Original Research Article

Effects of political instability on private investment: Empirical investigation from African firms

ABSTRACT

Using data from the World Bank Enterprise Surveys (WBES), our analysis focuses on the effect of perceptions of political instability on private investment at the firm level in Africa. We apply econometric techniques to correct for biases inherent in the data, such as measurement errors, missing observations, and the endogeneity problem.We used time series cross-section analysis employing the two-stage least squares (2SLS) method. Our results show that political instability has a negative and significant impact on business investment, irrespective of location of the firms. However, this effect is insignificant and weak for small firms. Furthermore, we identify a significant impact of administrative constraints, regulatory constraints and infrastructure constraints on investment. These findings highlight the importance of Strengthening political stability in order to stimulate investment, especially in small towns. Putting in place incentives and programmes to encourage employee training can improve business productivity.

Keywords : political instability, investment, firm, Africa

UNDER PEER REVIEW

1. INTRODUCTION

Investment is a key driver of economic progress. It increases the production of goods and services, stimulating economic activity and creating jobs through the construction of infrastructure and the expansion of businesses. These developments improve living conditions, reduce poverty and transaction costs. Since 2016, Africa has experienced a slowdown in growth (Rioux [1]). In 2016, as a result of falling commodity prices, terrorism and political scandals, there was a two per cent drop in growth. The African continent is the riskiest in the world, according to the 2017 Doing Business rankings. Of the 50 lowest-ranked countries in the world, 34 are African. Africa's ethnic diversity remains a headache for investors, as there are many ethnic groups, resulting in a wide variety of languages and potential political problems. In recent years, Cameroon has faced three conflicts, including the secessionist conflict in the English-speaking part of the country (north-west and south-west). This Anglophone crisis has led to the closure of several businesses in these two regions. In the north of the country, the Islamic sect Boko Haram has struck, spreading over three countries, namely

Cameroon, Nigeria, Chad and Niger since 2014. This insurgency has led to a decline in growth due to the discouragement of potential investment.

Since 2021, Africa has been facing a third wave of coups d'état in Sudan, Mali, Guinea, Burkina Faso, Niger and Gabon, with characteristics that differ from previous decades. The motivations of the perpetrators are changing, with concerns linked to democratic backsliding, manipulation of constitutions to extend mandates, fraudulent electoral results, deteriorating security, and the rise of anti-colonial sentiment, as indicated in the 2023 report of the African Union Peace and Security Council (PSC). Over the past two years, Mali has seen two political reversals, in August 2020 and May 2021. Combined with the COVID-19 crisis, this instability has led to a contraction of around 3% in Malian growth, mainly due to a reduction in private investment. At the same time, in September 2021, Guinea, the world's second largest bauxite producer after Australia, with significant reserves estimated at around 7.4 billion tonnes in 2020 according to the US Geological Survey, suffered a coup d'état. This political situation has raised concerns among entrepreneurs, particularly Chinese entrepreneurs. The coup in Guinea was justified by "the continuing deterioration of the security situation, corruption, poor governance and social and economic mismanagement" (Mahdi et al [2]).

Various studies have shown that political instability has a significant influence on investment, both theoretically and empirically. Several authors have analysed political and institutional variables, in particular political instability, in order to explain the level of growth in certain countries. These include Alesina and Perotti [3], Fosu [4], and Miljkovic and Rimal [5]. From their perspective, any change of government is seen as a source of instability. Alesina et al [6] define political instability from two distinct perspectives. The first is associated with change of government, where any change in the executive is seen as a form of political instability. The second perspective concerns individual manifestations, where the dissatisfaction of individuals with the powers that be is expressed through various means such as demonstrations, social unrest, riots, strikes and even civil war, thus contributing to socio-economic instability. Zouhaier et kefi [7]looks at analysing the effect of political instability, measured through variables such as military coups, political tensions, civil wars, social problems, ethnic tensions and political violence, on investment and economic growth. Unlike some previous studies that have relied on aggregate data, other researchers, such as Arega Shumetie and Mulugeta Damie [8], have taken an individual-level data-driven approach. Their study, focusing on 644 Ethiopian firms in the manufacturing, retail and services sectors, highlights the negative and significant impact of political instability on firms' innovative capacity.

Other researchers, such as Diagne [9] and Gelb Alan et al. [10], have explored various aspects of the business climate and the obstacles faced by companies. Diagne (2013) points out that improving the quality of institutions and combating corruption and crime can help to increase investment and production. Gelb Alan et al [10] identify five major barriers to business activity, including electricity, access to finance, corruption, macro-instability and labour regulation. Hosny [11] argues that political instability acts as a brake on business investment, a conclusion that is in line with Horney [12]who demonstrated the negative impact of political instability on business performance in Egypt. In this context, this article seeks to make an empirical contribution to understanding the effect

UNDER PEER REVIEW

of political instability on investment at the level of African firms based on firms' perceptions of the political situation.

This paper makes a significant contribution to the existing literature in several respects. First, it stands out as one of the first to focus on African firm-level data to examine the impact of political instability on investment. Unlike other papers that have analysed this relationship using aggregate data, this approach provides a finer-grained and firm-specific perspective. Second, unlike other studies that have assessed the effect of the investment climate on firm performance, this research takes into account entrepreneurs' perceptions of political instability, as well as other investment climate variables, in order to explore their impact on the investment rate of African firms. Third, the paper sets itself apart by examining the heterogeneity observed according to the size and geographical location of firms. Assuming that the magnitude of the effects of political instability may vary according to these characteristics, the study analyses how firms of similar size or located in cities of similar size may face comparable effects and adopt similar investment behaviour.

The remainder of the paper is structured to present the literature review in section II, detail the data and methodology in section III, outline the empirical results in section IV, and provide conclusions in section V.

2. Literature review

The analysis of the effect of political instability on investment is essentially based on the theory of institutional economics and investment. According to this theory, nations with stronger institutions, more secure property rights and less distortionary policies are inclined to invest more substantially in human and material resources (Acemoglu et al., [13]. In contrast to growth theory, which emphasises the importance of technology, North [14] argues that institutions play a predominant role in economic growth at the expense of technology (Davis and North, [15]; North and Thomas, [16]. Another theory is the theory of political-economic cycles developed by William Nordhaus [17]. According to this theory, political decision-makers, driven by the desire to be re-elected, have a habit of shaping economic policies to their advantage. Nordhaus [17] highlights the short-term nature of political thinking, pointing out that politicians, guided by a vision limited in time, seek above all to maximise their chances of re-election. This orientation can lead to the adoption of expansionary economic policies in the short term, even though this may have negative repercussions in the long term. As a result, investors are encouraged to favour short-term investment strategies to stimulate economic growth, given the continuing instability and uncertainty in an environment where the rules of the game are constantly changing.

Empirical studies on the relationship between political instability and investment suggest that political instability is a determinant of the investment climate and influences investment decisions as well as firm performance. Several researchers have analysed the effect of political instability on foreign direct investment: Asiedu [18], Sabir et al. [19], Kurecic and Kokotović [20], Elish [21], Fang [22], Le et al. [23]. Asiedu [18] used panel data on 22 African countries for the period 1984-2000 to assess the impact of several variables, including political instability, on FDI flows. He shows that infrastructure

UNDER PEER REVIEW

and an efficient legal framework favour FDI inflows. However, corruption and political instability discourage FDI flows. Sabir et al [19] report that political stability positively affects foreign direct investment. Similarly, Kurecic and Kokotović [20] examine the impact of political stability on foreign investment flows, concluding that no significant causal relationship exists between political stability and FDI in economies prone to political violence or terrorist attacks. René Gouenet [21] looks at socio-political risk and its impact on FDI attraction in Cameroon between 1960 and 2002. His results show that the risk of socio-political instability has a negative and significant influence on FDI flows, suggesting that a 1% variation in the risk of socio-political instability leads to a 5.4% decrease in FDI flows. Zouhaier and Kefi Mohamed [25], through the application of a panel data model on annual data from 11 MENA countries between 2000 and 2009, identify no significant correlation between political instability and economic growth. They suggest that the effect of political institutions on growth is mediated by investment and human capital. Burger et al [26] analyse investment flows to Middle Eastern and North African countries between 2003 and 2012, using the International Country Risk Guide (ICRG) political risk index as a measure of political instability. Their results indicate a significant negative influence of political instability on FDI flows.

Ciesielska-Maciagowska and Koltuniak [27] show that institutional factors in the country of origin determine the size of FDI stocks from Central and Eastern European countries. Similarly, Elish [21] for Brazil, Russia, India, China and South Africa, and Fang [22] for Brazil, India and Nigeria show that political instability has a significant negative impact on foreign investment. Le et al [23] analyse the impact of trade openness and political stability on foreign direct investment (FDI) in 25 Asia-Pacific countries between 1990 and 2020 using GMMs. They show that political stability has a negative effect. Trade openness has a positive effect on FDI, while political stability has a negative effect.

Unlike authors who rely on the democratic or dictatorial nature of a country, change of government, and individual demonstrations to reflect political instability, the World Bank has adopted a new approach. This is based on companies' perceptions of political development and government direction. Several authors have explored different characteristics of the investment climate in order to analyse their impact on business investment and performance.

Hosny [12] explored the impact of political instability on firm performance in eight MENA countries, finding a negative effect of political instability on employment growth and firm sales. Levratto et al [28] analysed the determinants of international engagement of firms in Jordan, Lebanon and Turkey in 2013. They found that size, human capital and agglomeration location have a positive and significant impact on the probability of internationalisation. Customs and trade regulations also positively and significantly affect the probability of internationalisation, while political instability has a negative and significant effect on firms adopting forms of internationalisation.

Kinda, T. [29], using data on 30 Sub-Saharan African countries, demonstrated that taxation does not play a decisive role in the process of business location, highlighting instead the crucial importance of infrastructure in ensuring the efficient operation of businesses. The results indicate that the lack of qualified workers and institutional problems have a negative impact on foreign direct investment (FDI), while favourable business regulations encourage FDI. Véganzonès-Varoudakis and

UNDER PEER REVIEW

Nguyen [30], based on data from the World Bank Enterprise Surveys (WBES), re-examined the link between the investment climate and firms' productive performance in 70 developing countries. The results confirm that infrastructure quality, access to information and communication technologies, financing, labour skills, quality of government relations and competition are positively correlated with firm performance, while security and political stability show a significant negative relationship. Ouedraogo [31] analysed the effects of investment climate on the productivity of manufacturing firms in Burkina Faso, concluding that access to finance, government relations, foreign ownership, age and firm size are important factors in explaining firm productivity.

Giovanis and Ozdamar [32], examining business climate barriers in Turkey and a sample of MENA countries, found that firm size is positively correlated with value added but negatively associated with labour productivity and TFP. They also identified political instability, corruption and barriers to access to finance as having the greatest negative impact on firm performance.

A review of the literature on this issue for Africa shows that a limited number of articles have examined the impact of political instability on investment. For the most part, these studies have focused on using aggregate data, highlighting a negative effect of political instability on overall investment. Few have looked specifically at the firm level, showing that political instability has a negative impact on firm investment. It should be emphasised that our study differs significantly from this work, as we focus on the firm level rather than the aggregate investment level. Furthermore, our sample is limited exclusively to African companies.

3. METHODOLOLOGY

3.1. Data and sources

To estimate the effect of political instability and the effects of the investment climate on firm-level investment, we used survey data. This data comes from the World Bank's World Bank Enterprise Survey of the investment climate in several African countries between 2014 and 2018. The main objective of the enterprise survey is to identify the main barriers to the business environment for enterprises, such as performance measures, access to finance, corruption, infrastructure, innovation, etc. All surveys include country-specific questions, so the aggregate dataset across countries does not include these country-specific questions. We cannot use all African countries, as for some countries there is an absence of data for our main variables, and in addition, for all these years, the number of companies surveyed is not the same. As a result, the number of companies is different each year. It is therefore impossible to carry out a panel analysis. Our empirical analysis is based on a non-standard panel of data where companies and sectors are grouped together over a single period.

Table 1. List of study countries

Country	years	Number of firms
Benin	2016	150
Cameroon	2016	361
Ivory Coast	2016	361
Egypt	2016	1801
Ethiopia	2015	848

UNDER PEER REVIEW

Guinea	2016	150
Lesotho	2016	150
Liberia	2017	151
Mali	2016	185
Mauritania	2014	150
Namibia	2014	581
Niger	2017	149
Nigeria	2014	151
Senegal	2014	601
Sierra Leone	2017	152
chad	2018	153
Zambia	2016	600
TOTAL		6694

Source: Our calculations based on the WBES

3.2. Descriptive and Econometric Model

Our database is organised as follows:

- From a sectoral point of view, the breakdown of our sample is characterised by significant diversity. Manufacturing companies account for the largest share at 45.84%, followed closely by miscellaneous services companies, which contribute 36.83%. The retail sector is also represented, accounting for 17.19% of our businesses, as the associated Fig 1 clearly shows. This sectoral diversity within our sample provides a unique opportunity to examine the impact of political instability on a range of sectors, from manufacturing to services and retail

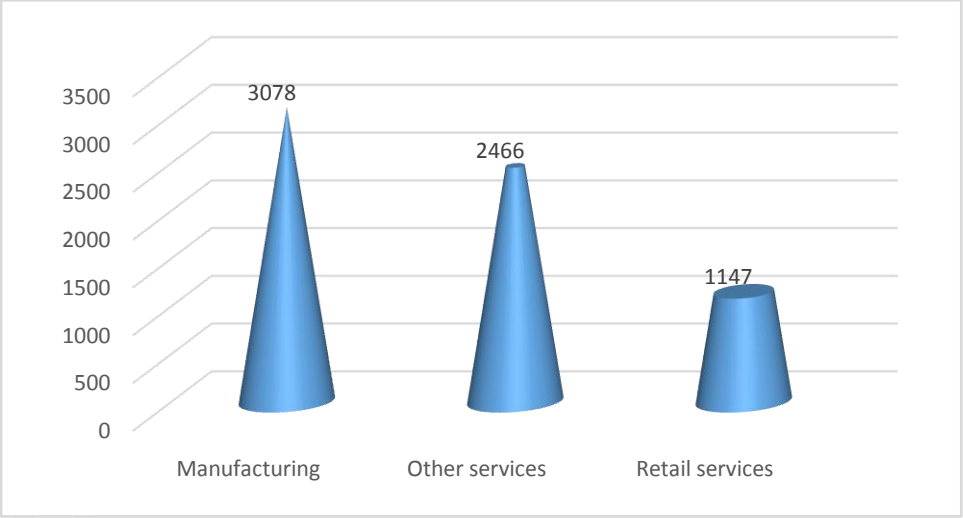

Fig.1. Breakdown of companies by business sector

- In terms of conurbation, a graphical analysis (see Fig.2) shows that of the sample of 6,695 companies studied, a significant proportion - 67% - are located in major cities. The remaining 33% are located in towns with fewer than 250,000 inhabitants. This distribution of companies in conurbations highlights a predominant concentration of companies in larger urban centres, which may influence various aspects of their activity due to the dynamics specific to large conurbations.

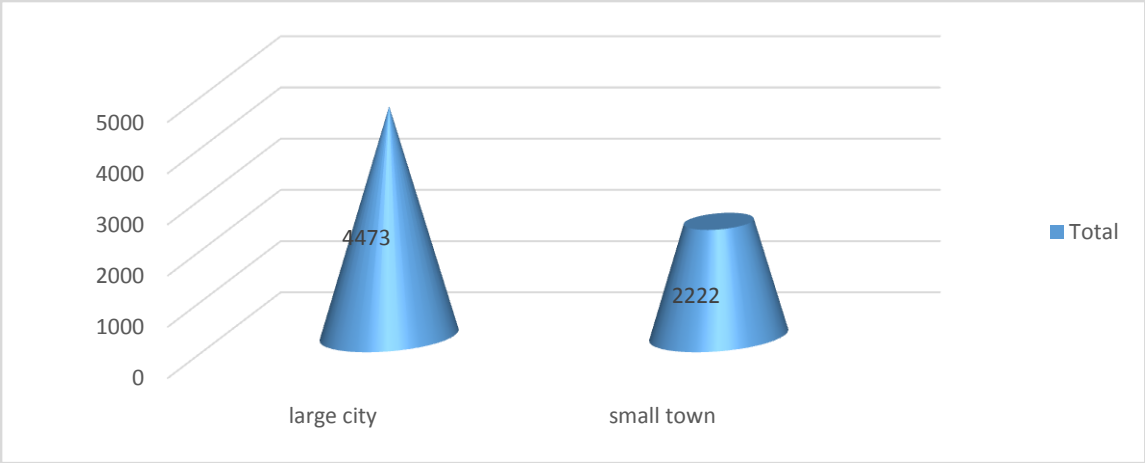

Fig.1. Breakdown of companies by location

- By company size within our sample, an emerging trend is the predominance of large companies, accounting for 72.56% of the sample. Medium-sized companies represent a significant share with 17.13%, while small companies constitute 10.31% as represented in Fig. 3. This distribution highlights the predominance of large companies within our study, which underlines the importance of analysing how different sizes of companies react to external factors, such as political instability.

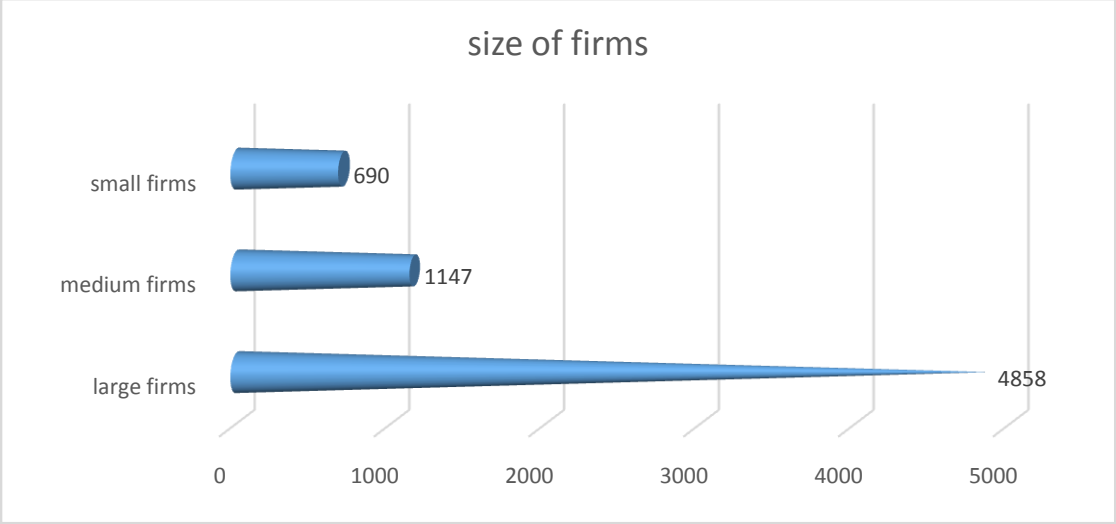

Fig.2. *Breakdown of companies by size*

- With regard to the sectoral composition of our sample, Fig.4 shows the following proportions: 8.51% of companies operate in the wholesale trade, 15.56% in the retail trade, 1.78% in the timber trade, 6.67% in the clothing sector, 2.29% in the furniture sector, 11.35% in foodstuffs, 3.35% in the manufacture of metal products, 6.17% in construction companies (Section F), 3.29% in chemical industries, and 1.18% in metal production companies. This sectoral diversity highlights the varied representation of economic activities in our sample.

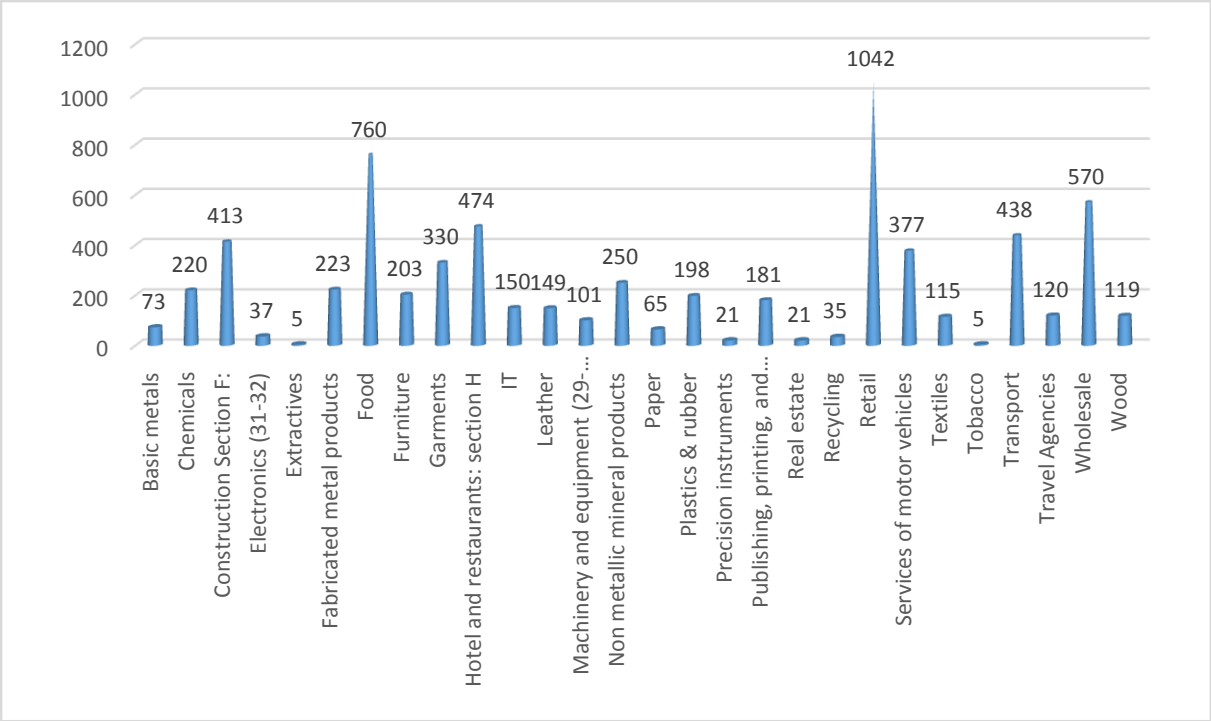

Fig.3. *Breakdown of companies by sample sector*

- By analysing the information gathered from companies on the most critical obstacles they faced, we focused on key aspects of the investment climate. Companies were asked to choose the most constraining factor from 15 possibilities, and the major or serious obstacles thus identified are listed in Fig. 5 below: The major constraints identified included access to finance (25.25%), political instability (13%), electricity (12%) and competition (11%). In contrast, contractors identified the courts (1%), work permits and licences (2%), labour regulations (3%), inadequately trained workforce (3%), crime (4%) and access to land (4%) as the least constraining factors. This analysis highlights the main challenges faced by the companies in our sample in their operating environment.

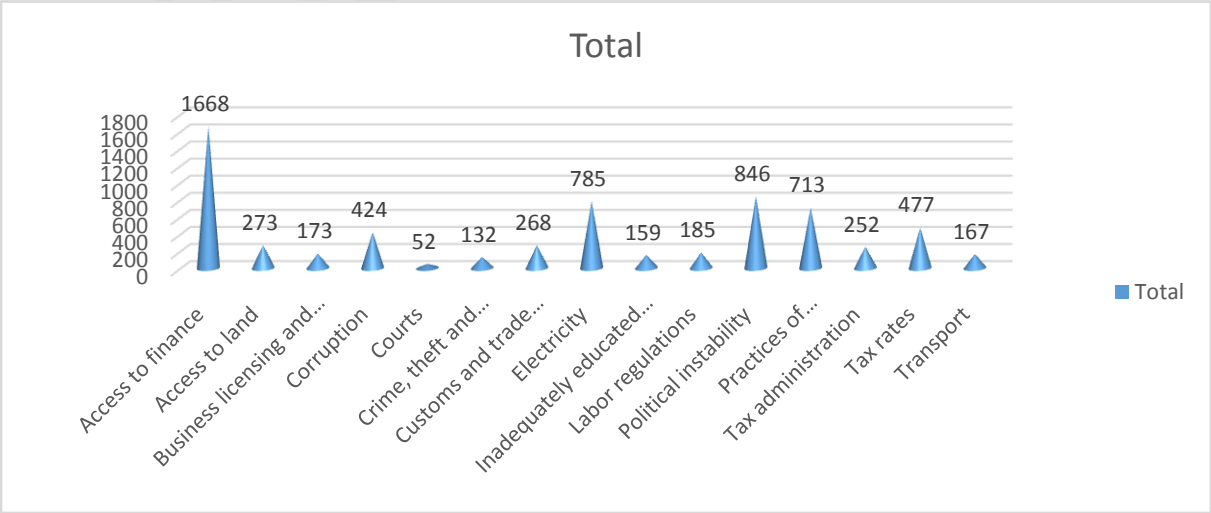

Fig.5.*Ranking of the most restrictive obstacles*

Conditional on the company's investment, our investment function is:

$$\frac{I_{ijt}}{K_{ijt-1}} = \beta_0 + \beta_1 p_{ijt} + \beta_2 X_{ijt} + \beta_3 Z_{ijt} + e_{ijt} \quad (1)$$

where:

$\frac{I_{ijt}}{K_{ijt-1}}$ is the investment rate (investment divided by the stock of capital of the previous period);

p_{ijt} is political instability;

X_{ijt} is a vector of control variable representing other factors of the investment climate;

Z_{ijt} are firms' idiosyncratic characteristics

e_{ijt} is the error term

$\beta_0, \beta_1, \beta_2, \beta_3$ are parameters to be estimated

i, j, t are respectively firm', sector, and time indices.

3.2.1. Definitions of Variables

The final variables we have decided to retain are those for which information is available.

- **Dependent variable**

$\frac{I_{ijt}}{K_{ijt-1}}$ is Investment in the capital stock of the previous period was examined. Companies were asked during the survey year to provide the amount spent on the purchase of new or second-hand machinery, vehicles and equipment, thus constituting our variable I. Similarly, our capital stock from the previous period was measured through the amount of net book value of all assets in the year prior to the survey. Companies were asked to indicate, from the balance sheet of their establishment for fiscal year N-1, the net book value of machinery, vehicles and equipment, i.e. the value of assets after;

- **Independent variable**

- Political instability is measured by entrepreneurs' perception of the political situation. The question asked was: to what extent is political instability an obstacle to the current operations of this establishment? The possible answers range from "no obstacle" (0), "minor obstacle" (1), "moderate obstacle" (2), "major obstacle" (3) to "very severe obstacle" (4). Political instability has a significant influence on investment decisions. Horney [12] has shown that political instability has a negative impact on business performance in Egypt
- Access to finance is a key element for business investment, and we will use three measures to assess this access. Firstly, external finance, which in this case is bank finance. According to Beck et al [33], in the absence of stock markets and other forms of market finance, bank finance predominates in developing countries. The second type of financing is internal financing, measured by the availability of a line of credit. Access to finance allows companies to finance more investment projects, leading to higher productivity through greater capital intensity. Several authors, including Rajan and Zingales [34], Demirgüç-Kunt and Maksimovic [35], and Kinda [36], have demonstrated that access to finance has a positive influence on company growth. Companies were asked about their current subscription to a line of credit or a loan from a financial

UNDER PEER REVIEW

institution. This variable is introduced in the form of a binary variable, taking the value 1 if the company has a line of credit with a banking institution and 0 if it does not. The third variable concerns firms' perception of the development of the financial sector. Chaffai et al [37] point out that the lack of financing limits the competition faced by established companies, encouraging them to innovate and thus improve their productivity. The expected sign of this variable should be positive.

- Human capital is assessed using two variables. These indicators approximate the dimensions of human capital, which plays an essential role in the investment process. The first indicator is the number of years' experience of the top manager. This binary variable takes the value 0 if the top manager has less than 10 years' experience in the field and 1 if he or she has more than 10 years' experience in the sector. The second indicator is a binary variable which takes the value 1 if the company has set up a training programme for its employees, and 0 otherwise. It is plausible that human capital has a positive influence on investment. In line with the World Bank (2018), an educated and healthy population is more productive, thus contributing more to economic growth. The work of Saffu et al [38] shows that prior experience in the sector can improve overall business performance. Similarly, Nguyen et al [39] have shown that human capital, measured by the number of years of experience of the top manager and the training of the company's employees, has a positive influence on company performance.
- Company size is defined by the number of permanent employees declared at the end of the tax year. A positive relationship is expected between company size and investment.
- Age is measured by the number of years between the company's creation date and the survey date. The older the company, the more likely it is to develop the managerial and entrepreneurial skills that will enable it to invest. The literature presents a mixed sign between the age of the company and its performance. Some authors find a positive effect (Das, [40]; Haltiwanger et al, [41]; Shanmugam and Bhaduri, [42], while others find a negative sign linked to the innovation potential of young companies (Barron et al, [43]).
- The locality in which the company operates is measured by a variable called "Agglomeration". It is evaluated in terms of the size of the city in which the company is located, measured by the number of inhabitants. The investment climate questionnaire is designed to distinguish this dummy variable, which takes the value 1 if the company is located in the most populated region and 0 otherwise. The purpose of this variable is to capture the external effects of agglomeration on company behaviour. Larger markets represent an investment potential for companies, but they also attract more competitors. In other words, the larger the markets, the more firms they attract, leading to more intense competition.
- Infrastructure quality is assessed on the basis of two variables: the transport of goods and raw materials, and electricity. In the case of transport, this involves the cost, quality and reliability of the transport network. Moyo [44] analysed the impact of power outages on manufacturing productivity in Nigeria, finding a significant negative influence, particularly for small firms. Similarly, Cole et al [45] studied WBES data for manufacturing and service firms in 14 sub-Saharan African countries between 2006 and 2014, highlighting the negative effects of unreliable electricity on total

UNDER PEER REVIEW

factor productivity (TFP), particularly for firms without generators. Carlin et al [46] and Gelb et al [10]identify access to electricity in low-income nations as a major problem. According to the World Bank, one of the most important constraints to business productivity and competitiveness in developing countries is infrastructure, as it drives business productivity. Chaffai et al [37]explain the lack of performance of certain companies by the poor quality of infrastructures such as telecommunications, the quality of roads and transport. Companies invest more and perform better when they have easy access to modern transport, telecommunications and electricity services. Poor-quality infrastructure increases operating costs; Nguyen and Véganzonès-Varoudakis [39] see infrastructure as a heavyweight for business performance. Infrastructure boosts private productivity by encouraging investment in new equipment (Blejer and Kahn, [47]; Nguyen and Véganzonès, [37]). However, infrastructures have a negative impact on business performance (Escribano and Guash, [48]; Dollar et al., [49]).

- The Information and Communication Technologies (ICT) indicator is assessed using two variables: use of Internet sites and evaluation of the cost, reliability and quality of the telephone network. These variables are rated on a scale of 0 to 4, where 0 indicates the absence of any obstacle and 4 indicates the presence of a very severe obstacle.
- Competition is assessed in terms of entrepreneurs' perceptions of unregistered or informal businesses, as well as general competition. The question asked is: To what extent is competition an obstacle to the current operations of this establishment? Possible answers range from no obstacle (0) to a very severe obstacle (4). According to Aghion and Griffith [50], competition has a positive impact on business performance. Studies such as those by Bastos and Nasir [51] found a strongly positive and significant impact of this variable on productivity, while Commander and Svejnar [52] observed a positive effect on company income. Competition is thus seen as an incentive to invest in technology to improve productivity.Goyal and Netessine [53] explore the effect of competition on firms' technology choice in the presence of uncertain demand. They conclude that, in response to competition, firms may adopt the same technology as their competitors, particularly when the technology is flexible. Competition is thus seen as an incentive to invest in technology to improve productivity. A positive sign is expected.
- Regulation is assessed across seven variables, including the percentage of total senior management time spent on paperwork and bureaucracy, visits by tax administration officials, fairness, impartiality and absence of corruption in the judicial system, and barriers caused by tax rates, tax administration, and customs and trade regulations. Although government regulation is necessary to protect the general public and fund public services, over-regulation and excessive taxation can hamper the productive performance of businesses by increasing the costs of setting up and running a business. It can also restrict companies' ability to take high risks, which can have a negative impact on investment, according to findings by the World Bank in 2004 and 2016. A negative sign is expected.
- Administrative constraint is measured by five variables, including corruption problems, the percentage of turnover spent on informal payments, the total amount of informal payments, and gifts during inspections. Corruption refers to the lack of transparency of government decisions, the

UNDER PEER REVIEW

extent to which officials demand and are willing to accept informal payments, and the extent to which government contracts are offered to those with political connections. Corruption is measured by two variables: firms' perceptions and the percentage of total annual sales spent on informal payments. Corruption affects business performance only if part of the revenue is paid to the official in the form of a bribe (K. Ojah et al., [54]. Bribery can facilitate the acquisition of business licences and building permits by circumventing bureaucracy, which has a positive impact on investment. Corruption acts as a tax on capital, but unlike official taxation, it remains random and difficult to anticipate (Nguedam Ntouko, [55]). A negative sign is expected.

- Crime is measured by three variables: the percentage of turnover spent on security, the losses incurred by the business due to theft, and the obstacles to business operations caused by crime (rated from 1 to 4). Crime leads companies to divert their limited resources from productive use to payments to security companies, as indicated by the World Bank in 2011. According to Véganzonès-Varoudakis et al. [30], crime further worsens companies' investments and productivity gains by increasing the uncertainty and risks associated with their activities. Insecurity is also accompanied by other problems, including fraud, corruption and weak institutions, further weakening the already precarious business environment in developing economies. The literature has shown that crime negatively affects business performance (Gaviria, [56], and BenYishay, [57]).

All the variables are presented in the summary table 2 below.

Table 2.The variables

Investment	investment on the capital stock of the previous period.
Political instability	Companies' perception of political development and government policy.
Human capital	Number of years' experience of the manager in the industry.
	Employee training: Dummy variable which takes the value 1 if the company has set up a training programme for its employees and 0 otherwise.
Finance	Availability of a bank credit line, measured by a binary variable which takes the value 1 if the company has a credit line with a bank and 0 if it does not.
	Availability of a bank credit facility, measured by a binary variable which takes the value 1 if the company has a credit facility with a bank and 0 if it does not.
	Companies' perception of the development of the financial sector
Age	Number of years elapsed between the date on which the company was set up and the date of the survey.
Size	Number of permanent employees declared at the end of the fiscal year
agglomeration	Location dummy variable which takes the value 1 if the company is located in the most populated region and 0 otherwise.
	Senior management time spent dealing with regulations, visits

UNDER PEER REVIEW

Regulatory constraints	from tax officials; Fairness, impartiality and non-corruption of the tribunal system; Business perceptions of : Tax administration, Tax rates, Business licences and permits.
Infrastructure	Transport constraints (goods and raw materials) in terms of cost, quality and reliability of the transport network. Perception of the quality and reliability of the electricity network.
ICT	Perception of the quality and reliability of the Internet; and the fact that the company uses a website.
Administrative constraints	The percentage of turnover devoted to unofficial payments, the total amount of unofficial payments, gifts during inspections; companies' perception of: corruption, the courts.
competition	The fact of competing with unregistered or informal businesses? And companies' perception of the practices of competitors in the informal sector.
Criminality	Perception of the annual cost of security, theft, burglary, vandalism or arson suffered by their business..

Source: authors

In surveys, we observe several indicators dealing with similar themes and showing a high correlation between them. The conventional approach in the literature is to restrict the analysis to a limited number of indicators, despite the inherent risk of a potential bias linked to the omitted variable. This approach also raises the question of whether the variables selected offer a faithful representation of the investment climate. An alternative is to opt for a composite indicator, offering more precise estimates and encompassing more dimensions of the business environment. Unlike most empirical studies, which rely on individual variables to capture various aspects of the investment climate, few previous authors have considered the aggregation of these variables. In our context, aggregation is particularly appropriate, as our aim is to incorporate a broad set of variables as possible that are rarely used in the literature. The idea is to determine which dimensions of the investment climate have the greatest impact on business investment. Among the aggregation methods available, Principal Component Analysis (PCA) stands out for being more rigorous than a subjective rating system. The main aim of PCA is to simplify the complexity of the data by reducing its dimensionality while preserving the crucial information. The process begins with the construction of a data matrix, where the rows represent the observations and the columns describe the variables. The covariance matrix is then calculated to measure the linear relationships between the variables, followed by the calculation of the eigenvectors and eigenvalues. The eigenvectors, ranked according to their eigenvalues, lead to the choice of principal components, with selection based on the relative importance of these values. The data is then projected onto these principal components, creating a new set of uncorrelated variables, the interpretation of which helps to understand the contribution of the initial variables to each principal component. Finally, PCA reduces dimensionality by retaining only the first principal components, thereby capturing most of the variance in the data.

The initial selection of indicators was based on their availability in the countries in our sample and their ability to capture different crucial dimensions of the business environment. Another selection

UNDER PEER REVIEW

criterion was to integrate quantitative indicators with qualitative, perception-based indicators to provide a more complete picture of the business investment climate in each sector and country. Based on the literature, 5 categories of business environment were defined: administrative and regulatory constraints and other investment climate variables (access to finance, infrastructure constraints, and competition).

These indices are standardised on the [0-10] scale. This approach makes it possible to compare the marginal impacts of the indices. Standardising indices on the [0-10] scale involves transforming the raw values of these indices so that they are expressed on a scale of 0 to 10, generally for reasons of comparability or normalisation. The general formula for standardising a variable X on the [0-10] scale is as follows:

$$X\ standardised = (X - Xmin\ /Xmax - Xmin) \times 10$$

- X is the gross value of the index,
- Xmin is the minimum possible value of the index,
- Xmax is the maximum possible value of the index,
- Xstandardised is the standardised value on the scale [0-10].

This formula normalises the index values so that they lie within the interval [0, 1], then stretches them over the scale [0-10].

3.2.2. Endogeneity and identification strategy

The nature of the variables, which are mainly qualitative, raises the problem of endogeneity, which deserves to be taken into account here. Most of the variables used in our study come from the World Bank Survey and are qualitative in nature, measuring companies' perceptions of their investment climate. They are based on the opinions of entrepreneurs in several areas of the investment climate, thus affecting the business climate. They thus raise the problem of potential endogeneity in certain variables, which may alter the causality of the relationship between political instability and investment. Some entrepreneurs may report certain obstacles as major when in fact they are not. Or we may find significant signs of certain variables when they are due to the good performance of certain companies (Beck et al., [33]; Aterido et al., [58]). Our initial use of OLS will result in biased estimates. To solve the endogeneity problem, we implement the double least squares method (2SLS), also known as the two-stage least squares method, which is a technique used when variables are correlated with the error term, thus contradicting the assumptions of the linear regression model term. Its principle is based on the use of instrumental variables uncorrelated with the error term to estimate the various model parameters. We use two sets of instrumental variables for. The first set consists of variables designed to reduce the bias arising from the perception of barriers, thereby shifting the focus from self-reports to contextual factors. The first variable, completed by the interviewer, questions the reliability of responses to questions about opinions and perceptions.The question asked is: "I feel that the answers to the questions about opinions and perceptions are true", with possible answers including (a) True, (b) Somewhat true and (c) Not true. The second variable

UNDER PEER REVIEW

answers the question "This questionnaire was completed in", with possible responses including (a) One face-to-face interview visit with one person, (b) One face-to-face interview visit with different managers/staff and (c) Several visits. Giovanis and Ozdamar [32] recommend using these two categorical variables because it is argued that they are correlated with perceptions of the business climate and cannot directly influence outcomes of interest. To illustrate, Cojocaru [59] ranked the well-being of each household using the judgement and perception of the interviewer as an instrumental variable.

We also use instrumental variables, including industry averages. This method is similar to that of Giovanis, Eleftherios & Özdamar, Öznur [60]. The idea of using average values as an instrumental variable is that the average level depends on firm size, location and industry. These mean values should be correlated with the unobserved elements that are linked to our variable. In the World Bank Survey, the perception of the investment climate by companies depends not only on the characteristics of the company itself, but also on the city in which the company is located. Is it a big city or a small town? It also depends on the size of the company. Companies of the same size will have the same characteristics. It also depends on the company's sector of activity, whether manufacturing or services. Again for the treatment of endogeneity, we follow the method of Dollar et al.[49], Commander and Svejnar [52], Kinda et al. [53], Augier et al. [61], Nadine Levratto et al. [28], Fernandes [62], who use means conditional on country, locality where the firm is located and firm size. Although the use of conditional averages cannot completely cancel out endogeneity, it has the advantage of mitigating measurement errors and the effect of missing observations.

4. RESULTS AND DISCUSSION

This section presents and discusses the results of basic model and the roustness analysis.

4.1. Basic results

We begin by estimating our model using ordinary least squares (OLS) across three equations, augmenting each base equation with only our political instability variable. Next, we introduce some environmental variables. The estimation results are presented in Table 3.

Table 3. OLS estimation results

	(1)	(2)	(4)
VARIABLES	lninvestment	lninvestment	lninvestment
political_instability	-0.109**	-0.109**	-0.105*
	(0.0539)	(0.0535)	(0.0583)
Criminality			0.00194
			(0.0171)
Human_capital			-0.00447
			(0.00991)
Finance			-0.00570

UNDER PEER REVIEW

			(0.00548)
Infrastructure_constraints			0.0138*41
			(0.00824)
ICT			0.0180*
			(0.00957)
age			-0.00274**
			(0.00116)
Agglomeration			0.0420
			(0.0577)
Size			-0.000317
			(0.000217)
Employee_training		-0.0889	
		(0.0562)	
Experience_top _manager			
Constant	5.505***	5.629***	5.556***
	(0.0399)	(0.0822)	(0.128)
Observations	955	953	926
R-squared	0.004	0.008	0.029

***Note**: *; **; *** represent significance at 10%, 5% and 1% respectively. Robust standard errors in parentheses*

***Source:** Author's estimates based on stata*

The results show that whatever the equation estimated, political instability has a significant negative impact on investment. A 1% change in political instability leads to a 10.5% decrease in investment. These results are identical to those found by Narayan et al. [39], showing that political instability associated with elections reduces business investment. This result is in line with those found by Busari and Lloyd [63] in the case of Nigeria, who, using ordinary least squares, show that at a confidence level of 10%, political instability negatively but insignificantly affects private investment.

After discussing the variable of interest, we briefly present the effects of the control variables on investment. The infrastructure variable, represented by electricity, transport and telecommunications infrastructure, has a positive influence on business investment in Africa at a threshold of 10%. A variation of 1% in infrastructure constraints leads to an increase in investment of 1.5% for electrical and transport infrastructure constraints and 1.8% for electrical obstacles. Similarly, the age of the company has a significant negative impact on investment.

As mentioned earlier, the use of OLS results in biased estimates due to endogeneity between our variables. To overcome this problem, we used instrumental variables, comprising country averages of variables such as competition from the informal sector, labour regulation, perception of transport, electricity and tax rate. The estimates using the 2SLS method are presented in Table 4.

This table shows that political instability has a significant negative influence on investment by African companies. A 1% change in political instability leads to a 56.6% decrease in investment. This

UNDER PEER REVIEW

result is consistent with those obtained by Hosny [12] and Giovanis and Ozdamar [32], who also observed a negative impact of political instability on the performance of MENA firms.

Table 4. Estimation results using the 2SLS method

UNDER PEER REVIEW

VARIABLES	(1) lninvestment	(2) lninvestment	(4) lninvestment	(5) lninvestment	(6) lninvestment	(7) lninvestment	(8) lninvestment	(9) lninvestment
political_instability	-0.387*	-0.595***	-0.635***	-0.756***	-0.575***	-0.744***	-0.551***	-0.566***
	(0.213)	(0.121)	(0.124)	(0.146)	(0.122)	(0.133)	(0.121)	(0.153)
Age		-0.00226*	-0.00206	-0.00201	-0.00245*	-0.00217*	-0.00213*	-0.00230*
		(0.00126)	(0.00127)	(0.00129)	(0.00130)	(0.00128)	(0.00126)	(0.00129)
Agglomeration		0.0939	0.0960	0.110*	0.0798	0.121*	0.0927	0.104
		(0.0594)	(0.0593)	(0.0609)	(0.0620)	(0.0622)	(0.0583)	(0.0651)
Size		-0.000145	-0.000157	-0.000215	-7.62e-05	-0.000146	-0.000174	
		(0.000218)	(0.000221)	(0.000227)	(0.000233)	(0.000223)	(0.000217)	
internal financing			-0.127** (0.0641)					
external financing			-0.0132 (0.0600)					
Regulatory_constraints				0.0405***				0.0248**
				(0.0112)				(0.0107)
administrative constraints					0.0805***			0.0880***
					(0.0251)			(0.0328)
Criminality						0.0614***		0.0209
						(0.0195)		(0.0244)
Infrastructure_constraints							0.0139*	-0.000807
							(0.00718)	(0.00866)
competition								0.0059 (0.008)
ICT								0.0182*
								(0.00955)
Human_capital								-0.0087 (0.0106)
Finance								-0.007(0.00585)
Constant	5.661***	5.835***	6.032***	5.731***	5.714***	5.621***	5.737***	5.431***
	(0.119)	(0.0856)	(0.138)	(0.0838)	(0.106)	(0.0970)	(0.101)	(0.120)
Observations	955	955	940	955	892	950	955	864
R-squared	-0.024	-0.074	-0.086	-0.115	-0.054	-0.117	-0.056	-0.017
j	13.72	12.91	9.941	8.766	4.231	5.346	11.51	3.550
jp	0.00331	0.0117	0.0414	0.0672	0.376	0.254	0.0214	0.470

*Note: *; **; *** represent significance at 10%, 5% and 1% respectively. Robust standard errors in parenthese*

UNDER PEER REVIEW

Similarly, Hosny [11] showed that political instability had an adverse effect on the performance of Tunisian firms.Internal financing has a negative and significant influence on investment, with a 1% variation in internal financing leading to a 12.2% decrease in investment. On the other hand, external financing does not appear to have any effect on investment. This result is in line with the findings of van Biesebroeck [64] for certain sub-Saharan African countries, as well as with the observations of K.Ojah et Al [54] for Kenya, Uganda and Tanzania, showing that financing has a negative impact on the decision to invest in equipment. Gatti and Love [65], in the case of Bulgarian firms, also find a significant sign between access to bank credit and firm performance.

African businesses face difficulties accessing domestic finance, particularly small businesses that cannot meet banks' credit requirements (Totoum, [66]). More than half of businesses said they did not need a loan or had sufficient capital. Other reasons given included complex application procedures, unfavourable interest rates, high collateral requirements (such as the owner's personal assets, land and buildings owned by the establishment, machinery and equipment, including movable assets), insufficient loan amount, inadequate maturity, and some businesses doubted whether the application would be approved.

Similarly, employee training has a negative influence on investment. Some 72.70% of our companies indicated that they had not set up a training programme for their employees. Yet training helps to improve the performance of employees and, consequently, that of the company. Companies have every interest in training their staff, as this translates into productivity gains. A trained employee is generally more productive. One possible explanation for this negative effect is the low mobility and competition between employees (Lê Jérôme, [67]).

Administrative constraints have a positive and significant influence on investment, with a variation of 1% leading to an increase of around 8% in investment. Crime has a positive effect on business investment, but its effect is only significant when crime is considered as the only variable in the investment climate. The work of Escribano and Guash [48] shows that crime has a significant influence on business productivity. Similarly, when infrastructures are examined individually, they have a positive and significant impact on firms' investment. However, when all the infrastructures are introduced simultaneously, their sign changes to become negative, although not significant. This contrasts with the results for Bangladesh obtained by Fernandes [62], who shows that electrical infrastructure has a negative and significant effect on firm performance. One possible explanation lies in the lower level of basic infrastructure in African countries. Small and medium-sized companies have a greater need for government intervention to improve road infrastructure than large companies. This contrasts with the results for Bangladesh obtained by Fernandes [62], who shows that electrical infrastructure has a negative and significant effect on business performance. One possible explanation lies in the lower level of basic infrastructure in African countries.

Small and medium-sized businesses have a greater need for government intervention to improve road infrastructure than large businesses. According to the AfDB's 2018 Infrastructure

UNDER PEER REVIEW

Development Index, many African countries have low infrastructure scores[1], with more than half of the countries in the sample showing poor performance. These results differ from those found by Hallward-Driemier and Xu [68] for China, where physical infrastructure has no effect on firm performance, probably due to the better quality of infrastructure in China compared to African countries.

The regulatory constraint has a positive impact on investment, but its effect is significant only for large companies. A variation of 1% in the regulatory constraint leads to an increase in investment of 4.05% when it is considered as the only variable in the investment climate. However, this positive value is halved when it is combined with other variables. The telecoms constraint has a significant influence on investment. On the other hand, the age of the company has a negative and significant influence on investment, with a variation of 1% leading to an increase in investment of 0.2%, although its effect is relatively small.

4.2. Heterogeneity tests

In order to test the influence of observable heterogeneity on the results obtained, we carry out the estimates as a function of size and sector of activity. The hypothesis is that the determinants of investment may vary according to company characteristics, such as size and agglomeration.

4.2.1. Heterogeneity by size category

Estimation of the model on the population as a whole revealed a negative and significant relationship with company investment. Fragmentation of the overall population according to size will enable us to confirm these results. The classification criterion used to determine company size is the number of employees per week at the end of the fiscal year. According to the World Bank, there are three types of company based on size: large companies with more than 99 employees, medium-sized companies with between 20 and 99 employees and small companies with fewer than 20 employees. The results of the estimates by size category are presented in table 5.

The results found are consistent with the estimates made for the population as a whole, except for two points. Generally speaking, political instability has a negative and significant influence on investment, whatever the size of the company. However, it is higher among medium-sized companies. Thus, a 1% variation in political instability leads to a 4.33% reduction in investment for small companies, 72.3% for medium-sized companies and 56% for large companies. Political instability has a greater impact on investment by medium-sized companies.

UNDER PEER REVIEW

[1]It is a composite index that measures nine elements in the field of infrastructure: transport, electricity, ICT, water, etc. Scores range from 0 to 1: a score below 0.333 is considered low; 0.334 and 0.6667 is medium; AND above 0.668 is considered high.

Table 5. Estimation results by company size

	(1)	(2)	(3)
VARIABLES	lninvestment	lninvestment	lninvestment
political_instability	-0.0433	-0.723*	-0.560***
	(0.313)	(0.390)	(0.167)
competition	-0.0418*	-0.0409*	0.0117
	(0.0217)	(0.0233)	(0.00923)
ICT	-0.00559	-0.0197	0.0263**
	(0.0262)	(0.0320)	(0.0108)
Regulatory_constraints	0.00105	0.0252	0.0301**
	(0.0230)	(0.0268)	(0.0131)
Administrative_constraints	0.0994*	0.0425	0.135***
	(0.0583)	(0.0612)	(0.0515)
Criminality	-0.0532	0.00981	0.00882
	(0.0446)	(0.0570)	(0.0324)
Infrastructure_constraints	0.0153	0.0196	-0.00543
	(0.0175)	(0.0191)	(0.0109)
Human_capital			-0.0218*
			(0.0132)
Finance			-0.0128*
			(0.00696)
Age	-0.00394	-0.00298	-0.00204
	(0.00305)	(0.00323)	(0.00145)
Agglomeration	0.0980	0.183	0.127
	(0.164)	(0.179)	(0.0796)
Constant	5.767***	5.771***	5.399***
	(0.253)	(0.299)	(0.147)
Observations	152	152	639
R-squared	0.071	-0.147	0.020
j	15.69	1.691	3.501
jp	0.0281	0.193	0.321

***Note**: *; **; *** represent significance at 10%, 5% and 1% respectively. Robust standard errors in parentheses*

***Source:** Author's estimates based on stata*

Whether the company is medium-sized or small, competition has a negative and significant influence on investment at the 10% threshold, respectively. A variation of 1% leads to a reduction in investment of 4.18% for small companies and 4.09% for medium-sized companies. We can see that the effect is almost identical for these two types. On the other hand, the effect is positive but not significant for large companies. Large companies that have reached a certain maturity can face competition from the informal sector, unlike medium-sized companies, which are younger and can compete through better quality products at affordable prices.The financing constraint has a significant negative impact on investment by large companies. A 1% variation in the financing constraint leads to a 1.28% reduction in investment for large companies. Whatever the size of the company, almost half consider access tofinance to be a major obstacle. This variable is made up of internal and external

UNDER PEER REVIEW

financing, with 21.67% taking out a line of credit or a loan from a financial institution and 36.53% taking out an overdraft.The financing constraint has a significant negative impact on investment by large companies. A 1% variation in the financing constraint leads to a 1.28% reduction in investment for large companies. Whatever the size of the company, almost half consider access to finance to be a major obstacle. This variable is made up of internal and external financing, with 21.67% taking out a line of credit or a loan from a financial institution and 36.53% taking out an overdraft.

Access to credit is an important element in financing business investment, but Africa is known as the continent where access to credit is most restricted. Furthermore, 57% of our businesses consider access to finance to be a barrier to their investment. Beck et al [33] show that access to finance is less of a constraint for large firms than for small firms.Human capital has a negative and significant influence on investment for large firms. A 1% change in employee training leads to a 2.18% decrease in investment. The administrative constraint has a positive effect on investment, but its effect is significant for both small and large companies. A variation of 1% in the administrative constraint leads to an increase of 9.94% for small businesses and 135% for large businesses.

The telecoms constraint has a significant influence on investment by large companies. Corruption through unofficial payments and bribes does not improve business performance. In a corrupt environment, it is easier for small businesses to escape administrative control by paying bribes.

Regulatory constraint positively affects investment, but its effect is significant for large firms, witha 1% change in regulatory constraint leads to a 3% increase in investment. Lee et Al [70] found that the worst performance in terms of infrastructure was in African countries such as Nigeria, and that small firms were the most affected regardless of the country studied. This negative effect of electricity infrastructure was found by Aterido et al [71], who show that electricity infrastructure measured by the number of power outages has a significant negative effect on the performance of medium-sized firms.

4.2.2. Heterogeneity according to location

Similarly, companies located in the same regions show marked similarities. The classification of these companies according to the size of the towns in which they operate is based on the number of inhabitants. Two categories of conurbation are thus distinguished: large towns, with a population of more than 500,000, and small towns, with a population of less than 500,000. The results of the estimates by size category are shown in table 6.

Table 6. Estimation results by agglomeration

	(1)	(2)
VARIABLES	lninvestment	lninvestment
political_instability	-0.725***	-0.552**
	(0.219)	(0.240)
competition	0.0106	0.00211
	(0.0142)	(0.00976)
ICT	-0.0165	0.0337***

UNDER PEER REVIEW

	(0.0166)	(0.0120)
Employee_training	0.109	-0.137*
	(0.146)	(0.0764)
Experience_top manager_	-0.00204	-0.000427
	(0.00376)	(0.00192)
Finance	0.000343	-0.00867
	(0.0117)	(0.00725)
Regulatory_constraints	0.0414**	0.0155
	(0.0196)	(0.0125)
Infrastructure_constraints	0.00857	-0.00345
	(0.0149)	(0.0107)
Administrative_constraints	0.0618	0.0739
	(0.0505)	(0.0516)
Criminality	-0.0385	0.0740
	(0.0288)	(0.0455)
Age	-0.000573	-0.00294*
	(0.00195)	(0.00168)
Constant	5.573***	5.541***
	(0.281)	(0.170)
Observations	279	585
R-squared	-0.015	-0.001
j	3.075	0.835
jdf	3	3
jp	0.380	0.841

***Note**: *; **; *** represent significance at 10%, 5% and 1% respectively. Robust standard errors in parentheses*

***Source:** Author's estimates based on stata*

Political instability has a negative impact on investment, regardless of where the firm is located. Nevertheless, its effect is higher and significant at 1% for firms located in small towns. A 1% change in political instability leads to a 72.5% reduction in investment. Companies in small towns may be more sensitive to political instability due to potentially more limited resources and infrastructure. In developing countries, small towns have a huge deficit in transport and electricity infrastructure, making them less able to adapt quickly to any form of political instability.

The effect of the telecommunications constraint on investment by businesses located in small towns is negative, although not significant. On the other hand, it is positive and significant for businesses in large cities, with an increase in investment of 3.37% for each 1% variation in the telecommunications constraint. This dynamic can be explained by the fact that, in African countries, businesses established in large cities benefit from high-quality networks and reliable Internet connections, while in small towns, the reliability and quality of the Internet network still needs to be improved. In particular, 5% of the companies in our sample do not have access to a website. Furthermore, human capital, as measured by employee training, has a negative and significant influence on investment by companies based in large towns. For example, a 1% variation in employee training leads to a 13.7% reduction in investment for companies in large cities, with the effect being even more marked in large cities. The phenomenon of rural exodus, which encourages greater

UNDER PEER REVIEW

dynamism in the labour market, combined with the high cost of training employees in large cities and the increasing mobility of employees, may encourage companies to reduce their investment in training. This could lead to an overall reduction in investment due to the increased mobility of workers. The regulatory constraint has a positive effect on investment, but its effect is significant for companies in small towns. A 1% variation in the regulatory constraint leads to a 4.14% increase in investment.

5. CONCLUSION

In conclusion, This study aimed to provide a high-quality empirical contribution to the literature on the relationship between political instability and private investment at the firm level in Africa. To achieve this objective, we undertook a thorough review of the main explanatory theories of the determinants of investment, which guided our analysis and led to the adoption of a rigorous methodology to ensure robust results. This includes the use of OLS estimators for the baseline estimates and accounting for endogeneity by applying the double least squares (2SLS) method.

The results confirm previous findings that political instability has a negative and significant effect on business investment, irrespective of location. Overall, our econometric results reinforce these conclusions by demonstrating that political instability has a negative and significant impact on business investment. Looking more closely at the effects according to firm size, we have highlighted their heterogeneity in terms of investment. Indeed, political instability has a negative and significant impact on investment, whatever the size of the company, but this impact is more marked among medium-sized companies. These findings are of crucial importance for policymakers tasked with improving the investment environment for African companies. It is crucial to improve the quality of infrastructure by reducing the number of power cuts, as solid infrastructure stimulates investment. Improving electricity supply through the entry of new investors into African markets will ensure greater competitiveness in the electricity market.

These results highlight the importance of strengthening political stability in order to stimulate investment, particularly in small towns. Providing incentives and programmes to encourage employee training could improve business productivity. We hope that in the near future this research can be extended to the African experience, exploring the effect of political instability on the irreversibility of investment.

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