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Full Length Research Paper

Bilateral trade in Waemu and Cemac zone

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In order to measure the effects of the monetary union on the intra zone trade, the study call on, a structural VAR, to which is associated the method of space state model assessment with the aim of distinguishing the impact of an economic policy shock in a group of country in open economy. The sample is constituted in this particular case of the 12 countries of the zone franc; seven countries of the West African Economic and Monetary Union (UEMOA) zone and five countries of the Economic and Monetary Community of Central Africa (CEMAC) zone. The results of the investigations show a sensitive reduction of the effects borders, an improvement of the institutional effects as well as the effects bound to the distance on the flux of the intra zone trade. On the other hand, the study by structural VAR and Kalman filter shows a relative symmetry of shocks observed in the real shocks of demand while the shocks of price and supply rather present an asymmetric character.

Key words: Structural VAR model, optimal currency area, shocks symmetry, Kalman filter.

INTRODUCTION

The internationalization of the economy characterized by a widening of the access to the markets, the inputs, the technology and the information, are a long historic process that is considered by a lot of observers like a phenomenon that only benefits to developed countries. Globalization imposed itself to African States with the advantages, drawbacks and systemic risks that it triggers off. Facing this problematic, the economic and monetary integration is more and more considered by a lot of researchers as a relevant strategy to assure a harmonious African national economy insertion in the world- wide economic tissue allowing the African States to better profit this phenomenon. Thus, some countries of West and Central Africa aware of this reality, started notably after the independences, the integration processes with the setting up of monetary unions in a common monetary zone that is the zone franc and the zone of economic communities. It is in this context, that those of West Africa, and those of the zone franc instituted, in place of the CEAO, the West African Economic and Monetary Union (UEMOA) and those of Central Africa set up the Economic and Monetary Community of Central Africa (CEMAC) that is endowed with other institutions namely the Monetary Union of Central Africa (UMAC) and the Economic Union of Central Africa (UEAC). These attempts of integration were made in the aim of encouraging the growth and the mobility of factors and in order to widen the markets in view of the under dimensionality of the national market.

While entering into a process of integration, the franc zone countries give up the exchange rate as means to re-establish the balance following an asymmetric shock. One of the criteria allowed to define an optimal monetary zone is the mobility of factors. Mundell, one of the first theoreticians of the optimal monetary zones, argues that, a strong mobility of the factors and or a strong flexibility of the prices and wages can minimize the costs related to the neglect of this instrument of unbalance correction. For Mac Kinnon (1963) the degree of opening economies makes lower the costs due to the neglect of the exchange rate as economic policy instrument.

Several studies on the relationship between monetary union and trade showed that, the adherence to a unique currency intensifies the commercial exchanges between country members. However the analysis on the trade data shows that the zone Franc countries of CFA exchange relatively little with the other countries of the zone. The part of the intra regional trade represents less than 10% of the total trade in the countries of UEMOA (9.47% on average between 1995 - 1999) and less than 3% in the countries of CEMAC (Julie Lochard, 2005). Considering these data,we can think that the agreements of integration did not really contribute to increase the intra - regional trade.

The study is about the impact of a monetary union on the bilateral intra zone between the different countries constituting the zone franc. Thus, the main works of research made on the theme used the model of gravity; the evaluations have been done with the least square method or in panels.The approach combines the classic approach of the gravitational model but is mainly based on the method of Blanchard and Quah, and is completed by the state measure models.The study uses the structural VAR model.The originality of this approach resides in the fact that it tempt to analyze the effect of the shocks of commercial policies of every country in this analysis.

The identification of the shocks of production, real demand, and price, allows assessing the intensity of the impact of a shock in a country no specified in all the other countries of the zone franc. Besides, the analysis of the costs and profits of participation of every country in the monetary zone will depend on the degree with which the shocks of the prices and the supply are correlated between country and the one of their macroeconomic similarity degree. The source and description of the variable is found in Table 1 of the appendix.

THE STATE OF INTRA REGIONAL TRADE

The intra zone exchanges are very weak and very erratic in the CFA zone (Table 2 and 3). On the set of the period 1981 - 1999, the part of the intra - regional trade passed from 8.5 to 11% for the UEMOA and 2.47 to 2.17% for countries of the CEMAC. The tendency is similar for the inter zone trade. The UEMOA zone and the CEMAC zone trade relatively little between them; exchanges between countries of the UEMOA and the zone franc rise to 11.90% in 1999 and those of countries of the CEMAC with the CFA zone are of only 3.34% the same year. However, it is necessary to note that the intra regional trade of these countries is the most often sustained by one or two countries of which the economic weight in the zone is higher. This is how Senegal and Ivory Coast are the main exporters toward the other countries of the UEMOA (14% of their total exports in 1999 are destined to the other country members) and countries enclosed of the Sahel (Burkina, Mali and Niger) are those that import the more of countries of the UEMOA (between 20 and 25% in 1999). In the CEMAC zone the main importers are the Central African Republic and Chad (with 15 and 22%, respectively of the total imports in 1999) and the main exporter is Cameroon with only 6% of intra - regional exports (Julie Lochard, 2005).

LITERATURE REVIEW

Facing the new structure of the international monetary system, countries in search of real and monetary economic stability choose more and more intermediate solutions, compromised between stationary and flexible change regimes. The monetary union as "a mixed solution" seems to be a good alternative and according to Mundell the only one compatible with the sudden important opening of the markets to the fluxes of funds.

Besides, it gives many advantages to the countries members: reduction of the costs of transaction and the speculative movements, the reduction of uncertainty, the increase of commercial relationship and the reduction of the negative externalities between the zone counties, etc. Thus, some built-in economic regions choose to evolve toward the setting up of a perfect regional fixity in relation to a unique currency of reference and flexible with the other mottos (as it is the case with the Union Monetary European). Other regions such as the CFA zone prefer a monetary union based on a key currency (dollar, yen or euro). However, this option is accompanied by constraints related to the use of stationary change by each of countries of the region, passing by the loss of independence of the monetary policy oriented according to the global situation of the zone. According to Mac Kinnon (1963), the costs related to the neglect of the exchange rate as economic policy instrument decreases according to the degree of opening economies (measured by the ratio of the exchangeable on the non exchangeable) and of the importance of their reciprocal exchanges. The more important, the degree of opening of a country is, the likelier the transmission of a world price change on the relative prices interns is. It misleads that the monetary illusion tends to disappear: the real income decrease becomes obvious and the agents ask for the revision of their nominal incomes. It is necessary to limit the variations of the exchange rates therefore to limit the variations of price. On the other hand, the efficiency of the change policy decreases with the degree of opening of the economy. In a very open economy the costs of production are influenced strongly by the prices of the raw materials and the intermediate consumptions imported, which they find very difficulty to replace with a local production. In devaluation, the effects of inflation due to the necessary import raise in prices immediately reverberate on the other goods prices and wages and limit the effects expected from devaluation. The exchange rate is therefore less efficient as instrument of adjustment. Besides, Mac Kinnon thinks that savings achieved concerning costs of transaction increase according to the intensity of the intra zone trade. In order to measure the impact of the monetary union on the trade, several authors had resorted to an equation of gravity, which is the empirical model generally used to explain the level of the trade between two countries. Already in 1962, after Ravenstein (1885) and Young (1924), Tinbergen used this model in order to explain the intensity of the migratory movement according to the size of nations - of regions or cities - concerned and of the distance that separates them. The theoretical foundations

of these models progressively developed thanks to the works of Linneman (1966), Leamer (1970, 1974), Anderson (1979), Bergstrand (1985, 1989), Deardorff (1995), Evenett and Keller (1998). This approach has been badly considered for a long time by the specialists of international economy because of its microeconomic foundation lack, even though it gave good empiric resultsto explain the bilateral exchange flux better than the models of Ricardo and Heckscher-Ohlin that distinguish countries by some structural features, but do not localize them in a geographical space. The numerous authors who use this model agree that the determining factors of the bilateral trade are the distance, the levels of income and the size of country (Rose, 2001). According to the specifications of these models one expects a positive effect of the income, and a negative effect of distance. While the variable prices and exchange rates have a positive effect if the prices of the exporting country are lower than those of the importing country. According to Combes, Mayer and Thisse (2005), in the basic version of the gravitational model, the bilateral commercial flux are positively bound to the size of each of the partners and negatively affected by the level of the transfer costs. Helpman (1987) and Hummel-Levinsohn (1995) experienced the theory of gravitation then on the OCDE countries on more global data. They analyzed the impact of the sizes and especially of the scattering on the relative exchange volume. The results showed that for the OCDE countries the scattering plays positive and meaningful way in the determinants of the exchange volume. Regarding the non OCDE countries, the results are more mitigated since the coefficient of scattering have negative effect. According to these authors the modern equations of gravity refined themselves to take in account a border effect independent of the distance (costs of transportation or right of customs).

Frankel (1997) estimates the gravitational equation for the years 1967, 1970, 1975, 1980, 1985, 1987, 1990, 1992 and 1994. His study on the exchanges of goods refers to 63 countries (either 1953 observations) industrialized or not. Frankel makes a regression on each of the 9 years and on the set of years while using the econometrics of the panels. He concludes that if two countries have a common border, a same language and historic past, it increases their commercial exchanges.One of the main uses of the gravitational model was the one made by Rose (2000) and Engel and Rose (2001). Rose (2001), while using the herfindahl index, showed in a survey done on the common monetary zones, that countries belonging to a monetary union are more opened and more specialized than countries that have their own currency. In this same study, Rose uses the gravitational model of the international trade to assess the effect of the adherence to a unique currency on the intensity of commercial exchange, while keeping stationary several other foreign determining exchanges. The data are about more than 150 countries (dependencies, territories, overseas departments, colonies, etc. merely called "country"). According to the results, the remoteness of two countries reduced the exchanges, whereas the increase of the "economic" mass (estimated according to the real GDP and the GDP per capita) intensifies them. On the other hand, the estimations indicate that the use of a same currency increases the bilateral exchanges. These results are similar to those obtained by the same author in a study done in 2000 on comparable data.

Until lately, most estimation using an equation of gravity was achieved from data in transversal cut. Many authors Shapiro and Watson (1988) and Blanchard and Quah (1989), proposed to identify the structural impulses that are economically explainable; shocks of supply, of demand, of economic policy, etc. So, the procedure of decomposition of the vector autoregression analysis (VAR) method allows to identify the shocks of supply and demand and to differentiate them from the answers to the shocks. This method gives an opportunity, not only to measure the correlation of the shocks between countries but also to examine the speed with which economies adjust to these shocks.

Just as Blanchard and Quah, Bayoumi and Eichengreen (1994, 1996) and Funke (1995) used reduced VAR to identify the structural shocks of every variable (inflation and growth rate of the production) while imposing a set of restrictions including the theory based on the hypothesis according to which by a long time the shocks of production can affect the inflation, but not the opposite (Fielding and Shields, 1999).

METHODOLOGY

History, definitions and model philosophy

It is necessary to first differentiate between a VAR and an SVAR. The cowles commission distinguished between a reduced form and a structure. The reduced form related endogenous variables to lagged endogenous (predetermined) variables and exogenous variables, while the structure did the same, but also allowed for a contemporaneous interaction between the endogenous variables. Moreover, very few variables entered each structural equation, at least compared with the large number in the reduced form equations. In the literature we are concerned with, the VAR is the equivalent of the reduced form, in that each variable is related to lags of all other variables in the system, but there are no contemporaneous interactions. An SVAR allows for some contemporaneous relations.

SVAR modelling

In a VAR system n endogenous variables are explained from their own past:

$$A(L)z_t = e_t, \tag{1}$$

Where the matrix polynomial A(L) has degree k and leading matrix in the polynomial A(L) is the identity matrix, reflecting the reduced form nature of the system. Impulse responses are calculated from the vector moving average representation

$$z_t = A(L)^{-1}e_t = C(L)e_t, \tag{2}$$

Where the leading matrix in C(L) is again the identity matrix. The elements of et are correlated, that is, $E(e_t e_t') = \Omega$ is not diagonal, and Sims (1980) argued that it is useful to transform them to orthogonal form to be able to see the "distinct patterns of movement" of the system. The triangular factorization $\Omega = T\Sigma T'$ where T is lower triangular with unit diagonal and _ is diagonal gives the transformation $e_t = T\varepsilon_t$ such that $E(\varepsilon_t\varepsilon_t') = \Sigma$. The orthogonalized impulse responses C(L)T then describe the consequences for $z_{t+s},\ s = 0, 1, \ldots$, of unit shocks to the individual, mutually uncorrelated elements of $(0, \ldots, 0, 1)'$. For the last element these are the same as the traditional impulse responses, since the last column of T is (0, . . . , 0, 1)0; for all other elements the shock has an instantaneous impact, not only on the corresponding z-variable, as in the original system, but also on all variables placed lower in the z-vector. The orthogonalized impulse responses thus depend on the ordering of the variables in the VAR. Often a further scaling of these impulse responses is reported by considering the diagonal matrix $\Sigma^{\frac{1}{2}}$ of the standard deviations of et. Defining $S = T\Sigma^{\frac{1}{2}}$ gives the Cholesky decomposition $\Omega = SS'$ and associated transformation $e_t = S\varepsilon_t^*$, and impulse responses to unit shocks to ε_t^* are then reported. These are $C(L)T\Sigma^{\frac{1}{2}}$, and describe the dynamic consequences for the y-variables of a shock of one standard deviation in the orthogonalized residuals. It is not clear how interpretability is improved by scaling in inverse proportion to the goodness of fit of the equations of the VAR. Writing the orthogonalized VAR as:

$$T^{-1}A(L)z_t = \varepsilon_t \tag{3}$$

gives the appearance of the Wold causal chain, with contemporaneous coefficient matrix that is lower triangular with unit diagonal, and uncorrelated disturbances. This arises from the orthogonalization procedure rather than the imposition of prior restrictions from relevant economic theory. The recognition that structural analysis in VAR models requires such prior restrictions led to the development of SVAR models. The shocks are often given "structural" names, such as supply, money demand, technology, and so forth. Taking these to be the disturbance terms u_t of the structural model:

$$B(L)z_t = u_t$$

With covariance matrix Σ, attention usually focuses on the relation:

$$B_0\Omega B_0' = \Sigma$$

and seeks restrictions that identify B0 and Σ given the reduced form VAR covariances Ω. This approach eschews restrictions on the dynamics, although, in some applications long-run restrictions are used. It is common in the SVAR literature to assume Σ diagonal, but this is not done in the SEM literature, and whether it is a reasonable restriction on an SVAR has been questioned, by Bernanke (1986) himself and Shiller in discussion of Blanchard and Watson (1986), for example, and in more recent reviews such as Pesaran and Smith (1998).

Generalized impulse response analysis (Koop et al., 1996; Pesaran and Shin, 1998) for a precursor. Evans and Wells (1983) is an alternative to orthogonalization, whether this is the result of prior restrictions or simple renormalization. Rather than attempting to describe responses to specified shocks, generalized impulse responses (GIRs) describe the effect of "realistic" shocks, meaning shocks of the type that are typically or at least historically observed, as described by the sample estimate of the covariance matrix. If this is not diagonal, a shock to one error is associated historically with changes in the other errors. The GIRs, defined as conditional expectations given the estimated system, describe its dynamic responses to the resulting composite or generalized impulse. They are given as C(L)†, where † denotes the matrix obtained from by dividing the elements of each column by its diagonal element, since

$$E(e_t|e_{jt} = 1) = (\omega_{1j}/\omega_{jj}, \omega_{2j}/\omega_{jj}, \ldots, \omega_{nj}/\omega_{jj})'.$$

The GIRs are invariant to the ordering of the variables in the VAR, and coincide with the orthogonalized impulse responses for shocks to the first variable in the VAR, since when j = 1 the above column vector coincides with the first column of the matrix T defined above.

The data used to estimate our gravitational model come from the CEPII site.

The Svar model

The study use the structural vector autoregression analysis (VAR) method and the procedure of decomposition developed by Blanchard and Quah (1989) in order to measure the correlation of the shocks between countries and to examine the speed with which economies fit to these shocks.

Shocks identification

The use of the structural "VAR" model allows topass from some shocks stem from canonical VAR to economically explainable shocks. According to an approach made by Blanchard and Quah (1989), the identification is obtained while imposing a set of restrictions on the long term effect of every disruption in the three variables included in the VAR model:

1. The flux of the exports apprehended by the flux of the bilateral intra zone trade
2. The prices apprehended by the indication of the prices to the consumption
3. The production apprehended by the GDP per capita.

The goal of this paper is to identify and to compare the different shocks of economic policy between the countries members of the

CFA zone. The identification of the structural impulses is based on three hypotheses:

1. A trade policy shock does not transmit to either the price or to the supply global
2. A shock on the prices has an impact on the trade policy and on the supply global
3. A shock of supply has an effect on all variables of the system (bilateral trade flux, price, supply).

The model can be expressed in the shape of mobile average:

$$\Delta X_t = A_0\varepsilon_t + A_1\varepsilon_{t-1} + \ldots = \sum_{i=0}^{+\infty} A_i\varepsilon_{t-i}$$

Avec

$$\Delta X_t = \begin{bmatrix} \Delta X_t \\ \Delta P_t \\ \Delta Y_t \end{bmatrix}$$

When, ΔX_t, $\Delta P_t, \Delta Y_t$, respectively designate the flux of the exports, the prices, and the production.

$$X_t = \sum L^i A_i \varepsilon_t$$

Where L is the lag operator and VAR(t) = I

The choice of the lag number is determined thanks to the criteria of Akaike and Schwarz:

$$\varepsilon_t = \begin{bmatrix} \varepsilon_t^d \\ \varepsilon_t^p \\ \varepsilon_t^s \end{bmatrix}$$

When $\varepsilon_t^d, \varepsilon_t^P, \varepsilon_t^s$ respectively represent, the shocks of real demand, of prices and the shocks of supply that affect the economy:

$$A_i = \begin{bmatrix} a_i^{Xd} & a_i^{Xp} & a_i^{Xs} \\ a_i^{Pd} & a_i^{Pp} & a_i^{Ps} \\ a_i^{yd} & a_i^{yp} & a_i^{ys} \end{bmatrix} \quad (4)$$

When a_i^{ys} must be interpreted as the effect of a supply shock in *t - i* on the real GDP in t.

In summary the vector obeys a mobile average vectorial process of infinite order. Thus, one gets the two traditional tools of the VAR modelling; it is about the answer functions to the shocks and the decompositions of the variance of the forecasting mistake. However, with the difficulty related to the modelling structural VAR, one makes an orthogonalisation as recommended by Shapiro and Watson (1989), Blanchard and Quah (1989), King and Al (1992).

The orthogonalisation allows a decomposition of the variance of the forecasting mistake corresponding to the different sets as the contribution of the different structural shock. This method enables us to define for every country the shocks of supply, real demand and of price.

Identification of common and specific of shocks by Kalman filter

It means to identify a common and a specific component (to every country) within a type of shock for the studied country group, considering the case of the real demand shocks of a country group. It is necessary to decompose these shocks in the following way:

$$\begin{pmatrix} \varepsilon_{1t}^d \\ \varepsilon_{2t}^d \\ \varepsilon_{3t}^d \end{pmatrix} = \begin{pmatrix} \theta_1^d & 1 & 0 & 0 \\ \theta_2^d & 0 & 1 & 0 \\ \theta_3^d & 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \alpha_{ct}^d \\ \alpha_{1t}^d \\ \alpha_{2t}^d \\ \alpha_{3t}^d \end{pmatrix} \quad (5)$$

Where the first vector constituted the real demand shocks that the study previously determined in the structural VAR models, the θ indicate for every country how the common component determines the real demand shock, α_c representing the common shock and α_i the specific shock in every country (still as regard to supply). The θ and α which cannot be observed, we estimate them through a space - state model (to components that are not observed) by the procedure of the filter of Kalman. Therefore, the study needs to determine an equation of measure and an equation of transition. Indeed, the equation of measure is expressed by the previous equation. The equation of transition is presented in the following way:

$$\begin{pmatrix} \alpha_{ct}^d \\ \alpha_{1t}^d \\ \alpha_{2t}^d \\ \alpha_{3t}^d \end{pmatrix} = IIDN\left(\begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & \sigma_1^2 & 0 & 0 \\ 0 & 0 & \sigma_2^2 & 0 \\ 0 & 0 & 0 & \sigma_3^2 \end{pmatrix} \right) \quad (6)$$

The study make the hypothesis that the common components are some white noises and that the different structural shocks are not auto correlated. The filter of Kalman is going to allow us to estimate the set of α (common and specific components), the parts of the common component within the national real demand shocks, as well as the variances σ. Thus, the study has to do with the identification of a common tendency, a new instrument of measure of the asymmetry between countries. Countries having recorded an important contribution on behalf of the variance of their real demand shocks of the common tendency present a symmetrical character in relation to this shock. In other words, the more the part of the variance of the real demand shocks of a country is explained by the common tendency, the more it will tend to present a symmetrical character of these same shocks faced to the countries presenting the same features. The decomposition of the shock variance is represented in the following way:

$$\sigma^{2}_{\varepsilon ij} = \theta^{2}_{ij} + \sigma^{2}_{\alpha j} \quad (7)$$

with *i* the studied country and j the nature of the shock. The part of the variance of the shock explained by the common tendency is then equal to the ratio:

$$\frac{\theta^{2}_{ij}}{\sigma^{2}_{\varepsilon ij}} \quad (8)$$

RESULTS INTERPRETATION

Variance decomposition and simulations

Sources of variation of intra zone trade

Tables 4 and 5 in the appendix highlight the contribution of each shock to the fluctuations of the level of the intra zone trade. The study observes overall a prevalence of the shocks of real demand, for the majority of the countries of the sample. This prevalence is much more uniform when emanating from CEMAC zone with approximately more than 65% of bilateral contribution of the intra zone trade supply, whereas it is a little erratic in UEMOA zone. This prevalence is maintained in general after the first five years and in general explains 60% of the variability of the intra zone trade supply. However, for the countries like Benin, Burkina and Niger, the study observe a contribution much more significant for the GDP per capita to the variations of the supply of the bilateral trade. Indeed for the Benin and Burkina, in the long term, it is rather the level of the GDP per capita which contributes more to the fluctuations of the bilateral trade, while for Niger; it appears that there are contributions of the price which prevails in the long term.

In general, the study observe for the responses of the shocks that the changes in the supply of bilateral intra zone trade are balanced in the short term by a negative effect on the consumer price index and a mixed effect on the level of the GDP per capita. In the long term, the study observes a negative impact marked on the prices while the level of bilateral intra zone supply records an upward trend. It also observes a depression tendency of the level of the GDP per capita in long-term.

Source of variation of price

The observation of the Tables 6 and 7 in appendix highlights the contribution of each shock to the fluctuations in prices. The study observes in general three groups of countries which are similar by the identity on the contribution to the price shocks. In the first group, it observes countries in which the contribution of the shocks of bilateral supply explains the essence of the variability of the prices. It is about, in fact, of Cameroon, the Ivory Coast, Chad, Togo, and the Central African Republic. The contribution of these various shocks isapproximately 45% on average per country.

The second group includes the countries where the contribution of the prices mainly explains the variability of the consumer price index. It is about Gabon, Congo, Senegal, Niger, and Mali. The average of the contribution of these shocks is 65% per country.

Finally, the last group including Benin and Burkina, which are characterized by a strong contribution of the GDP per capita to the fluctuations in prices to consumption. The study note, on average, a contribution by country near 67%.

The analysis of the responses of the shocks highlights a significant impact of the GDP per capita on the variation of the prices. The estimates show that a shock of nominal demand materializing a rising up of prices shows a short-term increase in the level of the GDP per capita and the level of the consumer price index, a fall of the bilateral trade supply. While in the long term, the study observes a rather negative reaction of the bilateral supply trade and GDP per capita.

Source of variation of economic activity

The sources of variation of the fluctuations of the level of the GDP per capita are explained in the short term mainly by the shocks of economic policies, the shocks of commercial policies, and a very tiny way by the shocks of price. The shocks of economic policy contribute for 52% on average, those of commercial policies for 29% and the price shocks policies for 19%. It arises a prevalence of the shocks of supply in the explanation of the fluctuations of the GDP per capita. The functions of response to the shocks highlight different effects on the target variables. Then, in the short term, a shock of supply has a positive impact on the level of the GDP per capita and the prices like on the supply of bilateral trade for the countries like Benin, Mali, Niger, Senegal, Togo and Gabon. The impact is overall negative on the price level and the level of the trade in the countries like Ivory Coast, Congo, and Central Africa. In addition, the study observe in the other countries a mitigated effect on certain countries characterized by an increase of the level of the GDP per capita, a mitigated impact on the trade and the prices.

Kalman filter estimation

Countries possessing the strongest percentages constitute the most symmetrical group in an economically way. Thus, for the set of the shocks, the study recovers some countries as the Ivory Coast, Gabon and Cameroon. It observes a bigger symmetry otherwise to the level of the real demand shocks. This result confirms those already observed while using the structural interrelationships, and puts thus, in evidence the

conception that the study had the weak gain, that would generate the commercial asymmetry disappearance.

The evaluation of the shocks when applying the state space model gives the following results:

The countries having the strongest percentages economically set up to some extent the most symmetrical group. Thus, for the whole of the shocks, the study finds countries such as Ivory Coast, Gabon and Cameroon. In addition, it observes a larger symmetry on the level of the shocks of real demand. This result confirms those already observed by using the structural correlations, and thus, highlights the conception which the study had of the weak profit that the disappearance of commercial asymmetries would generate. The estimate of the shocks by applying the model of state space specification gives the results as thus explained.

Commercial policies shocks

Only the structural shocks affecting the Ivory Coast (35.5%), Benin (15%), Cameroon, (22.7%), Gabon (22.9%) and Mali (7.6%) have a significant effect on the common component (Table 3)

Prices policies shocks

Only the shocks affecting the Ivory Coast are associated to the common component. The shocks emanating of the other countries have a quasi null effect on the final component.

Supply policies shocks

The study records for the whole of the countries a common component of the structural shocks significant for the Benin, Burkina Faso, Ivory Coast and Gabon.

Global results interpretations

The theory of the real cycle affirms that fluctuations are the result of the only real factor interaction to know the preferences of the agents, the technological possibilities, the endowments in factors and possibly of the institutional constraints. In the case of countries of the zone franc it is mainly the endowments in factors that explain the fluctuations of the levels of the economic activity and the flux of the bilateral trade.

The study can interpret the predominance of the commercial policy shocks by the weakness of the level of the trade between country in relation to the global trade of these countries, as well as by an unsuitability of the commercial policy implemented in these countries.

One of the fundamental reasons of this weakness of the intra zone trade is naturally the similarity of the structures of production and consumption in these countries to which the persistence of the tariff barriers is added, and of the underground trade in the different ones under zones. Indeed, the similarity of the structures of production makes that the countries, end up proposing on the markets the same lines of goods. What causes to weaken the trade between close countries, since the consumers with range of identical product will choose to get a stock on the local market. Thus, on making the assumption that the snobbery effect is very marginal.

In addition a relatively significant contribution of the commercial shocks on the common component translates the vulnerability of the countries of the zone to specificities of their economy mainly dominated by raw material exports. The strong contribution of agriculture in general and the agriculture of revenue in particular in these countries, weakens the installation of reliable commercial policies so far as this sector is dependent on the climatic risks and in particular of pluviometry. A very significant pluviometry for incipient food-processing industries, since the climatic risks directly cause immediate damage on the supply out of raw materials essential to these companies for their working.

A noticed weakness of the shocks of price to the common component highlights a control of the inflationary tensions, constituting one of the prime objectives in the multilateral monitoring of the country of the free zone, but also emanating from an old tradition rising from the monetary discipline observed since the advent of the programs of structural adjustments. This objective explains the paths of evolution controlled by the authorities in each country and in general in way concerted by the central banks, and the prevalence of the impulses printed by the shocks of economic policies on the fluctuations in prices in the countries of zone CFA. The weak contribution of the shocks of supply to the fluctuations in prices is also explained by the monetary policy fixed by the central banks which fixes the money supply according to the economic growth rate, as well as supplementary measures taken to stabilize inflation in the event of inflationary overheating. Indeed, any unfavourable impact of the external shocks on the prices is to inhibit, to cancel the interventions of the authorities. These interventions of the authorities appears by subsidies of the products of first need or energy-generating products for example, and in general aim the improvement of the purchasing power of the consumers and of against performances in the manufacturing units.

Finally, the shocks of supply are not very significant. This emanates on the one hand for the same reasons stated higher on the level of the analysis of the commercial shocks. In addition, this weakness of shock of supply can be explained by the structure of the elements which make it up. Indeed the structure is largely dominated by the debt and administrative expenditures which in fact have a weak capacity of stimulation on the

level of the total activity. The investment which has a very powerful catalyst capacity on the level of the economic activity is often relegated to the second plan and sometimes is falling in some countries.

ECONOMICS POLICIES RECOMMANDATIONS

The results which the study had found highlight a manifest asymmetry of the response of the countries to the various shocks. Moreover, the price and supply shock are asymmetrical according to results' of the investigations, the implications in terms of economic policies of the study are multiple.

The prevalence of the shocks of commercial policies highlights the installation of policies allowing to redynamise the structure of industries of the countries of CFA zone these last years. However the close connection between the climatic conditions and the supply of raw materials announce problems of provisioning in the long term. It is thus, essential to envisage a diversification of industrial and economic fabric, to allow the emergence of new capable sectors in the long term to ensure a regular rate of growth of these economies.

Diversification must be followed of an agricultural and industrial optimal policy. It is a question of being directed towards sectors or even niches with high potential of value added and creation of labour, with the risk to see the emergent industry in these countries going down from the causes of a very hard competition on the international market.

The weak contributions of supply shocks challenge on the installation of a line of constant economic policy. It is known that the reach of the objectives of the millennium goals and in fact the reduction in the incidence of the poverty of half passes by obtaining the constant economic growth rates. It is thus, essential, considering the weakness of the contributions of the supply shocks that measures are taken to reduce the government's rate of expenditure, by decreasing the administrative expenditures especially and while being focused on the investments and especially the infrastructures of bases which are cruelly lacking in these countries. If not how to understand that one speaks about economic integration or economic and monetary union whereas there are not transportation routes between the various countries which constitute the union. The installation of infrastructures would reduce in a very significant way the costs of transport, and the political decision makers must think of it.

Conclusion

By melting our analysis on the gravitational models, it distinctly appears the description of a significant effect of the monetary areas on the level of the intra zone bilateral trade. In addition approach by the criterion of symmetry of the shocks, which stipulates in filigree that the countries which have to win to be member of the monetary union are those which have shocks attached to the common component and symmetrical to this one. A profit, which would come owing to the fact that if the shocks hitting the economies cause in their centre of the similar or symmetrical effects, the cost to belong to the monetary area would be weakened by it since the common monetary policy appears adapted to the desires of each one of these economies. However, the cost is high if the shocks are very specific. This study consisted in identifying the shocks of supply and demand and appreciating of their influence on the macro-economic variables through a structural auto regression vector (SVAR) model.

The results show that, in a general way, the real shocks of request produce symmetrical effects on the macroeconomic variables for a group of country given. In addition, starting from the estimate of the state space models measures, it generally appears that only the shocks of commercial policies affecting the economies have a significant effect on the common component. These results indicate that the countries of CFA monetary area are closer by their commercial policies.

REFERENCES

Anderson J (1979). "A theoretical Foundation for the gravity equation". Am. Econ. Rev., 69 : 106-116.

Bayoumi T, Eichengreen B (1996). "Operationalising the Theory of Optimum Currency Areas". Working paper, CEPR.

Bergstrand JH (1985). "The Gravity Equation in International Trade: some Microeconomic Foundations and Empirical Evidence". Rev. Econ. Stat., 67: 474-481, August.

Bergstrand JH (1989). "The Generalised Gravity Equation Monopolistic Competition, and the Factor-Proportions Theory in International Trade," Rev. Econ. Stat., 71: 143-153, February.

Blanchard O. et Quah D (1989). "The Dynamic Effects of Aggregate Demand and Supply Disturbances". Am. Econ. Rev., pp. 654-673, September.

Combes P, Mayer T, Thisse JF (2005). " Gravitation et coûts de transfert ", Chapitre 5, Décembre.

Leamer Edward E. (1970), « The commodity composition of international trade in manufactures: An empirical analysis », Am. Econ. Rev., p 350-374.

Deardorff AV (1995) “Determinants of Bilateral Trade: Does Gravity Work In a Neoclassical World?” NBER Working Paper No. 5377. National Bureau of Economic Research. New York.

Evenett J, Keller W (1998). "On Theories Explaining the Success of the Gravity Equation". Working Paper N°.6529. NBER.

Fielding D, Shields K (1999), « Is the Franc Zone an optimal currency area ? », Department of Economics, University of Leicester, october.

Frankel JA (1997). "Regional Trading Blocs in the World Economic System". Institute for International Economics, Washington DC.

Funke M, Colavecchio R (2005). ‘Drifting Together or Falling Apart? The Empirics of Regional Economic Growth in Post-Unification Germany.’ CESifo Working Paper Series, No. 1533.

Hummels D, Levinsohn J (1995). "Monopolistic Competition and International Trade:Reconsidering the Evidence", Q. J. Econ., pp. 799-836.

Leamer EE, Stern RM (1970), Quantitative International Economics, Allyn and Bacon, Boston.
Leamer EE (1974). “The Commodity Composition of International Trade in Manufactures: An empirical Analysis”, Oxford Economic Papers, 26: 350-374.
Linnemann H (1966). An Econometric Study of International Trade Supply, Amsterdam, North-Holland.
Lochard J (2005). " Les unions monétaires et leurs effets sur les échanges et les investissements internationaux ". Thèse de Doctorat ès Sciences Économiques, Université Paris I - Panthéon - Sorbonne U.F.R de Sciences Économiques.
Mac Kinnon R (1963). Optimum currency areas. AER, 53 : 717-724.
Ravenstein EG (1885). "The laws of migration. J. Royal Stat. Soc., 48: 167-227.
Rose A (2000). One Money, One Market: Estimating the Effect of Common Currencies on Trade. Forthcoming, Economic Policy, Février.
Rose A (2001). " Étude pratique des zones monétaires communes ".
Rose AK, et CE (2000). "Currency Unions and International Integration". Document de travail no 7872, National Bureau of Economic Research.
Shapiro and Watson (1988), "Sources of Business Cycle Fluctuations". NBER Macroecon. Ann., 3: 111-148.
Tinbergen J (1962) Shaping the World Economy: Suggestions for an International Economic Policy. New York, Twentieth Century Fund.
Young EC (1924) "The movement of farm population. Cornell Agricultural Experimental Station". Bulletin 426, Ithaca, New York.

APPENDIX

Table 1. Sources and availability of variables.

Abbreviation	Description	Période	Source	Type
XIJ	Bilatéral trade flux	1980-2000	World Bank Database	Endogenous
GDPi	GDP of country i	1980-2000	World Bank Database	Exogenous
GDPj	GDP of country j	1980-2000	World Bank Database	Exogenous
GDPTi	GDP per capita of country i	1980-2000	World Bank Database	Exogenous
GDPTj	GDP per capita of country j	1980-2000	World Bank Database	Exogenous
Dij	border between country i and j	1980-2000	CEPII	Exogenous
LAND	Border between country i and j	1980-2000	World Bank Database	Exogenous
UEMOA	Country of UEMOA	1980-2000	World Bank Database	Exogenous
CEMAC	Country of CEMAC	1980-2000	World Bank Database	Exogenous
OIL	Ivory Coast, Cameroon, Congo, Gabon	1980-2000	World Bank Database	Exogenous
COTON	Benin, Burkina-Faso, Centrafric, Mali, Niger, Chad, Togo	1980-2000	World Bank Database	Exogenous

Table 2. Bilateral trade in UEMOA AND CEMAC.

WAEMU	Billions of $	CEMAC	Billions of $
Mali to Benin	5.58975854	TCDTOGAB	0.06157383
Benin to Burkina	19.3504369	RCATOCGO	0.441544
Mali to Niger	30.13219398	GABTORCA	3.87506151
Niger to Senegal	37.02855788	CGOTORCA	6.9671015
Togo to Senenegal	103.9322312	TCDTOCGO	6.998766
Niger to Benin	111.5991176	TCDTORCA	27.8211811
Benin to Senegal	189.2139994	GABTOCGO	56.578946
Togo to Burkina	209.826437	RCATOCMR	298.391508
Benin to Togo	239.489703	TCDTOCMR	329.730869
Benin to Cote D Ivoire	591.040127	CMRTOCGO	436.63781
Cote D Ivoire To Niger	853.7939	CMRTOGAB	659.557647
Senegal to Mali	951.1990167	Total	1827.06201
Cote D Ivoire to Togo	1094.246716		
Senegal to Cote D Ivoire	1615.276527		
Cote Divoire to Burkina	2788.337404		
Mali to Cote D Ivoire	3331.885322		
Total	12171.94145		

Source: Authors calculation.

Table 3. Share of the variance of macroeconomic shocks in CFA zone CFA explain by the common component.

		Exportations	Prix	Pib
		Chocs de demande reel (%)	**Chocs de demande nominal (%)**	**Chocs d'offre (%)**
	Benin	15,031	0,000	3,445
	Burkina	4,082	1,912	0,001
	Cote d'ivoire	35,480	16,986	17,282
UEMOA	Mali	7,565	0,038	2,204
	Niger	0,028	0,189	0,01
	Senegal	3,267	0,000	7,095
	Togo	1,147	0,001	9,230
	Cameroun	22,772	0,00	7,846
	Centrafrique	0,028	0,189	0,019
CEMAC	Congo	0,109	0,000	0,183
	Gabon	22,896	0,002	13,600

Source: Authors calculation.

Table 4. Bilateral trade variance decomposition in UEMOA zone.

Période	*S.E.*	Shock1	Shock2	Shock3
Variance decomposition of LOG(XIJGLOBEN)				
1	0.150135	100.0000	0.000000	0.000000
5	0.264290	83.26353	5.871962	10.86451
10	0.388755	59.21958	15.65540	25.12502
15	0.676868	45.95006	23.90523	30.14471
20	0.756678	36.98204	33.05826	29.95970
Variance decomposition of LOG(XIJGLOBFA)				
1	0.148011	100.0000	0.000000	0.000000
5	0.214853	62.80076	17.17616	20.02308
10	0.237330	57.26020	18.59257	24.14723
15	0.260015	48.04890	16.51545	35.43565
20	0.292538	38.04508	13.57061	48.38431
Variance decomposition of LOG(XIJGLOCIV)				
1	0.152230	100.0000	0.000000	0.000000
5	0.196317	79.51969	3.284235	17.19608
10	0.222349	67.87737	5.744821	26.37781
15	0.228050	66.95500	6.782640	26.26236
20	0.232076	66.09657	7.330528	26.57290
Variance decomposition of LOG(XIJGLOMLI)				
1	0.264095	100.0000	0.000000	0.000000
5	0.310394	85.76544	9.529945	4.704612
10	0.348940	70.01906	22.39737	7.583572
15	0.361056	67.92771	23.57415	8.498145
20	0.365663	67.42608	24.19259	8.381332

Table 4. Cont'd.

Variance decomposition of LOG(XIJGLONER)				
1	0.081684	100.0000	0.000000	0.000000
5	0.125655	73.59116	25.08560	1.323242
10	0.196232	37.57666	59.38742	3.035920
15	0.210067	33.42748	63.24821	3.324312
20	0.211398	33.01436	63.60329	3.382349
Variance decomposition of LOG(XIJGLOSEN):				
1	0.235835	100.0000	0.000000	0.000000
5	0.278254	87.85902	4.455023	7.685955
10	0.311052	80.10167	4.208153	15.69017
15	0.322974	79.58445	4.834985	15.58056
20	0.325114	79.47270	5.094785	15.43252
Variance decomposition of LOG(XIJGLOTGO)				
1	0.323775	100.0000	0.000000	0.000000
5	0.449873	85.44850	11.53520	3.016294
10	0.473732	82.36414	13.60695	4.028909
15	0.493894	82.12449	12.92214	4.953370
20	0.508637	81.72973	12.70828	5.561984

Source: Authors calculation.

Table 5. Bilateral trade variance decomposition in CEMAC zone.

Variance decomposition of LOG(XIJGLOCMR)				
1	0.265559	100.0000	0.000000	0.000000
5	0.382932	61.47391	13.34300	25.18309
10	0.386512	60.72643	13.35645	25.91712
15	0.392081	60.58629	13.31590	26.09781
20	0.392731	60.56628	13.32086	26.11286
Variance decomposition of LOG(XIJGLOCGO)				
1	0.365043	100.0000	0.000000	0.000000
5	0.484099	67.34091	8.959159	23.69993
10	0.508291	64.82309	12.49694	22.67997
15	0.509284	64.68606	12.60180	22.71214
20	0.509353	64.68193	12.60619	22.71188
Variance decomposition of LOG(XIJGLOGAB)				
1	0.435950	100.0000	0.000000	0.000000
5	0.560006	86.80790	4.482065	8.710033
10	0.586560	86.60740	4.634192	8.758406
15	0.589345	86.46321	4.704050	8.832743
20	0.589828	86.40083	4.727282	8.871886
Variance decomposition of LOG(XIJGLORCA)				
1	0.336661	100.0000	0.000000	0.000000
5	0.518613	77.27749	15.49281	7.229700

Table 5.Cont'd

10	0.530955	74.22960	17.18369	8.586705
15	0.549204	73.53611	16.57054	9.893355
20	0.555076	72.61060	17.44449	9.944912
		Variance decomposition of LOG(XIJGLOTCD)		
1	0.650816	100.0000	0.000000	0.000000
5	0.765565	78.70514	5.613487	15.68137
10	0.828345	77.99689	5.574630	16.42848
15	0.851158	78.23846	5.481121	16.28042
20	0.856500	78.30335	5.469369	16.22728

Source: Authors calculation.

Table 6. Price variance decomposition in UEMOA zone.

		Variance decomposition of LOG (PIJBEN)		
1	0.015141	34.96025	65.03975	0.000000
5	0.085359	72.49811	11.60116	15.90072
10	0.166751	44.33165	21.63675	34.03160
15	0.262292	31.95195	32.08956	35.95849
		Variance decomposition of LOG(PIJBFA)		
1	0.090208	1.721550	98.27845	0.000000
5	0.173699	19.22585	33.96102	46.81313
10	0.220048	16.44884	25.59911	57.95205
15	0.270408	11.73887	18.83369	69.42744
		Variance decomposition of LOG(PIJCIV)		
Period	S.E.	Shock1	Shock2	Shock3
1	0.040949	6.517578	93.48242	0.000000
5	0.091891	45.77023	43.52624	10.70353
10	0.124623	41.60001	34.66251	23.73748
15	0.138698	42.46519	32.60469	24.93012
		Variance decomposition of LOG(PIJMLI)		
1	0.057066	3.268906	96.73109	0.000000
5	0.151555	20.50232	74.06584	5.431849
10	0.204392	13.29964	74.96200	11.73836
15	0.216605	18.05022	69.39932	12.55046
		Variance decomposition of LOG(PIJNER)		
1	0.036806	0.335635	99.66437	0.000000
5	0.084189	10.45402	86.73915	2.806837
9	0.093411	8.514581	87.46705	4.018371
15	0.104821	7.654303	88.01085	4.334849
19	0.111662	6.956405	88.40821	4.635389
		Variance decomposition of LOG(PIJSEN)		
1	0.036753	6.017192	93.98281	0.000000
5	0.139953	26.81872	67.52993	5.651344
9	0.200249	24.96535	64.73418	10.30047

Table 6.Cont'd

15	0.225564	21.95382	63.35472	14.69146
20	0.230772	21.44178	61.75541	16.80282
		Variance decomposition of LOG(PIJTGO)		
1	0.033863	1.786772	98.21323	0.000000
5	0.080177	33.37368	58.74939	7.876930
10	0.102028	51.91215	37.49706	10.59079
15	0.115383	56.82553	31.50592	11.66854
20	0.125140	59.76339	27.97570	12.26091

Source: Authors calculation.

Table 7. Price variance decomposition in CEMAC zone.

		Variance decomposition of LOG(PIJCMR)		
1	0.073367	20.71891	79.28109	0.000000
5	0.136479	34.87535	36.15394	28.97071
10	0.156258	43.59884	32.60426	23.79690
15	0.157490	43.27213	32.23531	24.49257
20	0.157634	43.31004	32.19240	24.49756
		Variance decomposition of LOG(PIJCGO)		
1	0.030290	6.997299	93.00270	0.000000
5	0.077730	32.00424	57.88572	10.11004
10	0.089749	33.39198	55.35406	11.25396
15	0.090574	33.75717	55.00011	11.24271
20	0.090586	33.75291	54.99967	11.24742
		Variance decomposition of LOG(PIJGAB)		
1	0.027667	2.032734	97.96727	0.000000
5	0.054066	12.17226	75.11917	12.70857
10	0.069674	8.801775	71.02762	20.17060
15	0.080796	8.751349	66.20555	25.04311
20	0.088548	8.968334	63.24227	27.78940
		Variance decomposition of LOG(PIJRCA)		
1	0.031613	9.894766	90.10523	0.000000
5	0.053842	19.52082	59.61567	20.86352
10	0.075005	40.50719	34.56005	24.93276
15	0.080888	38.75045	37.89793	23.35162
20	0.086523	41.22657	33.87774	24.89568
		Variance decomposition of LOG(PIJTCD)		
1	0.021669	49.52620	50.47380	0.000000
5	0.096010	80.04493	10.46268	9.492393
10	0.107252	79.75298	10.14111	10.10591
15	0.108206	78.82135	10.27697	10.90168
20	0.110083	79.22128	10.16051	10.61821

Source: Authors calculation.