WEST AFRICAN MONETARY AGENCY (WAMA)

MONEY SUPPLY GROWTH AND MACROECONOMIC CONVERGENCE IN ECOWAS

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1.0 INTRODUCTION

Macroeconomic convergence is a core issue under the ECOWAS monetary Cooperation programme. In addition to facilitating policy coordination, it affords the opportunity of ensuring macroeconomic stability, thereby, guaranteeing the purchasing power of the common currency being envisaged. Thus, in pursuance of the need for convergence of the economies within the sub-region, certain indicators have been adopted which require Member countries to comply with prescribed benchmarks in addressing their fiscal, monetary and exchange rate imbalances in order to achieve the environment congenial for a successful monetary integration. These criteria focus on price stability, prudent fiscal policies, restrictive budget deficit financing and maintenance of adequate gross foreign reserves. The key monetary indicators among the convergence criteria relate to the maintenance of inflation below five percent, central bank budget deficit financing below 10 percent of previous year's tax revenue, positive real interest rates and real exchange rate stability.

In order to ensure compliance with the convergence criteria the Authority of ECOWAS Heads of State and Government instituted a multilateral surveillance mechanism in 2001 to ensure the achievement of the closest level of coordination of the economic policies. This action was based on the fact that the coordination of economic policies and their convergence ore prerogatives for the creation of a successful economic and monetary union. The surveillance mechanism therefore requires continuous monitoring by established bodies such as the Convergence Council, Technical Monitoring Committee and the WAMA _ECOWAS Joint Secretariat.

Money supply is the amount of money within a specific economy available for purchasing goods or services. For the purposes of this paper, the broad definition money supply (M2+) is adopted which includes currency in circulation, demand deposits, quasi-money and foreign currency deposits. The money creating activities of the deposit money banks impact directly on money supply and given that the central bank is responsible for controlling money supply in an economy, it is important to evaluate the role of these banking institutions on the convergence process. In this regard, the objective of this paper is to assess the contribution of the banking system to the convergence process particularly, with regards to performance on inflation, interest rate, exchange rate and output.

After this brief introduction, the paper is structured as follows. Section 2 provides a brief theoretical background on the implications of excessive increases in money supply, highlighting issues concerning the quantity theory, monetarism and the transmission mechanism. Section 3 gives a historical overview of developments in the quantity theory variables of the various countries in ECOWAS. Section 4 analyses the sources of money supply growth in member countries, categorized into the UEMOA, WAMZ and other countries. Section 5 uses simple statistical analyses to determine, empirically, the impact of changes in broad money supply on selected macroeconomic variables, including the established financial convergence

criteria on inflation, real interest rates and real exchange rate stability. Finally, section 6 summarizes the paper and proffers important policy recommendations.

2.0   THEORETICAL BACKGROUND

The quantity theory of money has since the 16th century been used to explain the relationship between money supply and inflation. It states that there is a direct relationship between the quantity of money in an economy and the level of prices of goods and services sold.

2.1   The Model and Its Assumptions
In its simplest form the theory could be expressed as MV=PQ (a variant of the Fisher equation) where:
 M=money supply in an economy during a period, say a year
 V=velocity of money in final expenditures
 P=price level associated with transactions for the economy during the period
 Q= real output

The theory assumes that V and Q are constant in the short term. The model also assumes that the quantity of money, which is determined exogenously, is the main influence of economic activity in a society. It also assumes an economy in equilibrium and at full employment in which economic activity is determined by the factors of production-labour, capital, natural resources, technology and organization.

Essentially, these assumptions imply that the value of money is determined by the amount of money available in an economy an increase in money supply results in a decrease in the value of money because of its inflationary implications and consequential loss in purchasing power. This deduction could be explained mathematically by rearranging the equation could be rearranged to form a rudimentary theory of inflation as:

$$P = \frac{MV}{Q}\frac{MV}{Q}$$

If V and Q are constant, then: $\frac{dP}{P} = \frac{dM}{M}$, and thus, $\frac{\frac{dP}{P}}{dt} = \frac{\frac{dM}{M}}{dt}$, where t is time.

That is to say that price levels (P) vary in exact proportion to changes in the money supply (M). Some empirical studies have confirmed the consistency of the quantity theory of money model, with the causation running from money to prices.

However, a number of other prominent economists have criticized the above assumptions, particularly, the assumption that V is constant. Keynes challenged the theory in the 1930s saying that increases in money supply lead to a decrease in the velocity of circulation and that real income (the flow of money to factors of production) increased, implying therefore that velocity could change in response to changes in money supply. Keynes argued that when there are unused resources in an economy, changes in spending are

more likely to impact employment and output rather than prices. He further demonstrated that an increase in money supply could be offset by fall in V, causing spending and income to stay the same. Many economists have subsequently conceded to the accuracy of Keynes's ideas and the arguments generally point out that the velocity of circulation depends on consumer and business spending impulses which cannot be constant. Furthermore, these critics assert that a change in money supply results in changes in money supply and/or a change in supply of goods and services.

The above criticisms suggest the need for a relaxation in the assumptions underlying the quantity theory of money. This relaxation allows a broader analysis of the possible interactions among the variables in the identity. Thus, given that the percentage change in a product, say XY is equal to the sum of the percentage changes (%ΔX +%ΔY), the quantity theory could be rewritten in terms of percentage changes as : %ΔP + %ΔQ = %ΔM + %ΔV. Rearranging the variables to make P the dependent variable gives the basic identities":

$$\%\Delta P = \%\Delta M + \%\Delta V - \%\Delta Q \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \text{(3)}$$
$$\%\Delta M = \%\Delta P + \%\Delta Q - \%\Delta V \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots \text{(4)}$$

Identity 3 above implies that inflation (%P) is equal to the rate of money growth (%M), plus the change in velocity (%V), minus the rate of output growth (%Q). Alternatively, identity 4 implies that an increase (decrease) in money supply could lead to an increase (decrease) in inflation, or output or a decrease (increase) in velocity or a combination of changes in these variables depending on a number of factors such as elasticity of supply and the level of unemployment in the economy concerned.

2.2   The Quantity Theory and Monetarism

The quantity theory of money forms the cornerstone of monetarism. Monetarists believe that the source of inflation is fundamentally derived from the growth rate of the money supply and that a rapid increase in money supply leads to a rapid increase in inflation. Consequently, this group of Economists are of the view that money supply should be kept within an acceptable bandwidth so that the levels of inflation can be controlled.[1] Money growth that surpasses the growth of economic output results in inflation as there is too much money behind too little production of goods and services.

On the other hand, less orthodox monetarists hold that an expanded money supply will not have any effect on real economic activity such as on production, employment levels and spending (Heakal, 2005). But for most monetarists, any anti-inflationary policy will stem from the basic concept that there should be a gradual reduction in money supply. Monetarists believe that instead of governments continually adjusting economic policies (i.e. government spending, and taxes), it is better to let non-inflationary policies lead an economy to full employment.

Notwithstanding its criticisms, the quantity theory of money was very popular in the 1980's as it was rooted in monetarism. Until recently, most political leaders and economists applied its principles, to economies

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[1] This premise leads to how monetary policy should be administered.

where money growth targets were set. There is however an increasing realization that strict adherence to a controlled money supply was not necessarily the cure-all for economic malaise (Heakal, 2005).

2.3   The Transmission Mechanism of Changes in Money Supply

The review of available literature indicates that money supply has a powerful effect on economic activity. Two transmission mechanisms exist to balance the variables in the model: the indirect mechanism which works through interest rates leading to increased consumption with a delayed impact on prices and the direct mechanism which works through aggregate demand and thus has a more immediate and potent impact on prices.

The indirect channel involves the manipulation of interest rates by the central bank. For instance, lowering interest rates spurs investments subsequently. Business firms then respond to increased sales arising from the excess money supply by ordering more raw materials and increasing production. The spread of business activity increases the demand for labour and raises the demand for capital goods. In a buoyant economy stock market prices rise and firms issue equity and debt. If the money supply continues to expand, prices begin to rise especially if output growth reaches capacity limits. As the public begins to expect inflation, lenders insist on higher interest rates to offset the expected decline in purchasing power over the life of their of their loans. Opposite effects occurs when the supply of money falls or when its rate of growth declines. In this case, economic activity declines leading to either a disinflation (reduced inflation) or deflation (falling prices).

The transmission of excess money to inflation through the direct aggregate demand channel is very potent and has a telling effect on macroeconomic stability as it involves putting more money in the hands of consumers (making them feel weather and thus stimulating spending). The increase in aggregate demand exerts an upward pressure on the general price level in the domestic economy, with the extent of its impact depending on the elasticity of supply.[2] In addition, the increase in demand may also cause a rise in imports, culminating in a downward pressure on the exchange rate as attempts are made to settle the increasing imports bill, thereby, causing a further increase in inflation. Furthermore, the corresponding increase in the demand for labour following the demand for higher production will cause a rise in money wages and unit labour costs. [3]

In conclusion, the above review shows that excess money supply, whether created though the direct or indirect channels, influences economic activity (growth) and may provide downside risks on macroeconomic stability, impacting negatively on inflation, interest rates and exchange rate.

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[2] The more inelastic is aggregate supply in the economy, the greater the impact on inflation.
[3] This may cause cost-push inflation.

3.0 DEVELOPMENTS IN THE QUANTITY THEORY INDICATORS IN ECOWAS

This section presents a historical overview of recent macroeconomic developments in respect of money supply growth, inflation, velocity of money in circulation and output. The exposition on these variables, which are the key variable in the quantity theory model, provides the basis for further analyses aimed at ascertaining the sources and consequences of excessive expansion in broad money supply.

3.1 Growth in Money Supply

Table 3.1 shows the broad money supply growth in ECOWAS countries between 2002 and 2008. It indicates that monetary policy has generally been expansionary in certain countries, especially in the non-UEMOA countries. In the UEMOA zone, the highest expansion of 18.7 was recorded in 2007 which declined subsequently to 10.1 percent. Notwithstanding this performance, Benin, Burkina Faso, guinea Bissau, Cote d'Ivoire, Niger, Senegal and Togo have recoded instances of higher growth rates above the zonal average. Most of the WAMZ countries generally record high liquidity growth rates. The growth rate accelerated in almost all the non-UEMOA countries in 2008 with Ghana, Guinea, Nigeria and Liberia recording 39.8 percent, 38.3 percent, 57.8 percent and 41.4 percent respectively.

TABLE 3.1: ECOWAS COUNTRIES: BROAD MONEY SUPPLY GROWTH

	2002	2003	2004	2005	2006	2007	2008
UEMOA	16.0	2.9	5.8	7.6	11.4	18.7	10.1
BENIN	-6.6	10.1	-9.4	22.4	18.0	19.8	26.9
BURKINA FASO	2.9	54.2	-7.3	-3.7	10.1	22.9	12.0
COTE D'IVOIRE	30.6	-26.6	9.5	7.4	10.3	23.6	5.6
GUINEA BISSAU	22.8	-64.7	42.7	20.5	5.3	24.8	29.4
MALI	28.5	25.5	-2.4	11.7	8.8	9.3	-0.7
NIGER	-0.4	42.3	20.2	6.6	16.2	23.2	11.9
SENEGAL	7.6	31.5	12.9	8.2	11.9	12.6	4.8
TOGO	-2.5	11.2	18.2	2.0	22.8	16.8	18.1
THE GAMBIA	35.3	43.4	18.3	13.1	26.2	6.7	18.4
GHANA	48.9	34.2	32.5	14.1	39.1	36.3	39.8
GUINEA	19.7	33.2	35.0	37.2	59.4	4.6	38.3
NIGERIA	21.6	24.1	14.0	24.4	43.1	44.2	57.8
SIERRA LEONE	29.6	21.9	20.1	31.3	21.4	22.6	22.5
CAPE VERDE	14.8	8.6	10.5	15.6	18.7	9.7	7.9
LIBERIA	4.9	9.5	43.5	35.7	34.4	40.1	41.4

Sources: ECOWAS central banks, WAMA calculations

3.2 Inflation

Table 3.2 shows that inflation has generally been relatively lower in UEMOA compared to that of the WAMZ and other countries. The average inflation recorded in the UEMOA was 3.2 percent compared to 13.6 percent in the WAMZ. However, inflationary pressures accelerated in 2008 under the influence of the global

turmoil (relating to the surge in food and petroleum prices) which impacted negatively on the economies in West Africa. The inflation in the UEMOA zone increased from 2.9 percent in 2007 to 8.5 percent in 2008. In the WAMZ, the average inflation increased by 8.0 percentage points to 15.3 percent.

The inflationary pressures in the non-UEMOA countries have partly been attributed to expansionary monetary and fiscal policies in certain countries. In addition to these difficulties the economies in West Africa are vulnerable to external shocks.

TABLE 3.2: INFLATION RATES IN ECOWAS COUNTRIES

	2000	**2001**	2002	**2003**	2004	**2005**	2006	**2007**	**2008**
BENIN	4.2	4.0	2.4	1.5	0.9	3.8	5.2	0.3	9.9
BURKINA FASO	-3.0	4.0	2.4	1.5	0.9	4.5	1.5	2.3	11.6
COTE D'IVOIRE	2.5	4.3	3.1	3.3	1.4	2.6	2.0	1.5	8.9
GUINEA BISSAU	8.6	3.3	3.9	-3.5	0.9	0.3	3.2	9.3	8.7
MALI	-0.7	5.2	5.0	-1.3	-3.1	3.4	3.6	2.2	7.8
NIGER	2.9	4.0	2.6	-1.6	0.2	4.2	0.3	4.7	13.6
SENEGAL	0.7	3.0	2.3	0.0	0.5	1.4	4.0	6.1	4.3
TOGO	1.9	3.9	3.1	-0.9	0.4	5.5	1.5	3.4	10.2
UEMOA	1.8	4.1	2.9	-0.7	3.8	2.9	2.7	2.9	8.5
THE GAMBIA	0.2	8.1	13.0	17.6	8.0	1.8	1.4	6.0	6.8
GHANA	40.5	21.3	15.2	23.6	11.8	13.9	10.9	12.8	18.4
GUINEA	7.2	5.2	6.1	12.9	27.6	29.7	39.1	12.8	13.5
NIGERIA	14.5	16.4	12.1	23.8	10.0	11.6	8.5	6.6	15.1
SIERRA LEONE	-2.8	3.4	-1.3	11.3	14.4	13.1	7.3	13.8	13.2
WAMZ	16.2	16.4	12.1	23.4	10.5	12.1	9.2	7.3	15.3
CABO VERDE	-1.1	4.2	3.0	-2.3	-0.3	1.7	4.7	4.4	6.8
LIBERIA	3.2	19.4	11.1	5.0	16.1	7.0	8.9	11.7	9.4

Sources: ECOWAS central banks, WAMA calculations

3.3   Velocity of Money in Circulation

Table 3.3 shows the velocity of broad money in the ECOWAS member countries.[4] The analysis showed that velocity of the domestic currencies is generally not constant in West Africa. It varied significantly from 2002 to 2008 in most countries. The descriptive statistics indicates that the velocity of circulation was

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[4] The velocity of money is the average frequency with which a unit of money is spent in a specific period of time. Velocity associates the amount of economic activity associated with a given money supply and it is important for measuring the rate at which money in circulation is used for purchasing goods and services. It is usually measured as a ratio of GNP to a country's total supply of money. This helps investors gauge how robust the economy is.

relatively stable in Cape Verde (standard deviation of 0.2) whilst it was very volatile in Liberia (standard deviation of 8.9). The degree of variation was moderate in Guinea Bissau, Niger and Guinea.

The analysis further showed that the velocity of money trended downwards consistently in most countries, especially in Niger, Togo the Gambia, Ghana, Guinea, Nigeria, Sierra Leone, and Liberia. The declining trends in velocity in most countries seem to suggest that excessive increases in money supply do not necessarily lead to increases in prices or output.

TABLE 3.3: VELOCITY OF MONEY IN ECOWAS COUNTRIES

	2002	2003	2004	2005	2006	2007	2008	DESCRIPTIVE STATISTICS		
								RANGE	MEAN	STD DEVIA-TION
UEMOA	3.9	**4.0**	3.9	**3.8**	3.7	**3.2**	3.3	**3.2-4.0**	**3.7**	**0.8**
BENIN	3.9	3.7	4.3	3.7	3.4	3.0	2.7	2.7-4.3	3.5	1.3
BURKINA FASO	5.2	3.7	4.3	4.8	4.6	4.0	4.0	3.7-5.2	4.4	1.5
COTE D'IVOIRE	3.6	5.0	4.5	4.3	4.1	3.3	3.5	3.3-5.0	4.0	1.7
GUINEA BISSAU	1.6	4.6	3.5	3.1	3.0	2.6	2.2	1.6-4.6	2.9	3.0
MALI	3.6	3.1	3.4	3.4	4.4	3.4	3.8	3.1-4.4	3.6	1.3
NIGER	10.3	7.9	6.6	7.1	6.6	5.7	5.9	5.7-10.3	7.2	4.6
SENEGAL	3.8	3.1	2.9	2.9	2.8	2.7	2.9	2.7-3.8	3.0	1.1
TOGO	4.4	3.7	3.3	3.5	3.0	2.7	2.4	2.4-4.4	3.3	2.0
THE GAMBIA	4.9	3.5	2.9	2.6	2.5	2.6	2.3	2.3-4.9	3.0	2.6
GHANA	3.3	3.3	3.0	3.2	2.8	2.4	2.0	2.0-3.3	2.9	1.3
GUINEA	7.7	6.6	6.0	5.8	5.2	5.1	4.4	4.4-7.7	5.8	3.3
NIGERIA	4.9	5.1	5.2	5.2	4.6	3.6	2.6	2.6-5.2	4.5	2.6
SIERRA LEONE	7.3	7.3	6.9	5.9	5.6	5.4	5.1	5.1-7.3	6.2	2.2
CABO VERDE	1.4	1.4	1.3	1.2	1.2	1.2	1.3	1.2-1.4	1.3	0.2
LIBERIA	12.2	6.8	5.8	4.7	4.3	3.8	3.3	3.3-12.2	5.8	8.9

Sources: ECOWAS central banks, WAMA calculations

3.4 Real GDP Growth

The West African economy has been characterized by adverse developments in the global economy relating to changing global climatic conditions (global warming, drought, severe rainfall, floods etc), high and escalating crude oil prices, surging global food prices and financial turmoil that began in 2007. In spite of these challenges and efforts made to address socio-political unrests in certain countries, the West African economy remained buoyant as evidence by high overall real GDP growth rates above 5.5 percent in recent years. This achievement was driven by sound economic policies, improved financial resources arising from debt relief and aid received from the development partners, investments in the agricultural, extractive and construction sectors and favourable weather conditions, especially in 2007 and 2008.

The growth in output was more pronounced in the WAMZ with the Gambia and Ghana with growth rates well above 6.0 percent. Nigeria also recorded significant growth rates in spite of socio-political disturbances experienced in the Niger Delta. Growth in the UEMOA zone was sustained above 3.0 percent on account of bumper agricultural production in the sahel belt and other countries. Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali and Niger recorded considerable increases in output in 2008. Cape Verde and Liberia also made significant progress during the period under review.

TABLE 3.4: REAL GDP GROWTH RATE IN ECOWAS MEMBER STATES

	2002	2003	2004	2005	2006	2007	2008	2009
ECOWAS	**3.7**	**6.8**	**5.1**	**5.7**	**5.4**	**5.7**	**5.8**	**5.8**
UEMOA	*1.3*	*3.1*	*2.8*	*4.2*	*3.0*	*3.3*	*3.9*	*4.9*
BENIN	4.4	3.9	3.1	2.9	3.7	4.6	5.3	6.1
BURKINA FASO	4.6	8.0	4.6	7.1	5.5	4.3	4.5	5.5
COTE D'IVOIRE	-1.6	-1.7	1.6	1.8	1.2	1.5	2.9	4.3
GUINEA BISSAU	-7.1	0.6	3.2	3.5	2.0	2.7	3.1	3.2
MALI	4.3	7.6	2.3	6.1	5.3	4.3	4.7	5.1
NIGER	5.8	3.8	-0.8	8.4	5.8	3.3	5.9	4.5
SENEGAL	1.2	6.7	5.6	5.6	2.3	4.8	3.9	5.2
TOGO	-0.2	4.8	2.5	1.2	3.9	1.9	0.8	3.3
WAMZ	*4.6*	*8.8*	*6.3*	*6.4*	*6.0*	*6.4*	*6.4*	*6.0*
THE GAMBIA	1.3	7.4	6.6	6.9	7.7	6.9	6.1	6.0
GHANA	4.5	5.2	5.6	5.9	6.2	6.3	7.3	5.8
GUINEA	4.2	1.2	2.3	3.0	2.4	1.8	4.9	3.9
NIGERIA	4.6	9.6	6.6	6.5	6.0	6.4	6.4	6.1
SIERRA LEONE	6.5	10.7	9.6	7.6	7.2	6.4	5.5	5.9
OTHERS	*6.1*	*2.4*	*1.9*	*4.2*	*8.1*	*7.7*	*6.3*	*8.6*
CAPE-VERDE	5.1	5.3	4.7	5.6	8.2	6.7	5.9	6.5
LIBERIA	7.8	-1.9	-2.8	1.4	7.8	9.5	7.1	12.7

Sources: ECOWAS central banks, WAMA calculations

4.0   SOURCES OF MONEY SUPPLY GROWTH IN ECOWAS (NFA, NCG, CP, CPUB, CRE, OIN)

This section analyses the sources of money supply growth in the economies in West Africa categorized into the countries in UEMOA, WAMZ and others. The components considered are in respect of Net Foreign Assets and net Domestic assets relating to the banking systems Net Claims to Government, claims on the Private Sector, Claims on public enterprises and claims on the rest of the economy. Knowledge of the various sources of money supply would assist policy makers to come up with appropriate strategies to address the prevalence of excess liquidity in the system.

4.1   Monetary Developments in UEMOA

In the UEMOA zone, monetary policy is conducted by the BCEAO located in Dakar, Senegal in collaboration with branches in its member countries. The expansion in broad money supply has generally been moderate. It was however noted that the growth rate accelerated from 2.9 percent in 2003 to its highest level of 18.7 percent in 2007 and decelerated subsequently to 10.1 percent in 2008. The main driving force behind the expansion in liquidity was the banking systems credits extended to the private sector, albeit, growth in net foreign assets contributed significantly in 2006 and 2007. Table 4.1 shows the contribution of the sources of money supply growth from 2002 to 2008.

Although monetary expansion has generally been moderate in the zone, certain countries have most often registered high monetary expansion above the zonal average in recent years. This expansion was typical in Benin, Burkina Faso, Guinea-Bissau, Niger and Togo. In 2008 for instance, Benin, Guinea Bissau and Togo recorded growth rates of 26.9, 29.4 and 18.1 percent respectively compared to the zonal average of 10.1 percent. As has already been explained, the instances of higher-than-average increases in liquidity was attributed to significant growth in net foreign assets and credits to the private sector, with the exception of a few instances where the net claims on government increased significantly, especially in 2008, in Benin, Burkina Faso and Togo. While the growth in monetary aggregates in Benin originated from net credit to the government and net credit to the private sector, monetary expansion in Guinea Bissau was largely driven by changes in NFA and credit extended to the private sector. In Togo, credit to the government and to a lesser extent change in NFA accounted for the high increase in broad money. On the other hand, Mali, Senegal and Cote d'Ivoire registered negative or very low growth rates in broad money (-0.7 %, 4.8% and 5.6%) respectively.

4.2   Monetary Developments in WAMZ and other countries

With the exception of Cape Verde, the WAMZ and other countries are generally noted for excessive liquidity creation compared to the UEMOA countries. For instance, Ghana, Guinea, Nigeria and Liberia recorded very high broad money supply growth rates of 39.8 percent, 38.3 percent, 57.8 percent and 41.4 percent respectively in 2008. Table 4.2 below provides an overview of the growth rates in the WAMZ and other countries. The performance of these countries in recent years is as follows:

- The Gambia has been able to control the growth rates in broad money supply in recent years. However, the contribution to liquidity accelerated from 6.7 percent to 18.4 percent in 2008. This performance originated mainly from a significant increase in net credit to government which represented 17.8 percent of the expansion in broad money supply. Net foreign asses had a dampening effect on liquidity.

- With the exception of the performance in 2005, Ghana generally pursued an expansionary monetary policy in the period under review. Broad money supply grew about 40.0 percent in the three consecutive years of 2006, 2007 and 2008. The expansion in liquidity during this period was mainly due to a surge in the volume of credits extended by the banking system to the private sector, albeit, net foreign assets contributed periodically to the growth. However, net credit to the government contributed to the expansion recorded in 2008. The contribution of net credit to the government jumped from negative 7.7 percent in 2007 to 21.4 percent, while credit to the private

sector saw a slight decline from 28.8 percent to 27.0 percent over the same period, suggesting a crowding-out effect on the private sector.

- In Guinea, the highest growth rate of 59.4 percent in broad money supply was recorded in 2006. Following a satisfactory performance in 2007, monetary policy deteriorated again in 2008, resulting in an expansion of 38.3 percent. net credit to the government accounted mainly for this development followed by net foreign assets, which rose by 17.3 percent and 14.3 percent respectively.

- Nigeria recorded the highest broad money supply growth rate of 57.8 percent in Nigeria in ECOWAS in 2008, noting hat the country had since 2005 pursued expansionary monetary policy. The main components that contributed to this expansion were credit to the private sector and net foreign assets. Recent improvements in fiscal policy enabled the government to avoid accommodation by the banking system with the resultant effect that the government's net position to the banking sector improved over the years.

- Monetary expansion in Sierra Leone was relatively moderate having maintained an average growth rate of 22.0 percent in recent years. The growth in broad money supply was driven mainly by the banking system's claims on the private sector, although net foreign assets contributed significantly in 2005, 2006 and 2007. The contribution of net claims on government increased from negative 4.3 percent in 2007 to 4.3 percent in 2008. Similarly, claims on the private sector also jumped from 8.5 percent in 2007 to 13.9 percent in 2008.

- The expansion in broad money supply has generally been low in Cape Verde. The highest growth rate of 18.7 percent was recorded in 2006 owing to a significant increase in credits to the private sector. Invariably, changes in money supply have been driven by transactions between the banking system and the private sector.

- Monetary expansion has generally been high in Liberia since the resumption of normal economic activities in the aftermath of the political disturbances that ended in 2003. The country runs second to Nigeria in terms of the degree of expansion in liquidity, having recorded growth rates of 40.1 and 41.4 percent in 2007 and 2008 respectively. The analysis indicated that volatility in net foreign assets, given the difficult macroeconomic situation, have been counterbalance by significant changes in the net claims on government. The banking system's claims on the private sector exhibited an upward trend in recent years, reflecting a gradual improvement in the private sector.

KEY TO TABLES 4.1 AND 4.2

M2+   = broad money supply including foreign currency deposits
M2   = broad money supply
NFA   = net foreign assets
NCG   = net claims on government
CP   = net claims on private sector
CPUB   = net claims on public sector institutions
CRE   = claims on rest of the economy
OIN   = other items net

TABLE 4.1: CONTRIBUTION TO BROAD MONEY SUPPLY GROWTH IN UEMOA
(ANNUAL PERCENTAGE CHANGE)

		2002	2003	2004	2005	2006	2007	2008
UEMOA	$\Delta NFA/M2+_{-1}$	14.5	3.8	2.2	1.8	9.4	10.7	0.7
	$\Delta NCG/M2+_{-1}$	-1.0	-1.8	-0.6	0.2	-3.6	-0.1	0.2
	$\Delta CP/M2+_{-1}$	3.6	3.7	4.8	6.5	6.1	8.5	9.5
	$\Delta OIN/M2+_{-1}$	-1.2	-2.9	-0.6	-0.9	-0.4	-0.4	-0.3
	$\Delta M2+/M2+_{-1}$	16.0	2.9	5.8	7.6	11.4	18.7	10.1
BENIN	$\Delta NFA/M2+_{-1}$	-9.4	-5.3	-11.0	9.3	23.4	18.8	3.8
	$\Delta NCG/M2+_{-1}$	0.5	2.8	-0.4	0.6	-10.6	-17.5	12.1
	$\Delta CP/M2+_{-1}$	5.5	14.2	3.3	12.5	6.6	14.3	11.2
	$\Delta OIN/M2+_{-1}$	-3.1	-1.6	-1.2	-0.1	-1.5	4.1	-0.3
	$\Delta M2+/M2+_{-1}$	-6.6	10.1	-9.4	22.4	18.0	19.8	26.9
BURKINA FASO	$\Delta NFA/M2+_{-1}$	2.9	43.6	-8.5	-16.6	8.5	28.4	-4.9
	$\Delta NCG/M2+_{-1}$	-9.7	2.6	-3.8	0.9	-6.5	-9.6	4.4
	$\Delta CP/M2+_{-1}$	11.9	9.4	6.2	15.0	11.2	0.5	14.9
	$\Delta OIN/M2+_{-1}$	-2.2	-1.4	-1.1	-2.9	-3.0	3.4	-2.1
	$\Delta M2+/M2+_{-1}$	2.9	54.2	-7.3	-3.7	10.1	22.9	12.0
COTE D'IVOIRE	$\Delta NFA/M2+_{-1}$	30.6	-17.0	11.7	3.2	5.7	9.4	-0.7
	$\Delta NCG/M2+_{-1}$	1.3	-2.7	-3.7	1.8	-1.6	3.7	-1.1
	$\Delta CP/M2+_{-1}$	-0.3	-5.0	4.9	0.8	4.9	10.5	6.1
	$\Delta OIN/M2+_{-1}$	-1.0	-1.8	-3.1	1.6	1.4	0.0	1.3
	$\Delta M2+/M2+_{-1}$	30.6	-26.6	9.5	7.4	10.3	23.6	5.6
GUINEA BISSAU	$\Delta NFA/M2+_{-1}$	23.7	-39.9	61.6	9.2	13.0	14.9	21.9
	$\Delta NCG/M2+_{-1}$	4.9	-4.3	-17.5	6.0	-3.8	-0.3	-1.6
	$\Delta CP/M2+_{-1}$	-0.3	-1.8	-1.2	2.5	5.5	7.6	11.8
	$\Delta OIN/M2+_{-1}$	-5.6	-18.6	0.1	2.1	-9.0	2.7	-2.7
	$\Delta M2+/M2+_{-1}$	22.8	-64.7	42.7	20.5	5.3	24.8	29.4
MALI	$\Delta NFA/M2+_{-1}$	17.8	22.1	-7.1	7.6	11.5	0.3	-4.5
	$\Delta NCG/M2+_{-1}$	-2.8	-7.6	1.9	4.1	-11.6	0.5	-2.5
	$\Delta CP/M2+_{-1}$	14.0	11.4	4.2	-4.3	10.9	4.6	4.6
	$\Delta OIN/M2+_{-1}$	-0.5	-0.4	-1.4	4.3	-1.9	3.9	1.7
	$\Delta M2+/M2+_{-1}$	28.5	25.5	-2.4	11.7	8.8	9.3	-0.7
NIGER	$\Delta NFA/M2+_{-1}$	-6.5	33.6	-0.4	4.8	33.7	24.1	16.4
	$\Delta NCG/M2+_{-1}$	3.7	7.5	11.3	-6.3	-31.6	-14.5	-18.4
	$\Delta CP/M2+_{-1}$	7.1	5.3	9.3	8.6	15.4	11.2	19.8
	$\Delta OIN/M2+_{-1}$	-4.8	-4.1	0.0	-0.6	-1.4	2.5	-5.9
	$\Delta M2+/M2+_{-1}$	-0.4	42.3	20.2	6.6	16.2	23.2	11.9
SENEGAL	$\Delta NFA/M2+_{-1}$	14.1	26.1	9.3	-0.9	7.8	4.1	-6.2
	$\Delta NCG/M2+_{-1}$	-8.3	-4.3	-3.1	-4.1	3.0	4.7	-3.8
	$\Delta CP/M2+_{-1}$	3.4	10.1	5.6	14.5	2.8	6.8	15.4
	$\Delta OIN/M2+_{-1}$	-1.5	-0.3	1.1	-1.3	-1.7	-3.0	-0.6
	$\Delta M2+/M2+_{-1}$	7.6	31.5	12.9	8.2	11.9	12.6	4.8
TOGO	$\Delta NFA/M2+_{-1}$	6.0	1.2	28.0	-3.0	21.8	-1.3	8.6
	$\Delta NCG/M2+_{-1}$	-6.4	-8.1	-3.7	-1.3	-0.2	1.4	15.6
	$\Delta CP/M2+_{-1}$	-4.0	16.7	2.8	6.8	0.4	15.2	-2.6
	$\Delta OIN/M2+_{-1}$	1.9	1.5	-9.0	-0.5	0.8	1.4	-2.0
	$\Delta M2+/M2+_{-1}$	-2.5	11.2	18.2	2.0	22.8	16.8	18.1

Sources: ECOWAS central banks, WAMA calculations

TABLE 4.2: CONTRIBUTION TO BROAD MONEY SUPPLY GROWTH IN WAMZ AND OTHER COUNTRIES (ANNUAL PERCENTAGE CHANGE)

		2002	2003	2004	2005	2006	2007	2008
THE GAMBIA	ΔNFA/M2+ $_{-1}$	-5.5	22.9	28.7	-0.4	18.8	-3.9	-6.0
	ΔNCG/M2+ $_{-1}$	34.1	12.4	-10.6	6.3	3.8	-5.0	17.8
	ΔCP/M2+ $_{-1}$	31.1	11.8	-5.1	4.9	8.3	4.8	6.8
	ΔCPUB/M2+ -1	0.1	8.4	-2.6	0.7	0.1	-0.5	2.4
	ΔOIN/M2+ $_{-1}$	-24.5	-12.1	7.9	1.7	-4.8	11.3	-2.6
	ΔM2+/M2+ $_{-1}$	35.3	43.4	18.3	13.1	26.2	6.7	18.4
GHANA	ΔNFA/M2+ $_{-1}$	19.8	45.1	18.6	6.3	20.3	8.2	-6.0
	ΔNCG/M2+ $_{-1}$	16.3	-3.2	26.7	2.6	5.3	-7.7	21.4
	ΔCP/M2+ $_{-1}$	13.6	13.0	10.1	17.6	20.4	28.8	27.0
	ΔCPUB/M2+ -1	-5.7	5.2	3.6	2.2	3.7	10.7	4.3
	ΔOIN/M2+ $_{-1}$	4.8	-25.7	-26.5	-14.6	-10.7	-3.7	-6.9
	ΔM2+/M2+ $_{-1}$	48.9	34.2	32.5	14.1	39.1	36.3	39.8
GUINEA	ΔNFA/M2+ $_{-1}$	-11.8	-9.4	11.7	8.8	2.8	0.9	14.3
	ΔNCG/M2+ $_{-1}$	39.0	31.8	19.1	7.9	42.7	2.7	17.3
	ΔCP/M2+ $_{-1}$	2.7	5.7	11.5	19.1	12.8	-0.3	5.2
	ΔCPUB/M2+ -1	-3.0	-0.7	-0.4	0.1	0.0	0.7	0.7
	ΔOIN/M2+ $_{-1}$	-7.3	5.8	-6.9	1.2	1.1	0.8	0.8
	ΔM2+/M2+ $_{-1}$	19.7	33.2	35.0	37.2	59.4	4.6	38.3
NIGERIA	ΔNFA/M2+ $_{-1}$	-3.1	6.6	63.3	64.2	78.5	23.8	22.1
	ΔNCG/M2+ $_{-1}$	30.2	7.3	0.0	-8.1	-79.7	-10.7	-12.7
	ΔCP/M2+ $_{-1}$	8.5	15.7	15.7	22.5	22.5	60.1	51.7
	ΔCPUB/M2+ -1	-0.1	0.0	0.1	0.0	0.4	-0.3	0.0
	ΔOIN/M2+ $_{-1}$	-14.1	-5.6	-65.1	-54.3	21.4	-28.6	-3.3
	ΔM2+/M2+ $_{-1}$	21.6	24.1	14.0	24.4	43.1	44.2	57.8
SIERRA LEONE	ΔNFA/M2+ $_{-1}$	21.2	-14.7	20.0	34.4	78.9	25.6	-4.7
	ΔNCG/M2+ $_{-1}$	-1.9	15.8	-12.8	-5.6	10.9	-4.3	4.3
	ΔCP/M2+ $_{-1}$	9.1	5.2	9.2	4.4	4.1	8.5	13.9
	ΔCPUB/M2+ -1	0.2	0.7	0.0	0.2	0.1	0.4	0.8
	ΔCRE/M2+ -1	0.0	0.0	0.0	1.1	-0.3	-0.8	1.0
	ΔOIN/M2+ $_{-1}$	1.0	14.8	3.7	-3.2	-72.3	-6.7	7.2
	ΔM2+/M2+ $_{-1}$	29.6	21.9	20.1	31.3	21.4	22.6	22.5
CAPE VERDE	ΔNFA/M2+ $_{-1}$	2.9	-1.7	5.9	12.9	4.5	6.7	-2.1
	ΔNCG/M2+ $_{-1}$	7.3	1.5	0.2	-0.1	0.0	-7.6	-1.6
	ΔCP/M2+ $_{-1}$	6.3	7.3	4.8	4.2	14.0	8.2	16.0
	ΔCPUB/M2+ -1	0.0	-0.1	0.0	0.4	0.3	-0.1	-0.3
	ΔOIN/M2+ $_{-1}$	-1.7	1.6	-0.3	-1.8	0.0	2.6	-4.1
	ΔM2+/M2+ $_{-1}$	14.8	8.6	10.5	15.6	18.7	9.7	7.9
LIBERIA	ΔNFA/M2+ $_{-1}$	-467.4	224.7	-218.1	-96.6	61.7	-24.2	54.7
	ΔNCG/M2+ $_{-1}$	639.6	-318.5	292.6	133.4	-18.9	74.4	-37.1
	ΔCP/M2+ $_{-1}$	10.0	-1.3	15.8	8.8	16.0	16.6	17.9
	ΔCPUB/M2+ -1	0.7	-0.9	1.4	-0.5	1.0	-0.2	-0.6
	ΔCRE/M2+ -1	-2.7	-0.6	3.1	-1.6	-0.3	-0.1	-0.7
	ΔOIN/M2+ $_{-1}$	-175.3	106.1	-51.3	-7.7	-25.1	-26.4	7.1
	ΔM2+/M2+ $_{-1}$	4.9	9.5	43.5	35.7	34.4	40.1	41.4

Sources: ECOWAS central banks, WAMA calculations

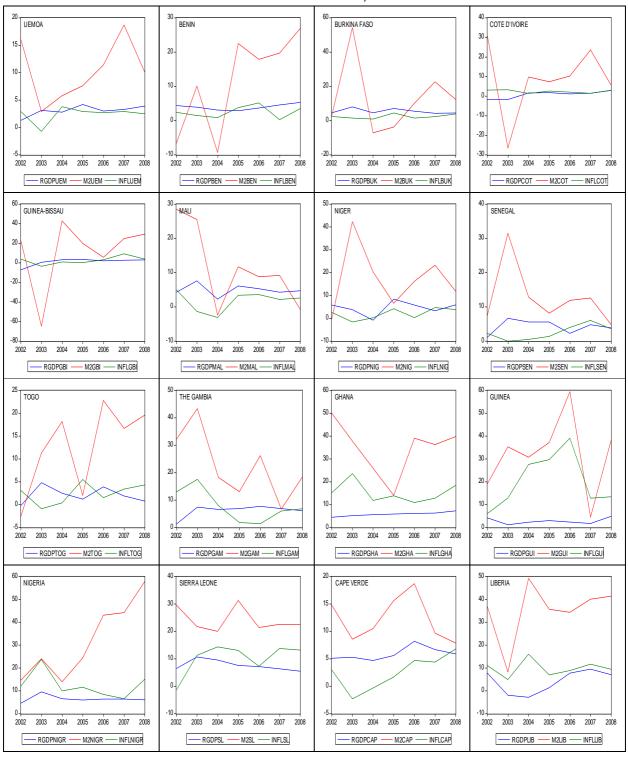## 5.0 CONSEQUENCES MONEY SUPPLY GROWTH ON KEY MACROECONOMIC INDICATORS

This section therefore attempts to analyse the macroeconomic impact of the monetary policy actions relating to changes in broad money supply in the ECOWAS member countries through graphical and simple mathematical techniques over the period from 2002 -2008.

Figure 5.0 is a graphical representation of money supply growth, inflation and output growth in the fifteen ECOWAS member countries from 2002-2008. In all the fifteen countries, the expansion in money supply exceeded the real GDP growth rate. The disparity was significant in most countries, especially, Benin, Cape Verde, Gambia, Ghana, Liberia, Niger, Nigeria, Sierra Leone and Togo. Nevertheless, there was weak correlation between money supply growth and output growth in few other countries.

The graphical representation further indicates the non-existence of relationship between money supply growth and inflation in UEMOA countries, with the exception of Benin and Guinea Bissau where the relationship appears weak. In the WAMZ and other countries, only The Gambia and Guinea show positive relationship between money supply growth and inflation. In Cape Verde and Liberia, it appears that there is no relationship between these two variables over the period specified.

The figure further reveals that there is a close relationship between inflation and real GDP growth in most countries. This correlation could be observed especially in the UEMOA countries where these two variables trend closely together in the same direction. The closeness between the variables suggests the possibility of predicting real GDP growth in ay of the UEMOA countries in a particular year if one has adequate knowledge about inflation trends. The association between inflation and real GDP is not as marked in the WAMZ and other countries as the case in UEMOA. The rate of inflation is often higher than real GDP growth, suggesting the possibility that increases in money supply is more likely to lead to inflationary pressures than affect output.

FIGURE 5.0: ECOWAS COUNTRIES: MONEY SUPPLY GROWTH, REAL GDP GROWTH AND INFLATION

5.1   Money Supply Growth and Output

This section is an empirical attempt to analyse the relationship between output and money supply growth using the correlation technique. Table 5.1 below shows the correlation between these two variables.

The table indicates that the correlation between money supply and output is generally not significant (above 0.7). Nevertheless, a positive but moderate correlation is observed in Burkina Faso, Cote d'Ivoire, Mali, Senegal and Togo (between 0.4-0.6). The degree of positive correlation is weak in Benin, Guinea Bissau, Guinea, Sierra Leone, Cape Verde and Liberia below (0.3).

TABLE 5.1: CORRELATION BETWEEN MONEY SUPPLY AND OUTPUT

	COUNTRY	CORRELATION
1.	BENIN	0.3092
2.	BURKINA FASO	0.5072
3.	COTE D'IVOIRE	0.2054
4.	GUINEA-BISSAU	0.1063
5.	MALI	0.5686
6.	NIGER	-0.4786
7.	SENEGAL	0.5801
8.	TOGO	0.5129
9.	THE GAMBIA	-0.2199
10.	GHANA	-0.1932
11.	GUINEA	0.0601
12.	NIGERIA	-0.0147
13.	SIERRA LEONE	0.3082
14.	CAPE VERDE	0.4800
15.	LIBERIA	0.2818

Sources: ECOWAS central banks, WAMA calculations

On the other hand, negative correlations were found in the case of Niger, The Gambia, Ghana and Nigeria, providing an indication that an increase in money supply is likely to lead to a reduction in real GDP. This negative correlation is however insignificant in these countries, with the exception of Niger where the relationship is moderately significant. A further review of the conduct of monetary policy appears to explain this negative correlation in the Gambia, Ghana and Nigeria where interest rates (the prime or monetary policy rate) is used as a key monetary policy instrument in reaction to high inflationary pressures. The increases in interest rates (the cost of capital) tend to affect output adversely.

5.2   Money Supply Growth and Inflation

Table 5.2 shows the correlation between money supply growth and inflation in each of the ECOWAS member countries. The analysis indicated that the relationship between money supply growth and inflation depends on the peculiar circumstances of the country concerned. Inflation exhibited a positive relationship with money supply in Benin, Guinea-Bissau, Mali, The Gambia, Ghana, Guinea, Cape Verde and Liberia. Thus in these countries, monetary policy contributed to movements in the general price level. On the other hand, the relationship was negative in Burkina Faso, Cote d'Ivoire, Niger, Senegal, Togo, Nigeria and

Sierra Leone. The negative correlations observed in certain countries confirm the existence of other determinants of inflation which may be structural in nature or attributable to supply-side factors.

Among the countries showing positive relationship, the degree of correlation is significant in the Gambia and Guinea (above 0.7). The inflationary impact of excessive increases in money supply is found to be moderate in Benin and Guinea-Bissau (between 0.4-0.6). The impact is marginal in Mali, Ghana, Cape Verde and Liberia (below 0.3). With regards to the countries that exhibited a negative relationship, the impact is moderate in Niger, Senegal and Sierra Leone whilst it is marginal in Burkina Faso, Cote d'Ivoire, Togo and Nigeria.

TABLE 5.2: ECOWAS COUNTRIES: CORRELATION BETWEEN BROAD MONEY SUPPLY AND INFLATION

	COUNTRY	CORRELATION
1.	BENIN	0.4353
2.	BURKINA FASO	-0.2510
3.	COTE D'IVOIRE	-0.3956
4.	GUINEA-BISSAU	0.6116
5.	MALI	0.3104
6.	NIGER	-0.6110
7.	SENEGAL	-0.4552
8.	TOGO	-0.3278
	UEMOA	0.4704
9.	THE GAMBIA	0.7386
10.	GHANA	0.2490
11.	GUINEA	0.7172
12.	NIGERIA	-0.1402
13.	SIERRA LEONE	-0.4343
14.	CAPE VERDE	0.1513
15.	LIBERIA	0.3278

Sources: ECOWAS central banks, WAMA calculations

The above deductions agree with the reality in all the countries cited above. In the UEMOA countries, inflation was generally low ranging most often below 5.0 percent. This low inflation trends has generally been explained by the sustained but low economic growth, reduced public deficits, improvements in trade and the peg of the CFA franc to the euro. In effect, the prevalence of these conditions facilitate the transmission of increases of money supply through the aggregate demand channel that leads to higher imports, resulting in imported inflation which is also comparatively lower than those pertaining in the zone. In addition, on the basis of the fact monetary policy is generally non-inflationary in UEMOA, money supply increases feeds directly into output resulting in declines in the general price level. Given that Burkina Faso, Cote d'Ivoire, Niger, Senegal and Togo are the major economies in UEMOA that largely depend on imported commodities to meet their consumption needs, deflation are normal phenomena in these countries. Thus, inflation in these countries, and in fact, in all the UEMOA countries is largely driven by exogenous factors reflecting macroeconomic developments of their trading partners, particularly, European countries. For instance, the global crisis relating to the surging food and petroleum prices that began in 2007 impacted significantly on these countries in the first half of 2008 and decelerated during the second half in line with the slump in prices experienced during this period.

In Nigeria, even though money supply growth was high, inflation depicted a declining trend. This observation suggests the fact that the economy of Nigeria has not yet reached its productive capacity and has the capacity to absorb more investments. In the case of Sierra Leone also, a post conflict country in dire need of infrastructure to support growth, these two variables could move in opposite directions as observed. In both countries, it could also be argued that an important determinant of inflation could be structural rather than monetary.

5.3 Money Supply Growth and Interest Rates

This section deals with the relationship between money supply growth and interest rates using simple correlation analysis. It also attempts to analyse how movements in the stock of money supply affects the convergence criterion on real interest rates. Theoretically, an excessive increase in money supply and the desire to mop up such an increase is likely to spur interest rates up in a given economy and vice versa. On the other hand, a decrease in money supply and possible desire of monetary authorities to inject liquidity in the system would bring about a fall in interest rates, all things remaining equal.

Table 5.3 (a) shows the correlation between money supply growth and the monetary policy rate (or prime rate) which has been used as the as proxy for interest rates in this study. The table shows that there is a moderate positive correlation between these two variables (between 03 and 0.7) in UEMOA, The Gambia and Ghana whilst that in Guinea and Cape Verde was marginal (below 0.3). The implication is that interest rates are likely to rise with programmed increases in money supply in UEMOA, the Gambia and Ghana in line with the expectation for higher inflation. On the other hand, there is a significant negative correlation between money supply growth and interest rates in Nigeria (above -0.7) whilst that of Sierra Leone is marginally negative (below -0.3). In case of Liberia, there is no monetary policy rate as the traditional instruments of monetary policy such as open market operations and interest rate policy are not being operated.[5]

TABLE 5.3 (a): CORELATION BETWEEN MONEY SUPPLY GROWTH AND MONETARY POLICY RATE

	COUNTRY	CORRELATION	
		RGDP GROWTH	M. POLICY RATE
1.	UEMOA	-0.3350	0.4154
2.	THE GAMBIA	-0.2200	0.5583
3.	GHANA	-0.1932	0.4071
4.	GUINEA	0.0601	0.2204
5.	NIGERIA	-0.0147	-0.9285
6.	SIERRA LEONE	-0.3082	-0.1543
7.	CAPE VERDE	0.4801	0.2731
8.	LIBERIA	0.2818	NA

Sources: ECOWAS central banks, WAMA calculations

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[5] During the war period, a lot of people/institutions who had purchased treasury bills suffered losses as they were not paid upon maturity. Thus there is total loss of confidence in such instruments and their utilisation as monetary policy instruments is yet to be popularized.

The positive correlation between money supply and interest rates observed in the Gambia, Ghana and the UEMOA countries explains the negative relationship between money supply and real GDP. As already indicated, an increase in interest rates is likely to dampen real GDP growth in these countries. It was observed that the monetary authorities in these countries move interest rates upwards in line with inflationary trends with the objective of dampening aggregate demand, which invariably slows down the level of economic activity.

This development could be confirmed from the fact that the key monetary policy rate correlates negatively with real GDP growth in the Gambia, Ghana and UEMOA, albeit, the relationship was relatively marginal in the Gambia, as per table 5.3 (b) below. Similarly, interest rates have a negative impact on output in Cape Verde and Liberia[6] even though interest rates are not used as key policy instruments.

On the other hand, it was observed that interest rates bear a positive relationship with real GDP growth in Guinea, Nigeria and Sierra Leone. This finding suggests the likelihood that increases in interest rates impacts positively on economic activity. As this observation contradicts economic activity, it may be necessary to ascertain the determinants of real GDP growth in these countries in order to facilitate appropriate policy formulation.

TABLE 5.3 (b): RELATIONSHIP BETWEEN REAL GDP AND MONETARY POLICY RATE

	COUNTRY/ZONE	CORRELATION
1.	UEMOA	-0.7466
2.	THE GAMBIA	-0.0407
3.	GHANA	-0.7266
4.	GUINEA	0.3683
5.	NIGERIA	0.0666
6.	SIERRA LEONE	0.6807
7.	CAPE VERDE	-0.3078
8.	LIBERIA*	-0.3270

Sources: ECOWAS central banks, WAMA calculations
* Lending rate used as proxy for monetary policy rate

The differences in relationship between these two variables arise from the divergence in interest rate policies prevailing in the various countries. In certain countries, interest rates are key monetary policy measures whilst it is not in other countries.

A further analysis of the impact of money supply growth on real interest rates showed interesting results, as per table 5.3 (c). In a majority of the ECOWAS counties, there is a low correlation between money supply growth and real interest rates. None of the countries has a significant correlation between the two variables (above 0.7), suggesting that real interest rates are largely insensitive to monetary expansion. However, the correlation is found to be moderate in a few countries, that is, Liberia (-0.68), the Gambia (-0.54), Guinea(-

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[6] Average lending rate used as proxy.

0.68), Benin (-0.51) and Mali (0.48), signifying that high monetary expansion are likely to give rise to negative real interest rates, and vice versa in these countries. The insignificance of the correlation figures in the other countries (especially, Burkina Faso, Senegal, Togo, Ghana, Nigeria and Cape Verde) seems to suggest that, in these countries, real interest rates are not directly responsive to growth in broad money supply.

TABLE 5.3 (C): CORRELATION BETWEEN BROAD MONEY SUPPLY GROWTH AND REAL INTEREST RATES

Country	Correlation
Benin	-0.51
Burkina Faso	-0.15
Cote d'Ivoire	-0.32
Guinea Bissau	-0.34
Mali	0.48
Niger	0.31
Senegal	-0.13
Togo	-0.17
The Gambia	-0.54
Ghana	0.13
Guinea	-0.68
Nigeria	0.10
Sierra Leone	0.22
Cape Verde	-0.16
Liberia	-0.68

Sources: ECOWAS central banks, WAMA calculations

5.4 Money Supply Growth and Exchange Rates

The national currencies fluctuated widely during the period from 2002 to 2008. With the exception of the Ghana cedi and Sierra Leonean leone that depreciated consistently, all the other currencies were characterized by bouts of appreciation and depreciation. However, all the national currencies depreciated in 2008. Table 5.4 (a) below shows the movements in the nominal exchange rates against the U.S dollar and their standard deviations from the mean depreciation or appreciation.

TABLE 5.4 (a): EXCHANGE RATE FLUCTUATIONS, 2001-2008

	UEMOA CFA	Dalasi	Cedi	G. Franc	Naira	Leone	Escudo	Lib. Dollar
2001	-1.8	-12.1	-3.7	-2.8	-3.0	-23.2	-5.3	-13.6
2002	18.2	-27.6	-13.2	-0.1	-10.6	-1.4	19.0	-23.8
2003	21.1	-24.4	-4.7	-1.2	-0.3	-14.5	20.4	28.7
2004	6.1	4.3	-2.2	-21.6	-7.5	-10.4	7.8	-7.3
2005	-11.6	5.5	-0.9	-43.3	3.1	-2.5	-13.4	-1.2
2006	11.4	0.3	-1.1	-20.4	4.6	-1.4	11.6	-6.0
2007	10.3	24.4	-4.9	35.1	7.7	-0.1	11.8	-3.6
2008	-4.5	-15.1	-20.0	-19.0	-11.0	-1.5	-6.6	-4.4
Some Descriptive Statistics								
Max	**21.1**	**24.4**	**-0.9**	**35.1**	**7.7**	**-0.1**	**20.4**	**28.7**
Min	**-11.6**	**-27.6**	**-20.0**	**-43.3**	**-11.0**	**-23.2**	**-13.4**	**-23.8**
Mean	**6.2**	**-5.6**	**-6.3**	**-9.1**	**-2.1**	**-6.9**	**5.6**	**-3.9**
Std. Dev	**11.4**	**17.4**	**6.8**	**23.0**	**7.1**	**8.4**	**12.5**	**15.0**

On the average, the CFA and escudo appreciated by 6.2 percent and 5.6 percent respectively whilst the other currencies depreciated in nominal terms (the dalasi by 5.6%, cedi by 6.3%, guinea franc by 9.1%, naira by 2.1%, leone by 6.9% and Liberian dollar by 3.9%). The table further shows (per the standard deviation) that the Guinean franc was the most unstable. The UEMOA CFA, the Gambian dalasi, the Cape Verdean escudo and the Liberian dollar also exhibited moderate signs of instability. On the other hand, the Ghana cedi, the Nigerian naira and the Sierra Leonean leone were relatively stable.

An analysis of the relationship between money supply growth and the movements in nominal exchange rates indicates that the degree of correlation is insignificant in UEMOA, Nigeria, Cape Verde and Liberia (below ±0.3). It is however moderate in Sierra Leone and Ghana (between ±0.4 and ±0.6) and significant in the Gambia and Guinea (above ±0.7). Table 5.6 (b) below shows the correlation figures between broad money supply growth and nominal exchange rates.

The correlation analysis suggests that an increase in money supply is likely to lead to currency depreciation in Gambia, Ghana, and Guinea. On the other hand, changes in money supply have negligible or no impact on the CFA, the Nigerian naira, the Cape Verdean escudo and the Liberian dollar. However, the analysis showed that an increase in money supply in Sierra Leone is likely to lead to a moderate appreciation of the leone.

TABLE 5.4 (b): CORRELATION BETWEEN MONEY SUPPLY GROWTH AND NOMINAL EXCHANGE RATE MOVEMENTS (2002-2008)

Zone/ Country	Correlation
UEMOA CFA	**0.12**
The Gambia Dalasi	**-0.86**
Ghana Cedi	**-0.57**
Guinea franc	**-0.76**
Nigeria naira	**0.13**
Sierra Leone leone	**0.40**
Cape Verde escudo	**-0.02**
Liberia dollar	**-0.14**

Sources: ECOWAS central banks, WAMA calculations

It appears that the correlation analyses reflect the reality in the various economies. In the Gambia, Ghana and Guinea, the nominal exchange rate is relatively flexible. Thus, the value of the currencies in these countries responds to changes in money supply. In UEMOA and Cape Verde, the monetary authorities have adopted a fixed exchange rate policy against the euro, thus, limiting direct interactions between changes in money supply and the intervention currency.[7] In Nigeria and Sierra Leone, the fact that the NFA constitutes a major source of money supply growth explains the positive relationship between money

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[7] The variations shown in table 5.6 (b) reflect the variations between the euro and the U. S. dollar on the international foreign exchange market.

supply growth and the domestic currencies (the naira and leone), as an injection of foreign exchange into an economy has an appreciating effect on exchange rates. The high degree of interventions in Ghana, Guinea, Nigeria, and Sierra Leone partly explains the weak to moderate correlations observed in these countries.

Regarding the relationship between money supply growth and the convergence criterion on real exchange rate stability (represented by movements in the real effective exchange rate), Table 5.4 (c) below shows that there is a high degree of correlation in The Gambia and Guinea (above ±0.7) and to a lesser extent, Liberia (above 0.66). The degree of correlation is moderate (between ± 0.4-0.6) in Burkina Faso, Cote d'Ivoire and Togo whilst it is marginal (below ±0.3) in Benin, Guinea Bissau, Mali, Niger, Senegal, Ghana, Nigeria and Cape Verde.

The tendency for real exchange rate appreciation following increases in broad money supply was observed in Liberia whilst the impact is moderately insignificant in Ghana, Nigeria, Sierra Leone, Cape Verde and most of the UEMOA countries. On the other hand, the pass-through effect of increases in broad money supply to real exchange rate depreciation is significant in the Gambia and Guinea.

In general, changes in money supply growth have no significant impact on real exchange rate stability in most ECOWAS countries, with the exception of the Gambia, Guinea and Liberia where the pass through effect is significant. Thus, it could be concluded that excessive monetary expansion could worsen the real exchange rate of a few countries, while in countries there are other important determinants that are likely to affect the real exchange rates.

TABLE 5.4 (C): CORRELATION BETWEEN MONEY SUPPLY GROWTH AND REAL EXCHANGE RATES

Country	Correlation
Benin	-0.20
Burkina Faso	0.48
Cote d'Ivoire	-0.50
Guinea Bissau	0.08
Mali	0.16
Niger	-0.09
Senegal	0.08
Togo	0.43
The Gambia	-0.91
Ghana	0.35
Guinea	-0.71
Nigeria	0.28
Sierra Leone	0.33
Cape Verde	0.21
Liberia	0.66

Sources: ECOWAS central banks, WAMA calculations

5.5 Trends in Currency Outside Bank and Broad Money Supply Ratio
A review of the trends in the ratio of currency outside banks to broad money showed a declining trend in most countries, indicating relative improvements in financial intermediation and public confidence in the

banking system during the period under review. However, the rate of improvement in the WAMZ and other countries was relatively more rapid than that recorded in UEMOA. Table 5.5 provides an overview of the ratios in the respective countries from 2002 to 2008.

TABLE 5.5: TRENDS OF THE RATIO OF CURRENCY OUTSIDE BANKS TO BROAD MONEY SUPPLY

	2002	2003	2004	2005	2006	2007	2008
UEMOA	36.6	32.7	30.1	31.8	31.1	29.9	29.6
BENIN	33.9	34.3	25.8	31.7	34.8	27.5	32.7
BURKINA	19.1	38.0	28.0	25.6	21.5	24.9	23.4
COTE D'IVOIRE	47.6	32.2	34.7	36.2	35.5	36.8	36.0
GUINEA BISSAU	81.3	69.9	74.9	77.3	71.9	63.1	59.8
MALI	39.5	43.4	35.9	40.3	36.9	31.8	31.5
NIGER	28.8	43.7	41.9	43.5	46.0	37.4	36.9
SENEGAL	19.8	26.4	23.8	24.9	25.9	24.5	22.9
TOGO	27.0	18.7	23.9	20.1	26.0	27.1	24.3
CAPE VERDE	12.3	11.5	10.8	10.5	9.0	8.9	8.5
LIBERIA	35.0	39.9	37.4	34.1	31.0	27.7	21.5
GAMBIA	24.9	25.8	26.1	23.2	25.0	20.4	18.7
GHANA	31.2	31.5	27.4	26.4	24.1	22.9	20.6
GUINEA	42.4	43.5	40.7	38.6	40.2	41.7	34.6
NIGERIA	29.0	25.3	20.3	20.0	16.2	12.7	9.7
SIERRA LEONE	39.3	41.0	37.1	31.9	31.3	28.7	25.8

Sources: ECOWAS central banks, WAMA calculations

In UEMOA, the ratio of the CFA currency with the non-bank public relative to broad money circulating within the zone decreased from 36.6 in 2002 percent to 29.6 percent in 2008. In particular, the declining trend was observed in Guinea-Bissau, which had traditionally maintained relatively higher ratios over the years, from 81.3 in 2002 percent to 59.8 percent in 2008. In addition to the situation in Guinea-Bissau, the some of the other UEMOA countries, notably, Benin, Cote d'Ivoire, Mali and Niger had ratios above the zonal average of 29.6 percent in 2008.

In the other countries, significant reduction on the proportion of currency outside banks was observed in Liberia, Sierra Leone, the Gambia and Nigeria. The declining trend in Liberia and Sierra Leone is attributable to the improving public confidence in the banking system following the restoration of peace and stability in the aftermath of the political disturbances. The developments in the Gambia, Nigeria and Ghana are driven by innovations in the banking system, particularly, the introduction of electronic banking services which have provided alternative and more efficient forms of payments. The highest prevalence of 34.6 percent was registered by Guinea while Cape Verde recorded a low rate of 8.5 percent in 2008. The relatively low level of currency in circulation outside the banking system in Cape Verde suggests a high level of public confidence in the banking system of this country.

6.0 CONCLUSION AND RECOMMENDATIONS

This paper assesses the contribution of the banking system operators to the convergence process. The available literature affirms that changes in liquidity have a powerful effect on economic activity and certain macroeconomic variables. An increase in money supply is likely to have a direct positive impact on the general price level and/or output depending on the structural circumstances. Using basic statistical analyses on historical data during the period from 2002 to 2008, this paper attempts to determine how changes in broad money supply impacted on the key macroeconomic variables, namely real GDP, inflation, exchange rate and interest rates and the financial convergence indicators.

The study showed that the percentage increases in broad money supply was higher than the corresponding GDP growth rates in the specific years in all the 15 ECOWAS countries. Furthermore, it was observed that the velocity of circulation declined in most countries during the period under review. The relatively high liquidity growth rates and declining velocity of money suggest the existence of excess liquidity in most economies, especially, in the Gambia, Ghana, Guinea, Nigeria, Sierra Leone and Liberia.

In most cases, the growth in money supply was attributed to credits extended by the deposit money banks to the private sector. There were also instances where the banking system contributed to liquidity growth through periodic accommodation of government operations, as was observed in certain years in respect of increases in the net claims on government (NCG) in the Gambia, Ghana, Guinea, Sierra Leone and Liberia. Increases in net foreign assets (NFA) also accounted most often for liquidity growth in Niger, Burkina Faso, Guinea Bissau, Nigeria, Sierra Leone and Liberia.

The analysis showed that money supply growth affected the countries differently, depending on specific country circumstances in macroeconomic governance. In most cases, the impact of money supply growth on economic activity and inflation was quite limited owing to the declining velocity of circulation. Nevertheless, money supply supported growth in a few countries: Burkina Faso, Mali, Senegal, Togo and Cape Verde. It had a marginal to moderate impact in Niger, Gambia, Ghana and Nigeria. Generally, changes in money supply have marginal impact in the UEMOA countries.

The growth in broad money supply had an inflationary impact in most countries, notably, in Gambia and Guinea where the impact was significant and a moderate effect in Benin, Guinea Bissau, Mali, Ghana, Cape Verde and Liberia. In the other countries, money supply growth interacts with other exogenous factors resulting in the tendency of deflation in certain countries, especially, Burkina Faso, Cote d'Ivoire, Niger, Senegal, Togo, Nigeria and Sierra Leone.

The study also pointed to a moderate tendency for interest rates (proxied by the monetary policy rate) to relate positively with increases in money supply in UEMOA, the Gambia, Ghana, Guinea and Cape Verde. The reverse effect was observed in Nigeria and Sierra Leone where interest rates correlates negatively with

changes in money supply, especially in Nigeria. The review further revealed that changes in money supply growth has no direct impact on real interest rates in most countries, with the exception of Liberia, the Gambia, Guinea and Benin where the relationship was found to be negative. The low inflation in the UEMOA countries and Cape Verde explain the prevalence of positive real interest rates in these countries. The differences in relationship between these two variables arise from the divergence in interest rate policies prevailing in the various countries, suggesting the need for policy harmonization in this area.

With regard to the nominal exchange rate, the currency depreciations in Gambia, Ghana and Guinea were attributed to money supply growth whilst it led to a moderate appreciation of the leone of Sierra Leone. The impact on the other currencies was marginal. Concerning the convergence criterion real exchange rate stability, it has a significant fluctuating effect in the Gambia, Guinea and Liberia and the moderate effect in Burkina Faso, Cote d'Ivoire, Togo, Ghana and Sierra Leone. It had a marginal impact on the stability in Nigeria, Cape Verde and most UEMOA countries.

In the light of the above developments and observations, the following recommendations may be useful:
1. Relate the expansion in broad money supply as closely as possible to GDP growth;
2. Strengthen the liquidity management mechanisms of the central banks and comply strictly with the money supply growth targets;
3. Strengthen banking supervision to enable effective monitoring of the exposure limits of the deposit money banks given the increasing volume of net claims on the private sector of the banking system;
4. Pursue monetary policy management with the objective of stabilizing prices and GDP growth;
5. Ensure effective functioning of the financial market to support the maintenance of equilibrium interest rates, thereby, avoiding the prevalence of low interest rates;
6. Maintain an effective credit policy in favour of the private sector;
7. Control the expansionary effect of net foreign assets (NFA) on broad money supply growth in Niger, Burkina Faso, Guinea Bissau, Nigeria, Sierra Leone and Liberia by instituting appropriate mechanisms to sterilize foreign exchange injections into the economy;
8. Control excessive expansion in broad money supply in all countries so as to avoid its inflationary impact;
9. Take appropriate steps to coordinate and harmonize monetary policies in ECOWAS in order to facilitate the financial integration process.

To achieve the above objectives, it may be necessary to harness the operational independence of the central banks. It may also be necessary to for each country to determine the most optimum level of money supply growth that would support programmed increases in output.

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