

Effects of foreign direct investment on structural transformation in WAEMU countries: the role of corruption and democracy

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Abstract

This research analyzes the role of corruption and democracy in the effects of foreign direct investment (FDI) on structural transformation in WAEMU countries. To do this, we estimated an Autoregressive Distributed Lag (ARDL) model using the Pooled Mean Group (PMG) over the period from 2002 to 2021. The results show that, in the long term, FDI has a positive and significant impact on structural transformation. Corruption control and democracy enhance the positive effects of FDI on structural transformation in WAEMU countries. These results suggest that the attractiveness of FDI, the control of corruption and the improvement of democracy are important in the implementation of policies aimed at promoting and accelerating structural transformation within the WAEMU.

Keywords: FDI, corruption, democracy, structural transformation, UEMOA

JEL Codes: E02, F21, L60, O14

1. Introduction

The issue of structural transformation has been at the heart of economists' concerns in recent years. The structural transformation of economies makes it possible to establish strong, sustainable and inclusive economic growth (UNCTAD, 2021). The United Nations' Sustainable Development Goals (SDG 9) and the African Union's (AU) Agenda 2063 recommend that countries structurally transform their economies. Structural transformation (ST), in fact, refers to the reallocation of resources from low-productivity activities to intra- and inter-sectoral high-

productivity activities (McMillan and Rodrik, 2011). McMillan and Rodrik (2011) identify structural transformation through two main elements, namely the rise of new, more productive activities and the transfer of resources from traditional activities to new ones, thereby raising overall factor productivity.

In developing countries in general, and the countries of the West African Economic and Monetary Union (WAEMU) in particular, the process of structural transformation remains subject to certain major constraints, notably the question of financing. WAEMOA countries do not have sufficient domestic resources to finance their investment projects. In this context, foreign direct investment (FDI) may offer an alternative means of financing structural transformation. FDI corresponds to investment flows that make it possible to acquire at least 10% of the share capital of a company of a nationality other than that of the investor, with the aim of acquiring a lasting interest and exercising significant influence over its management (OECD, 2008). FDI plays an important role in the structural transformation of host countries. They fill the savings gap by bringing additional resources to the economy, boost competition, create decent jobs, facilitate the transfer of technology and knowledge needed to modernize the manufacturing sector (Borensztein et al., 1998; Markusen and Venables, 1999; UNCTAD, 2016) and have a knock-on effect on private domestic investment (Ouibga, 2021). According to World Bank data (2023a), net inward FDI flows as a percentage of GDP in WAEMU increased from 0.81% to 5.04% over the period 2002-2021.

Theoretically, FDI inflows can have positive or negative effects on structural transformation. According to endogenous growth theory, FDI has positive effects on structural transformation. By facilitating the transfer of capital, technology and innovation, FDI encourages the reallocation of economic activity from agriculture to manufacturing (Lucas, 1988; Romer, 1990; Grossman and Helpman, 1991). Dependency theory, on the other hand, postulates that FDI generates negative effects on structural transformation in host countries. The entry of foreign firms can hinder the development of the local industrial fabric, since through capital and technology transfers, these firms can create a relationship of dependence with local firms in the production and export of goods.

The stylized facts show that WAEMU countries have not yet begun their structural transformation. Despite their enormous wealth in natural resources, the contribution of manufacturing to gross domestic product (GDP) in WAEMU countries is highly insignificant. Worse still, these countries are experiencing real de-industrialization: according to World Bank data (2023a), the value added of manufacturing as a percentage of GDP in the WAEMU has

fallen from 13.09% in 2002 to 9.78% in 2021, compared with 23.41% to 24.14% in the countries of East Asia and the Pacific over the same period.

Empirical work on the relationship between FDI and structural transformation has produced contradictory results. FDI can have positive effects on structural transformation (Ongo Nkoa, 2016; Hoekman et al., 2023). They can also have negative (Kang and Lee, 2011; Oduola, 2022) or neutral (Gui-Diby and Renard, 2015; Mamba et al., 2020) effects.

Although FDI contributes to structural transformation, institutional factors such as corruption control and democracy can play a catalytic role in this relationship. Indeed, studies have shown that the quality of institutions associated with FDI enhances structural transformation (Dazoué et al., 2023; Ongo Nkoa, 2023). According to North (1990) and Williamson (2000), institutions help reduce uncertainty and transaction costs, which can encourage investors to take the risk and invest. Moreover, investors are not motivated to invest in a country when corruption is present, as it increases the cost of doing business (Zallé and Ouédraogo, 2021). Corruption refers to the abuse of entrusted power for personal gain (Klitgaard et al., 2000; Transparency International, 2021). Democracy, on the other hand, can be defined as a system of governance in which power is managed and controlled by the people. WAEMU countries have a poor record in terms of institutional performance. According to World Bank data (2023b), the institutional quality index varied on average between -2.5 and 0 over the period 2002-2021 within the WAEMU. Corruption control and democracy showed respective averages of -0.67 and -0.31 over the same period (World Bank, 2023b).

Empirically, studies on the role of institutions in the analysis of structural transformation have not produced the same results. Some authors (Mijiyawa, 2017; Gbenga and Eseosa, 2022) show that institutions, and particularly the control of corruption and democracy improve manufacturing output, while other authors such as Effom and Emmanuel (2022) argue that institutions do not improve structural transformation.

Considering these debates and controversies, this research asks the following question: What is the role of corruption and democracy in the effects of FDI on structural transformation in WAEMU countries? The relationship between FDI and structural transformation has attracted a great deal of interest in economic literature. However, to our knowledge, very few studies have focused on the specific case of the UEMOA. Also, these studies have not explicitly considered the role of corruption and democracy in explaining this relationship. As a result, the aim of this research is to analyze the role of corruption and democracy in the effects of FDI on structural transformation in WAEMU countries. To achieve this objective, we formulate the

hypothesis that corruption control and democracy improve the effects of FDI on structural transformation in WAEMU countries.

This research uses annual data from an unbalanced panel of seven (07) WAEMU countries over the period 2002-2021. An autoregressive distributed lag a (ARDL) model is estimated using the Pooled Mean Group (PMG) estimator. The ARDL model allows both short-term and long-term dynamics to be considered.

The contribution of this research is threefold. Firstly, it extends and enriches the existing literature on the effects of FDI on structural transformation in developing countries in general and those of the WAEMU in particular. Secondly, unlike previous work (Asongu and Odhiambo, 2019; Dazoué et al., 2023) that focuses on the overall effect of institutional quality in explaining the effects of FDI on structural transformation, this research focuses on the direct effects of FDI on structural transformation but also on the interactive effects of corruption and democracy with FDI on structural transformation in the Union. Lastly, in line with the United Nations' Millennium Development Goals and the aspirations of the African Union's Agenda 2063, the implications of the latter aim to enable the Union's public officials to improve structural transformation in the WAEMU.

The rest of our work is organized into four (04) sections. The first section presents the literature review. The second section presents methodology and data. The third section presents and discusses the results. The last section concludes and draws policy implications from the results.

2. Literature review on the role of corruption and democracy in the effects of FDI on structural transformation

This section presents a theoretical and empirical review of the role of corruption and democracy in the effects of FDI on structural transformation.

2.1. Review of theoretical literature on the role of corruption and democracy in the effects of FDI on structural transformation

We present the theoretical debates explaining the relationship between FDI and structural transformation on the one hand, and the role of corruption and democracy in this relationship on the other.

2.1.1. Direct effects of FDI on structural transformation

The relationship between FDI and structural transformation can be assessed through dependency theory, endogenous growth theory and international trade theory.

According to dependency theory, FDI can have negative effects on structural transformation in host countries. The entry of foreign firms can hinder the development of the local industrial fabric, as they create a relationship of dependence with local companies in the production of various goods, as well as in the transfer of capital, technology and skills. This relationship of dependence hampers innovation and modernization in the host country's industrial sector.

According to endogenous growth theory (Romer, 1986; Lucas, 1988; Grossman and Helpman, 1991), FDI plays a driving role in the process of structural transformation. They promote capital accumulation, the creation of decent jobs and facilitate innovation through technological diffusion. They are also an important channel for mobilizing external savings. They also facilitate the reallocation of economic activity from agriculture to manufacturing.

However, international trade theorists (List, 1857; Krugman; 2000) show that FDI induced by trade openness can have adverse effects on local industries. This is because multinational firms, through their technological advances, create barriers to entry in certain sectors. This could put local companies in difficulty, and lead to underproduction in other sectors.

According to Rodriguez-Clare (1996), Markusen and Venables (1999) and Barrios et al. (2005), the link between FDI and structural transformation can be explained by a competition effect and a linkage effect. The competition effect is explained by the competitiveness resulting from competition between multinational firms and local enterprises in production, processing and marketing. The linkage effect can be explained by the complementarity between foreign and local companies in the production of goods. There are also spillover effects, which can be explained by the fact that the activities of multinational firms generate externalities on local firms. which can lead to an improvement in local industry (Barrios et al., 2005).

2.1.2. Effects of FDI on structural transformation: the theoretical role of corruption and democracy

Consideration of the role of corruption and democracy in the analysis of economic performance can be traced back to the New Institutional Economics (North, 1990; Williamson, 2000) through the theory of transaction costs. According to the New Institutional Economics approach, institutions reduce uncertainty by providing incentives and opportunities for

investors. In addition, combating corruption reduces transaction costs and investment costs. This can facilitate FDI inflows and therefore encourage investment in the manufacturing sector.

According to Klitgaard et al. (2000), corruption is a threat to economic and social development. It increases investment costs and reduces people's access to basic services. As a result, it discourages foreign investors and reduces investment initiatives in the industrial sector. To achieve this, these authors believe that corruption needs to be tackled by deterring monopolies, limiting discretionary powers and strengthening transparency, accountability and the rule of law.

According to Acemoglu (2009), institutions in general, and the fight against corruption and democracy in particular, are key to explaining long-term economic growth in countries. Indeed, good quality institutions (control of corruption, democracy) ensure the protection of property rights, the effective execution of contracts, innovation, citizen participation and transparency. This facilitates FDI inflows and structural transformation.

Rodrik and Subramanian (2003) show that good institutions lead to better economic performance. Indeed, institutions help to correct market failures, as they create, regulate, stabilize and legitimize markets. In this way, corruption control and democracy encourage the transfer of resources between sectors and improve competitiveness, all of which facilitate structural transformation.

2.2. Review of the empirical literature on the role of corruption and democracy in the effects of FDI on structural transformation

We present empirical arguments for the effects of FDI on structural transformation, followed by those for the effects of corruption and democracy on structural transformation.

2.2.1 Direct effects of FDI on structural transformation

Several studies have analyzed the effects of FDI on structural transformation. However, these studies have produced controversial results. Three (03) groups of authors stand out. The first group stresses the positive effects of FDI on structural transformation. The second group stresses the negative effects of FDI on structural transformation. The third group finds insignificant effects of FDI on structural transformation.

Based on the first group of authors, Blomström (1986) analyzed the effects of the presence of foreign firms on Mexican manufacturing performance over the period 1970-1975, using the ordinary least squares (OLS) method. He concludes that the efficiency of the Mexican

manufacturing sector is positively correlated with the presence of multinational firms. These findings are confirmed by Mühlen and Escobar (2019), who examine the effect of FDI on structural transformation in Mexico with a fixed-effect model over the period 2006-2016 and arrive at the results that FDI positively affects structural transformation in Mexico.

Emako et al. (2022a) study the effects of FDI on structural transformation in 44 developing countries over the period 1990-2018. They use a composite index of structural transformation and the Generalized Method of Moments (GMM). They find that inward FDI has a positive and significant effect on structural transformation. Emako et al. (2022b) examine the effect of FDI on structural change in Ethiopia using an ARDL model over the period 1981 to 2019. They find that FDI and domestic investment have a positive effect on structural change in Ethiopia.

Hoekman et al (2023) analyzes the relationship between FDI inflows and structural transformation of local markets in Africa with micro data over the period 1987-2019. Their results indicate a positive effect of FDI on structural transformation. In the same vein, Nsofor et al (2024) explore the impact of FDI on manufacturing growth in Sub-Saharan Africa (SSA) with an ARDL model over the period 1985-2021. Their results reveal that FDI has a positive effect on the manufacturing sector in the long term.

Examining the effect of Chinese FDI on the industrialization process of 49 African countries with the generalized method of moments and panel corrected standard error (PCSE) over the period 2003-2020, Darko and Xu (2022) show that Chinese FDI positively affects manufacturing value added in both the short and long term.

Mijiyawa (2017) identifies the drivers of structural transformation using a panel of 53 African countries over the period 1995-2014 using the GMM system and finds that FDI has a positive effect on manufacturing sector development.

Ngouhouo and Ewane (2020) examine the effects of FDI on industrialization in 23 African countries. distinguishing between franc zone and non-franc zone countries using the Pooled Mean Group (PMG) over the period 1990-2017. The results of their study show that FDI has a positive and significant effect on manufacturing value added in franc zone countries, but a negative and significant one in the non-franc zone.

Ongo Nkoa (2016) use the Generalized Method of Moments (GMM) system to analyze the effect of FDI on industrialization in 53 African countries over the period 1975-2014. The results show that FDI positively and significantly affects manufacturing value added.

Iddrisu et al (2015) assess the influence of FDI on industrial sector productivity in Ghana over the period 1980-2013 with a vector error correction model (VECM). The results show that FDI has a positive and significant effect on industrial performance in the long term.

Bouoiyour and Toufik (2007) studied the impact of FDI on the total factor productivity of local firms in 18 sectors of Moroccan manufacturing industry over the period 1987-1996. Their results show that FDI has a positive and significant impact on the productivity of the industrial sector.

Zongo and Diarra (2023) analyze the effects of FDI on industrial performance in SSA using Durbin's spatial method (SDM) over the period 1998-2018. They show that net FDI inflows have a direct and positive effect on industrial value added.

Zhang (2014) analyzes the relationship between FDI and industrial competitiveness in China over the period 2005-2010 with the ordinary least squares (OLS) method. The results indicate that inward FDI positively affects the competitiveness of Chinese manufacturing industries.

Evaluating the effect of FDI on economic growth using the instrumental variables method on a sample of 69 developing countries between 1970 and 1989, Borensztein et al. (1998) show that FDI positively affects the structural transformation of the host country, but only if the country has a minimum level of human capital.

For the second group of authors, FDI has a negative effect on structural transformation. Kang and Lee (2011) analyzed the relationship between FDI and deindustrialization in OECD countries using the Generalized Method of Moments (GMM). They find that FDI contributes to deindustrialization in OECD countries. In the same vein, Ongo Nkoa (2023) examined the relationship between FDI, institutional quality and industrialization in 42 African countries over the period 1996-2020 using the Generalized Method of Moments (GMM). The results show that FDI has a direct, negative and significant effect on manufacturing value added.

Studying the relationship between FDI, institutions and industrialization in Sub-Saharan Africa, Oduola et al. (2022) use OLS, fixed effects and GMM in system on a sample of 43 SSA countries over the period 1996-2018 and show that FDI exerts a negative and significant effect on manufacturing value added per capita.

Examining the relationship between FDI and manufacturing performance in Nigeria over the period 1970-2009, Victor (2013) uses the ARDL model and manages to show that in the long term FDI has a negative effect on Nigerian manufacturing.

Amara and Thabet (2012) study the effects of FDI on 138 delegations along the Tunisian coast over the period 1998-2004, with the results showing that FDI has a negative effect on

manufacturing value added. Also, Adabor et al (2023) explore the impact of FDI on manufacturing growth in Ghana over the period 1980-2019 with the ARDL model. The results show that FDI negatively influences manufacturing sector growth.

For the third group of authors, FDI has no significant effect on structural transformation. Akiana Mfere and Makosso (2023) empirically evaluate the effects of FDI on industrial performance in the Central African Economic and Monetary Community (CAEMC) over the period 2000-2020 using the generalized method of moments. Their results indicate that FDI has no effect on structural transformation in CAEMC countries. Similarly, Gui-Diby and Renard (2015) examined the relationship between FDI and the industrialization process in Africa using a sample of 49 countries over the period 1980-2009 with the method of fixed and random effects. They conclude that inward FDI has no significant effect on manufacturing value added.

Henri et al (2018) studied the relationship between Chinese FDI and industrialization. They used the generalized method of moments on a panel of 41 African countries over the period 2003-2015. The results of their research show that Chinese FDI has no significant effect on the industrialization of African countries.

Mamba et al (2020) assessed the effect of FDI on structural transformation in WAEMU countries over the period 1990-2017 using the panel corrected standard error (PCSE) method. The results indicate that FDI has no significant effect on manufacturing output in WAEMU countries. Studying the relationship between foreign direct investment and industrialization, Kriaa et al., (2017) use the generalized method of moments with instrumental variables over the period 1980-2015. They conclude that FDI has not contributed to Africa's industrialization. Similarly, Topcu (2016) analyzes the effects of FDI on the industrialization of 19 developing countries over the period 2000-2013 with OLS, fixed effects and dynamic effects. He finds that FDI has no effect on industrialization in developing countries.

2.2.2. The role of corruption and democracy in the effects of FDI on structural transformation: an empirical review

Most empirical studies show that the relationship between institutional quality and structural transformation is positive. However, a few works argue that there may be a negative relationship between institutional quality and structural transformation. The relationship between institutional quality and transformation may also depend on the specific type of institution.

Che et al (2017) study the impact of institutional quality on Chinese companies from 1998 to 2005. They find that institutional quality has a positive and significant effect on the

performance of Chinese companies. Ongo Nkoa (2023) examined the role of institutions on the contribution of FDI to industrialization in 42 African countries over the period 1996-2020, using the Generalized Method of Moments (GMM). The results show that the institutional quality index has a positive effect on manufacturing value added. Moreover, the interaction between FDI and institutional quality improves industrialization. However, he shows that corruption and democracy are not conducive to structural transformation. Also, Ibrahim (2021) evaluates the effect of institutional quality on structural transformation in SSA using the system generalized method of moments on a sample of 46 countries over the period 2002-2018. It finds that institutional quality improves structural transformation.

Asongu and Odhiambo (2019) examine the role of governance in modulating the effects of capital flight on industrialization in Africa using the generalized method of moments over the period 1996-2010. Their study shows that governance improves industrialization. In the same vein, Dazoué et al. (2023) used dynamic least squares (DOLS) and fully modified least squares (FMOLS) over the period 2006-2009 to show that institutional quality improves the effect of FDI on industrialization in 39 SSA countries.

Analyzing the effect of institutions on industrial performance in SSA through the generalized method of moments (GMM) over the period 1997-2016, Totouom et al. (2019) show that the quality of institutions significantly and positively affects structural transformation in SSA. They conclude that corruption control and democracy have positive and significant effects on industrial development in SSA countries. Also, Mijiyawa (2017) identifies the determinants of structural transformation in Africa and shows that good governance and particularly the control of corruption and democracy positively and significantly affect structural transformation in African countries.

Gbenga and Eseosa (2022) studied the correlation between governance and industrialization in the Nigerian economy using an ARDL model for the period 1996 to 2020. The result indicates that corruption control and democracy favor industrial production in both the short and long term. Adabor et al. (2023) investigate the role of institutional quality in the relationship between FDI and manufacturing growth in Ghana over the period 1980 to 2019 with the ARDL model. The results show that institutional quality boosts the impact of FDI on manufacturing sector growth.

However, Effom and Emmanuel (2022) assess the role of institutions in SSA's manufacturing performance with Pooled Mean Group Autoregressive Distributed Lag (PMG-ARDL) and Augmented Mean Group (AMG) estimators. They find that institutions do not improve industrialization in SSA. More specifically, they show that corruption control and

democracy have a negative and significant effect on the development of the manufacturing sector. Koné et al (2023) analyze the link between governance and industrialization in Mali over the period 2005-2021. They conclude that democracy has a positive effect on industrialization, while the fight against corruption has a negative effect on industrialization.

In summary, the literature shows that empirical work on the relationship between corruption, democracy, FDI and structural transformation remains contradictory. Some authors have found that institutions and FDI enhance structural transformation, while others have found negative or insignificant effects. The shortcomings that emerge from the literature are few studies for the specific case of the UEMOA, failure to consider the specific role of corruption and democracy in the relationship between FDI and structural transformation. Thus, the study of the relationship between corruption, democracy, FDI and structural transformation remains relevant in UEMOA countries.

3. Methodology and data

This section presents the methodological framework. data and variables. The methodological approach consists firstly of specifying the econometric model. Secondly, it presents the data and variables. Thirdly, it presents the preliminary tests and the estimation method chosen for the econometric estimation.

3.1 Model specification

This research analyzes the role of corruption and democracy in the effects of FDI on structural transformation. To this end, we draw on Borensztein et al. (1998), Gui-Diby and Renard (2015) and Ongo Nkoa (2016) to specify the empirical model. For these authors, FDI directly and indirectly influences structural transformation. The models to be estimated are as follows:

❖ Direct effects of FDI on structural transformation

$$MVA_{i,t} = \alpha_0 + \alpha_1 FDI_{i,t} + \alpha_2 INST_{i,t} + \alpha_3 GFCE_{i,t} + \alpha_4 KH_{i,t} + \alpha_5 TO_{i,t} + \alpha_6 ELEC_{i,t} + \alpha_7 POP_{i,t} + \varepsilon_{i,t} \quad (1)$$

❖ Interactive effects of corruption and democracy with FDI on structural transformation

$$MVA_{i,t} = \beta_0 + \beta_1 FDI_{i,t} + \beta_2 INST_{i,t} + \beta_3 INTER_{i,t} + \beta_4 FGCE_{i,t} + \beta_5 KH_{i,t} + \beta_6 TO_{i,t} + \beta_7 ELEC_{i,t} + \beta_8 POP_{i,t} + \varepsilon_{i,t} \quad (2)$$

In both models, i is the country index, t is the time index, MVA is manufacturing value added (proxy for measuring structural transformation), FDI stands for foreign direct investment, INST is the variable corruption or democracy, introduced alternately in the regression, INTER is the interaction term between FDI and corruption or FDI and democracy, introduced alternately in the regression, GFCF is gross fixed capital formation, KH is human capital, TO is trade openness, ELEC is access to electricity, POP is the labor force and ε is the error term.

3.2. Data and variables

This section describes the data and variables.

3.2.1. Data description

We use annual data. They cover a non-cylindrical panel of seven (07) WAEMU countries¹ over the period 2002-2021. Guinea-Bissau is excluded from the study due to insufficient data. The year 2002 as the start of our study is explained by the fact that annual data on corruption and democracy are available from 2002 onwards. The year 2021 is justified by the availability of data for all study variables. The data come mainly from three (03) sources: the World Development Indicators (WDI) database, the World Governance Indicators (WGI) database of the World Bank (2023a, b) and the Human Assets Index (HAI) database of the Foundation for International Development Studies and Research (FERDI, 2023).

3.2.2. Description of variables

Three types of variables are presented in this research: the dependent variable, the independent variables of interest and the control variables.

The dependent variable is structural transformation. It is measured by manufacturing value added (MVA) as a percentage of GDP. MVA is much more widely used in the literature (Gui-Diby and Renard, 2015; Mijiyawa, 2017) to measure structural transformation.

The independent variables of interest are: FDI, control of corruption and democracy. Foreign direct investment (FDI) is measured by net inward FDI flows as a percentage of GDP. According to Blomström (1986) and Ongo Nkoa (2016), FDI improves the manufacturing performance of host countries. The expected sign of the coefficient of this variable is positive.

Corruption control (CC) captures the extent to which public power is exercised for private ends. It ranges from -2.5 (lowest level of corruption control) to 2.5 (highest level of corruption control). Corruption control improves structural transformation (Totouom et al.,

¹ The list of sample countries includes Benin, Burkina Faso, Ivory Coast, Mali, Niger, Senegal and Togo.

2019; Gbenga and Eseosa, 2022). The expected sign of the coefficient of this variable is positive.

Voice and accountability (VA) measure the extent to which a country's citizens participate in selecting their rulers, as well as freedom of expression, association and the press. It ranges from -2.5 (low level of democracy) to 2.5 (high level of democracy). According to Sen (2006) and Acemoglu et al. (2008), democracy improves economic performance. The expected sign of the coefficient on this variable is positive.

Referring to the literature on the determinants of structural transformation, the control variables used are domestic investment, human capital, trade openness, labor force and access to electricity.

Domestic investment (DI) is measured by gross fixed capital formation (GFCF) as a percentage of GDP. Domestic investment can contribute to the improvement of the manufacturing industry through infrastructure. The expected sign of this variable's coefficient is positive.

Human capital (KH) is measured by the Human Capital Index. This indicator represents the quality of a country's workforce in terms of skills, education and health. According to Borensztein et al. (1998), human capital enables the absorption of technologies that are necessary for the development of the manufacturing sector. The expected sign of the coefficient on this variable is positive.

Trade openness (TO) is measured by the sum of exports and imports as a percentage of GDP. It can contribute to the process of structural transformation by facilitating the transfer of skills and technologies through the entry of multinational firms into host countries (Moudouté, 2023). The expected sign of the coefficient of this variable is positive.

The labor force (POP) is measured by the population aged 15 to 64 as a percentage of the total population. It represents an important workforce for the development of the manufacturing sector. The expected sign of this variable's coefficient is positive.

Access to electricity (ELEC) measures the proportion of a country's population with access to a reliable source of electricity. It can have a significant effect on structural transformation, as it facilitates industrial production, human capital formation and technological development. The expected sign of this variable's coefficient is positive.

Table 1 presents the variables, their definitions, expected signs and sources.

Table 1: Variables, definitions, expected signs and sources

Variables	Definitions	Expected signs	Sources
Manufacturing value added (MVA)	Manufacturing value added refers to the net output of the manufacturing sector.		WDI
Foreign direct investment (FDI)	Net inflow of investment aimed at acquiring a lasting management interest (10% or more of shares with voting rights) in a company operating in an economy other than that of the investor	+	WDI
Control of Corruption (CC)	It reports on the extent to which public power is exercised for personal gain	+	WGI
Voice and accountability (VA)	Measures the extent to which a country's citizens participate in the selection of their rulers. as well as freedom of expression. association and the press.	+	WGI
Gross fixed capital formation (GFCF)	Gross fixed capital formation refers to investment in infrastructure and the purchase of capital goods.	+	WDI
Human capital (KH)	Composite indicator made up of six (06) sub-indicators: under-5 mortality rate, maternal mortality rate, prevalence of backwardness, secondary school enrolment rate, adult literacy rate and gender parity index for secondary school enrolment.	+	FERDI
Trade openness (TO)	The sum of exports and imports as a percentage of GDP	+	WDI
Labor force (POP)	The total population aged 15 to 64 as a percentage of total population.	+	WDI
Access to electricity (ELEC)	Access to electricity is the percentage of the population with access to electricity.	+	WDI

Source: Authors

Table 2 presents descriptive statistics for the variables over the period 2002-2021. Manufacturing value added as a percentage of GDP in the WAEMU averages 11.39%. This demonstrates the low level of structural transformation within the Union. It ranges from a minimum of 5.45% to a maximum of 21.59%. The dispersion around the average is low. with an estimated standard deviation of 3.84%. This reflects a low level of disparity or heterogeneity between the economies of UEMOA countries in terms of structural transformation. Cote d'Ivoire is the only UEMOA country with a high level of structural transformation (Figure A1. appendix).

The average value of FDI is 2.27%. with a minimum value of -2.57% and a maximum value of 13.44%. Its standard deviation is estimated at 2.42%. This reflects a certain disparity in the distribution of FDI to WAEMU countries. Senegal has been the main destination for FDI in the UEMOA zone since 2018 (Figure A2. in appendix).

Corruption control and democracy show negative averages. This indicates a low level of control of corruption and democracy in WAEMU countries. However, these countries have achieved significant scores in recent years. Mali is the only country to have made no progress in fighting corruption and promoting democracy (Figures A3 and A4, appendix).

Table 2: Descriptive statistics for variables, 2002-2021

Variables	Observations	Mean	Standard deviation	Minimum	Maximum
MVA	135	11.392	3.838	5.453	21.587
FDI	140	2.275	2.418	-2.575	13.439
CC	140	-0.667	0.395	-1.597	0.248
VA	140	-0.307	0.472	-1.384	0.408
GFCF	140	20.401	4.637	12.844	34.031
KH	140	38.024	13.572	10.42	68.008
TO	140	54.798	11.876	30.368	87.006
ELEC	140	35.108	18.659	7.1	71.137
POP	140	52.402	2.261	48.397	56.656

Source: Authors

Table A.1 of the variable correlation matrix (in appendix) shows that there is no risk of multicollinearity, as the variables are not strongly correlated. FDI is negatively and significantly correlated with MVA at the 1% threshold, with an estimated value of -0.26. This means that WAEMU countries with more FDI tend to have a low structural transformation of their economies. This can be explained by the fact that most inward FDI in UEMOA countries is directed towards extractive industries, to the detriment of the manufacturing sector.

Control of corruption, human capital and access to electricity are positively and significantly correlated with MVA at the 1% threshold, with estimated correlation coefficients of 0.36, 0.37 and 0.33, respectively. Corruption control is positively associated with structural transformation in WAEMU countries. This is because controlling corruption reduces transactions and investment costs. This facilitates the development of the manufacturing sector,

Voice and accountability and working population are positively and significantly correlated with MVA at the 5% threshold. The respective correlation coefficients are 0.22 and 0.59. Democracy ensures a country's international credibility. As a result, it attracts foreign investors and stimulates the development of the manufacturing sector.

3.3. Preliminary tests and choice of estimation method

In this subsection, we present a series of standard tests on the equations and variables of the models to be estimated. We briefly present the homogeneity test, the inter-individual independence test, the stationarity test and the cointegration test. Finally, we present the error-correction model and the estimation method.

- **Heterogeneity-homogeneity specification test**

Homogeneity tests are important when estimating panel data. These tests are used to check whether the data are homogeneous or heterogeneous. The most used tests are those of Hsiao (2003) and Fisher.

We use Fisher's test to verify homogeneity. This test involves a trade-off between the specific effect (existence of specific characteristics for everyone) and the overall effect (absence of specific characteristics for everyone). The principle of the test is to test the null hypothesis of the absence of individual effects in the data against the alternative hypothesis of the presence of individual effects in the data. The null hypothesis of no individual effects is rejected if the p-value is less than 5%. Table 3 shows the results of the specification test.

Table 3: Specification test

Models	Statistics	P-values
Model 1	53.61	0.000
Model 2	57.75	0.000

Source: Authors

According to the estimates, we have p-values of less than 5% in both (02) models. The null hypothesis of no individual effects cannot therefore be accepted. Consequently, there is a specific individual effect. This confirms the presence of individual heterogeneity. The individual effect model is more appropriate.

- **Inter-individual independence test**

We use the Lagrange Multiplier test of individual interdependence developed by Breusch and Pagan (1979). To do this, we test the null hypothesis of inter-individual non-dependence of variables against the alternative hypothesis of inter-individual dependence. The null hypothesis is rejected when the p-value associated with the Chi2 statistic is less than 5%. Table 4 shows the results of Breusch and Pagan's inter-individual dependence test.

Table 4: Breusch and Pagan inter-individual dependence test

Models	Statistics	P-values
Model 1	35.51	0.000
Model 2	35.94	0.000

Source: Authors

The p-values associated with the Chi2 statistics are zero for both (02) models. We cannot therefore accept the null hypothesis of inter-individual non-dependence at the 5% threshold. As a result, the use of first-generation stationarity tests is ineffective. This leads us to test second-generation stationarity, which admits inter-individual dependence.

- **Stationarity test**

The study of the stationarity of variables is of practical interest only when the time dimension (T) is sufficiently long. Since the time dimension of our research is quite large (T = 20), it is necessary to check the stationarity of the variables before estimation. Non-stationarity can lead to spurious regressions (biased estimators) and diagnostic errors (invalid significance tests).

We use the Fisher-type stationarity test based on Augmented Dickey-Fuller (ADF) to test the stationarity of the variables. The choice of the Fisher test is justified by the fact that we are working on a non-cylindrical panel. The null hypothesis of this test assumes that all series are non-stationary or admit a unit root, against the alternative hypothesis that only a fraction of the series is stationary. If the p-value is below the test's critical threshold, the null hypothesis is rejected. The stationarity test shows that FDI and labor force are stationary and integrated of order 0. Variables such as MVA, control of corruption, democracy, gross fixed capital formation, human capital, trade openness and access to electricity are stationary and integrated of order 0 (Table A.3, in Appendix). This order of integration leads us to the study of cointegration between variables.

- **Cointegration test**

The principle of this test is to test the null hypothesis that there is no cointegration against the alternative hypothesis that all panels are cointegrated. Several tests are used in literature to test for cointegration. These include the tests of Kao (1999), Pedroni (2004) and Westerlund (2007). These tests have different decision rules. According to Kao (1999), the null hypothesis of no cointegration is rejected when the p-value associated with the unadjusted Dickey-Fuller test statistic is less than 5%. For Pedroni (2004), this hypothesis is rejected if the p-value associated with the Augmented Dickey-Fuller statistic is less than 5%. As for Westerlund (2007), it is rejected if the p-value associated with the variance ratio statistic is less than 5%. We use the Kao (1999) test to verify cointegration.

The results of the Kao test presented in Table 5 confirm that there is a cointegrating relationship between the variables in our models, since the p-value of the unadjusted Dickey-Fuller statistics is less than 5%. This leads us to present an error-correction model (ECM).

Table 5: Kao cointegration test

	Model 1	Model 2
Tests	P-values	
Modified Dickey-Fuller t	0.0022	0.0004
Dickey-Fuller t	0.0004	0.0002
Augmented Dickey-Fuller t	0.0001	0.0001
Unadjusted modified Dickey-Fuller t	0.0001	0.0000
Unadjusted Dickey-Fuller t	0.0001	0.0001

Source: Authors

- **Error correction model (ECM)**

The ECM models both short-term dynamics (first difference variables) and long-term dynamics (level variables) between the explanatory variable and the explained variable. In this case, the ARDL model of Pesaran et al. (1999) is more appropriate. This model is effective in the presence of integrated variables of order 0 and order 1. Given that the variables are integrated in order 0 and 1, we use the ARDL (1.1) models. The ARDL models associated with the two models are specified as follows:

- ❖ **Direct effects of FDI on structural transformation**

$$MVA_{i,t} = \mu_i + \gamma MVA_{i,t-1} + \alpha_1 FDI_{i,t} + \alpha_2 INST_{i,t} + \alpha_3 GFCE_{i,t} + \alpha_4 KH_{i,t} + \alpha_5 TO_{i,t} + \alpha_6 ELEC_{i,t} + \alpha_7 POP_{i,t} + \alpha'_1 FDI_{i,t-1} + \alpha'_2 INST_{i,t-1} + \alpha'_3 GFCE_{i,t-1} + \alpha'_4 KH_{i,t-1} + \alpha'_5 TO_{i,t-1} + \alpha'_6 ELEC_{i,t-1} + \alpha'_7 POP_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

- ❖ **Interactive effects of corruption and democracy with FDI on structural transformation**

$$MVA_{i,t} = \theta_i + \delta MVA_{i,t-1} + \beta_1 FDI_{i,t} + \beta_2 INST_{i,t} + \beta_3 INTER_{i,t} + \beta_4 GFCE_{i,t} + \beta_5 KH_{i,t} + \beta_6 TO_{i,t} + \beta_7 ELEC_{i,t} + \beta_8 POP_{i,t} + \beta'_1 FDI_{i,t-1} + \beta'_2 INST_{i,t-1} + \beta'_3 INTER_{i,t-1} + \beta'_4 GFCE_{i,t-1} + \beta'_5 KH_{i,t-1} + \beta'_6 TO_{i,t-1} + \beta'_7 ELEC_{i,t-1} + \beta'_8 POP_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

The error correction models that can be associated with the various ARDL models defined above are written as follows:

❖ **Direct effects of FDI on structural transformation**

$$\begin{aligned} \Delta MVA_{i,t} = & \mu_i + \gamma(MVA_{i,t-1} + \alpha_1 FDI_{i,t} + \alpha_2 INST_{i,t} + \alpha_3 GFCE_{i,t} + \alpha_4 KH_{i,t} + \alpha_5 TO_{i,t} \\ & + \alpha_6 ELEC_{i,t} + \alpha_7 POP_{i,t}) + \alpha_1^* \Delta FDI_{i,t-1} + \alpha_2^* \Delta INST_{i,t-1} + \alpha_3^* \Delta GFCE_{i,t-1} + \\ & \alpha_4^* \Delta KH_{i,t-1} + \alpha_5^* \Delta TO_{i,t-1} + \alpha_6^* \Delta ELEC_{i,t-1} + \alpha_7^* \Delta POP_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (5)$$

❖ **Interactive effects of corruption and democracy with FDI on structural transformation**

$$\begin{aligned} \Delta MVA_{i,t} = & \mu_i + \gamma(MVA_{i,t-1} + \alpha_1 FDI_{i,t} + \alpha_2 INST_{i,t} + \alpha_3 GFCE_{i,t} + \alpha_4 KH_{i,t} + \alpha_5 TO_{i,t} + \\ & \alpha_6 ELEC_{i,t} + \alpha_7 POP_{i,t}) + \alpha_1^* \Delta FDI_{i,t-1} + \alpha_2^* \Delta INST_{i,t-1} + \alpha_3^* \Delta GFCE_{i,t-1} + \alpha_4^* \Delta KH_{i,t-1} \\ & + \alpha_5^* \Delta TO_{i,t-1} + \alpha_6^* \Delta ELEC_{i,t-1} + \alpha_7^* \Delta POP_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (5)$$

where α and β represent the long-term parameter vectors, α^* and β^* the short-term parameter vectors and the recall forces of models 1 and 2, respectively. The model is valid if the estimated coefficients are significant, negative and of modulus less than unity, denotes the first difference operator. and denote the individual effects and represent the error terms.

• **Estimation methods**

Several methods can be used for econometric estimation: least squares (OLS) and instrumental variables (DMC and GMM). These methods are subject to several criticisms. The presence of the lagged variable in the explanatory variables leads to endogeneity bias. OLS is therefore inappropriate. However, these methods are ineffective in our case. given the small sample size and the conditions on the individual dimension (large N) and the temporal dimension (small T). Pesaran et al. (1999) have developed more robust estimators to address these concerns. These are the Mean group (MG) and Pooled mean group (PMG) estimators. The MG estimator assumes perfect heterogeneity between individuals. It allows the short- and long-term coefficients to differ between individuals. The PMG estimator, on the other hand, assumes the heterogeneity of short-term coefficients and the homogeneity of long-term coefficients. This estimator assumes that short-term coefficients differ between individuals and that long-term coefficients are the same for all individuals. In this research, we use the more efficient PMG estimator.

4. Presentation and discussion of results

This section presents the main results obtained.

4.1. Basics results

Table 6 presents the results of the long-term analysis of the direct effects of FDI on structural transformation in the WAEMU². The coefficient of the restoring force is negative, less than 1 and significant at the 1% level for all specifications. The estimates show that foreign direct investment has a positive and significant effect on manufacturing value added at the 1% level. Indeed, an increase in inward FDI of 1 percentage point in each of the specifications (1 and 2) leads to an increase in manufacturing value added of 0.37 and 0.52 percentage points respectively. This result confirms the importance of FDI in structural transformation in UEMOA countries. This result is explained by the fact that FDI brings in capital and technologies that are necessary for the modernization and development of the manufacturing sector. As a result, a policy of attracting FDI to the manufacturing sector helps to ensure structural transformation in UEMOA countries. Our results are in line with those of Iddrisu et al. (2015) and Emako et al. (2022a, b).

Controlling corruption has a positive and insignificant effect on manufacturing value added up to the 10% threshold. This can be explained by the fact that anti-corruption measures are not effective. Investors are prepared to sign tacit agreements with certain officials to win contracts. In so doing, they will evade anti-corruption institutions.

Voice and accountability have a positive and significant effect on manufacturing value added. Indeed, a 1point improvement in the democracy score leads to a 1.97 percentage point increase in manufacturing value added. This shows that democracy favors structural transformation in WAEMU countries. This result can be explained by the fact that democracy ensures investor confidence and the security of their investments. This implies that the promotion of democracy is necessary to accelerate the process of structural transformation in WAEMU countries. This result corroborates those of Totouom et al. (2019) and Gbenga and Eseosa (2022).

As for the control variables, human capital is positive and significant at the 1% level. Its coefficient is 0.12. Thus, an improvement in human capital leads to an increase in manufacturing value added of 0.12 percentage points. This confirms the importance of human capital in structural transformation in UEMOA countries. Indeed, quality training and access to quality healthcare facilitate the absorption of new technologies and innovation. This implies that policies that improve access to education, vocational training and healthcare are important

² Short-term results are not significant, so we have not presented these results.

for structural transformation in UEMOA countries. These results are similar to those of Borensztein et al. (1998) and Bouwane (2023).

Gross fixed capital formation, trade openness, access to electricity and working population have negative and significant effects at the 1% level. For gross fixed capital formation, the sign is negative and significant at the 1% level. Its value is -0.48 in specification (1) and -0.57 in specification (2). Thus, a one percentage point increase in domestic investment in each of the specifications (1 and 2) leads to a 0.48 and 0.57 percentage point drop in manufacturing value added, respectively. These results are not in line with theoretical expectations. The absence of a positive and significant effect of gross fixed capital formation can be explained by the quality of domestic investments, on the one hand, and by the sectors in which these investments were made, on the other. These results confirm those found by Guidiby and Renard (2015).

For trade openness, the sign is negative and significant at the 1% level. This means that a 1 point of percentage increase in trade openness in each of the specifications (1 and 2) leads to a 0.07 point of percentage drop in manufacturing value added in specification (1) and a 0.04 point of percentage drop in specification (2). This can be explained by the fact that when economies are open and countries are exporters of raw materials, local industries will lose competitiveness to multinational firms. These results are in line with those of List (1857) and Krugman (2000).

In the case of access to electricity, the sign is negative and significant at the 1% level. This means that a 1 point of percentage increase in access to electricity leads to a 0.14 point percentage drop in manufacturing value added. The sign does not conform to theoretical expectations. This can be explained in terms of the quality of the electricity supplied. In fact, load shedding and voltage drops lead to a drop in production and productivity.

For the labor force, the coefficient is negative and significant at the 1% level. An increase in the working population of one percentage point in each of the specifications (1 and 2) translates respectively into a drop in manufacturing value added of 1.89 and 0.90 percentage points. These results are not in line with theoretical expectations. The absence of a positive effect of labor on manufacturing value added may be explained by the under-utilization of labor or the lack of adequate skills for the structural transformation process.

Table 1 : Directs effects of FDI on structural transformation in WAEMU

Estimation method: PMG		
Variables	Manufacturing value added (% of GDP)	
	(1)	(2)
Error correction	-0.342** (0.159)	-0.383** (0.157)
Foreign direct investment	0.366*** (0.097)	0.520*** (0.070)
Gross Formation brute capital fixe	-0.477*** (0.089)	-0.565*** (0.055)
Human capital	0.115*** (0.028)	0.025 (0.019)
Trade openness	-0.069*** (0.022)	-0.043*** (0.011)
Access to electricity	-0.137*** (0.037)	-0.045 (0.034)
Labor force	-1.892*** (0.295)	-0.899*** (0.190)
Control of corruption	1.326 (1.023)	
Voice and accountability		1.968*** (0.490)
Constant	42.150** (19.510)	27.760** (11.540)
Observation	128	128

Note: ***, **, *, significance levels at 1%, 5% and 10%, respectively. Robust standard errors in brackets.

Source: Authors

Table 7 presents the results of the interactive effects of corruption and democracy with FDI on structural transformation in the WAEMU. The coefficient of the recall force is negative, less than 1 and significant at the 1% level for all specifications.

The coefficient associated with the interactive variable foreign direct investment and control of corruption is positively and significantly related to structural transformation at the 1% level. Indeed, a one-point increase in the interactive effect between foreign direct investment and corruption control leads to a 1.07 percentage-point increase in manufacturing value added. This means that FDI and corruption control interact to improve structural transformation in UEMOA countries. This is because fighting corruption reduces transaction and investment costs, which in turn facilitates FDI inflows and stimulates structural transformation. These results confirm the work of Adabor et al. (2022) and Dazoué et al. (2023).

The coefficient associated with the interactive foreign direct investment and democracy variable is positively and significantly related to structural transformation at the 5% threshold. Thus, an increase in the interactive effect between foreign direct investment and democracy of 1 point leads to an increase in manufacturing value added of 0.25 percentage points. This means that FDI combined with a high level of democracy can improve structural transformation in WAEMU countries. Indeed, democracy helps to ensure a country's credibility and political stability. As a result, it encourages domestic investors and attracts foreign investors. These results corroborate those of Adabor et al. (2022) and Dazoué et al. (2023).

Table 2 : Interactive effects of corruption control and democracy with FDI on structural transformation

Estimation method: PMG		
Variables	Manufacturing value added (% of GDP)	
	(1)	(2)
Error correction	-0.596** (0.236)	-0.430** (0.171)
Foreign direct investment	0.260** (0.107)	0.039* (0.021)
Gross formation capital fixe	0.034 (0.030)	-0.437*** (0.014)
Human capital	0.031*** (0.011)	-0.046*** (0.004)
Trade openness	-0.151*** (0.009)	-0.033*** (0.003)
Access to electricity	0.026 (0.031)	0.027*** (0.009)
Labor force	-1.452*** (0.147)	-0.733*** (0.034)
Corruption	-4.469*** (0.618)	
Interaction between FDI and Control of corruption	1.072*** (0.282)	
Democracy		2.842*** (0.205)
Interaction between FDI and Democracy		0.253** (0.127)
Constante	55.250** (21.690)	26.910** (10.810)
Observation	128	128

Note: ***, **, *, significance levels at 1%, 5% and 10%, respectively. Robust standard errors in brackets.

Source: Authors

4.2. Robust analysis of results

To analyze the robustness of the results, we replace the control of corruption and democracy from the Worldwide Governance Indicators (WGI) database (2023b) with corruption and democratic accountability from the International Country Risk Guide (ICRG) database.

Table 8 presents the results of the robustness test for the direct effects of FDI on long-term structural transformation. FDI has a positive effect on long-term structural transformation in the WAEMU. These results therefore confirm those of previous estimates (Table 6).

Table 3 : Direct effects of FDI on structural transformation: robustness test

Estimation method: PMG		
Variables	Manufacturing value added (% of GDP)	
	(1)	(2)
Error correction	-0.444** (0.189)	-0.421*** (0.155)
Foreign direct investment	0,308*** (0,110)	0,497*** (0,128)
Gross formation capital fixe	-0,467*** (0,098)	-0,562*** (0,115)
Human capital	0,028 (0,045)	0,008 (0,041)
Trade openness	-0,041** (0,016)	-0,014 (0,020)
Access to electricity	-0,034 (0,054)	-0,055 (0,051)
Labore force	-1,534*** (0,354)	-1,055*** (0,340)
Corruption	1,495** (0,721)	
Democratic accountability		0,961*** (0,294)
Constante	44,750** (19,200)	32,380*** (12,150)
Observation	109	109

Note: ***, **, *, significance levels at 1%, 5% and 10%, respectively. Robust standard errors in brackets.

Source: Authors

Table 9 presents the results of the robustness test of the interactive effects of corruption and democracy with FDI on structural transformation. Corruption control and democracy improve the effects of FDI on structural transformation in the long term. These results therefore confirm those of previous estimates (Table 7).

Table 4 : Interactive effects of corruption and democracy with FDI on structural transformation: a robustness test

Estimation method: PMG		
Variables	Manufacturing value added (% of GDP)	
	(1)	(2)
Error correction	-0.599** (0.248)	-0.499** (0.181)
Foreign direct investment	3.995** (0.856)	0.040 (0.194)
Gross formation capital fixe	0.034 (0.030)	-0.317*** (0.060)
Human capital	0.031*** (0.011)	-0.015*** (0.029)
Trade openness	-0.151*** (0.009)	-0.034*** (0.016)
Access to electricity	0.026 (0.031)	0.116*** (0.045)
Labor force	-1.452*** (0.147)	-0.465* (0.262)
Corruption	-2.772*** (0.452)	
Interaction between FDI and Corruption	0.348* (0.189)	
Democratic accountability		2.622*** (0.529)
Interaction between FDI and Democratic accountability		0,096*** (0.157)
Constant	19.340** (9.000)	23.360** (8.436)
Observation	109	109

Note: ***, **, *, significance levels at 1%, 5% and 10%, respectively. Robust standard errors in brackets.

Source: Authors

5. Conclusion and policy implications

This research analyzed the role of corruption and democracy in the effects of foreign direct investment on structural transformation in WAEMU countries. To this end, we estimated an autoregressive staggered lag model (ARDL) on panel data from seven (07) countries over the period 2002-2021. The results show that FDI has a direct, positive and significant effect on long-term structural transformation in WAEMU countries. In addition, corruption control and democracy improve the effects of FDI on structural transformation in WAEMU countries. This

confirms the hypothesis that corruption control and democracy improve the effects of FDI on structural transformation in WAEMU countries.

These results suggest that public decision-makers in WAEMU countries should, as part of their vision of structural transformation, improve the attractiveness of FDI, particularly in the manufacturing sector. To do so, they need to improve the business climate to further encourage FDI inflow into the manufacturing sector. These countries should also fight corruption and promote democracy by initiating awareness-raising campaigns, setting up anti-corruption committees within structures to ensure transparency, strengthening the rule of law and organizing credible elections to ensure political stability.

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Appendix

Table A.1: Variable correlation matrix, 2002-2021

Variables	MVA	FDI	CC	VA	GFCF	KH	TO	ELEC	POP
MVA	1,000								
FDI	-0,264***	1,000							
CC	0,356***	-0,084	1,000						
VA	0,220**	-0,054	-0,038	1,000					
GFCF	-0,108	0,614***	0,077	0,226***	1,000				
KH	0,366***	-0,009	0,187**	0,003	0,254***	1,000			
TO	-0,041	0,181**	-0,102	-0,313***	-0,045	0,469***	1,000		
ELEC	0,332***	-0,066	-0,162*	-0,136	0,101	0,726***	0,367***	1,000	
POP	0,586**	-0,275***	0,413***	-0,168**	-0,155*	0,675***	0,452***	0,600***	1,000

Note: Variables in brackets are p-values. ***, **, *, significance levels at 1%, 5%, and 10%.

Source: Authors

Table A.2: Variance inflation factors (VIF)

Variables	VIF	1/VIF
POP	4,64	0,216
KH	4,265	0,234
ELEC	4,062	0,246
CC	2,907	0,344
TO	2,835	0,353
GFCF	2,51	0,398
FDI	2,286	0,438
VA	1,494	0,669
Mean VIF	3,125	

Source: Authors

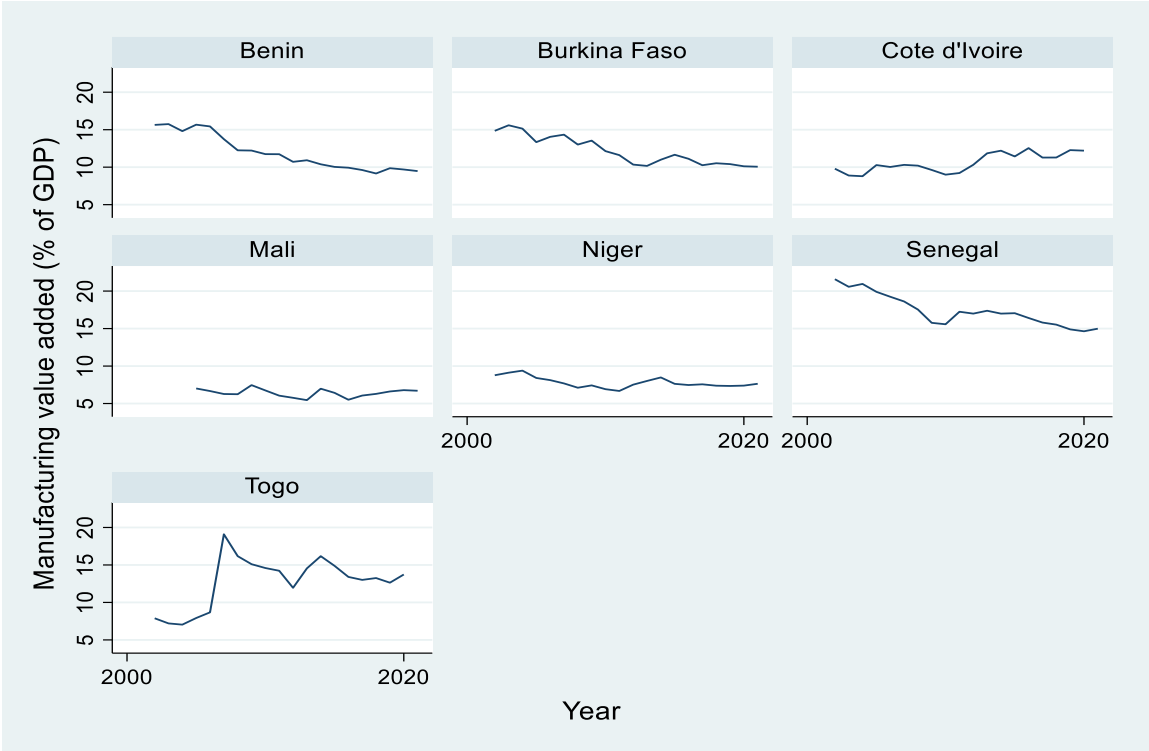
Table A.3: Results of variable stationarity test

Variables	P-Statistic	Z-Statistic	L*	Pm	Order of integration	Decision
MVA	107.0221 (0.0000)	-8.6594 (0.0000)	-11.2983 (0.0000)	17.5795 (0.0000)	I (1)	Stationary
FDI	34.7827 (0.0016)	-3.3054 (0.0005)	-3.6552 (0.0004)	3.9276 (0.0000)	I (0)	Stationary
CC	127.3588 (0.0000)	-9.4181 (0.0000)	-13.4358 (0.0000)	21.4228 (0.0000)	I (1)	Stationary
VA	87.0953 (0.0000)	-7.4299 (0.0000)	-9.1850 (0.0000)	13.8137 (0.0000)	I (1)	Stationary
GFCF	95.3938 (0.0000)	-7.9788 (0.0000)	-10.0669 (0.0000)	15.3820 (0.0000)	I (1)	Stationary
KH	64.6175 (0.0000)	-4.4840 (0.0000)	-6.0165 (0.0000)	9.5658 (0.0000)	I (1)	Stationary
TO	131.6704 (0.0000)	-9.1111 (0.0000)	-13.8832 (0.0000)	22.2376 (0.0000)	I (1)	Stationary
POP	40,3070 (0.0002)	1,1155 (0.0000)	0,1116 (0.0000)	4.9716 (0.0000)	I (0)	Stationary
ELEC	264.6434 (0.0000)	-14.8125 (0.0000)	-27.9437 (0.0000)	47.3671 (0.0000)	I (1)	Stationary

Note: Variables in brackets are p-values. ***, **, *, significance levels at 1%, 5%, and 10%.

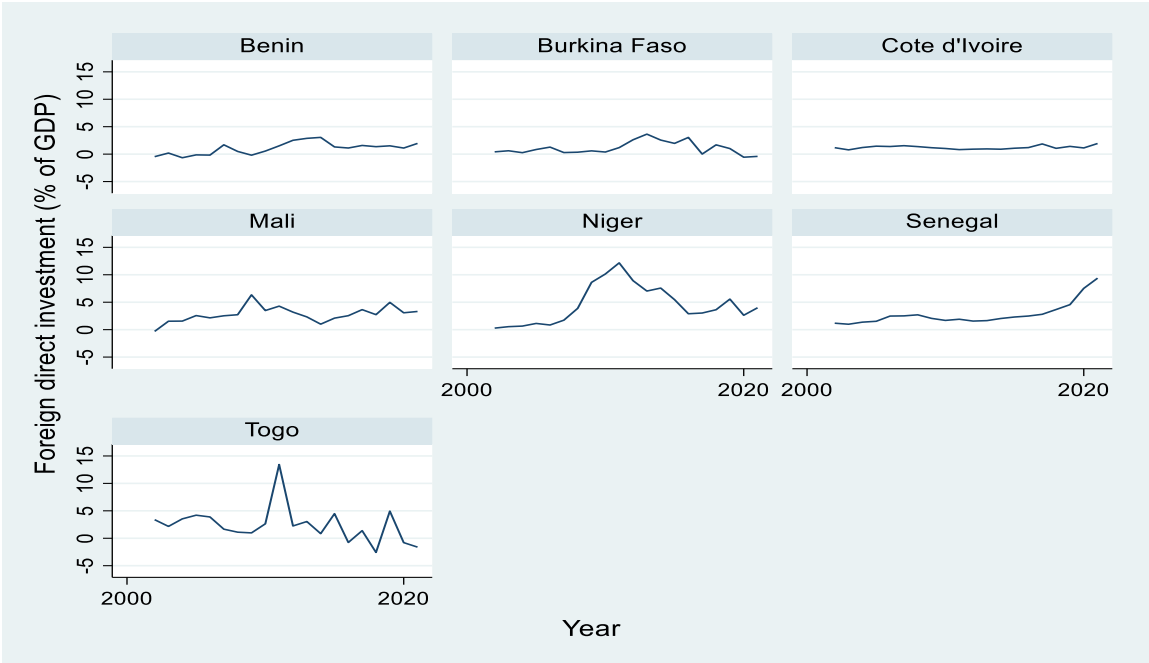
Source: Authors

Figure A.1: Manufacturing profile of WAEMU countries, 2002-2021



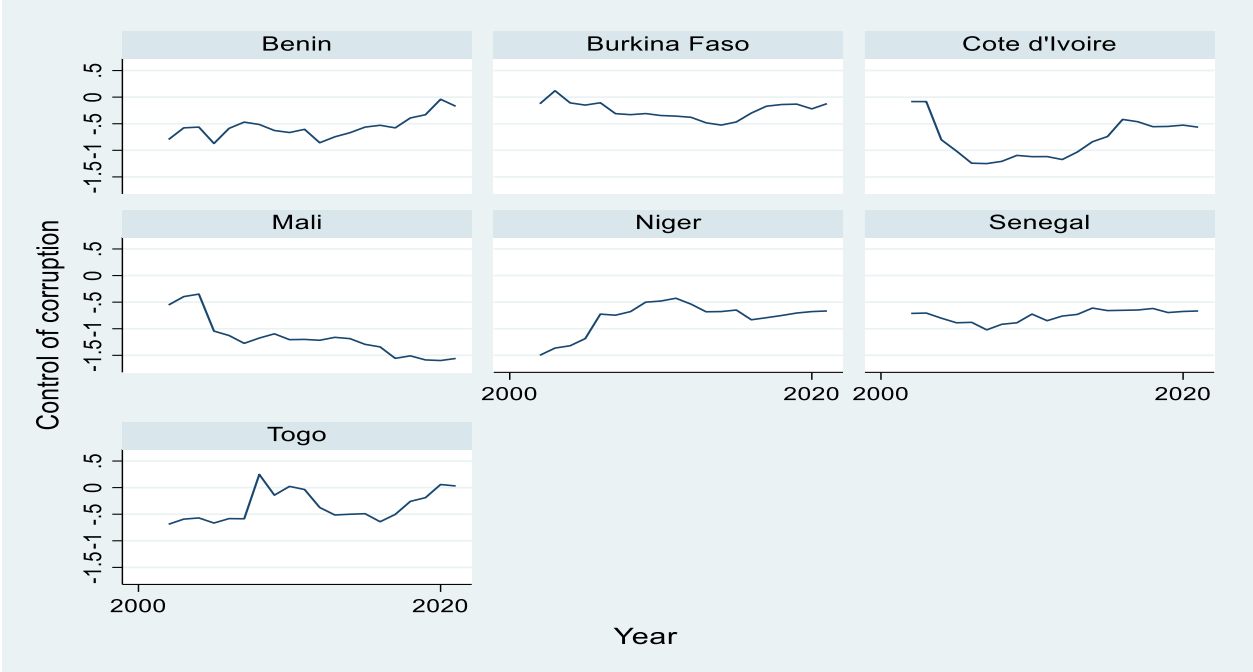
Source: Authors

Figure A.2: Foreign direct investment in WAEMU countries, 2002-2021



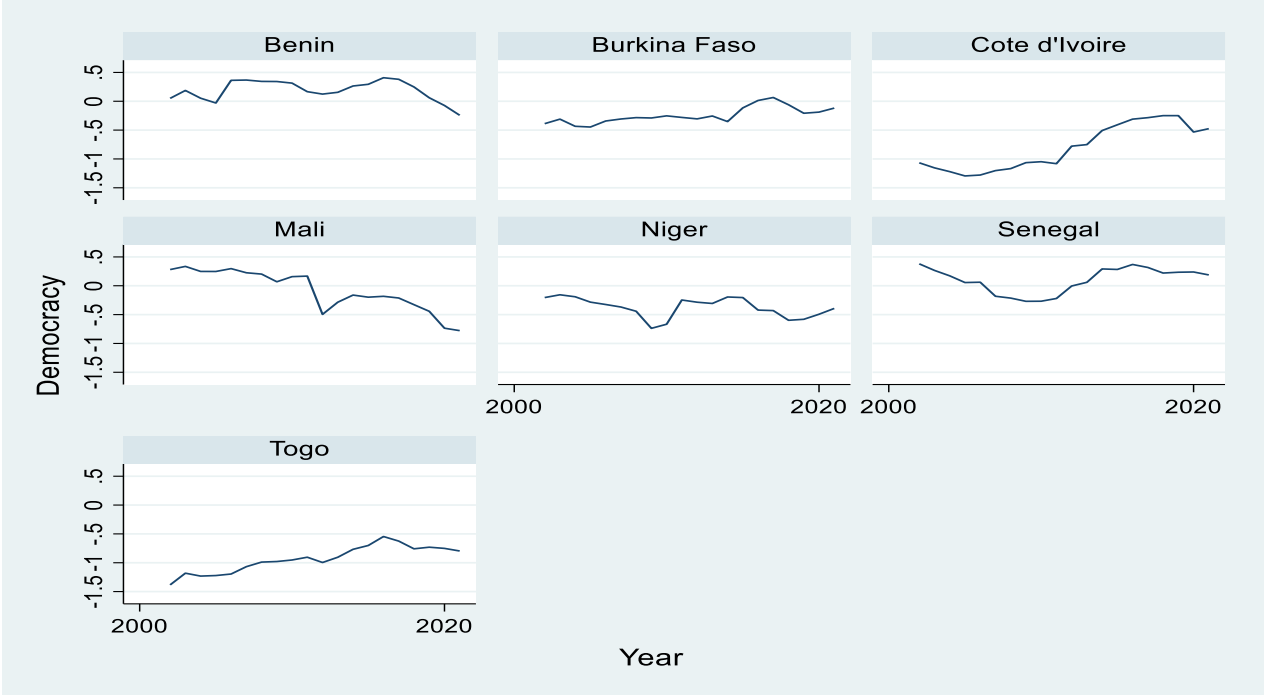
Source: Authors

Figure A.3: Corruption control profile for WAEMU countries, 2002-2021



Source: Authors

Figure A.4: Profile of democracy in WAEMU countries, 2002-2021



Source: Authors