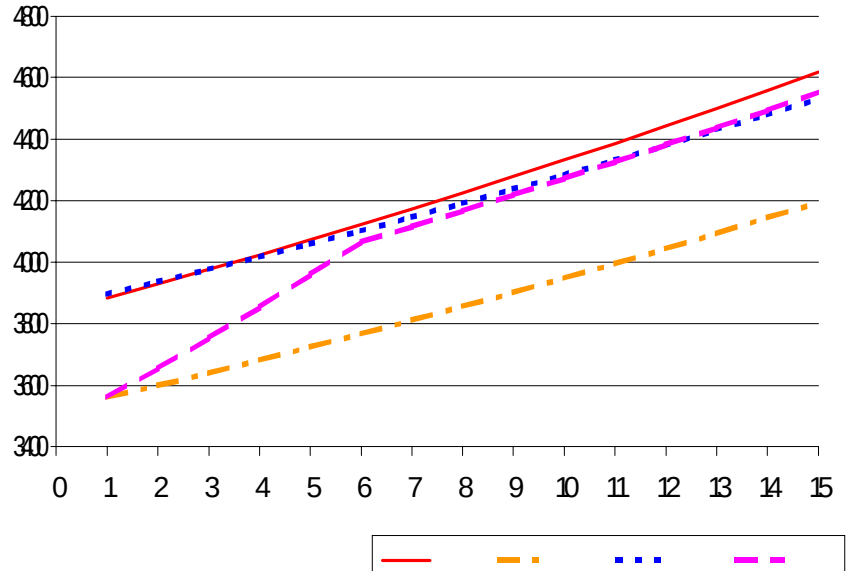
Government Income - UEMOA-LLDC



Employment - UEMOA-LLDC



Government Income - UEMOA-Other



Employment - UEMOA-Other