Analysis of the Determinants of Foreign Direct Investment Flows to the West African Economic and Monetary Union Countries

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Abstract

One of the problems facing sub-Saharan African countries is the low level of domestic investment. And yet the growth theory teaches us that it is impossible to envision development without a considerable accumulation of capital. An important channel through which these countries can solve the problem is to resort to foreign direct investment (FDI), especially since we know the significant role FDI played in the economies of several Asian countries. To date, countries in sub-Saharan Africa have not benefited enough from this type of capital. Several reasons for this exist, and they vary with countries and regions. This study, using dynamic panel data, is an attempt to identify the main determinants of the flows of private foreign investment into countries of the West African Economic and Monetary Union (WAEMU). After a review of the general framework of the study, three estimations were carried out: a "within" estimation, a random effect (RE) estimation, and an estimation using the Arellano and Bond (1991) Generalized Moments Method (GMM). This enables one to get a more effective estimator in cases of dynamic panels. It transpires from the main findings of the research that the rate of domestic investment, literacy, the level of economic openness, and delayed foreign investment are relevant factors that account for foreign investment flows to the WAEMU countries.

Acknowledgements

1. Introduction

The theory of capital teaches us that it is impossible to envision development without a considerable accumulation of capital.[1] If the stock of capital does not indeed reach a certain threshold, the positive effects one would have expected from it would not materialize and the country would fall back into the underdevelopment trap (d'Autume and Michel, 1993). This is the situation that characterizes developing countries and, in particular, those in sub-Saharan Africa where domestic investment remains small (World Bank, 1995a). In such circumstances, achieving sustainable growth requires a substantial flow of foreign capital. Several studies underscore the importance of the role played by foreign direct investment (FDI) in the development of certain countries (World Bank, 1995b; Husain and Wang, 1996). According to Borensztein, Gregorio and Lee (1998), when a reasonable minimum of stock of human capital exists, the contribution of FDI to economic growth is relatively higher than that of domestic investment.

Despite this important role played by FDI, sub-Saharan Africa has not received enough of this type of investment. For example, in 1993, the region managed to attract only US$700 million or about 1% of the US$65 billion FDI allocated to all developing countries (Bhattacharya, Montiel and Sharma, 1997). The same trend was observed in 1997, as the relative shares of the developing countries of Asia, Latin America and Africa of the total FDI flows were 22%, 14% and 1% respectively (Mallampally and Sauvant, 1999). According to UNCTAD (2000), despite a slight increase in private capital flows, which rose from US$8 billion in 1998 to US$10 billion in 1999, the situation remains unsatisfactory for Africa. Besides, there is an imbalance in the allocation of such capital, as the bulk of it goes to a small number of countries (Morisset, 2000). To attract more FDI, it is imperative to improve the main factors that are likely to influence the choice of possible foreign investors. The aim of this study is to identify all the factors that determine the evolution of the flows of FDI into the countries of the West African Economic and Monetary Union (WAEMU). The countries considered here are Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal and Togo.

An analysis of the institutional and socioeconomic framework of the Union's countries reveals certain weaknesses. Some of these are reflected in an ineffective judicial system, relatively high levels of corruption, little effectiveness of the tax legislation, and a weak banking system. Due to relatively low literacy levels, the late 1990s recorded a deterioration of the quality of human capital that was linked to the increase in HIV/AIDS. The economic infrastructure was also found to be little developed, but with significant differences between countries. Based on a dynamic panel model, an econometric analysis has shown that factors such as domestic investment, literacy and the degree of economic

openness played a non-negligible role in attracting FDI flows to the WAEMU region. Moreover, the positive role played by the lagged FDI is an indication that the advantage that is gained from the improvement of incentive factors is a lasting one. It was also observed that the devaluation of the CFA franc in January 1994 was preceded by a flight of capital. However, several factors such as public consumption, gross domestic product, real exchange rate, external debt and political status were not found to be relevant.

The remainder of the paper is structured as follows: Section 2 is a brief review of the literature on the main determinants of FDI. Section 3 presents the evolution and the sector-based distribution of FDI in the WAEMU countries. Section 4 describes the general framework of the study by looking especially at the institutional framework, the state of human resources and economic infrastructure, as well as the macroeconomic framework. Section 5 deals with the research methodology: it deals with the choice of variables, the specification of the model and sources of data. Section 6 presents the main findings and Section 7 gives the conclusion.

2. Literature review

Given that the theory of FDI brings to the fore the importance of the role that this type of investment is likely to play in the development of countries, empirical studies were carried out on the issue, notably concerning Asia (Husain and Wang, 1996). The marked disparities, in space and time, in FDI flows have led economists to reflect upon the deep causes of fluctuations on the world private capital markets. According to Bhattacharya, Montiel and Sharma (1997), the high risk of investing in sub-Saharan Africa would explain why this region has not benefited much from international flows of private capital, of which FDI is a part. It is indeed believed that two types of factors influence capital fluctuations: internal and external factors (Claessens, Dooley and Warner, 1995; Fernández-Arias and Montiel, 1996; Ul Haque, Mathieson and Sharma, 1997). The two causes of fluctuations in external factors generally put forward are: determinants having to do with the economic policy framework and economic determinants (Mallampally and Sauvant, 1999).

The economic policy framework essentially concerns the general regulatory framework for FDI and about trade facilitation measures (UNCTAD, 1998). The principal elements of this regulatory framework are:
*   economic, political and social stability;
*   the rules governing the inflow and utilization of FDI;
*   the standards that are applicable when dealing with foreign subsidiaries;
*   operating regulations and market structures;
*   international FDI agreements;
*   privatization policy;
*   trade regulations and how they are in line with FDI regulations; and
*   the tax system.

Several studies have sought to capture the link that exists between this type of determinant and FDI inflows. In this regard, Wheeler and Mody (1992) use country risk indexes to demonstrate that there exists a strong correlation between economic and political stability and flows of investment. For Sachs and Sievers (1998), political stability is indeed one of the most important determinants of FDI distribution. According to Singh and Jun (1995, 1996), socio-political instability is a complex phenomenon whose effect is difficult to define, since the estimations carried out to determine the link between this type of instability and FDI most often vary with the political risk indicators used. However, when it is a qualitative index that is used as a measure of the political instability risk, the effect seems significant for the groups receiving large amounts of FDI flows (Singh and Jun, 1995, 1996). The political risk index is indeed statistically

significant at the 1% threshold for countries benefiting from high levels of FDI, while it becomes significant only at the 10% threshold for those receiving small amounts of FDI. The same results will be obtained if one analyses the link between the overall business climate and FDI flows using the qualitative index.

Some experts have mentioned the slow rate of privatization in sub-Saharan Africa, compared with that in Latin America and Eastern Europe, as a reason for limited flows of FDI during the 1980s and the early 1990s. From 1988 to 1994 the sales of state-owned corporations in sub-Saharan African countries amounted to an estimated US$2.4 billion, compared with US$63.4 billion in Latin America and US$16.3 billion in Europe and Central Asia (Bhattacharya Montieland Sharma, 1997). Privatization is an important channel for direct investment and privatization initiatives undertaken in several countries offer great opportunities for FDI (Basu and Srinivasan, 2002). In this connection, Sader (1995) could prove, from a study carried out on developing countries, that the privatization effort undertaken by a given country triggers additional inflows of FDI. Not only does privatization attract FDI through direct sales of state-owned corporations, but it is a sign of improvement in the general business climate to the extent that it reduces state intervention (Pigato, 2000).

Furthermore, Morisset and Pirnia (2000) find that taxation can have a significant impact on flows of foreign investment if the other factors like political and economic stability, infrastructure and transport costs are the same for the countries studied.

As for trade facilitation measures, they have to do with:
- investment promotion;
- incentives to promote investment;
- parasite costs related to corruption, administrative inefficiency, etc.;
- social amenities (bilingual schools, quality of life, etc.);
- post-investment services. (UNCTAD, 1998).

Economic determinants cover areas as varied as the business climate, the search for markets, the search for resources and assets, and the search for efficiency gains. There are several economic factors usually mentioned to account for the evolution of FDI.

The availability of raw materials or an abundant labour force is generally recognized as a factor likely to attract foreign capital (Taylor and Sarno, 1997). According to Morisset (2000), the role of natural resources in the decisions made by multinational companies about investment manifests itself through a sector-based distribution of FDI flows into sub-Saharan Africa. There is generally a more than 60% probability that one FDI dollar that comes to Africa is invested in the natural resources and oil sectors (UNCTAD, 1999b). One other asset would be to have at one's disposal a good level of human capital, which would foster productivity gains.

The rates of wages and investment are potentially important factors accounting for the movement of capital (Brewer, 1991). When such rates are low for wages and high for investment, this means a conducive environment for business. According to Bhattacharya, Montiel and Sharma (1997), the wage bill tends to be higher in sub-Saharan Africa countries than in Asian ones, which might explain the lower level of FDI in sub-Saharan Africa.

The degree of economic openness indicates the level of access to regional and world markets: the bigger the volume of a country's foreign trade, the wider open is its door to portfolio investment (Sader, 1995).

The real interest rate can be an indication of the degree of incentive to place one's

savings in a given country, while the real exchange rate is an indication of the level of the competitiveness of its economy. Public consumption indicates the weight of the government in the economy: the higher it is, the less motivated the investors are to invest in the country (Brewer, 1991; Sader, 1995).

The size of the market and the per capita income can stimulate capital inflows to the country (Mallampally and Sauvant, 1999). It is believed that the low levels of FDI flows to sub-Saharan African countries can be accounted for by the small size of their domestic markets. Per capita income is a measure of the buying power of the domestic market: when it is high, the population is capable of acquiring the goods in the production of which the capital has been invested.

Some empirical studies have been carried out in an attempt to capture the effects of the different factors mentioned above on private capital inflows. For López-Mejía (1999), the considerable inflows of private international capital during the 1990s can be explained by the improvement, at the national level, in the risk-output ratio. This improvement was indeed achieved through:
- the restructuring of foreign debt, which enabled many countries to increase their solvency level;
- structural reforms and confidence building in macroeconomic management, which brought about productivity gains; and,
- the adoption of a fixed exchange rate which, by avoiding the problem related to the exchange rate volatility risk, makes investment more attractive.

From a study carried out on a group of 29 African countries between 1996 and 1997, it was possible to demonstrate the role that the size of the market had played on FDI inflows. The findings highlight a positive correlation between FDI flows and the gross domestic product (GDP), with a correlation coefficient of 0.99 (Morisset, 2000).

Batana (1999) finds that in the case of Togo factors such as rate of investment, degree of economic openness, real interest rate, solvency ratio and public consumption are likely to determine, in the long term, the rate of capital inflows. But in a short-term dynamic only the investment rate and public consumption are found to be relevant.

However, for many observers, the ability of African countries to attract private capital is mainly determined by the availability of natural resources and the size of their domestic market (Morisset, 2000). That is why countries like Nigeria and Angola, despite their political and economic instability, have managed to attract much private capital owing to their oil resources. Nonetheless, Morisset (2000) stresses that African countries can still attract FDI not because of their natural resources but because of their political reforms.

Using the case of MERCOSUR,[2] a study by Blomström and Kokko (1997) shows that, in the framework of a South–South regional integration, macroeconomic stability seems to be a stronger determinant than regional integration in accounting for FDI inflows. The two authors also emphasize that if integration is well effected, as in the case of MERCOSUR, it can attract considerable investment. However, the fact that the distribution of FDI flows in the WAEMU countries is inequitable is an indication that the way in which regional agreements on investment affect FDI flows depends on the volume of natural resources of each country, the competitiveness of local firms, incentives for investment etc.

That is why it is necessary to study the factors likely to determine the evolution and distribution of FDI flows in countries such as those in the WAEMU zone.

3. Evolution and sector-based distribution of FDI in WAEMU

Evolution of FDI

The information in Table 1 reveals that between 1987 and 1998 FDI flows increased in all the WAEMU countries. Indeed, while the capital flows amounted to US$111 million on average for the whole Union between 1987 and 1990, they were estimated to be close to US$459 million between 1995 and 1998. Compared with the share of sub-Saharan African countries put together, that of WAEMU countries rose from an average of 7.6% between 1987 and 1990 to 8.2% for the 1995–1998 period. This increase could be accounted for by the devaluation of the CFA franc. The aim of the devaluation was to make the economies concerned more competitive and, as a result, to lead to an increase in foreign investment in the medium and long term. However, the distribution of FDI flows within WAEMU is characterized by marked imbalance, as Côte d'Ivoire and Senegal get the lion's share, about 80%, of the foreign investment going into the WAEMU zone. However, FDI flows to Mali have increased greatly: from only an average of US$3 million between 1987 and 1990, they rose to an average of US$42 million between 1995 and 1998.

Table 1: FDI flows to the WAEMU countries between 1987 and 1998 (in US$ million)

Country	Averages by periods			Variations		
	1987–1990	1991–1994	1995–1998	1987–1990	1991–1994	1995–1998
Benin	1	8	10	1	6	3
Burkina Faso	4	16	36	3	12	20
Côte d'Ivoire	51	20	255	12	-32	235
Mali	3	4	42	1	0	39
Niger	16	0	0	13	-16	0
Senegal	24	20	104	31	-4	85
Togo	12	10	12	8	-2	2
WAEMU	111	78	459	69	-38	384
Sub-Saharan Africa	1,455	1,807	5,583	385	352	3,776

Source: Pigato (2000).

This increase could be attributed to the economic, social and political reforms that took place in the country since 1987 as a result of which the Malian economy, which at the time was heavily controlled, was transformed into an increasingly market economy

(World Bank, 1998). There were also notable increases for Côte d'Ivoire, Burkina Faso, Senegal and Benin. The situation in Togo remained relatively the same in the three periods. Niger experienced a notable increase in FDI inflows between 1987 and 1990; the other periods were characterized by negligible inflows.

However, the progression in the increase of FDI inflows was not linear (Table 1). Indeed the WAEMU countries recorded low levels of FDI flows during the 1991–1994 period; most of them (Côte d'Ivoire, Mali, Niger, Senegal, Togo) experienced a negative variation or no FDI flow at all during this period. The biggest losses were recorded by Côte d'Ivoire (-32) and Niger (-16).

The results in Table 2 confirm the increases in FDI flows recorded by Côte d'Ivoire, Burkina Faso, Mali and Senegal: for the four countries, FDI flows as a percentage of GDP and of exports increased between 1987–1990 and 1995–1998. As for Togo, there was no change during the two periods because FDI as a percentage of the GDP represented 0.83% for the former and 0.82 for the latter.

Table 2: FDI flows as a percentage of the GDP and of exports in the WAEMU countries, 1987–1998

Country	FDI/GDP			FDI/Exports		
	1987–1990	1991–1994	1995–1998	1987–1990	1991–1994	1995–1998
Benin	0.09	0.50	0.46	0.35	1.75	1.86
Burkina Faso	0.17	0.76	1.43	1.55	6.38	11.93
Côte d'Ivoire	0.50	0.16	2.43	1.58	0.61	5.46
Mali	0.15	0.29	1.62	0.95	0.84	7.27
Niger	0.66	0.00	0.00	3.92	0.00	0.00
Senegal	0.45	0.51	2.23	1.92	1.51	6.75
Togo	0.83	0.66	0.82	2.16	2.42	2.45

Source: Pigato (2000).

With regard to the origin of FDI, France remains the biggest foreign investor in African countries of the franc zone: its share represents about 40% of the total FDI stock in these countries. Nevertheless, the investment of French firms in this zone is marginal, compared with the total French investment in the world. To illustrate this, in 1968 the franc zone attracted 45% of French FDI; this dropped to between 1% and 3% in the 1990s. Furthermore, the distribution of French FDI in the WAEMU countries is inequitable, as Côte d'Ivoire alone receives more than half of it. Table 2 shows that, in general, the WAEMU countries saw an increase in FDI flows during the 1996–1998 period compared with the 1991–1995 period, with cumulative FDI flows rising from French francs 628 million to French francs 2,686 million for the entire Franc zone. This improvement could be attributed to the active participation of French firms in privatization operations (Banque de France [Bank of France], 1999).

Sector-based distribution of FDI

Generally, information on FDI in Africa is of poor quality (Pigato, 2000). That said, data from a 1999 UNCTAD report (see UNCTAD, 1999a) establishes, with regard to the FDI stock, that in 1997 the primary sector ranked first with US$1,716 million,

which represents a 53.4% share; then come the manufacturing sector (26.8%), and the service sector (19.8%). However, for FDI flows, of the US$581 million that African countries received in 1997, 15% went to the primary sector, 32% to the manufacturing sector, and 42% to the service sector. The mines and oil sub-sector represented 9.2% of the FDI received. In the service sector, the bulk of FDI seems to have gone to the finance sub-sector, which was allocated 22.2% of the total amount. This underscores the interest foreign investors have shown in the service sector in the recent years. This interest, in the current international environment characterized by globalization and the development of information and communications technology, seems to provide opportunities for investment in the years to come.

Table A1 in the Appendix shows that between 1996 and 1998 the FDI destined for the WAEMU countries was diversified and covered all the sectors of the economy. Côte d'Ivoire, in particular, received considerable investment in the three sectors: the primary, the manufacturing, and the service sectors.

4. The general framework for the study

The general regulatory framework for FDI

This framework concerns political developments, the judiciary system, legislation and regulations, the financial and banking system, and privatization programmes.

Political developments

The political situation in the WAEMU region was relatively stable during the 1970–2000 period, even though political life in some of the countries was marked by the democratization process in the 1990s. Despite the internal and external tensions experienced by Togo, Burkina Faso and Niger, overall there was political stability in the WAEMU zone.

As seen in Table 3, since 1987 the political situation was relatively more stable in Côte d'Ivoire, with an ICRG (International Country Risk Guide) index higher than 60.[3] Senegal ranked second in terms of stability during the same period, with an index of more than 50. Senegal and Côte d'Ivoire were less corrupt than the other countries in the Union with indexes of 50 and 45.8 respectively for the 1995–1998 period. However, while in Senegal the situation did not change throughout that period, in Côte d'Ivoire it deteriorated over time: the corruption risk index was 66.7 between 1991 and 1994. This rise in corruption could be attributed to political tensions and their socioeconomic consequences. For Togo and Niger, indexes between 1995 and 1998 were low (33.3 and 25 respectively), which indicated high risks of corruption.

Table 3: Evolution of the indexes of risks related to politics and corruption, 1987–1998

COUNTRY	The ICRG index for politics-related risks			The ICRG index for corruption-related risks		
	1987–1990	1991–1994	1995–1998	1987–1990	1991–1994	1995–1998
Benin	-	-	-	-	-	-
Burkina Faso	50.7	47.1	54.4	66.7	54.2	41.7
Côte d'Ivoire	64.5	66.9	63.4	50	66.7	45.8
Mali	37.6	47.1	58.5	22.9	35.4	41.7
Niger	55.3	40.5	45.1	64.6	50	25
Senegal	56.6	53.1	57.1	50	50	50
Togo	45.2	38.6	50.9	33.3	33.3	33.3

Legend: Scale: 0–100; the higher the figure, the lower the risk.
Source: Pigato (2000).

The judicial system

The judicial system in all the WAEMU countries seems to be the same; it has a pyramidal structure with high courts at the bottom, then courts of appeal, and, at the top, the Supreme Court.

However, with the exception of Benin, the other countries in the Union should make an extra effort to achieve more independence and transparency for their judiciaries. Benin enjoys relative maturity in matters of independence and transparency of the Judiciary, as has been evidenced by numerous court decisions that went against the country's different political parties.

All the countries have ratified the *Organisation pour l'Harmonisation du Droit des Affaires en Afrique* [Organization for the Harmonization of Business Law in Africa] (OHADA) Treaty, which came into effect in September 1995, with the aim of guaranteeing judicial security within member countries.

Legislation and regulations

Tax laws in the WAEMU countries are characterized by low levels of effectiveness, since government expenditure drastically went up while taxation yields remained weak (Kassé, 1999). According to this author, this weak performance is mainly due to the smallness of the tax base, the inefficiency of the tax collection services and unsuitable tax laws.

As part of the integration measures within WAEMU, a harmonization of the member states' laws was envisaged. In this connection, a legislation harmonization programme was adopted in 1996, with the aim of instituting a legal and tax environment that was conducive to economic activities (Adam, 1999).

The financial and banking system

According to Goreux (1995), the 1990–1991 banking restructuring in the WAEMU countries achieved its main objectives, as the banks have enough liquidity and are thus solvent.

However, overall there seems to be a huge imbalance in the banking system. On average, between 1996 and 1998 Côte d'Ivoire and Senegal had bank statements of accounts totalling about CFAF 2,679 billion which represented two-thirds of the WAEMU statements (Banque de France [Bank of France], 1999). The system was weak because banks were reluctant to fund medium- and long-term investment, in particular investment meant to benefit small- and medium-sized firms (Goreux, 1995). Hernández-Catá et al. (1998) also point out that there was a structural problem in the WAEMU banking system. For example, there was lack of competition illustrated by the big gap between the costs of deposits (2% on average) and lending rates (from 6% to 15%), which resulted in high profitability rates for the banks. According to these authors, such high profitability most often does not encourage banks to change their strategies so as to devise more entrepreneurial lending policies. That is why financial intermediation in those countries should be expanded and deepened and bank guarantees reinforced so as to ensure growth in the medium term.

Privatization programmes

Virtually all the countries in the Union started a policy of withdrawing from the production sector, a withdrawal that was accelerated in the 1990s.

According to data from the World Bank (see World Bank, 2001a), the total amount of the privatization operations in the WAEMU zone between 1990 and 1999 was estimated at about US$1,114.6 million. Côte d'Ivoire and Senegal shared the bulk of this amount, with US$597.4 million and US$410.7 million respectively, representing 90% of the amount for the whole zone. These countries were followed by Benin and Togo, with only US$39 million and US$38.1 million respectively. The other countries came last.

The state of human resources

The standards of education in the WAEMU zone are generally low. Only in Togo was more than half the population able to read and write in 1999; the country's rate of literacy was estimated to be 56.4%. Côte d'Ivoire followed (45.7%), Mali (40%), Benin (39%), and Senegal (36.4%). Niger and Burkina Faso had the lowest literacy rates, estimated at 15.3% and 23% respectively. These two rates are definitely inadequate in terms of producing enough skilled workforces for the economy (see Table 4). In comparison, the literacy rate was 84.3% for East Asia and the Pacific and 87.5% for Latin America in 1998.

Togo was also ahead in terms of formal education, with a school enrolment rate from primary to tertiary education of 62%, followed by Benin (45%) and Côte d'Ivoire (38%). This low performance can be attributed in part to the inadequate public resources allocated to the education sector (see Table 4). Furthermore, UNDP data (see PNUD [UNDP], 2000) indicate that between 1995 and 1997 Togo's rate of enrolment in science subjects at the higher education level was relatively low: it was only 11%, while it was 26% in Côte d'Ivoire, 19% in Burkina Faso, and 18% in Mali. Such low rates of enrolment in science subjects may lead to a mismatch between educational programmes and the real needs of the economy.

Table 4: Some indicators of the education levels in the WAEMU countries

Country	Adult literacy rates (in % of the population aged 15 and above in 1999)	Gross school enrolment rates (in %) from primary to tertiary education in 1999	Public expenditure on education (in % of GNP) in 1995–1997
Benin	39	45	3.2
Burkina Faso	23	23	3.6
Côte d'Ivoire	45.7	38	5.0
Mali	39.8	28	2.2
Niger	15.3	16	2.3
Senegal	36.4	36	3.7
Togo	56.3	62	4.5

Source: UNDP (see PNUD, 2001).

In the health sector, the ravages of HIV/AIDS account, to a large extent, for the increase in mortality and the decline in life expectancy in the WAEMU countries in the recent years. UNDP data (see PNUD, 2001) show that Côte d'Ivoire was the WAEMU country most affected by HIV/AIDS in 1999, with an infection rate (the number of people infected by HIV as a percentage of the population aged 15 to 49) of 11%, followed by Burkina Faso (6.44%) and Togo (6%). Senegal and Niger had the lowest rates of 1.77% and 1.35% respectively. It is vital to step up efforts to fight the HIV/AIDS scourge, as it mostly affects the active population and as such weakens human capital. These statistics are higher than those for countries in South Asia (0.5%), Southeast Asia and the Pacific (0.2%) and Latin America (0.5%).

The state of infrastructure

Côte d'Ivoire, Senegal and Togo seem to have the most developed infrastructure networks in the WAEMU zone. Whether we are talking of the number of telephone line subscribers (for every 1,000 people), electricity consumption (in kWh) per head or the ratio of the distance of the road network per inhabitant (1,000 km for 1 million people), the three countries have the highest statistics (see Table 5). As in the case of human resources, Niger seems to have the least developed infrastructure. Overall, the infrastructure network is little developed in the WAEMU countries, especially if compared with other developing countries. For example, in 1998 electricity consumption (in kWh) per head was 320 in South Asia, 670 in Southeast Asia and the Pacific, and 1,452 Latin America (World Bank, 2001b). These figures are much higher than those for the WAEMU countries.

Table 5: Key aspects of economic infrastructure in the WAEMU countries

Country	Telephone subscribers (per 1,000 inhabitants) in 1996–1998	Electricity consumption in kWh per head in 1997	Surfaced roads as a % of the total road network in 1998	Road network (1,000 km for 1 million people) in 1996
Benin	7	48	20	1.2
Burkina Faso	4	27	16	1.2
Côte d'Ivoire	12	196	9.7	3.6
Mali	3	37	12.1	1.5
Niger	2	38	7.9	1.1
Senegal	16	135	29.3	1.7
Togo	7	97	31.6	1.8

Sources: PNUD [UNDP] (2000); World Bank (2001b).

The information in Table 6 confirms most of the observations made previously, as the cost of various infrastructure services was relatively low in Côte d'Ivoire and Senegal. The weakness of the infrastructure network increases the cost of enterprises and slows down investment.

Table 6: The cost of energy, telecommunications and transport in the WAEMU countries in 1995–1996

Country	Electri-city[b] Industries kWh	Diesel oil[b] CFAF/l	Telephone[a] 1 min to France	to USA	Transport[b] Road per head/km CFAF	Transport[b] Rail per head/km CFAF	Transport[b] by Air[c] CFAF/kg
Benin	41	135	1,760	1,705	47	28.3	2,900
Burkina Faso	51	312	2,262	1,482	42.5	52.5	3,000
Côte d'Ivoire	37.3	270	1,390	870	37.2	31.4	2,900
Mali	55	275	3,060	1,360	43.6	26.3	3,000
Niger	55.4	265	1,800	1,285	50.1	31.4	2,800
Senegal	55.9	300	1,330	800	33.6	26.3	2,200
Togo	53	195	1,500	857	36.7	42.1	2,800

[a]: 1996, [b]: 1995, [c]: to Paris.

Source: CEFTE (1997)

The macroeconomic framework

Between 1995 and 1998, Côte d'Ivoire and Senegal had the highest GDPs in the WAEMU zone, namely US$10,987 million and US$4,875 million respectively, on average. This was also the case for exports and imports which, over the same period, were worth US$8,638 million for Côte d'Ivoire and US$3,334 million for Senegal; these two figures correspond to 79% and 68% of their respective GDPs (see Table 7). The relative importance of the economies of the two countries, which can be considered as the WAEMU zone's growth hubs, would to a large extent account for their better performance in terms of FDI. Mali and Burkina Faso also had high investment rates (more than 20% between 1991 and 1998). This investment effort would explain why the FDI flows to the two countries sharply rose between the two periods of 1987–1990 and 1995–1998, from US$4 million to US$36 million for Burkina Faso and from US$3 million to US$42 million for Mali.

Table 7: The evolution of the real GDP, the total of exports and imports, and investment in the WAEMU countries between 1991 and 1998 (in US$ million)

Country	Real GDP		Total of exports and imports (as a % of the GDP)		Gross investment (as a % the GDP)	
	1991–1994	1995–1998	1991–1994	1995–1998	1991–1994	1995–1998
Benin	1,812	2,179	57	59	15	18
Burkina Faso	2,240	2,560	37	39	20	26
Côte d'Ivoire	9,222	1,0987	66	79	9	15
Mali	2,263	2,646	56	56	23	22
Niger	1,798	2,004	39	39	8	10
Senegal	4,223	4,875	71	68	15	18
Togo	1,210	1,432	74	75	13	15

Source: World Bank (2000).

The devaluation of the CFA franc in 1994 resulted in price increases. However, the inflation rate remained moderate in the countries in the Union from 1995. Except in Benin (where it was 3.5%) and Burkina Faso (where it was 3.2%), the annual average rate of inflation between 1995 and 1999 remained below 3%, which was the maximum level that WAEMU had set for its member countries. Senegal, Mali and Togo, with respective inflation rates of 1.6%, 2.1% and 2.3%, achieved the best results in curbing inflation during that period (see Table 7). This success in curbing inflation enabled WAEMU to maintain a good proportion of the productivity-price gains that stemmed from the devaluation (Banque de France [Bank of France], 1999).

The information in Table 7 also shows that Côte d'Ivoire and Senegal had the highest tax revenues in the WAEMU zone during the 1996–1999 period, with an average of CFAF1,111.2 billion and CFAF425.1 billion respectively. Niger, as in most cases, had the lowest with only CFAF85.4 billion.

Table 8: Inflation rates, tax revenues (in CFAF billion) and foreign debt in the WAEMU countries

COUNTRY	Average annual inflation rate (in %) 1995–1999	Average tax revenues 1996–1999	Debt ratio/GNP (in %) 1994–1997
Benin	3.5	192.7	85.2
Burkina	3.2	180.3	55.3
Côte d'Ivoire	2.9	1,111.2	206.8
Mali	2.1	207	126.9
Niger	2.7	85.4	87.7
Senegal	1.6	425.1	88.6
Togo	2.3	110.4	120.3

Sources: BCEAO (1999); Banque de France (1999).

Between 1994 and 1997 Côte d'Ivoire, Mali and Togo had levels of foreign debt that were higher than their gross national products (GNPs). Their foreign debt ratios vis-à-vis their GDPs were 207%, 127% and 120% respectively. Burkina Faso was the least indebted country, with a debt ratio of about 55%. The implementation of the debt alleviation initiative for the highly indebted poor countries (HIPCs) would alleviate the debt burden on the WAEMU countries, which would put at their disposal additional resources that could be allocated to social sectors. Three countries, namely Burkina Faso, Côte d'Ivoire and Mali, were eligible for the HIPC Initiative.

5. Methodology

The choice of variables

The dependent variable for the model used in this study is the ratio of the amount of flows of FDI over GDP, as is the norm in the literature (Asiedu, 2002).

A review of the theoretical and empirical literature on FDI made it possible to select a number of independent variables likely to influence the foreign investors' decision-making process (Edwards, 1990; Sader, 1995; Asiedu, 2002). These variables are described below.

The degree of openness (DO), as measured by the significance of foreign trade, is a factor likely to influence FDI flows, with a positive sign being expected. This is understandable in the sense that most investors prefer to invest in a sector of tradable goods. The degree of openness is measured by the ratio of the total amount of exports and imports to the GDP. Such a ratio is meant to capture in some way the restrictions imposed on international trade. The trade volume can indeed reflect the results achieved by policies aimed at promoting economic openness; these are tariff policies and other incentive measures taken to attract foreign investment.

Domestic investment (INV) is another important factor. It indicates the level of the general business climate, with a positive sign being expected. The increase in domestic investment may indeed mean that the conditions to carry out business activities have improved, which is likely to motivate foreign investors to invest in the country.

Public consumption (GOV) measures the degree of the government's intervention in the economy, with a negative sign being expected because strong government intervention in the economy tends to turn away the private sector and FDI flows.

The real exchange rate (TCR) could prove to be an important factor in the FDI fluctuations on the world market. It is a measure of international competitiveness. However, its impact seems to be ambiguous, as the theoretical and empirical literature on the issue suggests. For instance, while in the short-term real currency depreciation has a negative effect on investment, its long-term effect could prove to be positive (Servers and Solimano, 1992). This thus raises the issue of devaluation, which is carried out with the aim of improving international competitiveness in the medium and long term, while leading to currency depreciation.

The real GDP comes in as a proxy of the size-of-the-market variable, with a positive sign being expected. It indeed measures the effort to increase the size of the market. It is assumed that the bigger the size of the market, the higher the investors' hopes to find enough outlets for their products to achieve economies of scale.

The POL variable was also included in the model used in this study. It indicates the level of liberties in a given country. More specifically, it is a reflection of the level of political rights and that of civil liberties. Since it is meant to measure institutions, this study preferred it to the political risk index (ICRG) used by Singh and Jun (1996), for the simple reason that this index was not available for the period studied.

Another explanatory variable for the model is the literacy rate (ALPH). It measures the quality of labour and can be a strong determinant notably in the area of computer science and the new information and communications technology.

It is often assumed that foreign debt (DET) can also have an impact on foreign investment inflows. An increase in foreign debt can indeed be perceived, to some extent, by investors as a future increase in the taxation rate to finance the servicing of the subsequent debt (Dahl, 2002). That is why its effect is expected to be negative.

The dependent variable delayed for a year (FDI_{t-1}) was included as an explanatory variable in the model, in order to measure the impact of previous investment. This would enable one to come to terms with the idea that an investor decides to invest not because the investment climate is favourable, but rather because previous investment produced satisfactory yields. Singh and Jun (1995) point out that the inclusion of the delayed dependent variable enables one to account for possible autocorrelations of errors, and to indirectly capture the effects of factors omitted from the model, but which may have negatively influenced FDI flows in the past. The expected effect thus seems to be ambiguous.

Specification of the model

The model used in this study is similar to the one used by Sader (1995), but it takes into account the adjustment that investors make over time in order to determine the levels of investment they desire in the face of the constraints which transnational firms undergo (Singh and Jun, 1995). However, the estimation was based on panel data.

Let us posit the following equation:

$$FDIT^{d}_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon_{it}. \tag{1}$$

Let $FDIT^{d}_{it}$ be the desired stock of FDI in country i and at time t; it is a function of the vector of all the explanatory variables (X_{it}) in country i and at time t, and of a random term ε_{it}. The following equation shows how, for each country i, the real stock of FDI is partially determined based on the difference between the desired stock of FDI and the FDI stock for the previous period. This adjustment is, however, not incompatible with the assumption of rational anticipation that guides the investors' choice about the level of the desired future FDI.

$$FDIT_{it} - = FDIT_{it-1} = \gamma \left(FDIT^{d}_{it} - FDIT_{it-1} \right), \tag{2}$$

where γ represents the speed of adjustment. By combining (1) and (2), and by deriving $FDIT_{it}$, we get:

$$FDIT_{it} = \gamma B_0 + \gamma B_1 X_{it\text{-}1} + (1\text{-}\gamma)\, FDIT_{it\text{-}1} + \gamma \varepsilon_{it} \tag{3}$$

Let us rather consider the flow:

$$FDI_{it} = FDIT_{it} - FDIT_{it\text{-}1}, \tag{4}$$

If, in (4) $FDIT_{it}$ is replaced by its expression in (3), we get:

$$FDI_{it} = \gamma B_0 + \gamma B_1 X_{it\text{-}1} + \gamma\, FDIT_{it\text{-}1} + \gamma \varepsilon_{it} \tag{5}$$

In the final analysis, if the stock of investment (FDIT) is approximated by the FDI flow (FDI) in the right-hand part of the equation, the model to be estimated becomes the following:

$$FDI_{it} = \alpha_0 + \alpha_1\, INV_{it} + \alpha 2\, GOV_{it} + \alpha_3\, POL_{it} + \alpha_4\, DO_{it} + \alpha_5\, TCR_{it} + \alpha_6\, ALPH_{it} +$$
$$\alpha_7\, DET_{it} + \alpha_8\, GDP_{it} + \alpha_9\, FDI_{it\text{-}1} + \alpha_{10}\, DUM + u_{it} \tag{6}$$

This approximation can be explained by the choice of the FDI ratio to the GDP. It indeed seemed more reasonable to use the ratio of FDI flows rather than the ratio of the stock investment to GDP. Apart from the variables TCR, GDP, ALPH and POL, all the others are expressed in terms of ratio to GDP. u_{it} designates the random term. In addition, a dummy variable (DUM) was included in the model to capture the anticipation behaviour on the part of investors on the eve of the CFAF devaluation. This variable was thus given the value 1 for the year 1993 and the value 0 for all the other years.

The model was estimated using three procedures: the individual-random-effects estimator (RE), the "within" estimator and the Generalized Moments Method (GMM) estimator used by Arellano and Bond (1991). The first procedure was turned into a simple "pooling" estimation which applied the method of ordinary least squares (OLS) to Equation 6 because of the limited number of countries which could not make the "between" estimation possible. With the second procedure, it was a question of eliminating individual effects. Indeed, by positing $u_{it} = \beta_i + v_{it}$, where β_i is the individual effect and v_{it} the stochastic component which is assumed not to be correlated with the explanatory variable, the "within" estimator was obtained by applying OLS to the following equation:

$$\left(IDE_{it} - \overline{IDE}_{it}\right) = \phi\left(X_{it} - \overline{X}_{it}\right) + \gamma\left(IDE_{it\text{-}1} - \overline{IDE}_{it\text{-}1}\right) + u_{it} - u_i \tag{7}$$

where $\overline{IDE}_{it}$ and $\overline{X}_{it}$ are the means of the dependent variable and the independent variables. Taking into account the deviations from the individual means enabled the individual effects, assumed to be correlated with the explanatory variables, to be cancelled out, which should produce an unbiased estimator. But the two estimators (RE and "within") are biased and non-convergent because of the autoregressive nature of the model. That is how the following relation was obtained:

$$E\left(FDI_{it\text{-}1}\,\beta_i\right) \neq 0 \tag{8}$$

Moreover, nothing rules out the existence of a correlation between the other explanatory variables and the fixed individual effect β_i. In the case of dynamic panels, the GMM estimator of Arellano and Bond (1991) is most often used in order to deal with the bias of auto-regressiveness and simultaneity. This estimator is used to manipulate the first differences of variables by using the levels of these variables delayed by at least two periods on two assumptions: that variables are predetermined and that error terms are not auto-correlated. That is how convergent estimators are obtained.

Sources of data

All the data come from the databases of the World Bank (World Tables, Global Development Finance and World Development Indicators) and the IMF (International Financial Statistics) and Freedom House. In all, seven countries were covered by this study, with data spanning the 1972–2002 period. The data bore especially on FDI ratios, the investment rate, public consumption and foreign debt ratios, the literacy rate, and the degree of economic openness as measured by the ratio of exports to the GDP, and the real GPD. There are also data on prices and nominal exchange rates which were used to estimate the real exchange rate. This rate was estimated using the following formula:

$$TCR = TCN \times \frac{P*}{P}$$

where TCN, represents the nominal exchange rate, P* the consumer price index in France, and P the consumer price index in the WAEMU countries. France was chosen because of its status as the majority investor. Figure 1 shows the link between the evolution of prices in France, Côte d'Ivoire and Senegal from 1970 to 2002. Table A5 in the Appendix also shows that prices in the WAEMU countries were strongly correlated with those in France.

Figure 1: Evolution of price indexes in France, Côte d'Ivoire, and Senegal, 1972–2002
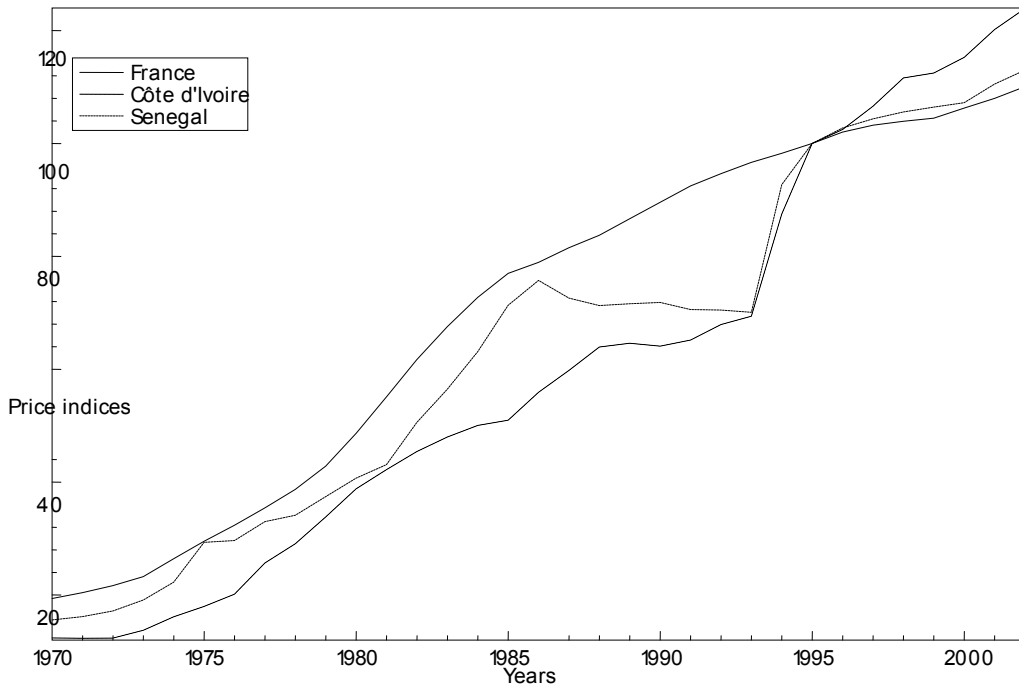
The data on levels of liberties (POL) in the different countries were obtained from Freedom House. Three levels were considered: absence of liberty, existence of partial liberty, and advanced state of liberty. The three were represented by the numbers 1, 2, and 3 respectively. A positive correlation was thus expected between the variable POL and the FDI evolution.

6. Results and discussion

The results of the "within" and RE estimations, and of the Hausman test, are presented in Tables A2 to A4 in the Appendix. Generally, most of the explanatory factors which the model used in this study took into account did not turn out to be relevant. The "within" and RE estimations produced quite similar results in terms of the main relevant factors. The Hausman test did not lead to a rejection of the null hypothesis, that of the lack of systematic difference between the coefficients of the two estimators. Even though it was not possible to systematically reject the exogeneity of individual effects, which amounts to favouring the RE estimation, it nevertheless seemed reasonable to resolve the auto-regressiveness bias that is inherent in the inclusion, in the model, of the lagged FDI. That is why the Arellano and Bond (1991) GMM estimator was brought in, as it gives robust results (see Table 9). The estimation first considered a wider model where the delays in explanatory variables were also included. A tighter model was thus obtained that excluded the least relevant variables.

This third type of estimation confirms the relevance of certain variables which were already shown by the other two estimations. However, the results are closer to those obtained with the "within" estimation. The Sargan tests of overidentification restrictions did not lead to the rejection of the null hypothesis, which means that the moment conditions were valid. Moreover, an absence of auto-correlation of errors was obtained. Indeed, according to the test proposed by Arellano and Bond (1991), the u_{it} distribution is not auto-correlated when the first-order auto-correlation is negative and significant while the second-order auto-correlation is not significant, which was the result obtained in this case. The results were also robust for the various changes in the number of delays taken into account for the variables serving as instruments.

For the period studied, the results in Table 9 show that the variables that turned out to be relevant in accounting for the foreign direct investment flows to the WAEMU countries are: investment, the literacy rate, the degree of openness, the binary variable, and the lagged FDI.

The domestic investment (INV) had a positive and significant effect on FDI flows in spite of the small amount of money globally invested in the countries in the WAEMU zone. In theory, investment can only produce the expected beneficial effects when it reaches a given optimal level. Yet, in the WAEMU zone, except for Burkina Faso and Mali which achieved significant levels of investment over the 1994–1998 period, the other countries recorded ratios of gross investment to GDP that were lower than 20%. According to Mlambo and Oshikoya (2001), the low levels of investments increase their vulnerability. However, the positive sign obtained shows that the level of investment

can turn out to be an important signal of the state of the business climate in a country. When conditions are created to attract domestic investors, this also attracts more foreign investors.

The contribution of the labour factor to the production process is appreciated through the productivity of this factor. After all, it is axiomatic that a high level of education will enable a country's working population to be more competitive internationally. Moreover, a higher level of human capital enables individuals to better adjust to new production and export structures. In this study, the rate of literacy (ALPH) was found to be relevant; its sign was positive, an indication of the role that it can play in attracting foreign capital into the WAEMU countries.

As revealed by the literature, when the ratio of foreign trade to GDP is high, this is an indication of weak trade barriers, which attract FDI. In the WAEMU countries, the relationship between this variable and FDI was found to be statistically significant, in agreement with Asiedu's (2002) finding that the degree of openness of the economy was a determinant in FDI flows to sub-Saharan African countries. This finding shows that in spite of their marginalization in terms of the world trade, their opening the economy attracted foreign investors. Indeed, a good part of the period covered by this study saw the liberalization of economic activities that went hand in hand with the progressive removal of trade barriers.

Table 9: Results of the Arellano and Bond (1991) GMM estimation, 1970-2002

Variables	Coefficients	Standard deviations	Z	P > |Z|
Domestic investment (INV)	0.05**	0.021	2.59	0.010
Public consumption (GOV)	-0.06	0.042	-1.33	0.184
Literacy (ALPH)	0.08***	0.030	2.73	0.006
Degree of openness (DO)	0.04*	0.021	1.74	0.082
Gross domestic product (GDP)	-0.003	0.003	-1.07	0.286
Real exchange rate (TCR)	-0.0006	0.001	-0.57	0.566
Foreign debt (DET)	-0.002	0.005	-0.35	0.728
Political status (POL)	0.079	0.174	0.45	0.650
Binary variable (DUM) (1 for 1993 and 0 other years)	-1.15**	0.526	-2.18	0.029
Lagged FDI	0.25***	0.071	3.52	0.000

Number of observations = 210
Number of groups   = 7
Sargan's test chi^2(410)   = 204.85   Prob > chi^2 =1.00
Autocorrelation test AR(1) Z = -7,96   Prob >   Z = 0.000
Autocorrelation test AR(2) Z = 1,90   Prob >   Z = 0.368

*, ** and *** mean that the coefficients are significant at the respective threshold levels of 10%, 5% and 1% .

Regarding the dummy (DUM) variable a negative sign was obtained which was significant with all the specified models. This finding suggests that some foreign investors held back their investment on the eve of the devaluation. Since the dependent variable was the net FDI, this finding can equally mean that a certain amount of capital was

brought back to the country of origin by investors who were concerned about preserving the monetary value of their assets.

Finally, it appears that there was a non-stop flow of FDI, since the results that the FDI of the previous year had a positive effect on the following one. The theory of investment provides justification for such a situation. Singh and Jun (1996) obtained the same result. This means that other factors not taken into account in a model whose effects can be observed in the short or medium term might influence the results and that foreign investment can itself constitute an incentive for further investment, if it generates positive returns or if it is invested in sectors that improve the economic environment of the country (like infrastructure, education etc.).

Contrary to expectations, potentially significant factors like public consumption, the real exchange rate, the institutional variable, the size of the market, and foreign debt did not turn out to be significant.

The coefficient of public consumption (GOV) was found to be negative but not significant. Contrary to the idea that a high level of public consumption results in the reduction of public investment, which happens to be complementary to private investment, be it domestic or foreign (Greene and Villanueva, 1991; Servers and Solimano, 1993; Mlambo and Elhiraika, 1997), the results of this study did not highlight such a negative effect. Moreover, in theory, public consumption can also have a positive effect on FDI flows, as it constitutes potential demand that is likely to stimulate the supply of goods and services.

The same applies to the real exchange rate (TCR). Although, in theory, a real depreciation (or appreciation) of the real exchange rate will result in the increase (or decrease) of FDI flows, it seems that in the case of WAEMU foreign investors did not respond to this factor based on the evolution of consumer prices in France. In general, while depreciation can render production more expensive due to the import of certain inputs, it improves the international competitiveness of the economy. This is plausible in the sector of export-oriented high-intensity labour activities. Empirical research has indeed shown that the relative cost of labour is significantly correlated with foreign investment, particularly in high-intensity labour industries and export-subsidies industries (Marr, 1997). When the bulk of FDI is destined for the privatization of big public corporations that supply domestic services, it is probable that depreciation will not produce the expected effect.

With regard to the institutional variable (POL) that indicates the level of liberties the coefficient was positive, although not significant. The same finding was observed by Morisset (2000), who instead used the ICRG variable as an alternative in a study that covered 29 sub-Saharan Africa countries, including five covered by this study. Even if investors took into account the political situation, especially in countries that are not rich in mineral resources, the relative stability of the WAEMU countries and the weak variability in the indicator used did not bear this concern out.

Finally, the fact that the real GDP was not found to be a relevant factor could be explained by the relative small size of the market in the WAEMU countries. As for the fact that foreign debt was not found to be significant either, that could be explained by the fact that, relatively, most of these countries are not heavily indebted. Besides, the debt alleviation schemes such as the HIPC Initiative, for which certain countries like Burkina Faso, Mali and Côte d'Ivoire are eligible, are of the kind to reassure foreign investors.

7. Conclusion

It is acknowledged that although FDI can be a windfall for economic development, the WAEMU countries do not receive enough of it. This study has identified a number of factors that can account for this phenomenon. The review of the general framework for the study helped to underscore the weakness of the general business climate in the WAEMU zone, characterized especially by low levels of human capital, low levels of domestic investment, the small size of the market, and an infrastructure sector that is small compared to that in Asian and Latin American countries.

From the main econometric results obtained in this study it transpires that domestic investment, literacy, degree of openness, and delayed foreign investment are determinants of FDI flows. On the whole, the level of real GDP seems to be too low for its evolution to reflect, from the investors' point of view, a considerable increase in the size of the market. For its part, foreign debt does not seem to have reached the level at which it can inspire an expression of expectations about a future increase in taxation rates. Another explanation could be the weak variability of factors which did not make it possible to establish a correlation with the variations in FDI flows.

From the discussion above, with levels of domestic investment being low, incentive measures should be taken to raise them, which is likely to affect, directly and indirectly, flows of foreign investment into the WAEMU countries. The privatization policy should be pursued to reduce public consumption and increase expenditure on priority infrastructure. Such a measure should also curb the countries' rate of borrowing, which would enable them to meet the WAEMU convergence criterion that requires the ratio of the outstanding domestic and foreign debt in relation to GDP to be lower than 70%.

Finally, the results of the estimations carried out in this study suggested that a good number of explanatory variables were not taken into account in the model used. Because of the small number of countries that make up WAEMU, it was not possible to include factors that are potentially significant, such as the HIV/AIDS pandemic which is spreading at an alarming rate in these countries. It is not unreasonable to think that the extent of the spread of this pandemic is likely to influence foreign investors' decisions and thus make them hold their investment back. A study based on a bigger sample of countries could enable the tackling of this other dimension of international capital flows. Much still needs to be done to enable a deeper understanding of the evolution of direct investment in Africa, since the lack of correlation, as found in this study, with most of the factors is an indication that there are factors capable of slowing down investment and which are capable of weakening the effects of macroeconomic variables.

Notes

1. This is known in the literature on development as the "big push theory", a big push without which developing countries could not achieve their economic take-off (Nurkse, 1953).

2. Southern Common Market in South America.

3. The International Country Risk Guide (ICRG) index enables one to assess the risks related to the climate of investment and trade. It is measured on a 0-to-100 scale where 0 corresponds to the maximum risk and 100 to the minimum.

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Appendix

Table A1: FDI flows to and investment opportunities in the WAEMU countries, 1996–1998 and 2000–2003

Sector	FDI flows from 1996 to 1998			Investment opportunities between 2000 and 2003
	Significant	**Not significant**	**None**	
Primary				
Agriculture	Côte d'Ivoire Mali	Burkina Togo	Niger	Mali, Niger Togo
Fishery	Côte d'Ivoire	Togo	Niger	Togo
Forestry	-		Togo	Niger Togo
Mines and extraction	Burkina, Togo Côte d'Ivoire Mali, Niger	-	-	Côte d'Ivoire Niger
Oil, gas and their by-products	Burkina Côte d'Ivoire	Niger	Togo	Niger
Manufacturing				
Foods and drinks	Côte d'Ivoire Togo	Burkina Mali	Niger	Côte d'Ivoire Mali, Niger, Senegal, Togo
Tobacco	Burkina	Côte d'Ivoire	Niger, Togo	-
Textiles, leather and clothing	Mali Niger	Burkina, Togo Côte d'Ivoire	-	Mali, Niger Senegal
Chemical and pharmaceutical products	Côte d'Ivoire	Mali, Niger Togo	-	Senegal
Metals and metallurgical industry	Burkina	-	Côte d'Ivoire Niger, Togo	-
Mechanical and electrical equipment	-	Côte d'Ivoire	Burkina, Niger, Togo	Senegal
Motor industry	-	-	Niger, Togo	-
Mineral and non-metal products	Burkina Côte d'Ivoire	Niger Togo	-	Niger
Services				
Telecommunications	Burkina, Mali Côte d'Ivoire	Togo	Niger	Mali, Niger Senegal, Togo

continued next page

Table A1 Continued

Sector	FDI flows from 1996 to 1998			Investment opportunities between 2000 and 2003
	Significant	Not significant	None	
Services				
Finance and insurance	Côte d'Ivoire	Burkina, Mali, Togo	Niger	-
Transport and storage	-	Burkina, Mali, Côte d'Ivoire Togo	Niger	Côte d'Ivoire
Tourism	Burkina Côte d'Ivoire	Mali Togo	Niger	Côte d'Ivoire Mali, Niger

Source: UNCTAD (1999b).

Table A2: Results of the "within" estimation, 1970–2002

Variables	Coefficients	Standard deviation	Z	P > |Z|
Domestic investment (INV)	0.05**	0.021	2.56	0.011
Public consumption (GOV)	-0.06	0.043	-1.31	0.191
Literacy (ALPH)	0.08***	0.031	2.70	0.008
Degree of openness (DO)	0.04*	0.021	1.72	0.087
Gross domestic product (GDP)	-0.003	0.003	-1.06	0.293
Real exchange rate (TCR)	-0.001	0.001	-0.57	0.571
Foreign debt (DEX)	-0.002	0.005	-0.34	0.732
Political status (POL)	0.08	0.176	0.45	0.655
Binary variable (DUM) (1 for 1993 and 0 otherwise)	-1.15**	0.532	-2.15	0.032
Lagged FDI	0.25***	0.072	3.48	0.001

Number of observations	= 217		
Number of groups	= 7		
F(10.200)	= 8.66	Prob > F	= 0.00

* = coefficient significant at the 10% level; ** = coefficient significant at the 5% level; *** = coefficient significant at the 1% level.

Table A3: Results of the random effect (RE) estimation, 1970–2002

Variables	Coefficients	Standard deviation	Z	P > |Z|
Domestic investment (INV)	0.04**	0.018	2.38	0.018
Public consumption (GOV)	-0.10***	0.036	-2.67	0.008
Literacy (ALPH)	0.02*	0.013	1.65	0.100
Degree of openness (DO)	0.02	0.012	1.46	0.146
Gross domestic product (GDP)	-0.001	0.001	-1.13	0.257
Real exchange rate (TCR)	0.0001	0.001	0.10	0.922
Foreign debt (DEX)	0.003	0.003	0.86	0.390
Political status (POL)	0.20	0.147	1.33	0.182

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Table A3 Continued

Variables	Coefficients	Standard deviation	Z	P > |Z|
Binary variable (DUM)				
(1 for 1993 and 0 otherwise)	-1.09**	0.531	-2.06	0.039
Lagged FDI	0.29***	0.069	4.25	0.000

Number of observations = 217
Number of groups = 7
Wald chi^2(10) = 97.42 Prob > chi^2 = 0.00

* = coefficient significant at the 10% level; ** = coefficient significant at the 5% level; *** = coefficient significant at the 1% level.

Table A4: Results of the Hausman tests, 1970–2002

	The "within" coefficient Convergent (A)	The RE coefficient Efficient (B)	Difference (A-B)	S.E.
Domestic investment (INV)	0.05	0.04	0.013	0.012
Public consumption (GOV)	-0.06	-0.10	0.039	0.024
Literacy (ALPH)	0.08	0.02	0.062	0.028
Degree of openness (DO)	0.04	0.02	0.019	0.017
Gross domestic product (GDP)	-0.003	-0.001	-0.002	0.003
Real exchange rate (TCR)	-0.001	0.0001	-0.001	0.001
Foreign debt (DEX)	-0.002	0.003	-0.004	0.003
Political status (POL)	0.08	0.20	-0.117	0.098
Binary variable (DUM)				
(1 for 1993 and 0 otherwise)	-1.15	-1.09	-0.052	0.040
Lagged FDI	0.25	0.29	-0.044	0.020

A is convergent under the null hypothesis Ho and the alternative hypothesis Ha
B is non-convergent under the hypothesis Ha and is efficient under the null hypothesis Ho.
Test: Ho: the difference between the coefficients is not systematic
Chi^2(9) = 7.46
Prob > chi^2 = 0.68

Table A5: Matrix of the correlation between consumer prices in France and those in the WAEMU countries between 1970 and 2002

	Niger	Mali	France	CI	Burkina	Benin	Togo	Senegal
Niger	1.00	0.94	0.92	0.93	0.97	0.94	0.95	0.95
Mali		1.00	0.93	0.99	0.99	0.99	0.99	0.98
France			1.00	0.94	0.96	0.90	0.92	0.97
CI				1.00	0.99	0.99	0.99	0.98
Burkina Faso					1.00	0.98	0.99	0.99
Benin						1.00	0.99	0.97
Togo							1.00	0.98
Senegal								1.00

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