



**Center for Research on Political Economy
Centre de recherche en économie politique**

**CREPOL RESEARCH PAPERS
CRP014**

**Title:
Economic Integration and Entrepreneurship in West Africa**

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I- Introduction

The current financial crisis stifling the European Union and the limited options of individual countries such as Greece, Italy, and Spain in financing their deficits at a reasonable cost, add to the challenges of African decision makers in designing the model towards a single currency for the continent. Amongst the concerns of populations and policy makers would be the effects of integration on job creation. In this research, we test the effects of economic integration on new business formation. Using data from World Development Indicators, World Bank Entrepreneurship Group (World Bank, 2010a, 2010b) and the International Labour Office database on Labour statistics, our analysis will focus on newly registered businesses per year in West African countries and compare the performances of UEMOA country members to the other ECOWAS countries in attracting new businesses and creating jobs.

Given the link between economic growth and employment, and the vast literature on the relationship between economic integration and economic growth [See World Bank(2003), Balassa (1961), Baldwin (1993) , Henrekson et al.(1997) , Landau (1995) and Walz (1998)], it can be argued that higher employment levels should be expected from higher economic and monetary integration. Economies of scale in production and in the sector of research and development, more competition, lower cost of capital resulting from more integrated capital markets are some of the channels through which integration could lead to higher employment levels. This makes testing for such effects highly relevant in West Africa. However, the lack of high quality and disaggregated data on employment in developing countries in general, and in West Africa in particular, would be our main challenge. We use available data on newly registered businesses, and employment to test if there are

measurable benefits from economic and monetary integration in West Africa by comparing UMOA countries to the other ECOWAS countries.

II- Integration and entrepreneurship

Given the link between economic growth and employment, and the vast literature on the relationship between economic integration and economic growth [See World Bank(2003), Balassa (1961), Baldwin (1993) , Henrekson et al.(1997) , Landau (1995) and Walz (1998)], it can be argued that higher employment levels should be expected from higher economic and monetary integration. Economies of scale in production and in the sector of research and development, more competition, lower cost of capital resulting from more integrated capital markets are some of the channels through which integration could lead to higher employment levels.

One of our research goals is to measure and compare the impacts of economic integration in two groups of West African countries: UEMOA and non-UEMOA countries. We build on a simplified model specification that can be summarized in the following equation:

$$(1) E = \alpha_0 + \gamma_1 I + \gamma_3 I * UEMOA + \text{other control variables.}$$

where E is entrepreneurship, I is the measure of economic integration, and UEMOA is the dummy variable equal to 1 for UEMOA countries. The expected relation between entrepreneurship and integration is therefore assumed to have the same intercept and different slopes. For UEMOA countries, the model will be as follows:

$$(2) E = \alpha_0 + (\gamma_1 + \gamma_3) * I + \text{other control variables.}$$

For non-UEMOA countries, the simplified model is as follows:

$$(3) E = \alpha_0 + \gamma_1 * I + \text{other control variables.}$$

III- METHODOLOGY

2-0 Measures of entrepreneurship

As a measure of entrepreneurship, we use data on the number of newly registered businesses in a given year taken from the World Development Indicators and World Bank Entrepreneurship Group (World Bank, 2010a, 2010b). In order to maximize sample size we compared the two data sources. Although the definition of businesses included for each source differed, in a great number of cases the numbers were the same for both sources. In such cases where the data matched for the overlapping observations we included the maximum number of years available for a given country. By using this method we were able to increase our sample size considerably.

2-1 Measures of integration

A key variable in our estimation is the measure of economic integration. Economic integration is a process, and using a dichotomous measurement would fail to account for this specificity. Following Fertig (2003), we use factor analysis to aggregate over different variables that measure different aspects of economic freedom, but also aspect of economic integration. The data is compiled by the Fraser Institute, and is publicly available. We will later refer to this integration variable as FRASER to differentiate it from other measures of integration. The five variables included in our integration construct as the following: size of government (area1), legal structure and security of property rights (area 2), access to sound money (area 3), freedom to trade internationally (area 4), and regulation of credit, labor, and business (area 5). The data is available on a five year interval (1980, 1985, 1990, 1995, 2000, 2005, and for 2007 and 2008. We extrapolate using constant growth rate to find the missing values. These five variables are used to generate the reflective construct of integration. The results are in table 1-A through 1-C. The eigenvalues criteria of determination of the number of factors indicate that one factor summarizes the data. The one factor accounts for 62% of the variability in the data (See table 1-A). Also the two variables Legal structure and security of property rights, and freedom to trade

internationally load strongly into factor (see table 1-B), which we therefore name economic integration.

Table 1-C shows the coefficients of the equation that predicted the values of the economic integration construct. It also shows that the two variables above are key in determining the values of the construct.

Table 1-A: Results of factor analysis of West African Countries

Factor	Eigenvalue	Difference	Proportion	Cumulative
Factor1	1.43702	0.71331	0.6203	0.6203
Factor2	0.72371	0.14056	0.3124	0.9327
Factor3	0.58315	0.72330	0.2517	1.1845
Factor4	-0.14014	0.14706	-0.0605	1.1240
Factor5	-0.28721	.	-0.1240	1.0000

Table 1-B: Factor loadings and Unique variance

Variable	Factor1	Uniqueness
Size of government	0.0905	0.4923
Legal structure and security of property rights	0.7137	0.3016
Access to sound money	0.3131	0.5945
Freedom to trade internationally	0.7727	0.2945
Regulation of credit, labor, and business	0.473	0.5733

Table 1-C: Scoring coefficients (method = regression)

Variable	Factor1
Size of government	0.0486
Legal structure and security of property rights	0.4157
Access to sound money	0.08376
Freedom to trade internationally	0.47665
Regulation of credit, labor, and business	0.15368

Interest rates spreads are a second measure of integration that we are considering in this research. As the financial sector in a monetary union becomes more integrated, interest rates spreads tend to shrink and converge if financial institutions compete. The potential shrinking of interest rates spread between countries can be pictured with the evolution of their standard deviation over time. Sticky and high interest rates spreads however are not necessarily a reflection of low level of integration. In areas such

as the UEMOA, high level of bank concentration, and the high presence of branches of the same foreign banks might stifle competition. In the UEMOA countries pictured in tables 2-A and 2-B, the spread appear to be steady since 1998.

Table 2-A: Evolution of interest rates spreads in the UEMOA area.

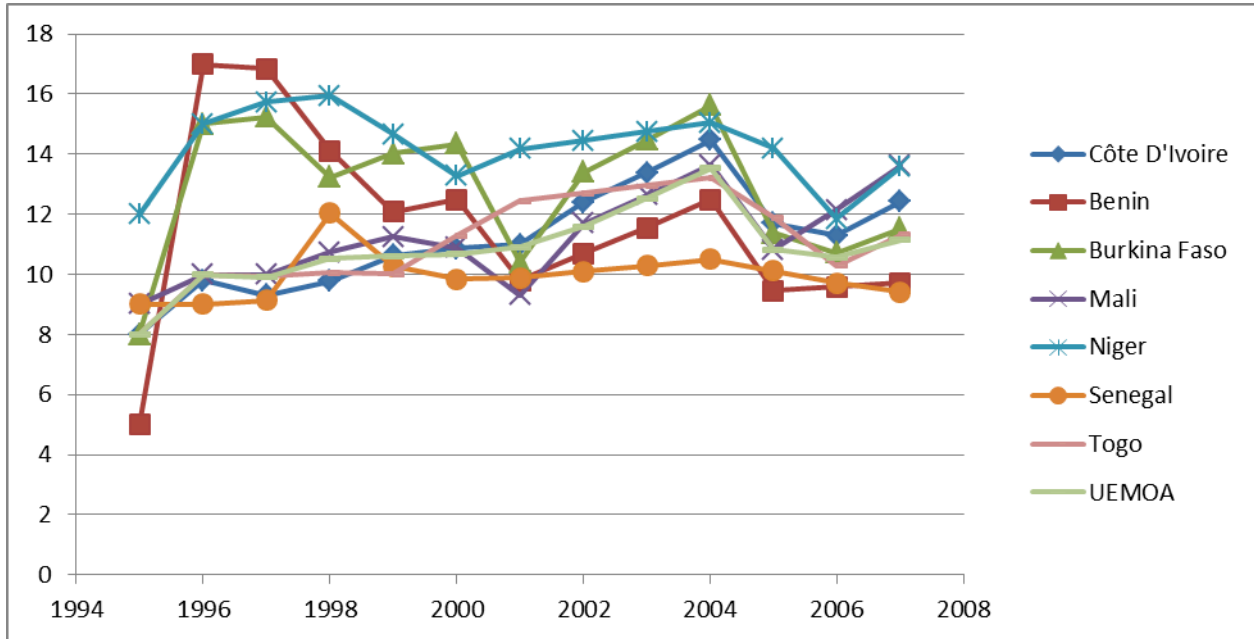
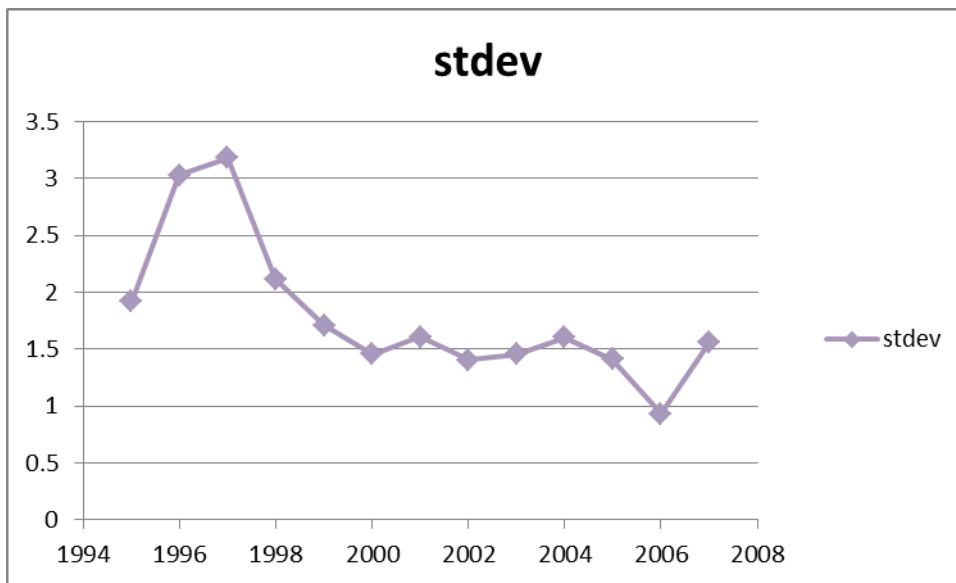


Table 2-B: Variability of interest rates spreads in the UEMOA area.



2-2 Model description

The general form of the model used to test our hypotheses is the following:

$$(4) \quad y_{it} = \mathbf{x}'_{it} \boldsymbol{\beta} + \boldsymbol{\alpha}' \mathbf{Z}_i + \varepsilon_{it},$$

Where y_{it} is our dependent variable measured for country i at time t , $\boldsymbol{\beta}$ is a k by one vector of parameters, \mathbf{x}_{it} is a k by one vector of time varying country characteristics (GDP per capita, population, percentage of population with secondary education, etc...), \mathbf{Z}_i is a vector of country characteristics that do not change over time, and ε_{it} are the idiosyncratic disturbances.

The specific econometric equation is as follows:

$$(5) \quad \ln(\text{New Businesses}_{it}) = \gamma_0 + \gamma_1 \text{Integration}_{it} + \gamma_2 \text{DUEMOA}_{it} + \gamma_3 \text{Integration} * \text{DUEMOA}_{it} + \gamma_4 \text{Pop}_{it} + \gamma_5 \text{Sec}_{it} + \gamma_5 \text{GDPC}_{it} + c_i + \varepsilon_{it}$$

$$(6) \quad \text{Employ}_{it} = \gamma_0 + \gamma_1 \text{Integration}_{it} + \gamma_2 \text{DUEMOA}_{it} + \gamma_3 \text{Integration} * \text{DUEMOA}_{it} + \gamma_4 \text{Pop}_{it} + \gamma_5 \text{Sec}_{it} + \gamma_5 \text{GDPC}_{it} + c_i + \varepsilon_{it}$$

where c_i is the unobserved heterogeneity. The dependent variable is a function of the number of newly registered businesses in a given year taken from the World Development Indicators and World Bank Entrepreneurship Group (World Bank, 2010a, 2010b)¹. Note the dependent variable is specified as a natural logarithm. The variable Integration is our measure of economic integration of a given country i at time t measured by the FRASER index, and by the adjusted interest rates spread respectively. It is expected that remittances will impact business formation and job creation in a positive manner.

The next variable is the dummy variable DUEMOA, which is set to 1 for UEMOA countries, and to 0 for non UEMOA countries. This variable is multiplied with the integration construct to capture the potential differences in the effects of integration on business creation, the moderating effects of integration on new business formation.

As control variables, we include some of the standard variables that are considered in the entrepreneurship literature (Glaeser, Rosenthal, and Strange, 2010). $Sec_{i,t}$ is the proportion of the population with secondary education. It is a measure of human capital. The predicted relationship between this variable and new business formation is positive. GDP per capita is included as a control variable as economic growth is associated with more new businesses, whether it expected growth or current. All these variables are taken from the World Development Indicators (World Bank, 2010a, 2010b).

The descriptive statistics are included in Table 3, and indicate a higher occurrence of new businesses in the non-UEMOA countries than in the UEMOA countries in a 5 to 1 ratio. Paradoxically, the index of integration is higher in the non-UEMOA countries than in the UEMOA countries. However the level of GDP per capita is slightly higher in the UEMOA group, even though in low income countries range.

The models in 5 and 6 are estimated using fixed effects and the results are reported in table 4. Due to limited data, we just used it as a default estimation method. We did not test for strict exogeneity, nor did we conduct a Hausman test to decide between fixed and random effects estimation methods. Small preliminary sample also forced us to compromise by limiting the number of control variables in order to preserve some degrees of freedom. In our next step, we will address the potential omitted variable bias with more controls once the sample size is improved. The 3 columns in table 4 differ in their dependent variable, and also their sample size.

Table 3: Descriptive Statistics

SUMMARY STATISTICS FOR CFA COUNTRIES

	mean	sd	min	max
gdpc	500.56	231.53	185.7	1106
otf	466.89	610.76	14.0	3028
fraser	0.89	2.09	-0.6	5
onf	439.02	610.84	14.0	3028
Employ	67.20	9.67	46.6	82
<i>N</i>	138			

SUMMARY STATISTICS FOR NON CFA COUNTRIES

	mean	sd	min	max
gdpc	441.97	280.32	149.4	1302
otf	25382.58	22630.24	5576.0	65089
fraser	1.03	0.95	-0.2	3
onf	25382.58	22630.24	5576.0	65089
Employ	63.58	6.88	51.2	73
<i>N</i>	97			

otf = number of new businesses; Fraser is the integration index; gdpc= GDP per capita; Employ is the proportion of total population that is employed. Data restriction left 5 countries in our panel: sample

PANEL DATA REGRESSIONS

	(1) PANEL_OTF	(2) PANEL_LNOTF	(3) PANEL_EMPTY
fraser	9424.4** (7.72)	-0.651 (-1.98)	0.559 (1.48)
gdpc	-12.20** (-5.71)	0.00131 (1.28)	-0.00308*** (-7.95)
DFRASER	-12426.4** (-5.33)	-0.953 (-1.77)	-2.271* (-3.51)
pop	0.00199*** (19.21)	6.79e-08 (2.62)	0.000000111* (4.02)
sec	-570.2** (-5.24)	0.0359 (1.95)	0.0748 (2.26)
_cons	-41679.8*** (-9.16)	3.264* (4.34)	64.13*** (49.72)
<i>N</i>	26	26	34
<i>r</i> ²	0.977	0.483	0.395

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Our results thus far show a positive effect of integration on entrepreneurship for non UEMOA countries in model 1 where the number of new businesses is our dependent variable. For UEMOA countries, the effect we find is negative. In model 2 with the logarithm of new business as the dependent variable, the effects of integration is negative for both group of countries, with a smaller effect for non UEMOA countries. When the proportion of the population that is employed is used as a dependent variable, the effect of integration for non-UEMOA countries is positive but insignificant, and negative for UEMOA countries.

The sign of the effect of integration on entrepreneurship is not robust in these models. The definition of our integration variable can explain these findings. Also the small sample sizes, and the omission of other relevant variables such as expected inflation, levels of investments, etc. With more data to be collected, we'll address these issues, and we expect to reach robust conclusions and policy recommendations.

References

