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Effects of Information Asymmetry and Political Governance on Investment in the WAEMU

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Abstract

Investment an important determinant of economic growth in the WAEMU. Despite research on the determinants of investment, certain factors explaining investment, such as information asymmetry and governance, warrant further examination in the context of the WAEMU. This study analyzes the effects of information asymmetry and political governance on investment in this region. We used the Fully Modified Ordinary Least Squares (FMOLS) estimation method (Pedroni, 1996, 2000). We used data from 7 WAEMU countries, covering the period 2003-2023. The study found that information asymmetry and political risk have direct long-term negative effects on investment in the WAEMU. In addition, information asymmetry has indirect long-term negative effects on investment in this region. The study therefore suggests, among other things, improving information management and the quality of political governance factors within this region.

Keywords

Information Asymmetry, Political Governance, Investment, WAEMU

1. Introduction

Investment is an important component of overall demand, and its variations affect long-term economic activity (Salahuddin and Islam, 2014). Studies have documented a close link between investment and the evolution of economic activity (Ben-David, 1998; Chari, Kehoe, and McGrattan, 1997; Barro, 1991; Khan and Reinhart, 1990; Kormendi and Meguire, 1985). In this context, the physical capital accumulation influences economic growth (Levine and Renelt, 1992). However, most developing countries have undergone economic regime shifts that have significantly influenced capital accumulation (Salahuddin and Islam, 2014).

There is a wealth of theoretical studies on the potential determinants of invest-

ment (Pindyck, 1991; McKinnon, 1973; Shaw, 1973; Jorgenson, 1971; Keynes, 1936). However, identifying the factors that explain investment remains a major concern in economics, particularly in the WAEMU context. Keynesian investment theory advocated for an independent investment function in the economy (Keynes, 1936). It favors the accelerator theory of investment. However, the neoclassical approach, formulated primarily by Jorgenson (1971), considers the optimal capital stock to be proportional to output. Since Keynes (1936), the role of certain macroeconomic variables on investment behavior has been highlighted in the literature. McKinnon (1973) and Shaw (1973) proposed a so-called "neoliberal" approach to investment that highlights the role of financial development and interest rates for stimulating economic growth.

From an empirical perspective, studies have examined the determinants of investment and its key components (private investment, FDI, public investment, etc.) in various contexts (Kumari and Sharma, 2017; Ucan, 2014; Salahuddin and Islam, 2014; Mottaleba and Kalirajan, 2010; Ghassemi, 1996; Wai and Wong, 1982). Based on this body of work, the determinants of investment include, among others, economic growth, domestic savings, trade openness, changes in aid, financial development, public investment, bank credit to the private sector, interest rates, private consumption, and current and capital public expenditures. Some of the literature has highlighted the decisive role of information asymmetry on investment and on certain components of investment (Istrate, 2018; Kouser, Saba, and Anjum, 2016; Tanha et al., 2015; de Wet, 2004; Fu, 1996). Across all these studies, information asymmetry harms investment. Studies have also documented the role of governance (institutional quality) on investment and its components (Icoz, 2018; Canare, 2017; Zallé, 2017; Rani and Batool, 2016; Zouhaier and Kefi, 2012; Staats and Biglaiser, 2011; Asiedu and Freeman, 2009; Gwartney, Holcombe, and Lawson, 2006; Daude and Stein, 2004; Campos, Lien, and Pradhan, 1999; Levis, 1979). In most of these studies, the quality of institutions influences the level of investment.

However, the role of factors such as information asymmetry and political governance on investment has received little attention in studies, particularly in the context of the WAEMU. Yet, when comparing the relationship between investment rates and economic growth, WAEMU countries perform less well than some other African countries (Soumaila, 2014). Taking into account issues related to credit market information and political risk can shed light on investment trends in WAEMU. Therefore, it is important to analyze the effects of information and governance factors on investment within this specific context. Consequently, our study addresses the following research question: What are the effects of information asymmetry and political governance on investment in the WAEMU? It aims to analyze the effects of these two factors on investment in this regional area. We hypothesize that information asymmetry and political risk have significant negative long-term effects on investment in the WAEMU.

The remainder of the study is organized into four sections. These are, respec-

tively, 1) the literature review, 2) the description of the methodology used in the study, 3) the presentation and discussion of the results obtained, and 4) the conclusion and the implications for economic policies.

2. Literature Review

2.1. Information Asymmetry, Market Imperfections, and Investment

New Keynesian economics posits that there are imperfections in the information available to economic agents in markets (Stiglitz and Weiss, 1981; Akerlof, 1970). These imperfections reflect information asymmetry, which leads to market failures. For example, in the functioning of the labor market, employers suffer from information asymmetry regarding their employees' productivity (Shapiro and Stiglitz, 1984). Employees reduce their productivity if they are not constantly monitored (Shapiro and Stiglitz, 1984). These information problems can reduce worker productivity and, consequently, investment. Similarly, financial markets are imperfect and therefore subject to information asymmetry between lenders and borrowers (Stiglitz and Weiss, 1981). Under these conditions of imperfect information in these markets, moral hazard can limit financial development. Information asymmetry in these markets thus generates risks of loan default, thereby limiting the supply of bank credit (Svetlana et al., 2011) and investment.

It is difficult to obtain a complete measure of information asymmetry in the economy. Nevertheless, information asymmetry in the credit market is approximated by the resulting credit defaults (Ouédraogo et al., 2026; Svetlana et al., 2011; Demetriades and Fielding, 2009). The latter used the credit default rate for this purpose. In our research, we focused our attention on information asymmetry in the credit market.

The literature highlights the decisive role of information asymmetry on investment. Indeed, studies have found that information asymmetry has a negative effect on investment (Istrate, 2018; Tanha et al., 2015; de Wet, 2004; Fu, 1996). According to Fu (1996), information asymmetry can have a negative effect on investment and consequently affect economic growth. Similarly, de Wet (2004) argues that asymmetric information (particularly adverse selection) can cause factors other than market fundamentals to influence investment flows to emerging markets. Similarly, Tanha et al. (2015) have also described the effects of information asymmetry on Foreign Direct Investment (FDI). They find a negative effect of information asymmetry on FDI in five Asian countries. Consequently, information asymmetry is likely to reduce investment in the WAEMU. The idea of a negative relationship between information asymmetry and investment is also present in Istrate (2018). Istrate (2018) argues that a well-organized financial information system plays an important role for both the firm and its partners, and vice versa. In contrast, the work of Kouser, Saba, and Anjum (2016) finds no significant relationship between information asymmetry and investment in Paki-

stan.

2.2. Governance, Political Risk, and Investment

Our approach to governance is grounded in North's (1990) institutional theory. According to North, institutions are constraints and rules of the game—both formal and informal—that serve to monitor and limit individual action. Consequently, governance refers to the rules and norms that frame and regulate behavior within an economy. In this context, poor governance in a country can thus affect investment. Governance encompasses several dimensions. Our study focuses on political governance. We assess this dimension using the variables described in Section 3.2 below.

According to the literature, the quality of governance in a country can affect investment. For example, in situations of political instability, it becomes less attractive for entrepreneurs to invest in long-term projects (Salem and Trabelsi, 2010; Roe and Siegel, 2009; Gries, Kraft, and Meierrieks, 2009). Political stability is therefore essential to support financial development and increased investment. Similarly, corruption can hinder the efficient allocation of public funds and economic growth (Mauro, 1998; Tanzi and Davoodi, 1997). It directly affects the productivity growth, technological progress, and investment (Svensson, 2005; Krusell and Rios-Rull, 1996). Consequently, reducing corruption can promote financial development and increased investment.

Empirical studies have documented the role of governance in investment and its key components. In some of these studies, high-quality institutions have a positive effect on investment (Gwartney, Holcombe, and Lawson, 2006; Daude and Stein, 2004). Indeed, better institutions have a positive effect on the location of FDI in OECD countries (Daude and Stein, 2004). Conversely, policy unpredictability, excessive regulation, insufficient respect for property rights, and a lack of government commitment contribute to deterring FDI flows. According to Gwartney, Holcombe, and Lawson (2006), a strong institutional framework is necessary for better investment establishment. More specifically, studies have analyzed the effects of certain governance variables on investment. Indeed, Asiedu and Freeman (2009) found a significant negative effect of corruption on the growth of corporate investment in transition economies. Using panel data from 46 countries in Asia and the Pacific, Canare (2017) also demonstrated that corruption has a negative effect on FDI inflows. Thus, according to him, countries that have implemented reforms and reduced their levels of corruption receive greater FDI inflows. Corruption, therefore, represents an additional cost for investors and increases risks. Furthermore, Zouhaier and Kefi (2012) found a negative relationship between political instability and investment in certain countries. Rani and Batool (2016), in the case of Pakistan, assert that political instability leads to a decline in investment and slows economic development. Icoz's (2018) study provides evidence of the relationship between political instability and the volatility of private investment growth in Türkiye. Furthermore, Staats and Biglaiser (2011)

demonstrated that judicial strength and the rule of law improve portfolio investment in developing countries.

Generally speaking, research on the determinants of investment has attracted considerable interest in the literature. However, the effects of this information and governance variables on investment have not been sufficiently discussed in the context of the WAEMU.

3. Study Methodology

3.1. Specification of the Investment Model in the WAEMU Context

Based on the previous literature review, the identification of explanatory factors for investment and its key components (private investment, FDI, public investment, etc.) has been the subject of modeling in the literature. However, due to differences in the contexts of these studies, not all of these models can explain investment in the WAEMU. Our model is based on the following specification of the model of investment determinants by Salahuddin and Islam (2014):

$$\begin{aligned}\mathrm{Inv}_{it} &= \alpha_i + \beta_0 \mathrm{GR}_{it} + \beta_1 \mathrm{IR}_{it} + \beta_2 \mathrm{TR}_{it} + \beta_3 \mathrm{DS}_{it} + \beta_4 \mathrm{AID}_{it} + \beta_5 \mathrm{DB}_{it} \\ &\quad + \beta_6 \mathrm{DEP}_{it} + \varepsilon_{it}\end{aligned}$$

where Inv measures gross domestic investment, GR is the GDP growth rate; IR is the real interest rate; TR is trade openness; DS is domestic savings; AID is foreign aid; DB is debt service; and DEP is the dependency ratio (Salahuddin and Islam, 2014).

This specification of the investment model applies to sub-Saharan Africa and thus most closely reflects the general context of developing countries. We adjust this investment model to the context of our study by incorporating variables related to banking development, information asymmetry, and political governance. Based on this relationship, we specify the following basic investment model for the WAEMU:

$$\begin{aligned}\mathrm{Inv}_{it} &= \alpha_i + \beta_0 \mathrm{GDP}_{it} + \beta_1 \mathrm{IR}_{it} + \beta_2 \mathrm{TR}_{it} + \beta_3 \mathrm{DS}_{it} + \beta_4 \mathrm{AID}_{it} \\ &\quad + \beta_5 \mathrm{DB}_{it} + \beta_6 \mathrm{INF}_{it} + \beta_7 \mathrm{BD}_{it} + \beta_8 \mathrm{Asym}_{it} + \beta_9 \mathrm{Gov}_{it} + \varepsilon_{it}\end{aligned} \quad \text{(Model 1)}$$

where, DB_{it} is a measure of banking development; INF_{it} is inflation; Gov_{it} is a measure of political governance; and Asym_{it} is information asymmetry.

According to the literature, in developing countries, information asymmetry can also affect investment through the credit market channel (specifically, bank credit). Information asymmetry in the credit market leads to a decrease in the supply of bank credit (Svetlana et al., 2011; Demetriades and Fielding, 2009) and, consequently, limits investment. We can therefore specify the following investment model:

$$\begin{aligned}\mathrm{Inv}_{it} &= \alpha_i + \beta_0 \mathrm{GDP}_{it} + \beta_1 \mathrm{IR}_{it} + \beta_2 \mathrm{TR}_{it} + \beta_3 \mathrm{DS}_{it} + \beta_4 \mathrm{AID}_{it} + \beta_5 \mathrm{DB}_{it} \\ &\quad + \beta_6 \mathrm{INF}_{it} + \beta_7 \mathrm{BD}_{it} + \beta_{10} \mathrm{AsymBD}_{it} + \beta_9 \mathrm{Gov}_{it} + \varepsilon_{it}\end{aligned} \quad \text{(Model 2)}$$

where, AsymBD_{it} is a variable capturing the interactive effect of information asymmetry and banking development on investment.

3.2. Description of Investment Model Variables (Table 1)

Table 1. Model variables and data sources.

Variables	Labels	Definitions	Source	Expected signs
		Dependent variable		
Inv	Investment	This variable measures domestic investment relative to GDP. Both GDP and investment are available in the BCEAO database.	BCEAO (2024)	
		Model variables of interest		
Asym	Information asymmetry	As part of this study, we approximate this variable by the bank credit default rate (Ouédraogo et al., 2026; Demetriades and Fielding, 2009; Svetlana et al., 2011).	Reports of the UMOA Banking Commission (2003-2023)	(−)
Gov	Political Governance	This variable appreciates political governance variables, assessed by the following political risk factors: GS, CO, DA, SC, IP, IC, EC, and MP. For each of these variables, governance scores are estimated for each country and are available in the International Country Risk Guide database. In general, a high score on each of these indicators reflects a low political risk. Conversely, a low score reflects a high political risk.	International Country Risk Guide (ICRG), 2024	(+)
GS	Government Stability	This variable appreciates the government's ability to carry out its stated programs and remain in power. It takes into account government cohesion. For this variable, the estimated score ranges between 0 and 12. Regarding this variable, a high score implies a stable government, a low probability of collapse, and consistent policies. Conversely, a low score reflects political instability and a risk of sudden government change.	ICRG, 2024	(+)
CO	Corruption	This variable appreciates the level of corruption within the political system. For this variable, the estimated score ranges between 0 and 6. Regarding this variable, a high score indicates low corruption and reliable institutions. Conversely, a low score indicates high corruption and poor governance.	ICRG, 2024	(+)
DA	Democratic Accountability	This variable measures the government's responsiveness to its citizens. For this variable, the estimated score ranges between 0 and 6. Regarding this variable, a high score indicates a strong democracy and a responsible government. Conversely, a low score indicates authoritarianism and low political participation.	ICRG, 2024	(+)
SC	Socioeconomic conditions	This is an estimate of the socio-economic pressures at work in society. This variable takes into account consumer confidence, poverty, and unemployment. For this variable, the estimated score ranges between 0 and 12. Regarding this variable, a high score indicates low unemployment, controlled poverty, and social stability. On the other hand, a low score indicates social tensions, high poverty, and a risk of unrest.	ICRG, 2024	(+)
IP	Investment Profile	This is an assessment of the level of contract enforceability, payment delays, and the repatriation of funds in a country. For this variable, the estimated score ranges between 0 and 12. Regarding this variable, a high score indicates investment security, a low risk of expropriation, and freedom of capital transfer. Conversely, a low score indicates risks for investors and financial restrictions.	ICRG, 2024	(+)

Continued

IC	Internal Conflicts	This is an estimate of the level of civil unrest, civil war, and terrorism in a country. For this variable, the estimated score ranges between 0 and 12. Regarding this variable, a high score reflects inner peace, an absence of violence. Conversely, a low score reflects civil war, terrorism, and internal instability.	ICRG, 2024	(+)
EC	External conflicts	This is an estimate of the level of cross-border conflict, foreign pressure, and war. For this variable, the estimated score ranges between 0 and 12. Regarding this variable, a high score indicates stable international relations and an absence of military tensions. Conversely, a low score indicates a risk of war and diplomatic tensions.	ICRG, 2024	(+)
MP	Military in Politics	This is an estimate of the level of decline in democratic accountability, distortion of government policy, change in a government's policy or its replacement, and the emergence of an armed opposition. For this variable, the estimated score ranges between 0 and 6. Regarding this variable, a high score indicates an army that is not very involved in politics. Conversely, a low score indicates the possibility of coups d'état and a strong military influence.	ICRG, 2024	(+)
Asym*BD	Information asymmetry* Banking development	This variable is obtained by taking the product between the bank credit default rate and the domestic credit to the private sector relative to GDP	World Development Indicators (WDI) 2024 and Reports of the UMOA Banking Commission (2003-2023)	(+)/(−)
		Other explanatory variables in the model		
BD	Banking development	This is a measure of banking development calculated as domestic credit to the private sector relative to GDP.	WDI 2024	(+)
GDP	Real Gross Domestic Product	It is a measure of the level of economic activity (real GDP). This variable is available in the BCEAO database. We used the logarithm of this variable in our estimates.	BCEAO (2024)	(+)
IR	Interest	Banking system interest as a percentage of GDP. In the absence of a long and continuous series of real interest rates for the countries studied, we use this variable as a proxy. In classical and Keynesian economic theory, there is a negative relationship between the interest rate and investment. When the interest rate rises, the cost of credit increases, and consequently, firms invest less.	BCEAO	(+)
TR	Trade openness	Is a measure of trade openness ((exports – imports)/GDP). Studies on investment have used this variable in the literature (Salahuddin and Islam, 2014; Mottaleba and Kalirajanb, 2010)	WDI 2024	(+)
DS	Domestic savings	Measures the amount of domestic savings relative to GDP	WDI 2024	(+)
AID	Foreign aid	Measures the amount of foreign aid as a percentage of GDP.	BCEAO	(+)
DB	Debt service	Measures debt service as a percentage of GDP.	WDI 2024	(−)
INF	Inflation	Average annual inflation rate (in %).	BCEAO 2024	(−)

Source: authors, March 2026.

Except for Benin, for which political risk data is unavailable, our sample covers all other WAEMU countries. These countries are Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, and Togo. Benin, not being a very heterogeneous case regarding the issue of our study, these 7 countries are representative of all UEMOA countries. We defined the study period (2003-2023) based on data availability.

3.3. Estimation of the Investment Model

Before estimating the different models of the study, we first examined the stationarity of the different variables of the model. This study of stationarity prevents us from performing spurious regressions. In this context, there are various unit root tests on panel data (Levin and Lin, 1992; Maddala and Wu, 1999). But within the framework of our study, we opted for the most robust and commonly used unit root tests in the literature, notably the tests of Levin, Lin, & Chu (2002), Im, Pesaran, & Shin (2003), and Hadri (2000).

We have summarized the results of the unit root tests in **Table A1** and **Table A2** for levels and first differences, respectively. The results obtained are consistent. They revealed that the variables are integrated of order 1.

Given these unit root test results, we conducted cointegration tests on the different models. These are the cointegration tests of Kao (1999) and Pedroni (2000). Indeed, these tests are very common in studies and provide more robust results. These tests yielded similar results and indicated a long-term relationship between the variables across the different models. Given the size of our sample, we favored the results of Kao's (1999) cointegration tests. Indeed, Gutierrez (2003) showed that the smaller the sample size, the more robust Kao's (1999) cointegration tests are compared to those of Pedroni (2000, 2004). The results of Kao's (1999) cointegration tests on the models reject the null hypothesis of non-cointegration of the variables in this model and the associated sub-models (see **Table A3** and **Table A4**). There is cointegration between investment and the explanatory variables in the different models and sub-models.

The specified investment model uses macroeconomic variables. Some of these variables may therefore be jointly determined. Endogeneity issues may thus arise. Consequently, using the ordinary least squares (OLS) method may lead to biased results. Given this consideration, an appropriate estimation of our investment model requires the use of an appropriate estimator. We therefore used the FMOLS estimator (Pedroni, 2000) and the PMG estimator (Pesaran, Shin, and Smith, 1999). Given the structure of our panel (N = 7 and T = 21), we prioritized the results of the FMOLS estimator. Indeed, for small panels where N is smaller than T, FMOLS estimators are highly efficient (Pedroni, 1996, 2000).

3.4. Robustness Tests on the Model

The coefficient of determination (R^2) ranges from 0.77 to 0.80 across the various estimates, indicating that the selected explanatory variables account for 77% to

80% of the variation in the dependent variable. These relatively high values reflect a good fit of the model. As part of the robustness analysis, we adopted an approach that used alternative unit root and cointegration tests on panel data. We therefore conducted alternative unit root tests by Levin, Lin, & Chu (2002), Im, Pesaran, & Shin (2003), and Hadri (2000) to verify the robustness of the stationarity results. We have summarized the results in **Table A1** and **Table A2**. At the end of the unit root tests, we conducted alternative cointegration tests of Kao (1999) and Pedroni (2000). The results of these tests are consistent regarding the existence of a long-term relationship between the variables of the different models. We have summarized the results of Kao's (1999) cointegration tests in **Table A3** and **Table A4**. Regarding the robustness analysis, we also used alternative estimation methods for the study's different models. These are the FMOLS estimator of Pedroni (2000) and the PMG estimator of Pesaran, Shin, and Smith (1999). The results of these two approaches are consistent regarding the stability of the estimated coefficients. The results of the FMOLS estimates are summarized in **Table 2** and **Table 3** below.

4. Presentation of Results and Discussion

4.1. Effect of Information Asymmetry and Governance on Investment

The previously specified Investment Model 1 was estimated by substituting the various political governance indicators GS, CO, DA, SC, IP, IC, EC, and MP, respectively. In this case, we therefore estimated 8 sub-models: Sub-model 1 is an estimation of investment model 1 with GS as the political governance variable; sub-model 2 with CO; sub-model 3 with DA; sub-model 4 with SC; sub-model 5 with IP; sub-model 6 with IC; sub-model 7 with EC; and sub-model 8 with MP. The results are summarized in **Table 2** below.

Except for sub-model 5, the estimated long-run coefficients of the "Asym" variable, capturing the direct effect of information asymmetry on investment, appear significant and negative across the various sub-models. Information asymmetry has a direct negative effect on long-term investment in the WAEMU. This result is in line with our expectations. Indeed, as theory suggests, information asymmetry generates market failures in the credit market. These market failures prevent the full utilization of productive capacity in this market, thereby limiting investment.

The long-term coefficients of the "Gov" variable, which capture the direct effect of the level of governance on investment, are all significant. The coefficients for government stability, corruption, democratic accountability, external conflicts, and military involvement in politics are negative. In the WAEMU, the risk associated with these political governance variables has a negative impact on long-term investment. Indeed, in econometric models, a positive coefficient for each of these variables implies an improvement in the political climate. Conversely, a negative coefficient implies a deterioration. Similar results are found in some of the literature (Icoz, 2018; Rani and Batool, 2016; Zouhaier and Kefi, 2012; Levis,

1979). According to these studies, the negative effect can be explained by the low level of governance, which fails to stimulate investment. The coefficients for socioeconomic conditions, investment profile, and internal conflicts are positive. This result reflects an improvement in the quality of governance associated with these variables and, consequently, an improvement in investment. An improvement in the quality of these political governance factors stimulates investment in the WAEMU. These results are consistent with some of the literature (Canare, 2017; Asiedu and Freeman, 2009; Gwartney, Holcombe, and Lawson, 2006; Daude and Stein, 2004; Campos, Lien, and Pradhan, 1999).

About government stability, the results indicate a limited ability on the part of the authorities to carry out their stated programs and a lack of cohesion in government action within the WAEMU. However, political stability is necessary for the establishment of stable investment patterns and, consequently, stable capital accumulation (Icoz, 2018). Consequently, political instability in the WAEMU generates risks and investment instability. Regarding corruption, the results indicate that it exacerbates resource allocation problems in the WAEMU and, consequently, reduces investment in the region. This finding is consistent with the literature. Indeed, corruption has negative consequences for resource allocation, entrepreneurship, investment, and innovation (Baumol, 1990). Widespread corruption and informal economies make it difficult for new firms to enter the market (Djankov et al., 2002). These barriers to market entry are thought to discourage investment decisions (Alesina et al., 2005). However, Zallé (2017) found a positive coefficient for corruption on FDI inflows in West Africa. According to him, some foreign investors are much more sensitive to cost minimization and would therefore be tempted to invest in countries with a high corruption index to take advantage of tax rents. Regarding democratic accountability, the results indicate the government's low responsiveness to public concerns and consequently hinder investment in the WAEMU. Regarding external conflicts, an increase in cross-border conflicts, foreign pressure, and war contributes to a deterioration of the political climate and reduces investment in the WAEMU. Regarding the military's role in politics, greater military involvement in politics can lead to reduced democratic accountability, distortion of government policy, changes in government policy, and the emergence of an armed opposition. Consequently, it may limit investment in the WAEMU. Regarding socioeconomic conditions, improvements in consumer confidence, employment levels, and living standards encourage investment in these countries. Regarding the investment environment, improvements in contract enforceability, the repatriation of funds, and the reduction of payment delays in the countries concerned stimulate investment in these countries. Regarding internal conflicts, the associated risks are low in the WAEMU. Consequently, an improvement in the quality of this variable (a risk reduction) contributes to increased investment in the WAEMU. By estimating model 1 using the PMG method, we obtain estimated coefficients similar to those of the FMOLS approach, particularly for the variables of interest. For illustrative purposes, when consider-

ing sub-model 5 (the model with the investment profile as a variable of political governance), the long-term coefficient of the variable "Asym" appears significant and negative with the PMG method. This coefficient is equal to −0.109146. Similarly, the coefficient of the variable "IP" is significant and positive. This coefficient is equal to 0.628757.

Table 2. Summary of the results of the estimates for Investment Model 1.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LogGDP	0.498658***	0.604593***	0.582024***	0.202232**	0.443511***	0.530375***	0.508120***	0.556204***
	(0.0000)	(0.0000)	(0.0000)	(0.0102)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LogIR	0.068947***	0.064956***	0.072075***	0.049967***	0.046522***	0.062548***	0.069126***	0.079128***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LogTR	−0.079458*	−0.062328	−0.137463***	0.112175**	0.299242***	−0.045148	−0.073898	−0.184764***
	(0.0868)	0.1853)	(0.0037)	(0.0257)	(0.0000)	(0.3898)	(0.1146)	(0.0006)
LogDS	0.182421***	0.182199***	0.188969***	0.185069***	0.186495***	0.197786***	0.187470***	0.208212***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LogAID	0.144293***	0.089914*	0.119174**	0.279333***	0.139870***	0.153815***	0.138324***	0.095305*
	(0.0048)	(0.0888)	(0.0181)	(0.0000)	(0.0097)	(0.0051)	(0.0069)	(0.0775)
LogDB	−0.105342***	−0.103192***	−0.086728***	−0.105115***	−0.106355***	−0.110149***	−0.100326***	−0.096356***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
INF	0.001677**	0.001699**	0.002523***	0.001626**	0.002007**	0.001865**	0.001735**	0.002201***
	(0.0296)	(0.0315)	(0.0015)	(0.0331)	(0.0162)	(0.0258)	(0.0266)	(0.0082)
LogBD	0.098207**	0.130402***	0.119595***	0.070110*	0.138332***	0.101220**	0.115638***	0.144814***
	(0.0168)	(0.0027)	(0.0041)	(0.0847)	(0.0021)	(0.0245)	(0.0062)	(0.0014)
LogAsym	−0.025037**	−0.027271**	−0.021625**	−0.026367**	0.003867	−0.023327**	−0.023613**	−0.024345**
	(0.0274)	(0.0199)	(0.0577)	(0.0193)	(0.7552)	(0.0578)	(0.0389)	(0.0453)
LogGov	−0.089723*	−0.139126***	−0.179268***	0.410353***	0.749574***	0.129745*	−0.045764	−0.022888***
	(0.0796)	(0.0003)	(0.0000)	(0.0000)	(0.0000)	(0.0766)	(0.6502)	(0.0000)
No. of obs.	130	130	130	130	130	130	130	130
R-squared	0.773821	0.776611	0.779285	0.790269	0.796852	0.773830	0.773761	0.779610
Adjusted R-squared	0.741796	0.744981	0.748033	0.760573	0.768088	0.741805	0.741727	0.748404

The values in parentheses are p-values; *** significant at 1%, ** significant at 5%, *significant at 10%. Source: authors' estimates.

The estimates of Investment Model 2 aim to analyze the indirect effects of information asymmetry on investment via the banking development channel. We estimate this model by cross-linking banking development and information asymmetry. The results are summarized in Table 3 below.

Except for sub-model 5, the long-run coefficients of the variables measuring the cross-effect of information asymmetry and banking development on investment

are significant and negative. Banking development variables, however, appear positive and significant. The negative coefficients of the cross-variables stem from information asymmetry. For example, considering sub-model 1 (see Table 3 below), the estimated coefficient of "LogBD" β_7 is equal to 0.123244, and the estimated coefficient of "LogAsym" β_8 is equal to −0.025037. However, the estimated coefficient of "LogAsym*BD" β_{10} is equal to −0.025037. The marginal effect of "LogAsym" ΔAsym is therefore, equal to $(\beta_8 - \beta_{10} * \beta_7)$. We fund ΔAsym = −0.021951. Information asymmetry thus has a negative indirect effect on investment in the WAEMU. It can therefore affect investment through the banking development channel. It would limit bank financing in the WAEMU and, consequently, reduce the investment.

Table 3. Summary of the results of the estimates for Investment Model 2.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LogGDP	0.498658***	0.604593***	0.582024***	0.202232**	0.443511***	0.530375***	0.508120***	0.556204***
	(0.0000)	(0.0000)	(0.0000)	(0.0102)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LogIR	0.068947***	0.064956***	0.072075***	0.049967***	0.046522***	0.062548***	0.069126***	0.079128***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LogTR	−0.079458*	−0.062328	−0.137463***	0.112175**	0.299242***	−0.045148	−0.073898	−0.184764***
	(0.0868)	(0.1853)	(0.0037)	(0.0257)	(0.0000)	(0.3898)	(0.1146)	(0.0006)
LogDS	0.182421***	0.182199***	0.188969***	0.185069***	0.186495***	0.197786***	0.187470***	0.208212***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
LogAID	0.144293***	0.089914*	0.119174**	0.279333***	0.139870***	0.153815***	0.138324***	0.095305*
	(0.0048)	(0.0888)	(0.0181)	(0.0000)	(0.0097)	(0.0051)	(0.0069)	(0.0775)
LogDB	−0.105342***	−0.103192***	−0.086728***	−0.105115***	−0.106355***	−0.110149***	−0.100326***	−0.096356***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)
INF	0.001677**	0.001699**	0.002523***	0.001626**	0.002007**	0.001865**	0.001735**	0.002201***
	(0.0296)	(0.0315)	(0.0015)	(0.0331)	(0.0162)	(0.0258)	(0.0266)	(0.0082)
LogBD	0.123244***	0.157674***	0.141220***	0.096477**	0.134465***	0.124547**	0.139252***	0.169159***
	(0.0061)	(0.0009)	(0.0019)	(0.0301)	(0.0057)	(0.0112)	(0.0026)	(0.0006)
LogAsym*BD	−0.025037**	−0.027271**	−0.021625**	−0.026367**	0.003867	−0.023327**	−0.023613**	−0.024345**
	(0.0274)	(0.0199)	(0.0577)	(0.0193)	(0.7552)	(0.0578)	(0.0389)	(0.0453)
LogGov	−0.089723*	−0.139126***	−0.179268***	0.410353***	0.749574***	0.129745*	−0.045764	−0.022888***
	(0.0796)	(0.0003)	(0.0000)	(0.0000)	(0.0000)	(0.0766)	(0.6502)	(0.0000)
No. of obs.	130	130	130	130	130	130	130	130
R-squared	0.773821	0.776611	0.779285	0.790269	0.796852	0.773830	0.773761	0.779610
Adjusted R-squared	0.741796	0.744981	0.748033	0.760573	0.768088	0.741805	0.741727	0.748404

Source: authors' estimates.

4.2. Effects of Other Model Variables on Investment

The estimated coefficients for the level of economic activity, domestic savings, foreign aid, inflation, and the interest rate appear significant and positive in the various estimates. This result is consistent with the literature. Indeed, Mottaleba and Kalirajan (2010) found a positive effect of economic growth on investment in 68 low- and middle-income developing countries. Furthermore, Salahuddin and Islam (2014) found a positive effect of economic growth, domestic savings, trade openness, and changes in aid on gross investment behavior in a panel of 97 developing countries.

The estimated coefficients for the banking development variables are significant and positive. This result is consistent with the literature. Indeed, financial development appears to be a factor in boosting investment in G7 countries (Ucan, 2014). Similarly, bank credit to the private sector has a positive effect on investment in five developing countries (Wai and Wong, 1982). The results regarding interest rates and banking development are particularly consistent with the neoliberal approach to investment proposed by McKinnon (1973) and Shaw (1973). Unlike neoclassical theory, this investment approach emphasizes the importance of financial deepening and high interest rates in stimulating economic growth. Regarding the interest rate, Keynesian economic theory reveals a negative relationship between the interest rate and investment (Keynes, 1936). When the interest rate rises, the cost of credit increases, and consequently, firms invest less. In the case of our study, due to the lack of long or continuous series on the interest rate, we approximated it by the interest ratio. In principle, a positive coefficient of this ratio implies a positive effect of the interest rate on investment and is therefore contrary to theory. But in a context of information asymmetry, such as the case of WAEMU, high interest rates do not systematically limit investment. Investors are willing to take out bank loans even at high costs. Kumari and Sharma (2017) also found a positive effect of the interest rate on FDI across 20 developing countries in South, East, and Southeast Asia. The debt service coefficients are negative and are consistent with the literature (Salahuddin and Islam, 2014).

5. Conclusion

Investment plays an important role in accelerating the level of production. However, improving overall investment remains a major challenge in WAEMU countries. Research on investment in this region has not fully covered certain important determinants of investment, namely information asymmetry and political governance. The objective of this study was therefore to analyze the effects of these determinants of investment in the WAEMU. Using Pedroni's (2000) FMOLS estimator on data from seven WAEMU countries, we obtained the following results: information asymmetry and governance significantly explain investment in the WAEMU.

Information asymmetry has a direct negative effect and an indirect negative effect on long-term investment in the WAEMU. The indirect effect of information

asymmetry on investment is transmitted through banking development, particularly via the bank credit channel. Political risk has a direct negative long-term effect on investment in this region.

Furthermore, we also found that the level of economic activity, domestic savings, aid, and banking development have positive long-term effects on investment in the WAEMU. Debt service and trade openness, on the other hand, have negative effects on investment in the WAEMU.

In light of these results, it is important to combine financial development policies with a policy to reduce information asymmetry—and thus credit risk—and a policy of good governance (reducing political risk) to improve bank financing, which is necessary to revive investment in the WAEMU region.

Regarding information asymmetry, the study suggests addressing the variables that influence credit risk. For example, the lending rate has a positive effect on credit risk within the WAEMU (Loaba and Zahonogo, 2018). Similarly, an increase in the interest rate on credit increases opportunism and, consequently, the risk of borrower default (Boyd and De Nicoló, 2005). Therefore, a policy of lowering interest rates can improve the profitability of investment projects financed by bank credit. Such a policy can reduce credit defaults and, consequently, boost investment. In addition to interest rates, the study suggests other approaches to reducing information asymmetry, such as: 1) the creation of optimal contracts between managers and investors, requiring the provision of financial information; 2) the issuance of regulations requiring managers to provide private investors with comprehensive information on actions taken; and 3) the use of financial intermediaries to obtain internal information.

In terms of political governance, it is important to implement institutional reforms to reduce political instability, corruption, internal and external conflicts, and military involvement in politics across WAEMU countries. It is therefore important, among other things, to: 1) formulate and implement robust regulations to promote investment, 2) effectively combat corruption, and 3) promote citizen participation in public management.

Furthermore, the results imply other economic policy measures, including increasing the mobilization of domestic savings, raising export levels, and reducing external debt and debt service.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendices

Table A1. Results of unit root tests at the level.

Variables	IPS H0: non-stationary		LLC H0: non-stationary		Hadri H0: stationary	
	Constant	Constant + Trend	Constant	Constant + Trend	Constant	Constant + Trend
LogGDP	1.0000	0.0213	0.6726	0.0066	0.0000	0.0000
LogIR	0.0000	0.0005	0.0009	0.0037	0.0026	0.0006
logTR	0.1581	0.2111	0.0630	0.2349	0.0000	0.0001
Log DS	0.0061	0.0014	0.0093	0.0015	0.0000	0.0001
logAID	0.9686	0.8389	0.0595	0.5765	0.0000	0.0000
LogDB	0.3687	0.2014	0.2235	0.0494	0.0001	0.0000
INF	0.0000	0.0000	0.0000	0.0000	0.5878	0.0000
Log BD	0.2166	0.8845	0.0000	0.1309	0.0000	0.0000
Log asym	0.1597	0.3658	0.1456	0.0197	0.0000	0.0000
Log GS	0.2796	0.2810	0.1440	0.1718	0.0000	0.0195
Log CO	0.0434	0.6073	0.0262	0.6532	0.0103	0.0002
Log DA	0.3278	0.2831	0.0756	0.0134	0.0000	0.0000
Log SC	0.8303	0.7324	0.8992	0.5959	0.0000	0.0066
Log IP	0.9746	0.9970	0.9737	0.9737	0.0000	0.0016
Log IC	0.0028	0.0010	0.0111	0.0193	0.0000	0.0001
Log EC	0.1652	0.0719	0.0950	0.0645	0.0003	0.0004
MP	0.9690	0.7344	0.5022	0.6745	0.0000	0.0000
Log(asym*BD)	0.0583	0.4376	0.0440	0.0365	0.0000	0.0000

The figures correspond to the probabilities p. For $p > 0.1$, the null hypothesis of non-stationarity cannot be rejected by the LLC and IPS tests. However, for $p < 0.1$, the null hypothesis of stationarity is rejected by the Hadri test.

Table A2. Results of unit root tests on first differences.

Variables	IPS H0: non-stationary		LLC H0: non-stationary		Hadri H0: stationary	
	Constant	Constant + trend	Constant	Constant + Trend	Constant	Constant + Trend
LogGDP	0.0000	0.0000	0.0000	0.0000	0.0080	0.0030
LogIR	0.0000	0.0000	0.0000	0.0000	0.7631	0.2265
logTR	0.0000	0.0000	0.0000	0.0000	0.3594	0.0068
LogDS	0.0000	0.0000	0.0000	0.0000	0.6418	0.0013
logAID	0.0000	0.0000	0.0000	0.0000	0.0666	0.0000
LogDB	0.0000	0.0000	0.0000	0.0000	0.1494	0.0223
INF	0.0000	0.0000	0.0000	0.0000	0.0071	0.0000
LogBD	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Logasym	0.0000	0.0000	0.0000	0.0000	0.0297	0.0000

Continued

LogGS	0.0000	0.0000	0.0000	0.0000	0.7357	0.0081
LogCO	0.0000	0.0009	0.0000	0.0000	0.1520	0.0474
LogDA	0.0000	0.0000	0.0000	0.0000	0.0614	0.0000
LogSC	0.0000	0.0000	0.0000	0.0000	0.1394	0.0139
LogIP	0.0001	0.0000	0.0000	0.0000	0.6227	0.0004
LogIC	0.0000	0.0000	0.0000	0.0000	0.3292	0.0030
LogEC	0.0000	0.0000	0.0000	0.0000	0.4028	0.0000
MP	0.0000	0.0000	0.0000	0.0000	0.4139	0.0010
Log(asym*BD)	0.0000	0.0000	0.0000	0.0000	0.0381	0.0000

Table A3. Results of Kao's (1999) cointegration tests on investment model 1.

	(01)	(02)	(03)	(04)	(05)	(06)	(07)	(08)
	t-Statistic	t-Statistic	t-Statistic	t-Statistic	t-Statistic	t-Statistic	t-Statistic	t-Statistic
ADF	−5.4320***	−5.7920***	−5.2394***	−5.3427***	−5.8217***	−5.4572***	−4.8682***	−5.7023***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

The values in parentheses are the *p*-values. (*), (**), and (***) indicate rejection of the null hypothesis of non-cointegration at the 10%, 5%, and 1% significance levels, respectively.

Table A4. Results of Kao's (1999) cointegration tests on investment model 2.

	(01)	(02)	(03)	(04)	(05)	(06)	(07)	(08)
	t-Statistic	t-Statistic	t-Statistic	t-Statistic	t-Statistic	t-Statistic	t-Statistic	t-Statistic
ADF	−5.4723***	−5.8375***	−5.2676***	−5.3950***	−5.8756***	−5.4926***	−4.9071***	−5.7620***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0000)

The values in parentheses are the *p*-values. (*), (**), and (***) indicate rejection of the null hypothesis of non-cointegration at the 10%, 5%, and 1% significance levels, respectively.