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Effect of economic institutions and the political environment on industrialisation in the WAEMU

Abstract: The purpose of this paper is to analyse the effect of economic institutions and the political environment on industrialisation in the West African Economic and Monetary Union (WAEMU). The data used cover six countries over the period 2008-2018. These are Burkina Faso, Ivory Coast, Mali, Niger, Senegal and Togo. Ordinary least squares and generalized least squares estimates reveal that economic institutions, proxied by economic freedom, have a positive effect on industrialisation. In contrast, terrorism undermines the industrialisation boom in the region. The findings of the paper point to the need for WAEMU governments to take a critical look at economic freedom and a stable political environment as a precondition to ensure industrial development in the Union.

Keywords: Industrialisation - Economic institutions - Political environment - WAEMU

Effet des institutions économiques et de l'environnement politique sur l'industrialisation dans l'UEMOA

Résumé : L'objectif de cet article est d'analyser l'effet des institutions économiques et de l'environnement politique sur l'industrialisation dans l'Union Economique et Monétaire Ouest-Africaine (UEMOA). Les données utilisées couvrent six pays sur la période 2008-2018. Il s'agit du Burkina Faso, de la Côte d'Ivoire, du Mali, du Niger, du Sénégal et du Togo. Les estimations des moindres carrés ordinaires et des moindres carrés généralisés révèlent que les institutions économiques, représentées par la liberté économique, ont un effet positif sur l'industrialisation. En revanche, le terrorisme compromet l'essor de l'industrialisation dans la région. Les conclusions de cet article soulignent la nécessité pour les gouvernements de l'UEMOA de porter un regard critique sur la liberté économique et un environnement politique stable comme condition préalable pour assurer le développement industriel dans l'Union.

Mots-clés : Industrialisation - Institutions économiques - Environnement politique - UEMOA

1.   Introduction

Industrialisation, particularly manufacturing-based industrialisation, plays a critical role in the process of economic development (Haraguchi, Martorano, & Sanfilippo, 2019; Kaldor, 1975). It generates significant productivity gains, offers more opportunities for employment creation and export market growth, drives growth in other sectors of the economy, allows the catching up and convergence of economies and increases the overall welfare (Aryeetey & Baffour, 2022; Mijiyawa, 2017; Rodrik, 2016; United Nations Industrial Development Organization, 2017). Additionally, industrialisation is an important issue in the current development agenda. For example, Sustainable Development Goal (SDG) 9 aims at building resilient infrastructure, promoting sustainable industrialisation and fostering innovation. Goal 9.2 calls to promote inclusive and sustainable industrialisation and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries. The United Nations General Assembly also adopts resolution proclaiming the third industrial development decade for Africa (2016-2025) on 25 July 2016. It reaffirms the importance of supporting Africa's industrialisation efforts on its path towards inclusive and sustainable economic growth and accelerated development. Likewise, African Union Agenda 2063 stresses the imperative of adopting macroeconomic policies that promote growth, job creation, investment and industrialisation.

Realizing that industrialisation matters for development, West African Economic and Monetary Union (WAEMU) member countries adopted a Common Industrial Policy (CIP) on december 8, 1999 through the additional act N° 05/99. The context of the adoption of the CIP is marked by the disengagement of states from the productive sphere and the primacy of the private sector as the engine of economic growth. Through this policy, it is a about orienting and articulating the projects and programs of industrial development and related services of the community space. The ultimate objective is to make the industry the driving force behind growth and development, by significantly increasing the share of industry, especially manufacturing, in the Union's value added. The Common Industrial Policy thus marks the will of the Member States of the Union to have a common vision of their industrialisation, namely "to become together a significant actor in globalisation within a framework of sustainable industrial development". Unfortunately, more than two decades after the adoption of the CIP, industrialisation remains at an embryonic stage. The contribution of manufacturing to Gross Domestic Product (GDP) has declined from 13.01% in 2000 to 10.42% in 2020, a drop of 2.58 percentage points (World Bank, 2022). Similarly, the share of manufacturing in total value added in 2020 is below the Sub-Saharan African average (11.17%) and the low income countries average (10.70%). Indeed, except for Ivory Coast, which is relatively more industrialized, the other WAEMU member states have a weak manufacturing sector with some minor industries. The derisory share of manufacturing is explained by the fact that no country has been able to transform its raw materials, which unfortunately are exported in their raw state (Tarno & Maman, 2019).

Regarding this underperformance, it is important to analyse the determinants of industrialisation in WAEMU countries. One of the factors that has attracted the attention

of researchers is the economic institutions and the political environment. Since the pioneering work of North (1990), it has been recognised that institutions affect the performance of countries. Institutions, as rules of the game, shape human behavior in a society (North, 1990). Thus, if the institutional environment is such that economic agents can obtain the returns from an investment in physical capital, human capital and new ideas, they are more likely to make these investments (Acemoglu, 2008a). Moreover, when institutions are good, they help reducing the uncertainties inherent in human relationships, making information available and the behavior of actors more predictable, while allowing transaction costs to be reduced (Acemoglu & Robinson, 2010; North, 1990). Conversely, when institutions are deficient, they favour rent-seeking activities (Acemoglu, 2008b).

In this vein, and in relation with structural transformation, Edokat and Njong (2019) argue that good governance and strong institutions are prerequisites to industrial development. They enable governments to formulate and execute the industrial policies necessary for the structural transformation of their economies, discourage unproductive rent-seeking and harmful business practices (Elhiraika, Ibrahim, & Davis, 2019). Similarly, as Chang (1994) argues, in the process of structural change in modern economies, the state has two major roles to play: cultivating entrepreneurship and managing conflict. As an entrepreneur, the state's position as a central agent gives it the crucial role of providing a vision of the future in period of transformation, while its role as an institution builder allows it to give institutional reality to its vision and to institutionalise the emerging coordination structure. In addition, its roles as guarantor of property rights and designer and implementer of a public agenda make it the ultimate manager of conflict. This role also has a very important productive function in providing a governance structure through which risk can be socialised.

However, in WAEMU countries, the political environment is marked by permanent instability while the economic institutions are of poor quality. WAEMU is one of the epicentres of fragility in sub-Saharan Africa, with 4 of the 8 countries classified by the World Bank as fragile and conflict-ridden in 2022. Similarly, it hosts 3 (Burkina Faso, Mali and Niger) of the top 10 countries most affected by terrorism in 2020 and 2021 (Institute for Economics & Peace, 2022). In 2021, these 3 countries accounted for 26 percent of all deaths from terrorism. In the area of economic freedom, 5 of the 8 countries are in the bottom quartile and 3 in the second to last (Gwartney, Lawson, Hall, & Murphy, 2022).

The objective of this paper is to analyse the determinants of industrialisation in the WAEMU with a focus on economic institutions and the policy environment. The political environment will be considered through terrorism, state fragility and political stability.

2. Economic institutions, political environment and industrialisation : A brief Literature review

Economic theory provides predictions that political and economic environment affect industrial development. The political and economic environment may create incentives for economic agent to invest, adopt technology and to accumulate human capital and enable policymakers to formulate and implement or not industrial policies (Acemoglu, 2008a; 2008b; Chang & Zach, 2019). High quality institutions reduce uncertainties, transaction costs and rent-seeking activities and create incentives for innovation and facilitate technological advancement for industrial productivity (Acemoglu & Robinson, 2010; Acemoglu, 2008b; Botta, 2009; North, 1990). In the political environment, the UNIDO (2017) argues that political stability is one of the key common denominators of 'successful industrializer' economies. Political stability enables governments to formulate and execute long-term industrial policies and plans necessary to promote the development of new industries (Elhiraika, Ibrahim, & Davis, 2019; United Nations Industrial Development Organization, 2017).

Additionally, political stability provides an appropriate environment for promotion of investment necessary to industrialization (Edokat & Njong, 2019; Haraguchi, Martorano, & Sanfilippo, 2019). Conversely, political instability with its associated terrorism, violence and uncertainty increases investment risks and promotes capital flight, leading to a transfer of investments to countries less affected by the phenomena and thus slowing down industrialisation (Asongu, Nnanna, & Nting, 2021; McMillan & Zeufack, 2022). Political instability can destroy existing investment, reduces the volume and efficiency of investment (Aron, 2000). Empirical evidence supports this view. Carraro and Karfakis (2018) find that political instability hinders structural transformation in 11 sub-Saharan countries, including Senegal. In the same vein, Effiom and Uche (2022) find that political stability is positively associated with industrialization in 30 Sub-Saharan Africa countries between 2007 and 2019. In a sample of 126 countries for the period 1971-2014, Haraguchi et al. (2019) analyse the determinants of successful industrialiser and find that political stability promotes industrialisation.

In addition to the political environment, economic institutions, when they are of good quality, contribute to the industrial development of nations. Economic freedom, particularly voluntary exchange, enforcement of contract, freedom to enter markets and compete, security of people and privately owned property shape the incentives of entrepreneurs to undertake industrial activities (Henrekson & Johansson, 2011). The industrial activities require large investments over a relatively long period of time and investors need to be reassured that they will be able to enjoy the benefits of these investments. In addition, Economic freedom may lift countries to better allocate productive resources to sectors where they have a comparative advantage, which can trigger the process of structural transformation (Carraro & Karfakis, 2018). Empirically, in China, Lu, Png and Tao (2013) found that property rights protection positively affect manufacturing enterprise productivity.

3. Methodology, data and stylized facts

This section presents the methodology and the data.

3.1. Empirical model and data

Based on previous empirical analysis on the determinants of structural change in developing countries (Bankole & Oladapo, 2019 ; Elhiraika, Ibrahim & Davis, 2019, Mensah et al., 2019), we propose the following general functional form:

$$MVA = f(PE, EF, X) \qquad (1)$$

Equation (1) indicates that the Manufacturing Value Added (MVA) is a function of political environment (PE), economic freedom in the world (EF) and a set of control variables (X). When we take into account the panel and time dimension and the control variables, we obtain equation (2).

$$MVA_{it} = \beta_0 + \beta_1 PE_{it} + \beta_2 EF_{it} + \beta_3 INF_{it} + \beta_4 HC_{it} + \beta_5 INVEST_{it} + \varepsilon_{it} \ (2).$$

In equation (2), INFL stands for inflation rate, HC for human capital and INVEST for investment.

We use economic freedom of the world of Fraser Institute to measure economic institutions. It measures the degree to which scarce resources are allocated by personal choices coordinated by markets rather than centralized planning directed by the political process (Gwartney, Lawson, Hall, & Murphy, 2022). The cornerstones of economic freedom are personal choices, voluntary exchange, freedom to enter markets and compete, and security of the person and privately owned property. It is taken from Gwartney et al. (2021). The economic freedom indicator is scaled from 0 to 10 with 10 indicating greater freedom.

The Global Terrorism Index is used as a proxy for the political environment. It is provided by the Institute for Economics and Peace and measures terrorist activity and its effects in a country. It is constructed from four indicators (i) the total number of terrorist incidents (ii) the total number of deaths caused by terrorists (iii) the total number of injuries caused by terrorists and (iv) the total number of hostages caused by terrorists. The index is based on a scale of 0 to 10, where 0 represents the absence of terrorism and 10 the highest level of terrorism.

Following the literature (Bankole & Oladapo, 2019; Haraguchi, Martorano, & Sanfilippo, 2019), we control for macroeconomic stability, human capital and the level of investment. Macroeconomic stability is measured by the inflation rate through the consumer price index. This is the annual percentage change in the cost to the average consumer of purchasing a basket of goods and services. Macroeconomic stability is assumed to foster structural transformation. Human capital is proxied by the Penn World Table 10 human capital index (Feenstra, Inklaar, & Timmer, 2015). The human capital index is calculated using the average years of schooling from Barro and Lee (2013) and the expected rate of return to education. Increased investment stimulates industrialisation through higher aggregate demand and increased productive capacity (Haraguchi, Martorano, & Sanfilippo, 2019).

Over the period 2000-2020, manufacturing value added as a share of GDP was low in Sub-Saharan Africa, including WAEMU countries, compared to other regions in the world as shown in Figure 1 below.

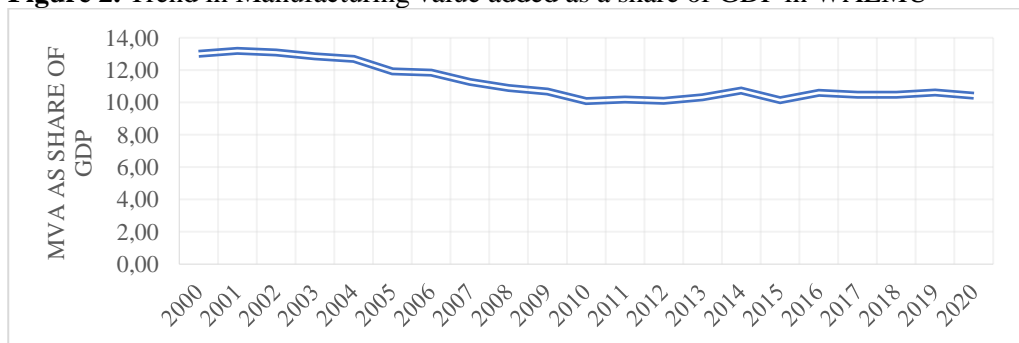**Figure 1.** Manufacturing value added as a share of GDP, Mean 2000-2020
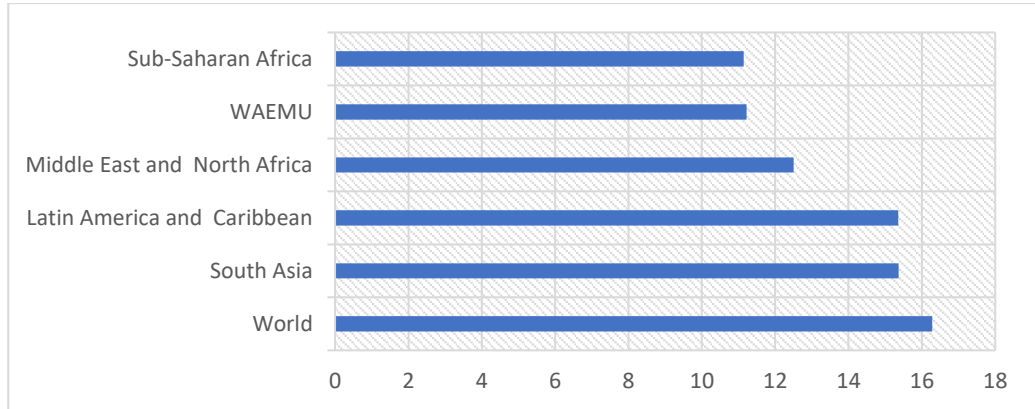
Source: Authors

Manufacturing value added over the period was 11.14% of GDP in Sub-Saharan Africa, slightly higher than in WAEMU countries, compared to 16.28% of GDP for the world, 15.37% for South Asia, 15.36% for Latin America and Caribbean, and 12.50% for Middle East and North Africa.

The Figure 2 presents the trend of manufacturing value added as a share of GDP in WAEMU over the period 2000-2020. Manufacturing value added as a proportion of GDP has declined. From 13.01% of GDP in 2000, manufacturing value added fell to 10.09% in 2010 and 10.42% in 2020.

Figure 2. Trend in Manufacturing value added as a share of GDP in WAEMU
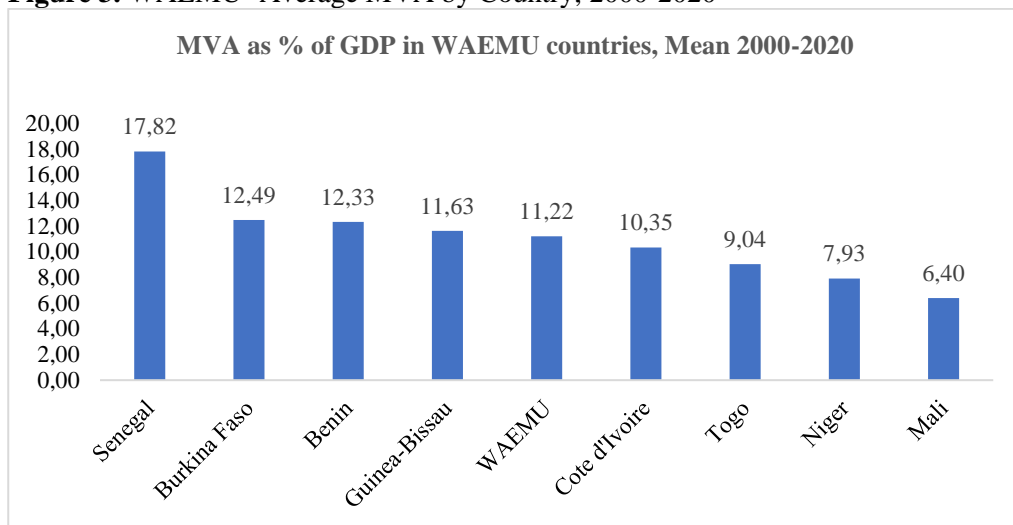

Source : Authors

However, this sub-regional averages mask the countries' disparities. For example, as Figure 3 shows, four countries have manufacturing value added to GDP ratios above the WAEMU average and four countries have ratios below the average. In the first category

of countries, Senegal has the highest average MVA as percentage of GDP at 17.82%, followed by Burkina Faso (12.49%), Benin (12.39%) and Guinea Biassau (11.63%). The second category consists of the Ivory Coast with a manufacturing value added of 10.35 percent of GDP, followed by Togo (9.04%) , Niger (7.93%) and Mali (6.40%).

Figure 3. WAEMU- Average MVA by Country, 2000-2020

Source : Authors

Although in the analysis of stylized facts we use the period 2000-2020 corresponding to the adoption and implementation of the common industrial policy, the period of the econometric analysis has been restricted between 2008 and 2018 and covers 6 of the 8 countries due to the unavailability of data. Benin and Guinea Bissau are not included due to lack of data. Table 1 presents the descriptive statistics of the main variables used. It appears that manufacturing value added averaged 10.19% of GDP between 2008 and 2018. The overall average terrorism index was 2.17 during the period under review.

**Table 1:** Descriptive statistics of the main variables

Variables	Obs.	Mean	Std. Dev.	Min	Max	Source
Manufacturing value added as % of GDP	66	10.19	3.655	5.453	17.54	World Development Indicators, World Bank (2022)
Inflation	66	1.992	2.691	-2.25	11.31	
Investment as % of GDP	66	22.32	4.521	14.82	32.61	
Human capital	66	1.423	0.223	1.146	1.794	Penn World Table 10 (Feenstra, Inklaar, & Timmer, 2015)
Global Terrorism Index	66	2.167	0.228	1.749	2.645	(Institute for Economics & Peace, 2022)
Economic Freedom	66	5.695	0.309	4.913	6.280	(Gwartney, Lawson, Hall, & Murphy, 2022)

Source: Authors

Before we discuss the results from our econometric regressions, let us briefly take a look at the bivariate associations between the terrorism index and manufacturing value added on the one hand and economic freedom and manufacturing value added on the other. This bivariate association is shown in Figure 4.

From Figure 4, a positive correlation appears between economic freedom and manufacturing value added. Terrorism is negatively correlated with manufacturing value added. By and large, over the sample period, countries that enjoyed more economic freedom had a higher manufacturing value added. However, countries where terrorism is most prevalent have a lower contribution of manufacturing to total value added.

Figure 4. Correlation between the terrorism index, economic freedom and manufacturing value added
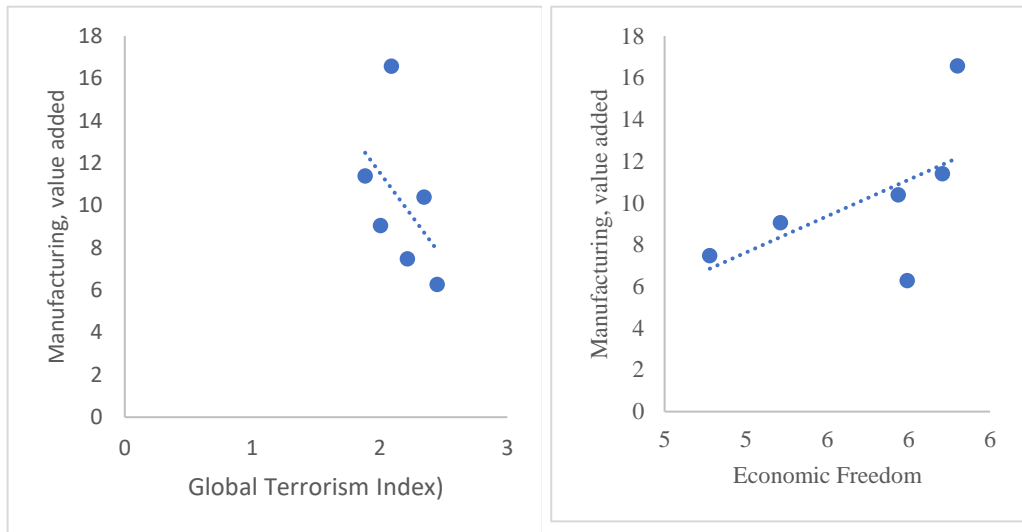
Source : Authors

3.2. Estimation method

We use ordinary least squares (OLS) for regression. The OLS estimates are robust to heteroskedasticity as we report robust standard errors. The empirical specification of the linear model estimated through OLS is not very conservative. As a result, we investigate how estimates change in size and precision when more conservative assumptions on the standard errors are specified. In this vein, we allow for clustering the standard errors at the year and country-level. Additionally, we include year dummies and country dummies. Taking into account country fixed effects allows to control for the impact of unobserved country-specific characteristics. Country fixed effects are useful in removing omitted factors that influence both institutional framework and industrial development in the long run (Feldmann, 2017). For example, country fixed effects allow us to take into account any country-specific features such as geography, endowments, history that create a difference in the baseline conditions for manufacturing industry across different countries (Rodrik, 2016). Temporal fixed effects are included to filter out the impact of common shocks that might have manufacturing industry.

In the event of autocorrelation of errors and heteroscedasticity, the OLS estimators obtained are unbiased but are not at minimum variance (Bourbonnais, 2015). Under these conditions, the unbiased linear estimator of minimum variance is generalized least squares (GLS) estimator, also called the Aitken estimator (Bourbonnais, 2015; Gujarati, 2004). We use therefore, in addition to OLS, the GLS.

4. Results and discussions

The empirical results are presented in this section. The basic results are presented and discussed in the first subsection. In the second subsection, a series of robustness tests are undertaken.

4.1. Baseline Results

The preliminary estimates are performed using OLS and GLS. The results of the estimation are presented in Table 2. The result of the OLS regression reported in columns 1-5 while the result of GLS estimation are presented in column 6.

Table 2. Effect of economic institutions and the political environment on manufacture value added in the WAEMU

Variables	(1)	(2)	(3)	(4)	(5)	(6)
						Generalized Least Squares
	Ordinary Least Squares					
Economic Freedom	5.206***	8.091***	3.877***	5.206***	5.206**	4.465***
	(1.222)	(2.058)	(1.126)	(0.859)	(1.939)	(0.457)
Global Terrorism Index	-5.804***	-4.454***	-1.697	-5.80***	-5.804*	-4.852***
	(1.100)	(1.445)	(1.417)	(1.076)	(2.521)	(0.564)
Inflation	0.0549	-0.540**	-0.00733	0.0549	0.0549	0.0338
	(0.171)	(0.264)	(0.0639)	(0.159)	(0.0754)	(0.0371)
Human Capital	2.837**	3.722**	-9.777**	2.837***	2.837	2.401***
	(1.418)	(1.569)	(4.680)	(0.831)	(3.431)	(0.609)
Investment	-0.0443	0.113	-0.21***	-0.0443	-0.0443	-0.0781***
	(0.0867)	(0.105)	(0.0699)	(0.0436)	(0.0924)	(0.0297)
Constant	-10.04	-34.73**	4.410	-10.04	-10.04	-6.639**
	(9.840)	(16.50)	(5.921)	(7.761)	(9.934)	(3.341)
Observations	66	66	66	66	66	66
Time dummy	No	Yes	No	No	No	No
Country dummy	No	No	Yes	No	No	No
Cluster Year	No	No	No	Yes	No	No
Cluster country	No	No	No	No	Yes	No
R-squared	0.394	0.496	0.895	0.394	0.394	No
Prob > F or chi2	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses   *** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source : Authors

From OLS regressions, it emerges that the coefficient associated with economic freedom is positive and statistically significant at the 5% level at most, whether or not countries or years dummies are included and years and whether or not years or countries has been

clustering. Similarly, in the GLS regression, the coefficient of economic freedom is positive and significant at the 1% level. This result indicates that better economic institutions favours the development of the manufacturing industry. In contrast, overall in the OLS and GLS regressions, the coefficient associated with terrorism is negative and significant at conventional thresholds, suggesting that terrorism negatively affects the rise of manufacturing industry in WAEMU countries.

These results support arguments that improving the functioning of market institutions is an important part of state intervention to boost industrial development (Abreha, et al., 2021). Similarly, good institutions are a prerequisite for successful structural transformation in countries (United Nations Economic Commission for Africa, 2016). In particular, better governance resulting in government stability allows for the implementation of long-term public policies necessary to promote investment and the emergence of new industries (Haraguchi, Martorano, & Sanfilippo, 2019). Conversely, political instability leads to opportunistic behaviour by rulers (Humphreys & Robert, 2005). Such behaviour can be detrimental to policies supporting industrial development and hinder structural transformation. In this respect, it is recognised that the success of structural transformation in some Asian countries had been favoured by favourable economic and political conditions (Haraguchi, Martorano, & Sanfilippo, 2019). Our result is in accordance with empirical finding that better institutions promote industrial development (Bankole & Oladapo, 2019; Mensah, Adu, Amoah, Abrokwa, & Adu, 2019; Totouom, Fotio, & Sundjo, 2019). Concerning control variables, the most robust results is that human capital positively affects the development of manufacturing industry.

4.2. Robustness checks

We test the robustness of the results obtained in four ways : (i) using alternative variables for the political environment, (ii) changes in economic freedom indicator, (iii) change in industrial development indicator and (iv) using alternative method that accounts for endogeneity.

(i)   Using alternative variables for the political environment

We use three alternative variables to the political environment : Political stability and absence of violence and terrorism from World Bank, Internal conflict of International Country Risk Guid from Political Risk and Fragile States Index from Institute for Economics and Peace (2022).

Political stability and absence of violence and terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism (Kaufmann, Kraay, & Mastruzzi, 2011). The indicator ranges from -2.5 (political instability and presence of violence and terrorism) to 2.5 (political stability and absence of violence and terrorism). Internal conflict refers to an assessment of political violence in the country and its actual or potential impact on governance. It is constructed from three sub-components: (i) civil war and coup threat, (ii) terrorism and political violence and (iii) civil disorder. The index ranges from 0 to 12.

Table 3. Robustness with alternative indicators of the political environment

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Political Stability and Absence of Violence/Terrorism PSAVT		Internal Conflict		Fragile States Index	
	OLS	GLS	OLS	GLS	OLS	GLS
Economic freedom	4.485***	3.885***	7.472***	5.567***	3.120**	2.165
	(1.194)	(0.532)	(1.063)	(0.671)	(1.175)	(1.400)
Inflation	-0.115	-0.0704*	0.0454	0.0661	0.116	0.0245
	(0.181)	(0.0405)	(0.174)	(0.0489)	(0.159)	(0.0786)
Human capital	1.090	0.811*	0.566	-0.0411	14.95***	13.55***
	(1.641)	(0.452)	(1.422)	(0.525)	(2.668)	(1.570)
Investment	-0.0845	-0.132***	0.0644	-0.0193	-0.33***	-0.178**
	(0.0893)	(0.0361)	(0.0886)	(0.0414)	(0.110)	(0.0698)
PSAVT	3.038***	2.652***				
	(0.681)	(0.213)				
Internal conflict			1.757***	1.334***		
			(0.331)	(0.146)		
Fragile states index					-0.38***	-0.28***
					(0.0676)	(0.0465)
Constant	-12.44	-7.901**	-48.44***	-31.62***	13.98	9.410
	(9.342)	(3.946)	(9.029)	(5.578)	(11.93)	(8.236)
Prob > F OR CHI2	0.000	0.000	0.000	0.000	0.000	0.000
Observations	66	66	66	66	55	55
R-squared	0.472		0.409		0.572	

Robust standard errors in parentheses.   *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source : Authors

The highest score is given to countries where there is no armed or civil opposition to the government and where the government does not engage in arbitrary, direct or indirect violence against its own people. The lowest rating is given to a country embroiled in an on-going civil war. The Fragile States Index (FSI) is an indicator of stability. It highlights the stability and tensions in sovereign countries based on 12 indicators, each scaled from zero to 10, and zero indicates the most stable and 10 the least stable. The higher the state's score in the index, the more unstable that state is. The result of the estimations with these 3 indicators as proxies of the political environment is provided in the table 3.

The results show that the coefficients associated with economic freedom remains positive and significant at the 1% and 5% levels in most estimations. Similarly, le coefficient of political stability and the absence of violence and terrorism and that of the absence of internal conflicts are positive and significant at the 1% level. Conversely, state fragility is negatively and significantly associated with manufacturing output at 1% level. These results show that political stability and the absence of internal conflict favours the development of manufacturing, while the fragility of the state undermines it. These results support those obtained in the baseline model.

(ii)   Change in economic freedom indicator

We run again the same set of regressions (baseline ones) using an alternative measure of economic freedom: Index of Economic Freedom from Heritage Foundation. Table 4 presents the results from these regressions.

Table 4. Robustness with an alternative indicator of economic institutions : the Index of Economic Freedom of Heritage Foundation

	(1)	(2)
Variables	**OLS**	**GLS**
Index of economic freedom (heritage foundation)	0.345**	0.223***
	(0.151)	(0.0676)
Global terrorism index	-5.968***	-5.901***
	(1.326)	(0.690)
Inflation	-0.0678	-0.0283
	(0.158)	(0.0480)
Human capital	5.306***	4.685***
	(1.935)	(0.765)
Investment	-0.109	-0.122***
	(0.0896)	(0.0367)
Constant	-0.961	6.729
	(13.19)	(5.570)
Observations	66	66
R-squared	0.344	
Prob > f or chi2	0.000	0.000

Robust standard errors in parentheses.   *** p<0.01, ** p<0.05, * p<0.1
Source : Authors

The estimation with an alternative indicator of economic freedom provides a result converging with the basic results. The positive effect of economic freedom is supported by both OLS and GLS regressions. Conversely, the coefficient on the terrorism indicator is negative and significant at the 1% level. Thus, while economic freedom favours manufacturing development, terrorism is a gangrene that handicaps the development of the manufacturing industry.

(iii)   Change in industrial development indicator

We repeat the estimations with alternative dependent variables : the share of industrial value added in GDP and the share of industrial employment in total employment. The results of the estimations are reported in Table 5.

The estimates show that overall, the coefficient of economic freedom is positive and statistically significant in the equation of industrial value added and industrial employment. The coefficient of global terrorism index is negative and significant. These results suggest that economic freedom promotes industrial development while terrorism inhibits it. They are therefore in line with those established in the basic model.

(iv)   Taking into account the potential endogeneity of the political environment and economic freedom

Global terrorism index and economic freedom are potentially endogenous due to reverse causality and errors of measure. Global terrorism index and economic freedom are potentially endogenous due to reverse causality. If institutions promote industrial development, industrial development can also influence the quality of institutions (Totouom, Fotio, & Sundjo, 2019). Industrial development is accompanied by productivity gains, leading to higher wage and income levels. In turn, the better future prospects brought about by industrial development may limit the propensity of men to engage in terrorist activity. In addition, Faria and Montesinos (2009) evidenced that High GDP per capita is causing economic freedom. Likewise, Acemoglu et al. (2014) and Edison (2003) argue that institutions are endogenous by nature. Indicators of institutional quality are not observed but estimated and that for this reason their measures contain errors. We address endogeneity by using two stages least squared by instrumenting the endogenous variables by their lags. Instruments should be correlated with the endogenous regressors, and they should be orthogonal to any other omitted characteristics and not correlated with the error terms in the equations. The results are reported in Table 6. The test of Hansen is not significant (p-value>10), meaning that the instruments are not correlated with the error terms. The Kleibergen-Paap rk LM is also significant at 1%. The instruments are therefore valid. Globally, the coefficients associated with economic freedom are positive and significant while the coefficient of global terrorism index is negative and significant. These results mean that economic freedom improves industrial development whereas terrorism impede it. The baseline results are robust.

Table 5. Robustness with an alternative indicator of industrial development

	INDUSTRY VALUE ADDED						INDUSTRY EMPLOYMENT					
	OLS					GLS	OLS					GLS
Economic Freedom	3.322***	3.779***	-0.614	3.322**	3.322**	3.348***	4.163**	2.330	4.211***	4.163***	4.163	4.266***
	(0.866)	(1.235)	(2.253)	(1.113)	(1.034)	(0.772)	(1.756)	(1.614)	(1.310)	(1.239)	(3.373)	(0.897)
Global Terrorism Index	-6.355***	-6.251***	-22.76***	-6.355***	-6.355***	-6.945***	-20.42***	-7.167***	0.612	-20.42***	-20.42***	-16.61***
	(1.028)	(1.032)	(2.641)	(1.223)	(1.222)	(0.926)	(2.369)	(2.019)	(2.073)	(2.043)	(3.111)	(1.222)
Inflation	-0.107	-0.454**	-0.104	-0.107	-0.107	-0.0610	-0.206	-0.100	-0.153	-0.206	-0.206	-0.0316
	(0.104)	(0.191)	(0.399)	(0.0871)	(0.0793)	(0.0781)	(0.172)	(0.104)	(0.176)	(0.144)	(0.179)	(0.0936)
Human Capital	-8.908***	-8.880***	-4.510*	-8.908***	-8.908***	-8.187***	-3.014	-2.996	-0.815	-3.014	-3.014	-1.059
	(1.179)	(1.090)	(2.317)	(0.934)	(1.279)	(0.783)	(2.115)	(7.064)	(6.507)	(2.198)	(3.618)	(1.064)
Investment	0.0954	0.144**	-0.786***	0.0954	0.0954	0.0769	-0.534***	-0.0525	-0.0961	-0.534***	-0.534**	-0.320***
	(0.0650)	(0.0690)	(0.142)	(0.0660)	(0.0864)	(0.0497)	(0.114)	(0.0878)	(0.0949)	(0.106)	(0.144)	(0.0645)
Constant	26.80***	21.85**	91.57***	26.80**	26.80**	27.40***	50.37***	29.03***	-14.78	50.37***	50.37**	33.21***
	(7.420)	(10.12)	(20.89)	(9.271)	(8.713)	(6.115)	(14.02)	(10.43)	(10.15)	(12.18)	(18.02)	(7.498)
Time dummy	No	Yes	No	No	No	No	No	Yes	No	No	No	No
Country dummy	No	No	Yes	No	No	No	No	No	Yes	No	No	No
Cluster Year	No	No	No	Yes	No	No	No	No	No	Yes	No	No
Cluster country	No	No	No	No	Yes	No	No	No	Bo	No	Yes	No
Observations	66	66	66	66	66	66	66	66	66	66	66	66
R-squared	0.687	0.759	0.724	0.687	0.687		0.673	0.752	0.912	0.673	0.673	
Prob > F or chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses.   *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Source : Authors

Table 6. The industrial development effect of political environment and economic freedom, 2SLS regression

VARIABLES	(1)	(2)	(3)
Economic Freedom	6.553***	9.143***	3.662*
	(1.323)	(2.223)	(2.002)
Global Terrorism Index	-4.640***	-3.631**	1.163
	(1.265)	(1.707)	(2.428)
Inflation	-0.0304	-0.406	-0.251**
	(0.291)	(0.410)	(0.109)
Human Capital	3.612**	4.490**	-9.987
	(1.545)	(1.692)	(9.392)
Investment	0.0569	0.154	-0.206**
	(0.0897)	(0.0969)	(0.0809)
Constant	-23.89**	-45.40**	9.972
	(10.14)	(17.55)	(7.322)
Observations	54	54	54
Time dummy	No	Yes	No
Country dummy	No	No	Yes
F-statistic p-value	0.000	0.000	0.000
Kleibergen-paap rk LM Statistic p-value	0.0015	0.0005	0.0083
Hansen J statistic p-value	0.8782	0.6473	0.1718
R-squared	0.430	0.491	0.901

Robust standard errors in parentheses   *** $p<0.01$, ** $p<0.05$, * $p<0.1$
Source : Authors

5. Conclusion

This paper analyses the effect of economic freedom and the policy environment on structural transformation in WAEMU countries over the period 2008-2018. Ordinary least squares and generalized least squares methods are used for the estimations. The results show that economic freedom has a positive impact on manufacturing value added and more globally on industrial value added as well as on industrial employment. The results also reveal that terrorism is undermining the WAEMU's industrial development. These results are robust to a battery of tests. In terms of economic policies, these results suggest further efforts to strengthen economic liberalisation on the one hand and to ensure a stable policy environment for industrial development in the WAEMU on the other.

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