

*Full Length Research Paper*

# Exogenous shocks and financial stability in the West African Economic and Monetary Union (WAEMU)

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The search for financial stability remains a priority in every country today, mainly because of high costs incurred by financial crises and induced effects of financial stability on economic growth. The economies of the West African Economic and Monetary Union (WAEMU) countries are characterized by a strong dependence on the outside, especially with regard to the value of their currency, the CFA franc, and thus the variability of their exports but also the terms of trade. This study is conducted using an equation of financial instability with panel data. We used simple moving averages to measure the volatility for the different variables. The results show that the main predictors of financial instability in the WAEMU are: distributed credit, inflation and the rate of export growth. The study shows the need for diversification of production in the area and effective supervision of the banking system to better cope with shocks from internal and external, and financial stability.

**Key words:** Financial stability, financial development, economic growth, West African Economic and Monetary Union (WAEMU), exportation, exogenous shocks, CFA franc.

## INTRODUCTION

The West African Economic and Monetary Union (WAEMU) is a eight member States, namely Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo. WAEMU is characterized by a common monetary policy, implemented by the Central Bank of the States of West Africa (BCEAO), with the primary objective of price stability. The Union is also characterized by specific fiscal policies to member states. Different countries have in the past four decades banking and economic crises. The area economies are highly vulnerable to internal and external shocks. These shocks result in financial instability and a slowdown in economic activity. Indeed, financial stability is supposed to inform the economic agents in their investment choices, promote aggregate demand and hence economic growth. Financial stability is defined by the absence of its opposite.

Financial instability is represented by the instability of the financial development indicator selected from its long-

term trend. For developing countries, particularly those of the WAEMU, the ratio of broad money M2 to GDP or credit to the private sector to GDP is chosen as an indicator of financial development. There are also other indicators of financial development, for developed countries. In particular, market capitalization is used to measure financial development.

So the choice of the indicator was mainly due to the nature of the financial system, notably by the traditional opposition between economics of debt and economics of capital markets. Due to the weight of banks in the funding mechanism of the agents in the countries of the Union, financial development was measured by the share "Credit to the private sector on Gross Domestic Product." Financial development is positively related to financial instability. Indeed, it leads the development of banking intermediation in these countries, and results in an increase in credit distribution. Financial development is supposed to promote economic growth, but in return and because of more or less risky projects funded and the asymmetry information in these countries, it is usually accompanied by financial instability.

The economic and financial situation of the West

**JEL classification:** E42, E44, E50, F18, F31, F36.

African Economic and Monetary Union countries is characterized by certain fragility due to exogenous shocks, which affect in particular the cotton sector, and against secondary sector performance, hit by malfunctions in the energy sector. These are mainly the appreciation of the euro against the dollar affecting exports from the area, billed in dollars and rising oil prices, the WAEMU countries are net importers of oil. Added to this, are a drop on global demand in response to the global financial crisis and some deterioration on the terms of trade. This vulnerability results in a decline in factor productivity. Different sectors of economic activity are adversely affected by the multiple internal and external shocks. This study explains the relationship between these shocks and financial stability in WAEMU.

## FINANCIAL STABILITY AND ITS DETERMINANTS

A good understanding of financial stability requires the definition and identification of its determinants. Issues of financial stability are also on the quality of institutional arrangements and payment systems in place to guide risk-taking for credit institutions and investment decisions or investment by non-financial agents.

### The definitions of financial stability

Financial stability means a strong and efficient financial system, which includes:

- i. An efficient allocation of economic resources,
- ii. A normal and sustainable financial sector,
- iii. Effective responses to potential shocks from internal or external.

But there is no single definition of financial stability. Icard (2007) defines financial stability as "the environment in which the financial system ensures proper allocation of savings to investment through time, space and sectors, sound risk management induced these activities, the regular functioning of the financial infrastructure and capacity to withstand shocks without these functions are put at risk".

Mishkin (1997) proposes to define financial stability in the absence of its opposite (which is the lack of financial instability), "financial instability occurs when shocks to prevent the financial system flow of information so that the financial system can no longer fulfill its role in directing funds to those with productive investment opportunities. "His definition highlights the impact of asymmetric information in order to preserve financial stability. Indeed, price volatility in the financial markets is related to the imperfect information available to stakeholders in these markets.

The most comprehensive definition is provided by Patat

(2000): "The concept of financial stability covers a multidimensional concept that could be expressed as a situation in which the operation of various components of the financial system, and especially their interrelationships, occurs in a healthy way and without sudden disturbances". That is why financial stability occupies a special place for the proper functioning of an economy. For our part, we will consider a financial system in a situation of instability when it can no longer provide its main function that is, the optimal allocation of agent resources to lending to those in need of funding.

Credit institutions have an important role in financial stability. Indeed, in one hand more and more of the assets and liabilities of banks are owned in the form of securities, these securities are often denominated in foreign currencies. Therefore, proper management of these securities is essential to avoid situations of financial instability (Eboue, 2004). There are also other actors in the financial system whose behaviors directly affect financial stability; this is the case of investment companies with variable capital, pension funds, insurance companies, products and effect leverage as "hedge funds".

### Financial development and economic growth

Concretely when addressing the issue of financial stability, it addresses the link between financial development and economic growth. Indeed, financial instability is measured in general by the instability of the indicator of financial development. However, there is a debate on the direction of causality between financial development and economic growth.

Levine (1996) summarizes the theoretical arguments in five positive relationships between financial development and economic growth:

- i. The financial system helps protect against the risk and sharing it;
- ii. It allows an optimal allocation of resources;
- iii. It allows a better control of the company executives and the shareholders;
- iv. It facilitates the mobilization of domestic savings;
- v. It facilitates the exchange of goods and services.

For Gurley and Shaw (1960) and Goldsmith (1969), a strong and efficient financial system facilitates portfolio diversification for investors (and the incentive to finance riskier projects (long-term projects), but also more profitable (St. Paul, 1992; Pagano, 1993).

Goldsmith (1969), in "Financial structure and development" shows that there is a strong correlation between financial development and the level of economic activity.

These empirical studies revolve primarily around the choice of indicator of financial development. Goldsmith

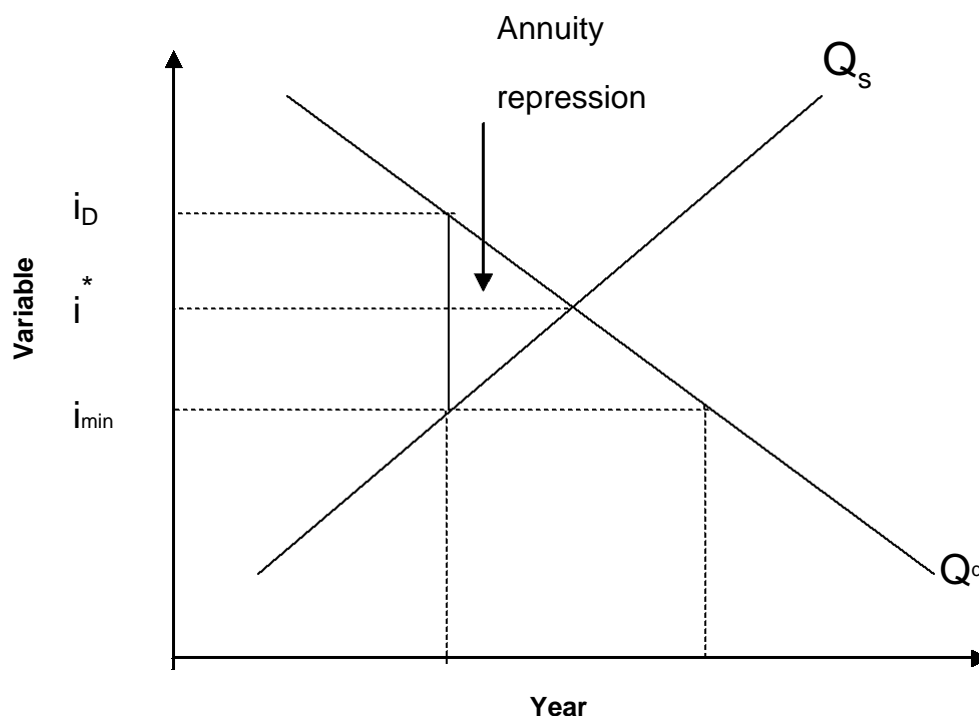


Figure 1. Financial repression.

(1969) checks on a sample of 35 countries, the positive relationship between the two sizes. The indicator of financial development chosen is the value of assets reported in financial intermediation to GDP. Subsequently other authors including Barro (1991); King and Levine (1993) augmented the study of Goldsmith on 80 countries over the period 1960 to 1989 while the study of Rousseau and Wachtel (2000) highlights the positive relationship between liquidity of financial markets and economic growth.

Four indicators measuring the level of financial development are often used particularly by international agencies. This is the size of financial intermediation, the degree of credit allocation by the central banks in comparison to those of commercial banks, the ratio of credit allocation to private domestic credit relative to the total Credit and to private enterprises divided by GDP.

The link between financial development, financial instability and economic growth is also discussed by Guillaumont and Kpodar (2004). From their results, the level of financial development acts in one way or another on the stability of the financial system and therefore on economic growth. However, some authors criticize the direction of causality. Thus, Robinson (1952) and Lucas (1988) argue that the financial sector does not have a particular importance for economic growth.

According to these authors, it is growth that drives the development and financial development is only part of economic development. According to Robinson, it is

economic growth which promotes the application of certain financial services and the financial system simply responds automatically, with this request. Lucas, meanwhile, said that "economists overload the role of financial factors in the process of economic growth". In summary, for these authors, the development of financial markets can be seen as the result of a request by the productive sector. MacKinnon (1973) and Shaw (1973) criticize the pressure exerted by the government on financial intermediaries, which had resulted in interest rates on loans and deposits on the ceiling, the reserve ratios of banks is excessively high, the phenomena of administrative allocations of credit, barriers to entry into the banking system, nationalizing banks or creation of public banks. Figure 1 shows the financial repression exercised by the authorities.

This blocks the functioning of the market and consequently, reduces the level of savings and investment. The pension is the capture of repression by the state whose income would have had to hold the implicit households and businesses in their operations of bank loans, given the lending interest rate cap. The authors talk about situation of financial repression. They advocated the need for financial liberalization to find the paths of growth and economic development. The effects of financial repression can be summarized as follows: if the State arbitrarily fixed real interest rates (via the setting of nominal interest rates used and / or requested by banks) below their value market equilibrium, it reduces

economic growth since:

- It reduces the amount of funds available for investment through the decrease in bank deposits;
- This affects the quality of investment behavior change via financial intermediaries, as Shaw points out, the actual caps to lower real deposit rates are intensifying risk aversion and liquidity preference intermediaries.

In the Franc Zone and in particular for the countries of the WAEMU after the currency reforms of 1989, there has been a liberalization of credit distributed as a consequence with, higher interest rates, the objective being to maintain Union Savings available but also attract foreign capital. The theory of financial liberalization developed in the 70's as we have just shown says that in developing countries the interest rate is set arbitrarily by the authorities below the level of market equilibrium, which is unfavorable to economic growth. Kaminsky and Reinhart (1998) shows that, premature financial liberalization leads to potential risks and to financial stability. This calls for a gradual financial liberalization and therefore calls for some discipline in capital allocation.

More recent studies show the advantages and disadvantages of opening the economies of the WAEMU countries. Kiema et al. (2011), states that the real effective exchange rate is overvalued in the WAEMU. It also analyzes the impact of devaluation on the trade balance. They focus on the optimal exchange rate regime. The study by Diaw et al. (2011) focuses on production capacity and accessibility to the external market for developing countries. Dramani (2011) did a study on bilateral trade for the WAEMU and CEMAC zone, highlighting some asymmetrical shocks. It is increasingly recognized that, external shocks permanently disrupt the structure of developing economies. This study will therefore attempt to show the variables to control for best mitigation of these impacts.

## METHODOLOGY

### Measure of financial instability

In general, financial stability depends on the level of financial development (measured alternatively by the report and M2/GDP, CREDIT / GDP), the macroeconomic environment as measured by the level of inflation (or the budget deficit), trade shocks related to the growth rate of exports, the balance of current account, trade openness, financial shocks including the weight of the short-term debt as a percentage of foreign currency reserves, the report of the short-term debt and total debt, the debt service to total exports ..., the soundness of financial institutions in place, political stability and the rule of law.

There are several methods of measurement of financial instability: the coefficient of variation, variance (or standard deviation), the conditional variance and standard deviation. These variables are indicators of dispersion of a random variable. The coefficient of variation of an estimator is a measure of the relative dispersion corresponding to the ratio of standard deviation to the

mean. The higher the value of this coefficient, the greater the dispersion around the mean is large. Indeed, in certain situations, we wish to compare the rate of dispersion of the distribution, while their respective measurement scale is not comparable. The objective of the coefficient of variation is to provide a quantitative index for this comparison. The coefficient of variation is primarily intended to establish a general index, independent of the units of measurement used. However, the standard deviation is a dispersion index sensitive to the mean value and unit of measure. For the estimate, the mobile average deviation (high squared) was used. We define the gap as the difference between the value of the indicator at time  $t$  and the simple moving average of the period, that is:

$$y_i = (x_i - \bar{x}_i)^2,$$

This can be written in sequence:

$$y_i = ((x_i - (x_{i-1} + x_i + x_{i+1})/3))^2$$

$$y_i = ((3x_i - x_{i-1} - x_{i+1})/3)^2$$

$$y_i = ((2x_i - x_{i-1} - x_{i+1})/3)^2$$

$\bar{x}_i = (x_{i-1} + x_i + x_{i+1}) / 3$  is called simple moving average, it measures the variability of  $x_i$  over the period.

It is this formula we use to measure financial volatility and exogenous shocks. Indeed, it makes it easier to identify situations of vulnerability.

### Choice of variables

Financial development is measured by the ratio of credit to the private sector and GDP. This quantity is expected to have a positive impact on financial instability.

Price stability has an impact on consumption, savings and investment. Thanks to the stability of prices, income earners face less uncertainty. Their consumption patterns are more stable. Savings, high inflation discourages long-term investments because it discriminates against the lenders at fixed rates. Price stability also gives confidence to investors who are faced with less uncertainty. In short, inflation distorts the rational calculation of economic agents and is positively related to financial instability.

Also, the more the country economic development and less is financial instability. Economic growth leads to financial development, with some authors, is positively related to financial instability so that the sign of  $a_3$  appears ambiguous. We can also use the GDP per capita that captures better the level of economic development; this size should be negatively related to financial instability.

Taking the variability of exports as a percentage of GDP, which is an indicator of economic sustainability, a positive relationship is therefore expected between financial instability and the trade shocks.

In general, it holds as an indicator related to the financial shock, the ratio of short-term debt to foreign reserves. The higher this ratio, the greater that country is at risk of financial crisis, because if speculation is involved in its currency, the Central Bank will not be able to respond to all requests for refunds of the country's creditors. But for the countries involved in this study, it does not pose a major problem on this issue. Indeed, the BCEAO has sufficient reserves and its currency has credibility internationally, due to its peg with the euro and the mechanism of the operations account. To highlight the financial shocks, we had to resort to the report of the short-term debt on total debt. It also uses the ratio of debt service to exports. But to deal with the problem of collinearity between variables in the model, this indicator will not be used; hence one can say

emphatically that, financial shocks are positively related to financial instability.

Using macroeconomic variables, banking, financial, we obtain the following model:

$$\text{INSFI}_{it} = \alpha_i + \lambda_t + a_1\text{DEVFIN}_{it} + a_2\text{INSIPC}_{it} + a_3\text{PIBTC}_{it} + a_4\text{CCOM}_{it} + a_5\text{CFIN}_{it} + \varepsilon_{it}$$

With,

INSFI as financial instability meaning that we measure by the instability of the credit to the private sector to GDP; DEVFIN is financial development.

INSIPC represents the instability of the price index for consumption.

PIBTC is the growth rate of Gross Domestic Product.

COM represents trade shocks.

CFIN represents financial shocks.

$\alpha_i$  is a constant for each individual in the case of the fixed effects model and a disturbance in the case of individual random effects model;  $\lambda_t$  is the time specific effect and it is the omission from the list of variables, variables whose value is identical for all countries at a given point of time.

The econometric panel data of the equation of financial instability that is made over the period 1980 to 2004<sup>1</sup> for seven WAEMU countries<sup>2</sup>, namely Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal and Togo. Panel data are used to study phenomena in their diversity and dynamics. There are basically the fixed effects model and random effects model.

## RESULTS

This section presents a graphical analysis of financial stability, by country, followed by the econometric results.

### Graphical analysis of financial instability in countries

The objective here is to compare the different periods of high volatility of variables that might explain financial instability for each country<sup>3</sup>. We have used the variability of inflation (to measure the action of the central bank) and exports referred to as trade shocks. Similarly, due to the difference in scale, the three curves have not been in a similar pattern. Indeed, in this case, we cannot observe the different peaks for each curve.

#### Benin

For Benin, the curve of the variability of inflation shows a single period of instability, that of the CFA franc devaluation of 1994. However, for trade shocks, areas of turbulence are the strongest 80 years, marked by structural adjustment programs, and the banking crisis unprecedented in Benin and throughout the Union.

<sup>1</sup> Rigorously, the study is conducted over the period 1979-2005, but using moving averages, you lose the first and the last information, the data are from the CD-ROM of the World Bank (2006).

<sup>2</sup> Guinea Bissau is excluded from the study due to lack of data for this country.

<sup>3</sup> Please see the graphs in appendix.

However, the 1994 devaluation, accompanied by deteriorating terms of trade, had a significant impact on the variability of its exports. We note that it is rather the variability of exports that has a significant impact on financial instability in Benin. Indeed, Benin's economy, like other WAEMU countries, is highly dependent on commodity exports (Figures 2 to 4).

#### Burkina Faso

As for Benin, there is also in Burkina Faso a large peak of the curve of the variability of inflation during the period of the devaluation in January 1994. But the other two sub-periods are taken into account, that is to say, the mid-80s and the 90s. Export variability is characterized by a series of movements of bull and bears the entire period, but only the 1996 to 2000 period that is, just after the devaluation of the CFA Franc appears to be significant. However, financial instability in Burkina Faso seems to precede the variability of exports, suggesting that causality is reversed for this country. Another answer is to highlight the mechanism of contagion. Indeed, financial instability appears in Ivory Coast before they go off in Burkina Faso, for example. Also, considering the link between the variability of inflation and financial instability, we can say that inflation has had a significant impact on the financial instability in Burkina during the period 1996 to 1998. Similarly, the period 1988 to 1992 calls for an impact of financial instability on the variability of inflation. Ultimately, the direction of causality between the three variables for this country seems ambiguous (Figures 5 to 7).

#### Côte d'Ivoire

We see that inflation in the Ivory Coast is mainly marked by a strong variation during the period of the CFA franc devaluation of 1994. However, the rate of export growth is characterized by three periods of instability: the period 1982 to 1986, marked by economic recovery program (short-term component of structural adjustment), the period of currency devaluation (1994) and the period 2000 to 2004, marked in particular the entry into force of the euro, especially the socio-political crisis. Thus, we note that financial instability in this country is basically characterized by a sharp increase in devaluation and during the early 80's. Indeed, it has been a banking crisis and throughout the Union. However, the socio-political crisis, the euro and rising oil prices were not too affected by financial stability in the country (Figures 8 to 10).

#### Mali

Three peaks have strongly influenced the variability of inflation in Mali. These are the periods 1984 to 1988, 1992 to 1995 and 1998 to 2004. Variability of exports in

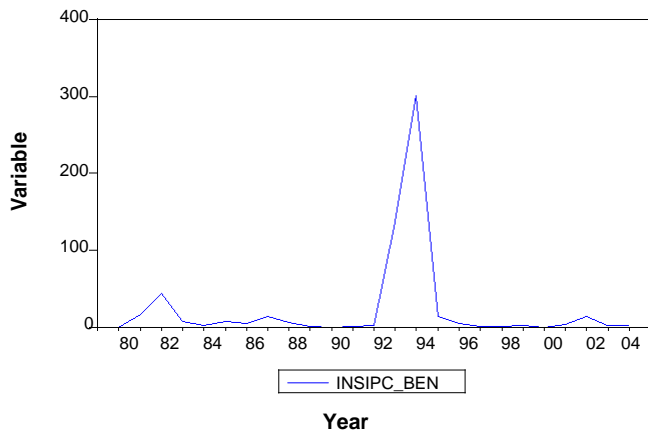


Figure 2. Variability in inflation in Benin, Source: author.

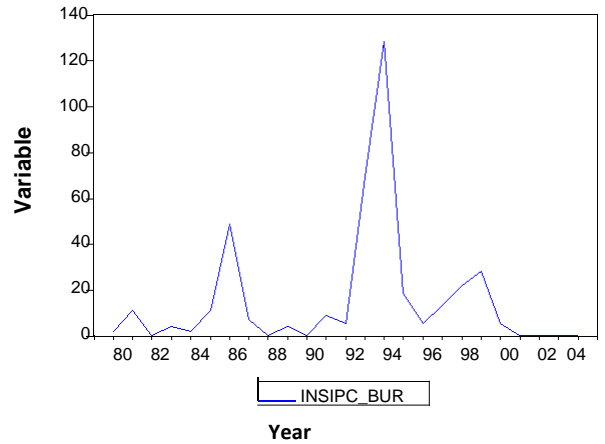


Figure 5. Variability in inflation in Burkina, Source: author.

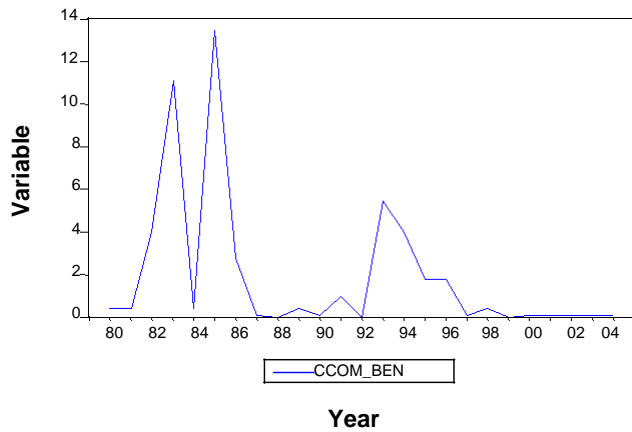


Figure 3. Variability of exports in Benin, Source: author.

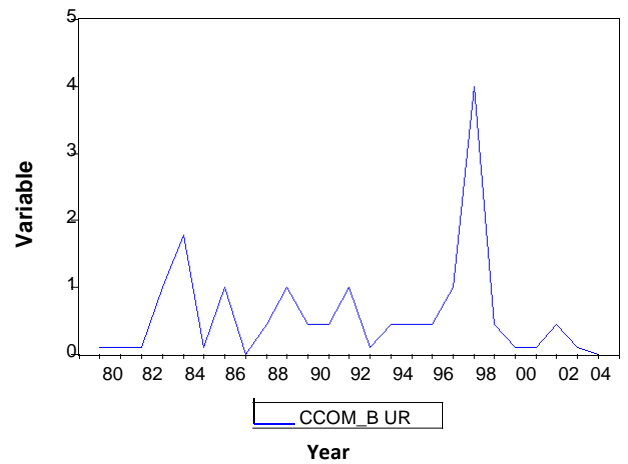


Figure 6. Variability of exports in Burkina, Source: author.

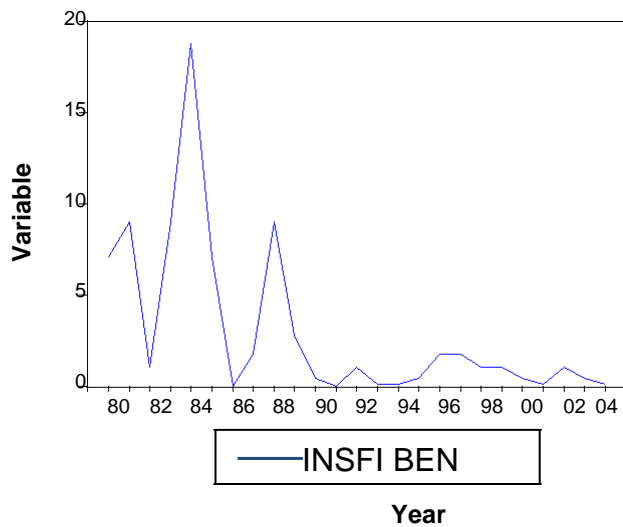


Figure 4. Financial instability in Benin, Source: author.

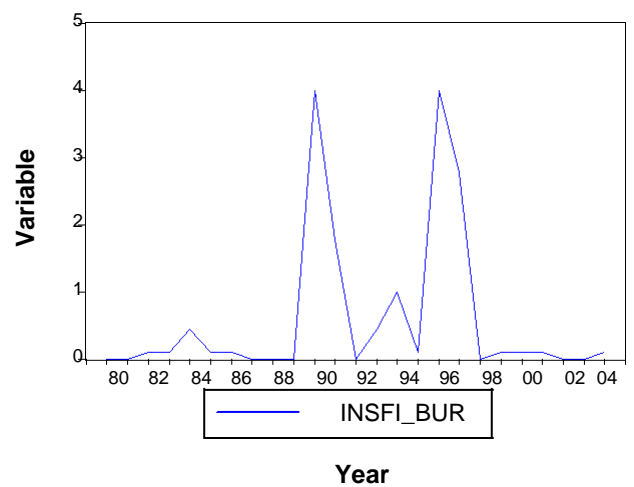


Figure 7. Financial instability in Burkina, Source: author.

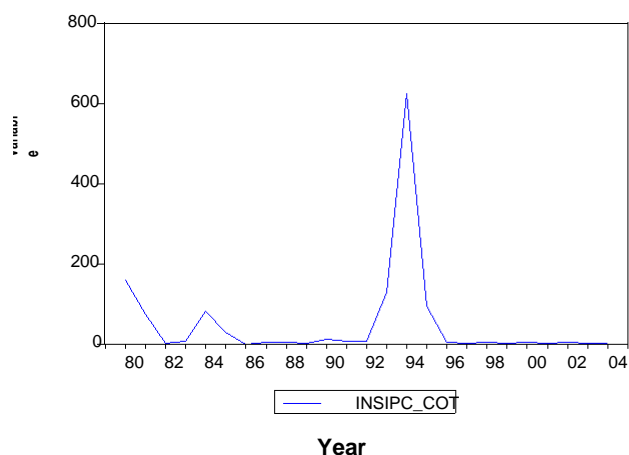


Figure 8. Variability in inflation in Côte d'Ivoire, Source: author.

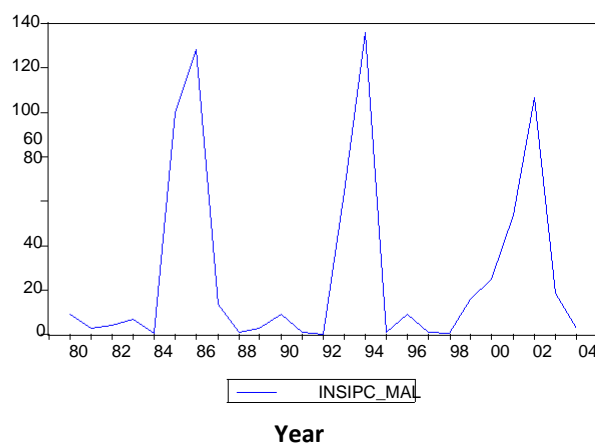


Figure 11. Variability in inflation in Mali, Source: author.

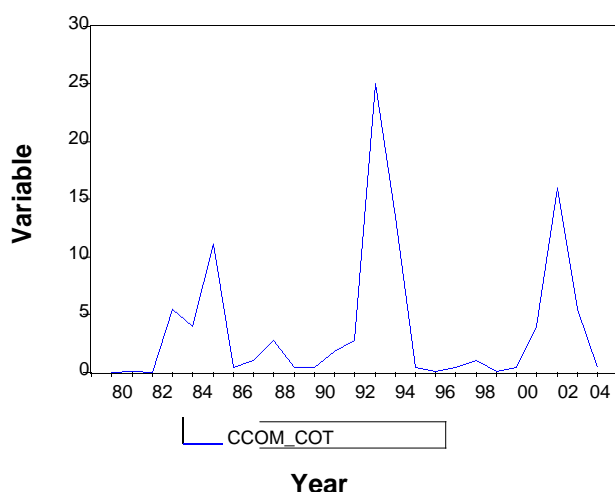


Figure 9. Variability of exports in Côte d'Ivoire, Source: author.

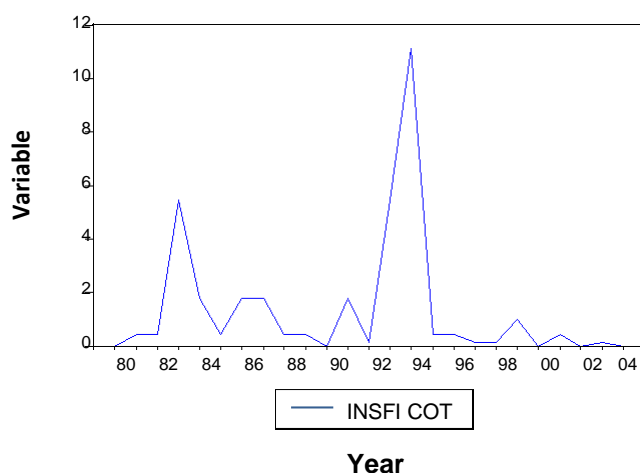


Figure 10. Financial instability in Côte d'Ivoire, Source: author.

Mali is rather continuous and marked since 1992. The country has been hard hit by the loss of competitiveness of cotton, its main export markets worldwide. However, financial instability does not seem to respond to this variability of exports, or even that of inflation. The only significant period is the early 80's characterized by the debt crisis (Figures 11 to 13).

**Niger**

As with almost all countries of the Union, the curve of inflation variability in Niger for the period was marked by the devaluation of the CFA franc in 1994. For the variability of exports, there is also movement of bull and bear, very significant period. This means that not only the Niger has no control of its agricultural production as it depends on rainfall very volatile from one year to another, but also suffered declining terms of trade. Indeed, like all EU countries, Niger has specialized in the production of raw materials to being volatile, and the level of which remains uncertain, due to climatic hazards. Thus, financial instability in this country seems to be explained by the variability of both inflation and exports (Figures 14 to 16).

**Senegal**

As for Niger, the variability of inflation in Senegal is marked for the only time of the devaluation of the currency of the Union in 1994. But the variability of exports, we observe two periods of turbulence, namely the period 1982 to 1986 and that of 1992 to 1996. Thus, financial instability in Senegal seems to be explained by the variability of inflation as well as that of exports. But, again, the issue of causality between exports and the variability of financial instability could be debated

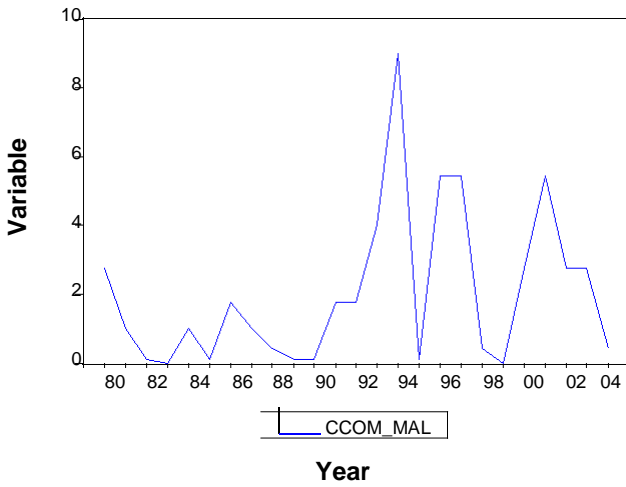


Figure 12. Variability of exports in Mali, Source: author.

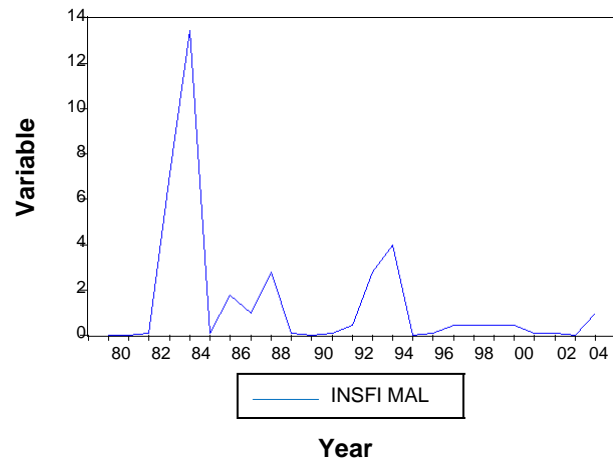


Figure 13. Financial instability in Mali, Source: author.

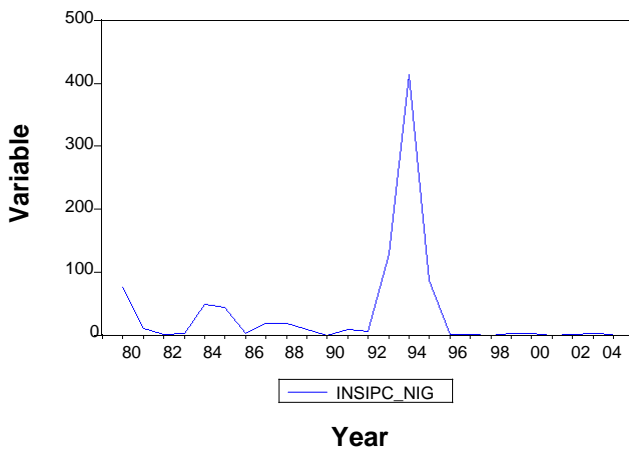


Figure 14. Variability in inflation in Niger, Source: author.

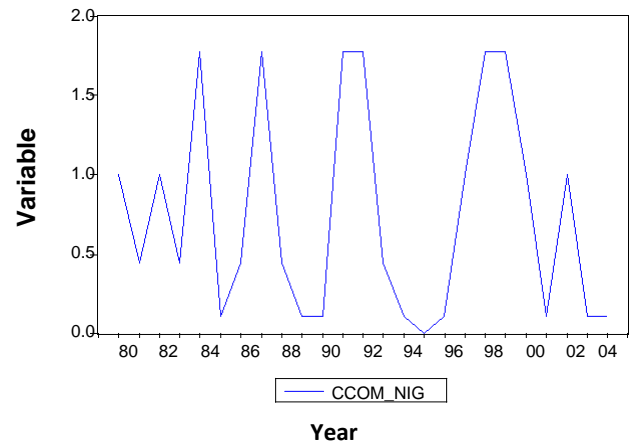


Figure 15. Variability of exports in Niger, Source: author.

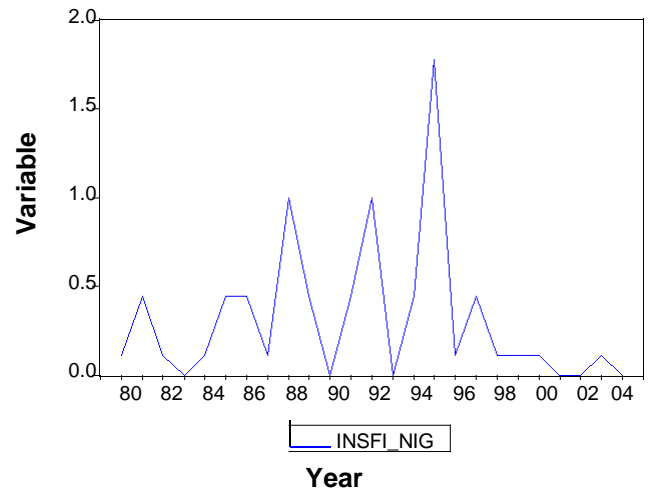


Figure 16. Financial instability in Niger, Source: author.

(Figures 17 to 19).

**Togo**

For Togo too, we observe a single peak for the variability of inflation, the period of the devaluation in 1994. But the curve of the variability of exports is characterized by periods of instability, again, very significantly, for the period from the early 80s, and that of the devaluation of the currency of the Union. But the variability of inflation appears to be the main explanatory factor of financial instability in Togo (Figures 20 to 22).

Ultimately the graphical analysis, by country, informs that there is a link between the three variables, namely, the variability of inflation, the variability of exports and financial instability. However, different countries, the main



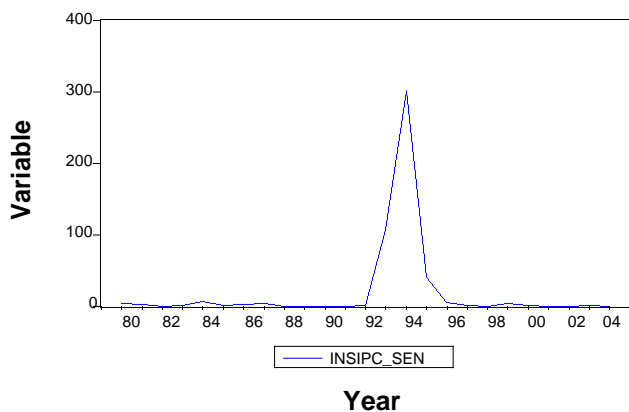


Figure 17. Variability in inflation in Senegal, Source: author.

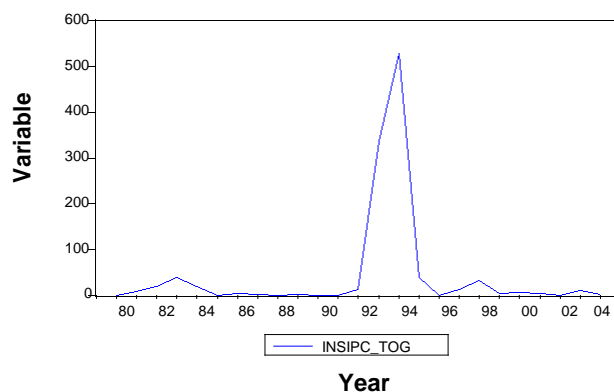


Figure 20. Variability in inflation in Togo, Source: author.

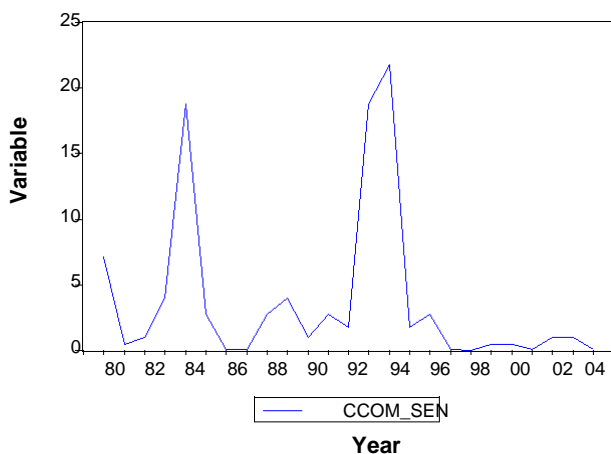


Figure 18. Variability of exports in Senegal, Source: author.

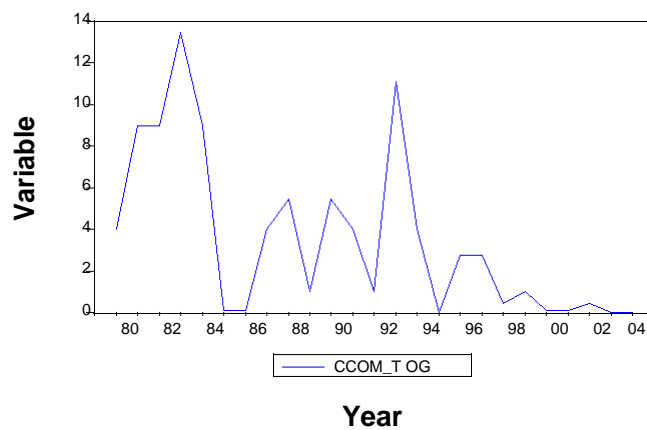


Figure 21. Variability of exports in Togo, Source: author.

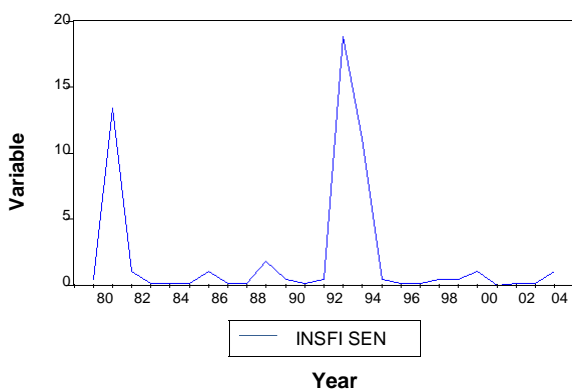


Figure 19. Financial instability in Senegal, Source: author.

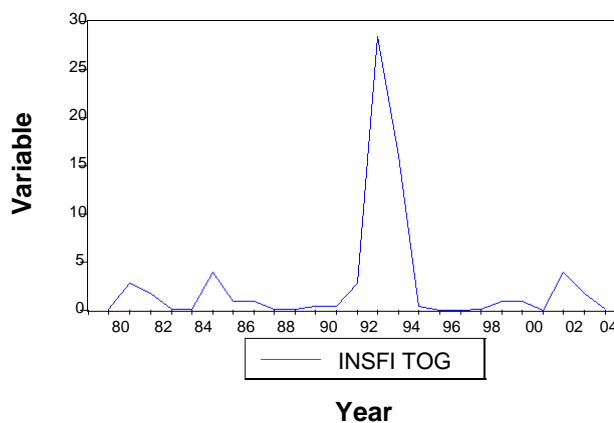


Figure 22. Financial instability in Togo, Source: author.

predictor of financial instability is sometimes the variability of inflation (as in Togo), sometimes that of exports (in Benin), and sometimes both at once (Burkina,

Côte d'Ivoire, Niger, Senegal). In the case of Mali, two variables can neither be accepted. Checks using econometric panel data will be made later to show the

relative contribution of each variable used in explaining financial instability. In other words, only the Student tests can be taken into account (for significance of coefficients) and Fisher (for the joint significance of the model considered).

### Econometric results

Panel data are used to study phenomena in their diversity and dynamics. There are basically the fixed effects model and random effects model. The first assumes uniformity coefficients from one individual to another, except for the constant term. Indeed, it captures individual heterogeneity. The estimator defined on this model is called "Within". The estimator "Within" is also called the covariance estimator, since it corresponds to ordinary least squares applied to the fixed effects model. If we introduce the temporal effect in the fixed effects model, the estimator is defined as so called "double within". In the random effects model, the individual effect is distinguished from the residual effect that made the error of the model equation. Therefore, this model is also called model "error component". In its general form, it also adds the temporal effect. The estimator defined on this model is called "MCG" Generalized Least Squares. It is unbiased, convergent and efficient.

When considering panel data, the first thing to be verified is the specification; homogeneous or heterogeneous that is, the data generating process (Bourbonnais, 2004). Econometrically, this amounts to testing the equality of the coefficients of the model studied in the individual dimension. In economic terms, the specification tests return to what extent the theoretical model studied is exactly the same for all countries or, conversely, if there are specific conditions in each country.

Fisher's test shows whether you are in the presence of a model without effects or fixed effects model. The F statistic test follows, under the null hypothesis of no fixed effects, a Fisher's law with  $(n-1)$  and  $(nT-n-1)$  degrees of freedom. We accept the null hypothesis of no fixed effects if the test statistic is less than the critical value read from the table of Fisher. In contrast, the Breusch and Pagan (LM-test) verifies the existence of random effects. Test is carried out on the Lagrange multiplier. The Hausman test, meanwhile, allows discriminating between fixed and random effects. Under the null hypothesis of the presence of random effects, the H test statistic follows a chi-K Two degrees of freedom. We accept the null hypothesis if the H-statistic is less than the value shown on the table chi-Two. Also note that if the sample size goes to infinity, the fixed effects models and random effects are indistinguishable and are perfectly similar.

Below are set out successively, the model results without effect, the fixed effects model and random effects model.

### The model without effect

$$\text{INSFI} = -0.780 + 0.017\text{INSIPC} + 0.164\text{CCOM} + 0.07\text{DEVFIN} - 0.005\text{PIBTC} + 0.022\text{CFIN}$$

(1.24) (5.548) (2.417) (2.149) (0.107) (0.394)

$R^2 = 0.28$  (Table 1).

### The fixed effects model

$$\text{INSFI} = 0.019\text{INSIPC} + 0.156\text{CCOM} + 0.084\text{DEVFIN} - 0.036\text{PIBTC} + 0.093\text{CFIN}$$

(6.004) (2.329) (2.1863) (0.036) (1.467)

$R^2 = 0.36$  (Table 2).

### The random effects model

$$\text{INSFI} = -1.099 + 0.017\text{INSIPC} + 0.158\text{CCOM} + 0.075\text{DEVFIN} - 0.024\text{PIBTC} + 0.057\text{CFIN}$$

(1.466) (5.840) (2.370) (2.127) (0.461) (0.958)

$R^2 = 0.32$  (Table 3).

For the three types of estimations (model without effects, fixed effects model and random effects models), we obtain the expected signs for the variables. But we notice that the PIBTC and financial shocks appear insignificant. The volatility of the CPI has a positive (and significantly) on financial instability, but the coefficient remains low in all three models. However, the variability of exports (CCOM) is the main factor influencing the financial instability in the Union.

Inflation, as measured by the harmonized index of consumer prices is generally well controlled in the EU. Its level rarely exceeds the 3%. But with soaring food prices and energy internationally since 2006, there is a higher standard. The general price level has increased significantly. This rise is due mainly to higher energy and food prices but also by a high level of public spending (public works, salaries, elections, grants). Local prices are determined element in explaining the evolution of the overall index. Although the recent period is characterized by soaring oil prices and food prices internationally, the prices of local products contribute more to the explanation of the general rise in prices. Indeed, local products have a preponderant weight in the basket. The recent food and fuel crisis has also led to a surge in consumer prices in particular with regard to food and transportation. International prices of most foodstuffs (rice, palm oil, peanut oil, corn, soybean oil, milk and dairy products) dollar-denominated, recorded greater increases than domestic prices. These elements explain the preponderance of prices for financial stability in the Union.

The situation of the Union's external trade has been marked in recent years by a loss of competitiveness of domestic products. The changing structure of global demand is badly considered by the countries of the WAEMU. Therefore, the low diversification of production has resulted in high vulnerability of countries to the external environment. The increase in energy prices at the international level also affects significantly the general

**Table 1.** Model without effects.

| Dependent Variable: INSFI?                          |             |                    |             |          |
|---|-------------|--------------------|-------------|----------|
| Method: Pooled Least Squares                        |             |                    |             |          |
| Sample(adjusted): 1980 2004                         |             |                    |             |          |
| Included observations: 25 after adjusting endpoints |             |                    |             |          |
| Total panel (balanced) observations 175             |             |                    |             |          |
| Variable  | Coefficient | Std. Error         | t-Statistic | Prob.    |
| C   | -0.780560   | 0.626953           | -1.245007   | 0.2149   |
| INSIPC?   | 0.017911    | 0.003228           | 5.548480    | 0.0000   |
| CCOM?   | 0.164730    | 0.068131           | 2.417847    | 0.0167   |
| DEVFIN?   | 0.070531    | 0.032814           | 2.149405    | 0.0330   |
| PIBTC?  | -0.005725   | 0.053065           | -0.107894   | 0.9142   |
| CFIN?   | 0.022694    | 0.057501           | 0.394675    | 0.6936   |
| R-squared   | 0.287270    | Mean dependent var |             | 1.658413 |
| Adjusted R-squared                                  | 0.266183    | S.D. dependent var |             | 3.824685 |
| S.E. of regression                                  | 3.276343    | Sum squared resid  |             | 1814.118 |
| Log likelihood                                      | -379.6018   | F-statistic        |             | 13.62330 |
| Durbin-Watson stat                                  | 1.469671    | Prob (F-statistic) |             | 0.000000 |

Source: Author.

**Table 2.** Fixed effects model.

| Dependent variable: INSFI?                          |             |                    |             |          |
|---|-------------|--------------------|-------------|----------|
| Method: Pooled Least Squares                        |             |                    |             |          |
| Sample (adjusted): 1980 2004                        |             |                    |             |          |
| Included observations: 25 after adjusting endpoints |             |                    |             |          |
| Total panel (balanced) observations 175             |             |                    |             |          |
| Variable  | Coefficient | Std. Error         | t-Statistic | Prob.    |
| INSIPC?   | 0.018889    | 0.003146           | 6.004592    | 0.0000   |
| CCOM?   | 0.156976    | 0.067384           | 2.329575    | 0.0211   |
| DEVFIN?   | 0.084939    | 0.038849           | 2.186398    | 0.0302   |
| PIBTC?  | -0.036996   | 0.053420           | -0.692542   | 0.4896   |
| CFIN?   | 0.093418    | 0.063655           | 1.467567    | 0.1441   |
| Fixed effects                                       |             |                    |             |          |
| _BEN--C   | 0.150203    |                    |             |          |
| _BUR--C   | -1.267430   |                    |             |          |
| _COT--C   | -3.838798   |                    |             |          |
| _MAL--C   | -0.972745   |                    |             |          |
| _NIG--C   | -1.871701   |                    |             |          |
| _SEN--C   | -1.771994   |                    |             |          |
| _TOG--C   | -1.222619   |                    |             |          |
| R-squared   | 0.356495    | Mean dependent var |             | 1.658413 |
| Adjusted R-squared                                  | 0.313069    | S.D. dependent var |             | 3.824685 |
| S.E. of regression                                  | 3.169949    | Sum squared resid  |             | 1637.918 |
| Log likelihood                                      | -378.5884   | F-statistic        |             | 22.57510 |
| Durbin-Watson stat                                  | 1.614048    | Prob (F-statistic) |             | 0.000000 |

Source: Author.

**Table 3.** Randon effects model.

| Variable                                       | Coefficient | Std. Error         | t-Statistic | Prob.    |
|--|-------------|--------------------|-------------|----------|
| Dependent variable: INSFI?                     |             |                    |             |          |
| Method: GLS (variance components)              |             |                    |             |          |
| Sample: 1980 2004                              |             |                    |             |          |
| Included observations: 25                      |             |                    |             |          |
| Total panel (balanced) observations 175        |             |                    |             |          |
| C  | -1.099791   | 0.750027           | -1.466336   | 0.1444   |
| INSIPC?  | 0.018421    | 0.003154           | 5.840504    | 0.0000   |
| CCOM?  | 0.158886    | 0.067025           | 2.370537    | 0.0189   |
| DEVFIN?  | 0.075239    | 0.035360           | 2.127814    | 0.0348   |
| PIBTC?   | -0.024347   | 0.052758           | -0.461478   | 0.6450   |
| CFIN?  | 0.057736    | 0.060253           | 0.958225    | 0.3393   |
| Random effects                                 |             |                    |             |          |
| _BEN--C  | 0.984717    |                    |             |          |
| _BUR--C  | 0.079470    |                    |             |          |
| _COT--C  | -1.158401   |                    |             |          |
| _MAL--C  | 0.229805    |                    |             |          |
| _NIG--C  | -0.271074   |                    |             |          |
| _SEN--C  | -0.093965   |                    |             |          |
| _TOG--C  | 0.229448    |                    |             |          |
| GLS transformed regression                     |             |                    |             |          |
| R-squared                                      | 0.324954    | Mean dependent var |             | 1.658413 |
| Adjusted R-squared                             | 0.304982    | S.D. dependent var |             | 3.824685 |
| S.E. of regression                             | 3.188553    | Sum squared resid  |             | 1718.201 |
| Durbin-Watson stat                             | 1.543195    |                    |             |          |
| Unweighted statistics including random effects |             |                    |             |          |
| R-squared                                      | 0.341899    | Mean dependent var |             | 1.658413 |
| Adjusted R-squared                             | 0.322429    | S.D. dependent var |             | 3.824685 |
| S.E. of regression                             | 3.148278    | Sum squared resid  |             | 1675.070 |
| Durbin-Watson stat                             | 1.582931    |                    |             |          |

Source: Author.

level of prices, with consequences on financial stability. Finally, the evolution of credit granted especially its variability affects financial stability in the Union.

The risks involved at the macro level for WAEMU countries are mainly: the political instability in the sub region and the continued increase sustaining euro against the dollar penalizes exports of the Union; deteriorating terms of trade, or rather the volatility of commodity prices, rising oil prices, which weakens the secondary sector. Financial stability depend on the evolution of macroeconomic variables (including the level of inflation or the level of budget deficit), the structure of the financial system (weight of foreign banks, bank concentration), trade shocks and financial relationship with the outside world and the strength of the various components of the financial system (measured by the indicators of financial strength) and institutions in place (supervisory agencies, payment system).

## Conclusion

Financial systems allow a better allocation of capital. They promote the financing of the economy and thus contribute to promoting economic growth. At the same time a shaky financial system has more fragile economies and often leads them into recession. Therefore, it is very important to ensure the financial stability to promote economic development. Several factors may explain financial instability.

In WAEMU, the main sources of vulnerability are fundamental macroeconomic imbalances, banking and financial structures and particularly ill-suited excessive growth of credit distributed. But the main variable to be monitored according to this study is the variability of exports. The authorities of the Union must diversify the production area to better withstand exogenous shocks. Countries should also take into account the dynamics of

world demand. It must also ensure that credit grows at the rate of the economy. The funds distributed must also be on careful selection of the banks. It is also essential to preserve the stability of the internal and external value of money. The CFA currency is pegged to a fixed parity with the euro. Thus, any appreciation of the euro leads to that of the CFA with consequences on the volume of exports of the area. We advocate the adoption of a mixed exchange rate regime indexed on the major currency transactions to ensure a stable currency. All these elements are essential to ensure financial stability and promoting strong economic growth and sustainable development.

Indeed, the answer to the loss of external competitiveness of WAEMU products must also be found on the side of structural reforms (education, health, legal, regulatory and administrative, labor markets, the financial sector intermediation and governance). The recent appreciation of the Real Effective Exchange Rate (REER) can be explained by higher production costs. The effects of the devaluation of the CFA in 1994 were short in terms of export promotion of the Union. Three factors may explain this situation: structural barriers, the dynamics of world demand and the appreciation of the CFA franc against the U.S. dollar. The REER of the Union was overrated before the CFA franc devaluation in January 1994 and before the economy recovers some competitiveness right after. Since the early 2000s, the evolution of the REER of the Union is marked by an appreciation that results in higher prices for domestic products. This assessment is due to higher production costs of domestic products and the appreciation of the euro against the U.S. dollar over the period.

## REFERENCES

- Barro R (1991). Economic Growth in a cross section of countries. NBER 3120.
- Bourbonnais R (2004). Econométrie: manuel et exercices corrigés, Dunod, 5<sup>ème</sup> édition.
- Diaw D, Rieber A, Tran T (2011). Performance à l'exportation et commerce sud-sud : une analyse sectorielle appliquée à l'Afrique subsaharienne » version provisoire, CARE-EMR, Université de Rouen, France.
- Dramani L (2011). Bilateral trade in WAEMU and CEMAC zone. J. Dev. Agric. Econ. p. 3.
- Eboue C (2004). Rapport sur la réflexion économique et financière contemporaine des Banques Centrales, BCEAO, Avril.
- Goldsmith R (1969). Financial Structure and Development, Yale University Press, New Haven.
- Guillaumont JS, Kpodar K (2004). "Développement financier, instabilité financière et croissance économique", CERDI, Etudes et Documents. p. 13-40.
- Gurley JG, Shaw ES (1960). Money in a theory of finance, The Brookings institutions Washington D.C.
- Icard A (2007). Stabilité financière et banques centrales, Economica.
- Kaminsky GL, Reinhart CM (1998). The Twin Crises: The Causes of Banking and Balance-of-payments problems », Am. Econ. Rev. 89:473-500.
- Kiema A, Nubukpo K, Sanou G (2011). Impact d'une dévaluation du Franc CFA sur la balance commerciale et la production dans les pays de l'UEMOA, Commission de l'UEMOA, UPS, Pôle Analyse économique et Recherche.
- King R, Levine R (1993). Finance and Growth: Schumpeter Might Be Right », Q. J. Econ. 108(3):717-738.
- Levine R (1996). Financial Development and Economic Growth: View and Agenda, World Bank, Working paper n°1678, Washington.
- MacKinnon R (1973). Money and Capital in Economic Development, Washington DC, The Brookings Institution.
- Mishkin F (1997). The cause and propagation of financial instability: lesson for policy makers », Federal Reserve Bank of Kansas City Pagano M (1993). Financial markets and Growth: An Overview, Europ. Econ. Rev. 37:2-3, 613-622.
- Patat JP (2000). La stabilité financière : nouvelle urgence pour les Banques Centrales. Bulletin de la Banque de France n°84, décembre.
- Lucas R (1988). On the mechanics of economic development. J. Monet. Econ.
- Robinson J (1952). "The Generalization of the General Theory", in the rate of interest and other essays, London.
- Rousseau LP, Wachtel P (2000). Equity markets and growth: cross-country evidence on timing and outcomes, 1980-1995. J. Bank. Financ. 24:1933-1957.
- St. Paul G (1992). Technological choice, Financial Markets and Economic Development, Europ. Econ. Rev. 36(4):763-781.
- Shaw E (1973). Financial Deepening in Economic Development, Oxford University Press, New York.