

Labour Market Flexibility and Economic Growth in Africa*

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Abstract: Africa is endowed with both natural resources and a young growing workforce. In light of this, it is obvious that regulations on labour markets will have significant impacts on economic growth, especially through effects on employment and productivity. This study provides information on labour market regulations (labour market flexibility) and their impacts on economic growth in Africa. In particular, this study examines the impact of labour market flexibility (regulations) on economic growth (real GDP per capita growth) relying on the Driscoll-Kraay fixed-effects estimator and the two-step system generalized method of moments (GMM) estimation techniques using data from 2000 to 2019 for 37 African countries. The results show a positive correlation, indicating that liberalizing rigid labour market regulations can lead to economic growth benefits. Specifically, it is observed that economic growth increases by approximately 0.16% resulting from a unit (one standard deviation) increase in labour market flexibility. The study also finds that economic growth (real GDP per capita growth) is high in countries that have flexible hour regulations, flexible mandatory costs of worker dismissal, and the absence of (or not strictly enforced) military conscription. These findings have important implications for African governments and policymakers as they may find it useful to liberalize the prevailing rigid labour market regulations to reap economic growth benefits.

Keywords: Labour market, military conscription, hiring and firing regulations, endogeneity, economic growth

JEL: J08, J10, J21, O43, O55

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1. Introduction

The growth of economies continues to be one of the most widely researched topics in economic literature. Empirical evidence points out that economic growth is needed for the evolution and well-being of the human race. For instance, Boldeanu and Constantinescu (2015) assert that the development of the Western world and improvements in the living standards of the people were based on the economic growth of these Western countries. The crucial role of the growth of economies in the well-being of individuals has called for research into the various determinants of economic growth. This explains why a large body of empirical literature exists that examines the impact of factors such as technological advancement, trade, FDI, and public expenditure on economic growth (Ahuja and Pandit, 2020; Bhumali et al., 2019; Donou-Adonsou, 2019).

However, few empirical studies have pointed out the effect of labour market flexibility (LMF) on unemployment and economic growth. Most of these studies have been conducted on industrialized OECD countries, where labour markets are regulated, especially with minimum wages being influenced by trade unions (Bassanini and Venn, 2007; Kharroubi, 2006; Pauwels and Zhang, 2008). Research on labour market flexibility, unemployment and economic growth is even rarer in Africa. The continent is endowed with both natural resources and a young growing workforce, so it is natural to study the effect of labour regulations on economic growth. For instance, in 2015, there was a global youth population of about 1.2 billion within the ages of 15–24 (United Nations, 2013). Interestingly, a youth population of 226 million within the ages of 15–24 lived in Africa. African youth population accounted for 19% of the global population (United Nations, 2013). The United Nations (2013) projects a 42% increase in the youth population in Africa. Moreover, about 30% of all global mineral resources are located in Africa (AfDB, 2016). Interestingly, an empirical evidence by Bernal-Verdugo et al. (2012) points out the crucial impact of labor market flexibility especially on youth unemployment across both OECD and non-OECD countries including some African countries. The study clearly establishes how labor market regulations can be used as an important policy tool to affect the economic performance of countries. This sets the tone for this important study which analyses the impact of labor market flexibility on real GDP per capita growth in Africa using recent year data.

A crucial attempt in understanding the effect of labour market flexibility on economic growth is to understand how flexible labour markets are. This paper examines labour market flexibility as a crucial policy tool for economic growth generally in Africa. However, as Kingdon et al. (2006) pointed out, one of the barriers to careful analysis of issues relating to African labour markets can be attributed to the access to comparable data across African countries and over periods. In this paper, data on labour market flexibility are sourced from the Fraser Institute's Economic Freedom of the World (EFW) database (Gwartney et al., 2022). The data on labour market flexibility cut across 37 African countries and include a composite labour market flexibility index (5b) and its sub-components, which reflect six main policy areas: (5bi) minimum wage, (5bii) regulations

on hiring and firing, (5biii) collective wage bargaining, (5biv) hours regulations, (5bv) mandatory costs of worker dismissal, and (5bvi) military conscription. Labour market regulations denote the legal and regulatory measures on a country's labour market.

The main aim of this paper is to analyse the effect of the flexibility of labour markets on economic growth in Africa. Thus, the paper provides extensive answers to the following questions: (1) Does an increase in the flexibility of labour markets foster economic growth? (2) Does the rate of unemployment negatively affect the growth of economies?

The rest of the paper is organized as follows. Section 2 discusses relevant literature, including previous empirical evidence and relevant theories. Section 3 explains the data and the methodology used. Section 4 presents the results and empirical analysis. Section 5 concludes the study and presents relevant policy recommendations and directions for future studies.

2. Related Literature

Labour market flexibility is important for the operation of the labour market. According to Whyman (2009), labour market flexibility refers to the degree to which labour market outcomes are determined by the operation of market forces free from rigidities and/or restrictions imposed by powerful actors such as the government, trade unions and monopsony employers. An ideal labour market would be one on which all obstacles to free market forces are removed.

Global labour market deregulation trends have caused a surge in flexibility, which refers to the ability of firms to have greater control over staffing decisions (hiring and firing, work hours and use of nonstandard contracts) than does labour by simultaneously containing labour costs (Pulignano, 2019). Facilitating labour market adaptability and response to change, flexibility is achieved through higher organizational turnover, subcontracting, use of external labour through agency and temporary workers, contract workers and teleworkers; through functional flexibility in work tasks, skills and job rotation; through structural flexibility, associated with job availability and changes in job titles; through temporal and monetary flexibility, promoting flexible hour arrangements and wages (Pérez Muñoz, 2009).

2.1 Impacts on unemployment and employment

Several researchers have analysed the effect of labour market flexibility on unemployment. Agnello et al. (2014) observed that unemployment is increased by tax-driven consolidation programmes, their size and duration. However, youth unemployment and long-term unemployment were found to decline with increased labour market flexibility. The study involved a panel of 17 countries from 1978 to 2009. Similarly, Feldmann (2009) analysed labour regulations around the world from 2000 to 2003 using data on 73 countries. The paper

confirmed that stricter labour market regulations appear to increase unemployment and this effect appears to be substantial for youth unemployment. In line with this, Botero et al. (2004) also observed a negative relationship between labour market regulations and unemployment for a sample of 85 developed and developing countries. To address the issue of labour market flexibility and unemployment on a global scale, Bernal-Verdugo et al. (2012) expanded the number of countries to a panel of 97 countries from 1985 to 2008. Relying on both static and dynamic effects, Bernal-Verdugo et al. (2012) provided empirical evidence on the negative effect of labour market flexibility on unemployment. The evidence indicates that improvements in labour market conditions had significant effects on reducing overall unemployment rate outcomes, including total unemployment, youth unemployment and long-term unemployment. This indicates that policies aimed at enhancing labour market flexibility should consequently enhance employment or reduce unemployment. However, Ahmed and Aljane (2014) found an insignificant effect of labour market flexibility on unemployment for a sample of 115 developing economies from 2000 to 2013. Their main findings showed that the labour market indicators used have insignificant relationships with the unemployment rate. However, the study observes a direct effect of firing and hiring regulations on unemployment. Additionally, the rise in the rates of unemployment in European countries has called for several empirical studies into the causes of unemployment within the region. Liotti (2020) studied twenty Italian regions from 2001 to 2016 and found that there is no evidence that increased labour market flexibility improves youth unemployment outcomes.

There are two broad group of policymakers who disagree on the role of labour market flexibility in the economic process. On the one hand, the distortionist viewpoint contends that in the absence of labour market flexibility, government rules such as minimum salaries, social security contributions, job security and collective bargaining will cause distortions in an optimum environment (Hill, 1993). This viewpoint holds that labour market flexibility removes barriers to growth and employment for three primary reasons. Firstly, the labour market assures that wages equal their marginal product in equilibrium, resulting in efficient resource allocation. Secondly, labour market flexibility guarantees that labour markets react to economic shocks. Finally, labour market flexibility eliminates the possibility of redistribution of economic rents from capital to labour, which may reduce investment profitability; examples of such possible redistribution include collective bargaining schemes and expansionary fiscal programmes to fund public employment, which may discourage investment and lower growth. However, the presence of labour market flexibility decreases the possibility of such economic problems occurring.

The institutionalist viewpoint, on the other hand, contends that market failures cause deviations from the ideal world as a result of labour market flexibility (ILO, 1991). Labour market flexibility may not fulfil redistributive roles to low-wage workers or constitute insurance against adverse market outcomes (Chakravarty et al., 1992). Employers are reluctant to focus

on improving their workforce through training or technological advancements due to labour market flexibility (Freeman, 1992; 1993). Finally, labour market flexibility in the absence of legislated benefit standards exacerbates moral hazard or selectivity difficulties, leading firms to offer socially undesirable benefits or contracts (Summers, 1989).

2.2 Impacts on growth/productivity

The consequences of flexibility are often presented in a dichotomous light. On the one side, scholars claim that flexibility helps firms contain wage-related costs, increase productivity and provide workers with opportunities for independence, self-development and mobility (Findlay and Thompson, 2017). On the other hand, critical accounts argue that many nonstandard work experiences in developed economies are largely negative. The burden of risk and uncertainty falls disproportionately on workers, who face “atypical” employment led by contractual insecurity, wage vulnerability, limited access to social security, career and training opportunities (Keller et al., 2009). The neoclassical theoretical arguments in favour of higher labour market flexibility are based on the fact that labour market flexibilization is a key factor to enhance productivity, increasing firms’ competition, favouring economic growth and reducing unemployment (Jha and Golder, 2008).

Few papers have examined the impact of labour market flexibility on growth. Stylized facts on the relationship between growth and labour market flexibility have been documented by Kharroubi (2006). The study identified the growth of an economy based on the accumulation of capital and labour. Two sources of growth were employed: total factor input (TFI) growth and total factor productivity (TFP) growth. The study observed that countries with lower employment protection (greater labour market flexibility) had larger average total factor input growth for the period 1981–2004. However, average total factor productivity was larger in countries with large employment rigidity (inflexible labour markets). A sample of 15 European countries and the USA was used in the study. The sample was decomposed into two categories: low employment rigidity (flexible markets) and high employment rigidity (inflexible markets). Bassanini and Venn (2007) examined the impact of employment protection legislation, minimum wages, parental leave and unemployment benefits on productivity. The paper relied on the difference-in-difference approach for annual cross-country aggregate data from 1979 to 2003 using 18 OECD countries. The study observed that an increase in the wage-to-median wage by 10% is associated with an increase in long-run labour productivity and multi-factor productivity levels between 1.7% and 2.0%. However, the evidence is inconclusive in developing countries. According to Pages and Micco (2012), there exists a negative relationship between employment protection and factor productivity growth in countries with strong rule of law. This is, however, not the case in countries with weak rule of law. In such countries, the paper found no effect between employment protection and factor productivity growth.

2.3 Impacts on FDI

Flexibility of labour markets has also been found to influence growth-enhancing outcomes such as foreign direct investment (FDI). However, unlike the case of the negative relationship between labour market flexibility and unemployment, the case is different with the effect of labour market flexibility on FDI. Macroeconomic level studies on the effect of labour market flexibility on FDI show some ambiguity. Some studies have confirmed a positive relationship between labour market flexibility and FDI, others have found mixed results, while yet others have observed insignificant findings. Foreign direct investment is an important tool for the economic growth of host economies and allows creation of new jobs and introduction of new technologies.

Studies that confirm a positive effect of labour market flexibility on FDI include Bénassy-Quéré et al. (2007), Dewit et al. (2009) and Leibrecht and Scharler (2009). For instance, studies show that economies with high labour regulations tend to impose greater adjustment costs of the production level on multinational companies, which in turn results in a lower level of investment (Leibrecht and Scharler, 2009). This shows the flexibility of the labour market as an effective policy for FDI attraction which leads to economic growth. Labour regulations harm FDI in both developed and developing countries. Restrictions involving working hours have the sharpest effect on the level of foreign investment (Oliveira and Forte, 2021). Bénassy-Quéré et al. (2007) also studied the influence of institutional variables on foreign direct investment. By relying on indicators such as difficulties in hiring and firing and the implementation of labour laws, the paper found that labour market flexibility boosts FDI. Moreover, Oliveira and Forte (2021) analysed the effect of labour market flexibility on FDI for a sample of 180 countries from 2004 to 2009. The study relied on panel data econometric estimation techniques and found that flexibility of labour markets enhanced the attraction of FDI. Particularly, after decomposing labour market flexibility outcomes, rigid working hours is the labour market flexibility dimension that most negatively affects the attraction of FDI.

On the other hand, Wood et al. (2015) concluded that countries presenting lower labour market flexibility tend to attract higher inflows of FDI. The study decomposed labour market flexibility into three subindices and found that the only dimension which negatively affects FDI is difficulty in hiring.

Finally, Oliveira and Forte (2021) stated that studies that found an insignificant relationship between labour market flexibility and FDI are those that employed the most recent periods. Bénassy-Quéré et al. (2007), Dewit et al. (2009) and Leibrecht and Scharler (2009) observed that labour legislation had an insignificant effect on the flows of FDI. According to these authors, rigidity of the labour markets in transition economies is not high enough to prevent multinational investment decisions. Thus, the level of FDI realized in such economies is mainly due to low production costs.

3. Data and Methodology

3.1 Data

The study draws on macroeconomic level data from 2000 to 2019 for a total of 37 countries in Africa for which adequate data on labour market flexibility could be obtained. Data used are sourced from the Fraser Institute's Economic Freedom of the World (EFW) database², Pen World Table (PWT) database version 10.0³ (Feenstra et al., 2015) and the World Bank Indicators database. The variables that capture labour market flexibility include the composite labour market regulations index and six sub-components of the labour market flexibility indicators which reflect six main policy areas. All the variables are explained in Table 1.

Table 1: Data description

Data	Description
Real GDP per capita growth	Real GDP at constant 2017 national prices (in million 2017 US\$). Used for studies comparing growth rates across countries. The logarithmic transformation of the real GDP per capita growth was used as the dependent variable in this study. The data are obtained from the Penn World Table database version 10.0.
Labour market flexibility index	Quantitative measure of legal and regulatory measures in the country's labour markets. These regulations include minimum wage regulations, regulations on hiring and firing, conscription, costs involved in hiring and firing, and wage bargaining. The data are obtained from the Fraser Institute's Economic Freedom of the World (EFW) database.
Hiring regulations and minimum wage	This sub-component is based on the "Employing Workers" section of the World Bank's Doing Business and uses the following components: (1) whether fixed-term contracts are prohibited for permanent tasks; (2) the maximum cumulative duration of fixed-term contracts; and (3) the ratio of the minimum wage for a trainee or first-time employee to the average value added per worker. An economy is assigned a score of 1 if fixed-term contracts are prohibited for permanent tasks and a score of 0 if they can be used for any task. A score of 1 is assigned if the maximum cumulative duration of fixed-term contracts is less than 3 years; 0.5 if it is 3 years or more but less than 5 years; and 0 if fixed-term contracts can last 5 years or more. Finally, a score of 1 is assigned if the ratio of the minimum wage to the average value added per worker is 0.75 or more; 0.67 for a ratio of 0.50 or more but less than 0.75; 0.33 for a ratio of 0.25 or more but less than 0.50; and 0 for a ratio of less than 0.25 (Gwartney et al., 2022).

- 2 Adequate data exist for 140 countries over the period 1980–2019 for labour market flexibility. In particular, data on labour market flexibility are available every five years from 1980 to 2000, and annually from 2000 to 2019. The sample is reduced by the limited availability of data on labour market flexibility indicators for some African countries over the period 2000–2019. See Table 2 for a list of countries in the sample.
- 3 This version is a database that has information on relative income levels, output, input and productivity for 183 countries between 1950 and 2019.

Regulations on hiring and firing	Based on the World Economic Forum's Global Competitiveness Report. Countries are assigned lower ratings if their freedom to hire and fire workers are impeded by regulations. This sub-component is based on the <i>Global Competitiveness Report</i> question: "The hiring and firing of workers is impeded by regulations (= 1) or flexibly determined by employers (= 7)" (Gwartney et al., 2022).
Military conscription	Data are drawn from the International Institute for Strategic Studies' "The Military Balance", and the War Resisters International's "World Survey of Conscription and Conscientious Objection to Military Service," (Bernal-Verdugo et al., 2012). Rating intervals were constructed from data on the use and duration of military conscription. Countries with longer conscription periods received lower ratings. A rating of 10 was assigned to countries without military conscription. When the length of conscription was six months or less, countries were given a rating of 5. When the length of conscription was more than six months but not more than 12 months, countries were rated at 3. When the length of conscription was more than 12 months but not more than 18 months, countries were assigned a rating of 1. When conscription periods exceeded 18 months, countries were rated zero. If conscription was present but apparently not strictly enforced or the length of service could not be determined, the country was given a rating of 3. In cases where it is clear that conscription is never used, even though it may be possible, a rating of 10 is given. If a country's mandatory national service includes clear non-military options, the country was given a rating of 5 (Gwartney et al., 2022).
Mandatory costs involved in hiring and firing	Both are sourced from the World Bank's Doing Business report. Mandatory costs of hiring include social security and payroll taxes, as well as other mandatory benefits including paid vacations and holidays, family allowance, health care, sickness, retirement and maternal leave associated with hiring employees while mandatory costs of firing involve requirements on advance notice, severance payments and penalties for firing redundant workers (Bernal-Verdugo et al., 2012)
Collective wage bargaining	Based on WEF's Global Competitiveness Report. These ratings are based on centralized wage bargaining where higher values are assigned to countries with increased decentralized wage bargaining processes. The index is standardized on a scale of 0–10. Higher values of these indicators represent increased flexibility of labour markets.
Money growth	Obtained from Fraser Institute's Economic Freedom of the World (EFW) database. This component measures the average annual growth of the money supply in the last five years minus the average annual growth of real GDP in the last ten years. Countries where the growth of the money supply greatly exceeds the growth of real output receive lower ratings. The broad money supply (basically what used to be called M2) was used to measure the money supply.
Trade openness	Trade openness is obtained from the World Bank Development Indicators database. The data measure the sum of the exports and imports as a share of GDP. Data are expressed in percentages.
Population growth	This is based on the growth of population annually. Data are expressed as a percentage with the total population including all residents regardless of citizenship. These data are also sourced from the WDI.
Size of government	Represents the extent of government consumption, control and direct the resources of an economy in a year.
Inflation	Measured by Consumer Price Index (CPI). The data reflect the persistent increase in the general price level of goods and services. These data are also sourced from the WDI database.
Unemployment rate	Measures the share of the labour force that is not employed but available for and seeking employment; obtained from the WDI.

Source: Authors' calculations based on data from EFW database, PWT version 10 and WDI (2000 to 2019).

3.2 Methodology

To estimate the effect of labour market flexibility on economic growth, we use two different estimation methods. The first is the Driscoll-Kraay fixed-effects estimator (Driscoll and Kraay, 1998), due to the presence of serial correlation⁴, cross-sectional dependence⁵ and heteroskedasticity⁶. The second estimation method is the two-step system GMM. The Driscoll-Kraay estimator has been noted to be suitable for temporal and spatial dependence. Essentially, the Driscoll-Kraay fixed-effects estimator is used to account for the presence of cross-sectional dependence, serial correlation and heteroskedasticity. The presence of serial correlation and cross-sectional dependence particularly leads to endogeneity issues which results in the estimation of biased coefficients. The Driscoll-Kraay fixed-effects estimator has been used to estimate Equations (1) below.

$$\ln rgdp_{it} = \alpha_1 + \delta_i + \beta Lab_{it} + \gamma X_{it} + U_{it} \quad (1)$$

Where the dependent variable, $\ln rgdp_{it}$ denotes the logarithmic transformation of real GDP per capita growth, Lab_{it} denotes a group of variables that capture labour market flexibility. X_{it} is a vector of the set of control variables including trade openness, population growth, size of government, money growth, inflation and the rate of unemployment. β and γ are the coefficients for the endogenous and exogenous variables used. The country-effect characteristic, represented by δ_i , measures country-specific effects that affect economic growth. The results of the Hausman specification reveal that the fixed-effects model is the most preferred model to estimate the impact of LMF on economic growth. To choose between the random or fixed effects, the Hausman test is conducted against the backdrop that the random effects are appropriate (the null hypothesis H_0) against the alternative hypothesis H_1 of the fixed-effects model being the preferred model⁷.

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- 4 The test is based on the “xtserial y x” command in Stata. Several serial correlation tests exist; however, we adopt the test discussed by Wooldridge (2002) because of its easy implementation and its high power even under “small T, large N” and an unbalanced panel with gaps (Drukker, 2003). Based on the estimation of the Wooldridge-Drukker test, we reject the null hypothesis of no serial correlation. This implies the existence of serial correlation in our linear panel data.
 - 5 The “xtcsd, pesaran abs” Stata command was used after running the “xtreg y x, fe” regression.
 - 6 In Stata, the “xttest3” command was used after running the “xtreg y x, fe” regression. The test is based on the null hypothesis of no heteroskedasticity, which was rejected at the 0.01 level. This confirms the presence of heteroskedasticity in the panel data. The detailed test results are shown in the Appendix.
 - 7 The Hausman test was conducted using the Hausman Stata code (Hausman fe re). The estimations produced a Prob>Chi2=0.0000. Thus, we reject the null hypothesis that the random effect model should be the preferred model.

Another potential source of endogeneity is related to the potential reverse causality between economic growth and labour market flexibility. Additionally, it is important to note that the lagged term of the dependent variable (y_{t-1}) is correlated with the concurrent error term, leading to biased estimations. To account for this, we employ the dynamic system GMM approach by Arellano and Bond (1991). The model is used to estimate Equation (2) below.

$$\ln rgdp_{it} = \alpha_1 + \alpha_2 \ln rgdp_{it-1} + \delta_i + \beta Lab_{it} + \gamma X_{it} + U_{it} \quad (2)$$

4. Results and Discussion

Table 2: List of countries

Countries	Years	Countries	Years
Algeria	2000–2019	Madagascar	2000–2019
Angola	2005–2007; 2009–2019	Mali	2000–2019
Benin	2004–2019	Mauritania	2005–2019
Botswana	2000–2019	Mauritius	2002–2019
Burkina Faso	2005–2019	Morocco	2000–2019
Burundi	2005–2019	Mozambique	2005–2019
Cabo Verde	2010–2019	Namibia	2003–2019
Cameroon	2000–2019	Nigeria	2000–2019
Chad	2000–2019	Rwanda	2009–2019
Congo Democratic Republic	2013; 201–52016	Senegal	2000–2004; 2006–2019
Cote d’Ivoire	2007–2019	Sierra Leone	2011–2019
Egypt	2000–2019	South Africa	2000–2019
Eswatini	2010–2019	Tanzania	2000–2019
Ethiopia	2011–2019	Tunisia	2000–2018
Gabon	2011–2019	Uganda	2000–2019
Gambia	2010–2019	Zambia	2000–2019
Ghana	2000–2004; 2007–2019	Zimbabwe	2010–2019
Guinea	2013–2019		
Kenya	2000–2019		
Lesotho	2007–2009; 2012–2019		

Source: Data from the EFW database, PWT and WDI (2000 to 2019).

4.1 Summary statistics

Since a fixed-effects econometric model is employed, we provide details on the statistics for all the variables used. Particularly, the within and between-country variations (standard deviations) are reported and discussed. The results shown in Table 3 show that the average real GDP per capita growth in the last two decades (2000–2019) is approximately 10.8%. Moreover, variations in real GDP per capita growth between the countries are higher than the within-country variations. The composite labour market flexibility index has an average rating of approximately 6.3 standard deviation, which represents moderately rigid flexibility of African labour markets. Additionally, between-country variations in labour market flexibility exceed the within-country variations. The implication is that labour market regulations vary across the 37 selected African countries. This is corroborated by higher between-country variations relative to the within-country variations in all six sub-components of the labour market regulation indicators.

The average unemployment rate of approximately 8.8% points out the prevalence of unemployment in Africa especially in the last two decades. The rate of unemployment rate has increased from 0.6% to 33.29% across the 37 selected countries over the last two decades. Moreover, trade openness has increased significantly. Average population growth is estimated at 2.34% with higher between-country variations. Population growth has increased from around –0.15 to 3.86%. The average inflation rate is also estimated at 6.74% with higher variations within countries than between countries.

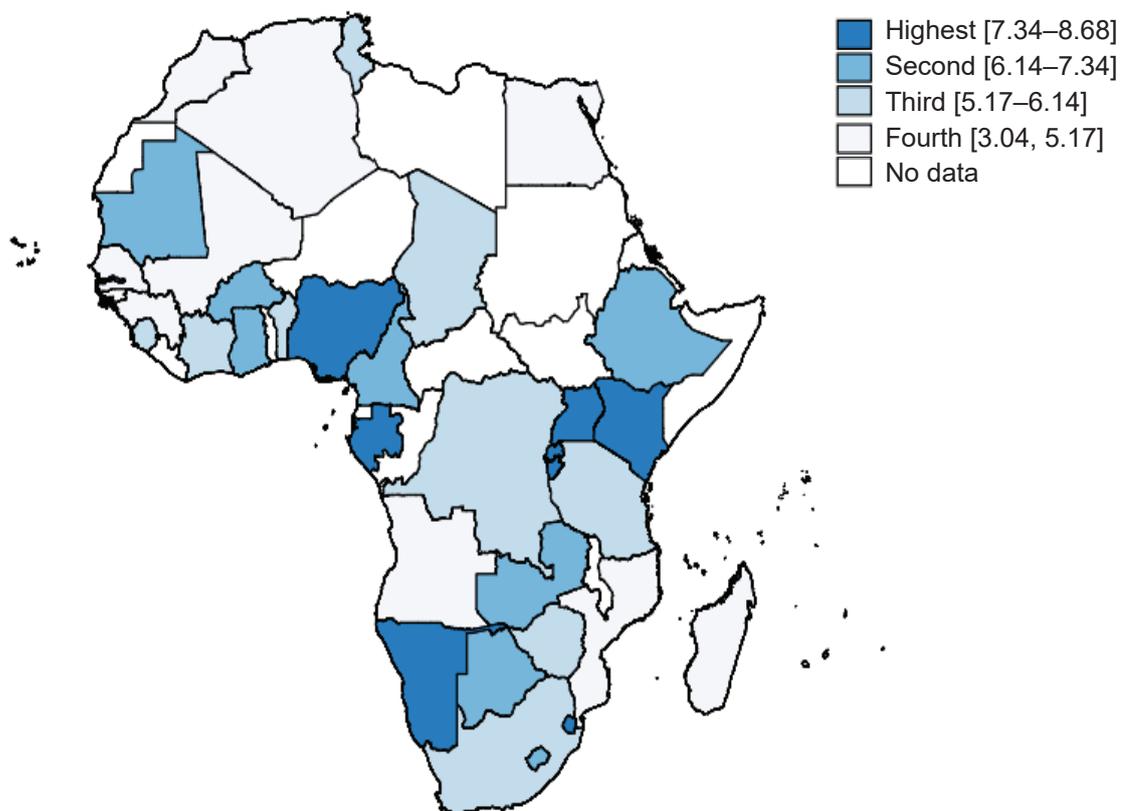
The presented map (Figure 1) shows the degree of flexibility of the labour markets for the selected 37 countries from 2000 to 2019. The study employs the average labour market regulations index for each country to plot the map. The map reveals essential findings about labour market flexibility in Africa. The first is that there exists a significant heterogeneity in labour market flexibility in Africa. Among the 37 countries, nine countries, namely the Gambia, Nigeria, Gabon, Namibia, Swaziland, Rwanda, Burundi, Uganda and Kenya, have average labour market regulations indices of 7.3 to 8.7 out of a maximum of 10 from 2000 to 2019. The West African labour market has Nigeria and the Gambia markets dominant with high flexibility or easy regulations on their labour markets. The high flexibility on the Nigerian labour market is expected, given the country's robust performance especially in 2018. The country has been one of the superpowers in the region with its GDP estimated at \$409 billion in 2018. In East Africa, Rwanda and Kenya are among the countries with increased economic growth in 2018 with their real GDP growths driven by industry and services. Surprisingly, three out of the nine countries (Swaziland, Rwanda and Burundi) have relatively small land sizes.

Other countries that have performed relatively well include Ghana, Mauritania, Burkina Faso, Cameroon, Botswana, Lesotho, South Africa, Morocco, Tunisia, the Democratic Republic of Congo, and Ethiopia with average labour market regulations indices ranging from

approximately 5.2 to 7.3. Since the Arab Spring in 2010, North African countries have seen a strong recovery. There has been a surge in real GDP from 3.3% in 2016 to 4.9% in 2017, which was largely contributed by Libya. Improved security situation resulted in massive production and exportation of oil by Libya (African Development Bank Group, 2019). The region's growth has also benefited from the growth in the Moroccan economy. From 2016 to 2017, the Moroccan economy grew from 1.2% to 4.1%. West African countries including Ghana and Burkina Faso experienced increased growth in GDP per capita from 2014 to 2018. The South African economy has been robust, contributing approximately one-quarter of Africa's GDP. The white-coloured areas of the map mean no data available.

Figure 2 shows that real GDP has been increasing in Africa from 2000 to 2019 from as low as 128,340 million US dollars in 2005 to close to 165,000 million US dollars in 2019. The graph shows economic performance in the region, reduced again in 2007 after it began to recover in 2006. It is not surprising that economic growth decreased in 2007 due to the financial crisis. Figure 3 shows that there has been an increase in the flexibility of labour markets in Africa. The increase in labour market flexibility accounts for the increase in real GDP per capita over the same period due to an increase in investment and productivity.

Figure 1: Map of labour market flexibility in Africa



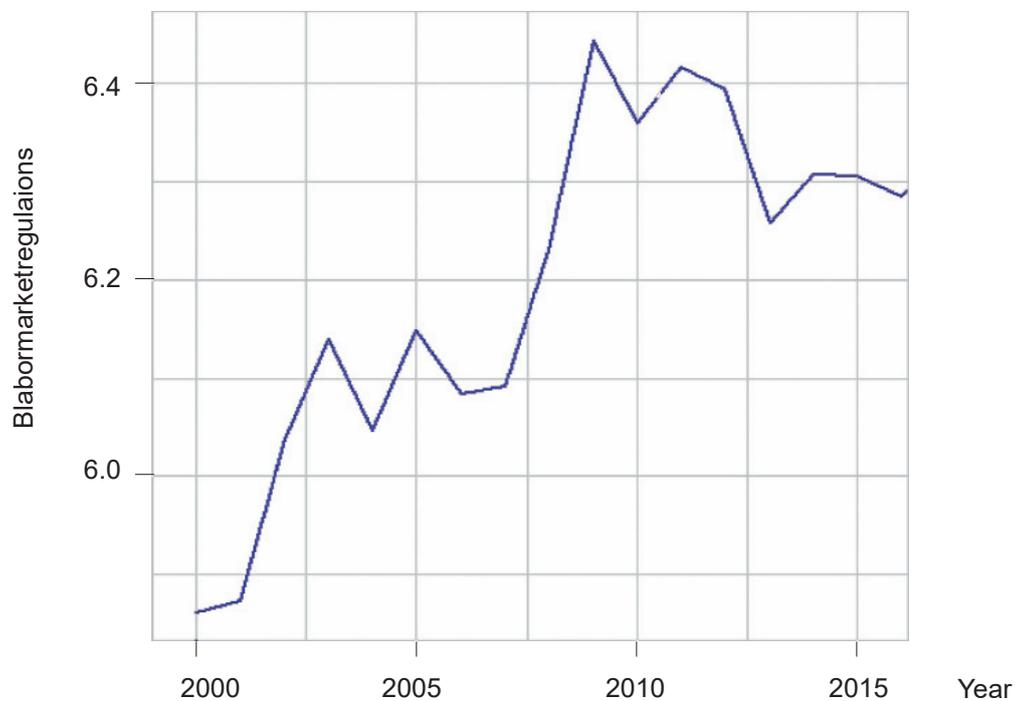
Source: Author's Calculations Based on Data from the EFW database (2000–2019)

Figure 2: Average real GDP per capita for 37 countries



Source: Authors' calculations based on data from PWT 10.0 database (2000–2019)

Figure 3: Average labour market regulation index for 37 countries



Source: Authors' calculations based on Fraser Institute's Economic Freedom of the World (EFW) database (2000–2019)

Table 3: Summary statistics: labour market flexibility and economic growth

Variable		Mean	Std. dev.	Min.	Max.	Observations
Ln (rgdp)	overall	10.853	1.374	8.061	14.068	N = 573
	between		1.36	8.162	13.667	n = 37
	within		0.267	9.987	11.598	T-bar = 15.486
Labour market flexibility	overall	6.258	1.422	2.451	9.238	N = 573
	between		1.373	3.043	8.683	n = 37
	within		0.415	4.583	7.648	T-bar = 15.486
Min. wage	overall	6.487	2.956	0	10	N = 573
	between		2.635	0.55	10	n = 37
	within		1.272	1.237	11.361	T-bar = 15.486
Hiring and firing regulations	overall	4.732	1.103	1.549	8.162	N = 573
	between		0.857	2.4	6.619	n = 37
	within		0.657	2.78	7.931	T-bar = 15.486
Centralized collective bargaining	overall	6.282	1.209	2.453	8.839	N = 573
	between		1.091	2.948	8.469	n = 37
	within		0.572	3.347	9.187	T-bar = 15.486
Hours regulations	overall	7.82	1.62	4	10	N = 573
	between		1.427	4	10	n = 37
	within		0.806	4.62	10.22	T-bar = 15.486
MCW	overall	5.976	3.004	0	10	N = 573
	between		2.868	0	10	n = 37
	within		1.035	-0.602	9.261	T-bar = 15.486
Conscription	overall	6.274	4.343	0	10	N = 573
	between		4.296	0	10	n = 37
	within		0.906	0.324	9.607	T-bar = 15.486
Total unemployment	overall	8.794	7.343	0.6	33.29	N = 573
	between		7.307	0.966	27.158	n = 37
	within		1.855	4.046	24.026	T-bar = 15.486
Trade	overall	67.598	25.495	20.723	165.059	N = 573
	between		24.252	37.513	144.701	n = 37
	within		10.412	34.644	114.228	T-bar = 15.486
Population growth	overall	2.338	0.844	-0.151	3.857	N = 573
	between		0.852	0.313	3.511	n = 37
	within		0.174	1.589	2.894	T-bar = 15.486
Inflation (CPI)	overall	6.74	11.961	-8.975	255.305	N = 573
	between		5.474	1.223	27.449	n = 37
	within		10.868	-23.14	234.596	T-bar = 15.486
Money growth	overall	8.473	1.24	0	9.999	N = 573
	between		0.877	4.916	9.394	n = 37
	within		0.941	1.564	12.927	T-bar = 15.486
Size of government	overall	6.701	1.094	3.252	9.256	N = 573
	between		0.94	4.02	7.975	n = 37
	within		0.576	4.626	8.784	T-bar = 15.486

Source: Authors' calculations based on data from EFW database, PWT and WDI (2000 to 2019).

Table 4 presents the correlation between labour market flexibility outcomes and economic growth. Unsurprisingly, all the labour market flexibility indicators are significantly positively correlated within each group. Among the sub-components of labour market flexibility, hiring and firing regulations and centralized collective wage bargaining have the strongest correlation⁸. The composite labour market flexibility index has a strong positive correlation with each of its sub-components. Among the sub-components of the composite labor market flexibility index, minimum wage, military conscription and hours regulations have positive correlations with economic growth. The positive correlation between conscription and economic growth is intuitive since higher values are assigned to countries without military conscription. This implies higher real GDP per capita in countries without military conscription. Within the sub-components, military conscription has the strongest positive correlation with economic growth.

Table 4: Correlation matrix of labour market outcomes and flexibility indicators

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) rgdp	1.00								
(2) Labour market flexibility	-0.04	1.00							
(3) Min. wage	0.11***	0.70***	1.00						
(4) Hiring and firing regulations	-0.08*	0.43***	0.23***	1.00					
(5) Centralized coll. Barg	-0.03	0.30***	0.18***	0.58***	1.00				
(6) Hours regulations	0.07*	0.61***	0.35***	0.23***	0.00	1.00			
(7) MCW	-0.11***	0.40***	-0.02	0.05	0.06	0.12***	1.00		
(8) Conscription	-0.07*	0.79***	0.48***	0.16***	-0.00	0.46***	0.04	1.00	
(9) Total Unemployment	0.19***	0.06	0.14***	-0.40***	-0.39***	0.12***	-0.02	0.19***	1.00

Note: rgdp = real GDP per capita growth; Labour market flexibility = composite labour market flexibility index; Min. wage = minimum wage; MCW = mandatory costs of worker dismissal; Conscription = military conscription. *** denotes significance at 1%, ** denotes significance at 5%, * denotes significance at 10%.

Source: Author's calculations based on data from EFW database, PWT and WDI (2000 to 2019).

⁸ Bernal-Verdugo, Furceri and Guillaume (2012) also found the strongest correlation among the labor market flexibility indicators exists between hiring and firing regulations and centralized wage bargaining.

4.2 Static relationship between labour market flexibility and economic growth

In order to examine the relationship between labour market regulations and the level of economic growth in Africa, a static reduced-form specification relying on Equation (1) was conducted. By this, the level of economic growth is regressed against the measures of labour market flexibility as well as a set of control variables. Important conclusions can be drawn from the estimations of the static specifications of the econometric model. Firstly, we find that the composite labour market regulation has an increased effect on economic growth. The results in Table 5 show that an increase in the rating of the composite labour market flexibility index by one standard deviation consequently increases real GDP per capita growth by 0.16%. Thus, real GDP per capita increases with increased flexibility of labour markets. This is in line with the findings of Kharroubi (2006), who observed that out of the 15 European countries sample, those with greater labour market flexibility had larger average total factor input growth. Additionally, our study observes that among the sub-components of labour market regulation, hours regulations, mandatory costs of worker dismissal and military conscription have significantly positive effects on real GDP per capita growth. The results indicate that real GDP per capita growth is higher in countries that have flexible hourly regulations, flexible mandatory costs of worker dismissal and without military conscription. Among the sub-components of labour market flexibility, estimates for real GDP per capita growth are greater in countries with flexible hours regulations (with a coefficient of 0.0681). The indication is that real GDP per capita increases by 0.0257 to 0.0681 percentage points in countries with increased hours regulations, flexible mandatory costs of worker dismissal and no military conscription. This is in line with the findings of Keller et al. (2009), who showed that military conscription has a statistically significant negative impact on economic performance for OECD countries. One of the potential reasons to explain this negative effect of conscription on economic growth deals with lack of experience and absence of motivation and incentives leading to lower productivity for draftees (Keller et al., 2009). Since the labour market flexibility index is measured by using six different proxies, they are integrated individually into the growth equations to be estimated. We do this to correct for possible multicollinearity issues between economic growth and labour market flexibility (see the correlation matrix in Table 4). It is important to consider all these sub-components for the fact that improvements in labour market efficiency possibly require reforms in more than one area of the labour market (Bassanini and Duval, 2009).

Additionally, the estimates from the static specification of the econometric model show a negative effect of unemployment on economic growth. The result is indeed relevant based on the fact that increasing unemployment rate has the effect of limiting the productive capacities of countries, which reduces their overall economic performance (economic growth). In line with that, this study estimates that for every 1% increase in the rate of unemployment, real GDP per capita growth falls on an average of 0.030 to 0.034%. This reaffirms the earlier findings by Eshun (2020), who observed a negative relationship between economic growth and unemployment in West Africa.

Table 5: Fixed-effects regression results

Variables	(1) Ln (rgdp)	(2) Ln (rgdp)	(3) Ln (rgdp)	(4) Ln (rgdp)	(5) Ln (rgdp)	(6) Ln (rgdp)	(7) Ln (rgdp)
Labour market flexibility	0.162*** (0.0255)						
Min. wage		0.00787 (0.00866)					
Hiring and firing regulations			0.0117 (0.0169)				
Centralized collective bargaining				0.0158 (0.0191)			
Hours regulations					0.0681*** (0.0132)		
MCW						0.0641*** (0.0102)	
Conscription							0.0257** (0.0120)
Total unemployment	-0.0332*** (0.00577)	-0.0330*** (0.00607)	-0.0320*** (0.00598)	-0.0320*** (0.00598)	-0.0299*** (0.00586)	-0.0335*** (0.00578)	-0.0302*** (0.00602)
Trade	0.00183* (0.00103)	0.00203* (0.00106)	0.00193* (0.00106)	0.00192* (0.00106)	0.00155 (0.00104)	0.00238** (0.00103)	0.00180* (0.00106)
Population growth	-0.0660 (0.0626)	-0.0312 (0.0651)	-0.0234 (0.0646)	-0.0228 (0.0646)	-0.0504 (0.0633)	-0.0108 (0.0624)	-0.0353 (0.0646)
Inflation (CPI)	-0.000233 (0.00101)	0.000510 (0.00104)	0.000604 (0.00104)	0.000579 (0.00103)	0.000331 (0.00101)	-0.000378 (0.00101)	0.000521 (0.00103)
Money growth	0.0922*** (0.0120)	0.0928*** (0.0125)	0.0950*** (0.0128)	0.0945*** (0.0126)	0.0854*** (0.0123)	0.0879*** (0.0121)	0.0919*** (0.0124)
Size of government	-0.0153 (0.0186)	0.00223 (0.0191)	0.00204 (0.0193)	0.00202 (0.0192)	0.00793 (0.0186)	-0.00900 (0.0185)	0.00408 (0.0190)
Constant	9.482*** (0.268)	10.22*** (0.250)	10.18*** (0.262)	10.14*** (0.276)	9.817*** (0.257)	9.946*** (0.245)	10.11*** (0.256)
Observations	573	573	573	573	573	573	573
R-squared	0.212	0.153	0.152	0.152	0.192	0.210	0.158
Number of countries	37	37	37	37	37	37	37

Source: Author's calculations based on data from EFW database, PWT 10.0 and WDI (2000 to 2019).

T-statistics based on non-robust standard errors in parentheses; *** denotes significance at 1%, ** denotes significance at 5%, * denotes significance at 10%.

Among all other control variables, trade openness and money growth have positive effects on real GDP per capita growth. This evidence adds to existing literature by confirming the positive impacts of trade and money growth on enhancing growth outcomes. The coefficient of trade openness suggests that a percentage increase in trade openness increases real GDP from 0.0018 to 0.0024 percentage points. The results are in line with those of Silajdzic and

Mehic (2018), who also observed that economic growth is high in countries with increased trade openness. Moreover, the study also shows that real GDP per capita growth is significantly higher from 0.085 to 0.095% for every increase in the rating of money growth by one standard deviation. We do not find any evidence of the effect of government size, population growth and inflation on economic growth.

4.3.1 Robustness checks

In order to correct the presence of heteroskedasticity, serial correlation, and cross-sectional dependence in the panel data, the study employs the Driscoll-Kraay (Driscoll and Kraay, 1998) fixed-effects estimator. The results confirm the findings from the fixed-effects model. The results are shown in Table 6. One may notice that the coefficients are exactly the same and significant. The coefficients of the composite labour market flexibility index confirm the positive effect of flexible labour market regulations on real GDP per capita growth in Africa. The results show that real GDP per capita growth values are higher in countries with high flexibility on their labour markets. Additionally, the study confirms the various roles of the sub-components of labour market regulations on economic growth. Among the sub-components of labour market regulations, the study estimates that an increase in the ratings by one standard deviation has the effect of increasing real GDP per capita growth by 0.026 to 0.068% on average. The standard errors from the Driscoll-Kraay fixed-effects estimators are significantly different (greater) from the standard errors produced by fixed-effects regression estimations. Most importantly, the Driscoll-Kraay standard errors are robust against heteroskedasticity, serial correlation and cross-sectional dependence, which allows sound inferences.

In Table 7, robustness checks are performed. The growth regression model is estimated using the Driscoll-Kraay fixed-effects model for Sub-Saharan African (SSA) countries with the exclusion of South Africa. South Africa is excluded based on the fact that in terms of economic development and structural transformations, South Africa appears to be an outlier that is likely to cause biases in the overall results (Busse et al., 2019). Its economy has been robust and contributing approximately one-quarter of Africa's GDP. Surprisingly, the study shows that labour market flexibility plays a positive role in SSA slightly above the whole of Africa. The coefficient for the composite labour market index is 0.17 in SSA relative to a coefficient of 0.16 for the 37 selected African countries. The study also finds that trade openness and money growth are factors fuelling economic growth in SSA, while unemployment rate and population growth contribute negatively to real GDP per capita growth in SSA. Considering how money growth has been calculated (IMF, 2020; United Nations Statistics Division, 2015; World Bank, 2021), it is not surprising that the coefficient for money growth is positive and significant. The implication of this result is that real GDP per capita growth is low in countries with a greater average increase in annual money supply in the last five years relative to their annual growth real output in the last ten years.

Table 6: Driscoll-Kraay fixed-effects estimator

Variables	(1) Ln (rgdp)	(2) Ln (rgdp)	(3) Ln (rgdp)	(4) Ln (rgdp)	(5) Ln (rgdp)	(6) Ln (rgdp)	(7) Ln (rgdp)
Labour market flexibility	0.162*** (0.0400)						
Min. wage		0.00787 (0.0104)					
Hiring and firing regulations			0.0117 (0.0165)				
Centralized collective bargaining				0.0158 (0.0141)			
Hours regulations					0.0681*** (0.0143)		
MCW						0.0641*** (0.0217)	
Conscription							0.0257** (0.00906)
Total unemployment	-0.0332*** (0.00619)	-0.0330*** (0.00607)	-0.0320*** (0.00625)	-0.0320*** (0.00609)	-0.0299*** (0.00581)	-0.0335*** (0.00726)	-0.0302*** (0.00617)
Trade	0.00183 (0.00109)	0.00203 (0.00146)	0.00193 (0.00137)	0.00192 (0.00142)	0.00155 (0.00118)	0.00238* (0.00135)	0.00180 (0.00135)
Population growth	-0.0660 (0.0419)	-0.0312 (0.0514)	-0.0234 (0.0589)	-0.0228 (0.0577)	-0.0504 (0.0533)	-0.0108 (0.0607)	-0.0353 (0.0596)
Inflation (CPI)	-0.000233 (0.00126)	0.000510 (0.00113)	0.000604 (0.00106)	0.000579 (0.00105)	0.000331 (0.00100)	-0.000378 (0.00122)	0.000521 (0.00109)
Money growth	0.0922*** (0.0132)	0.0928*** (0.0154)	0.0950*** (0.0149)	0.0945*** (0.0164)	0.0854*** (0.0144)	0.0879*** (0.0133)	0.0919*** (0.0160)
Size of government	-0.0153 (0.0317)	0.00223 (0.0319)	0.00204 (0.0310)	0.00202 (0.0323)	0.00793 (0.0332)	-0.00900 (0.0292)	0.00408 (0.0339)
Constant	9.482*** (0.620)	10.22*** (0.507)	10.18*** (0.545)	10.14*** (0.533)	9.817*** (0.491)	9.946*** (0.565)	10.11*** (0.482)
Observations	573	573	573	573	573	573	573
Number of groups	37	37	37	37	37	37	37
Driscoll-Kraay	Yes						
Fixed effects	Yes						

Source: Author's calculations based on data from EFW database, PWT and WDI (2000 to 2019). Standard errors in parentheses with the Driscoll-Kraay fixed-effects estimator; *** denotes significance at 1%, ** denotes significance at 5%, * denotes significance at 10%.

Table 7: Robustness checks (Sub-Saharan African countries except South Africa)

Variables	(1) Ln (rgdp)	(2) Ln (rgdp)	(3) Ln (rgdp)	(4) Ln (rgdp)	(5) Ln (rgdp)	(6) Ln (rgdp)	(7) Ln (rgdp)
Labour market flexibility	0.170*** (0.0568)						
Min. wage		0.00374 (0.0113)					
Hiring and firing regulations			0.0106 (0.0169)				
Centralized collective bargaining				0.0176 (0.0174)			
Hours regulations					0.0455*** (0.00840)		
MCW						0.0698** (0.0260)	
Conscription							-0.000672 (0.0156)
Total unemployment	-0.0548*** (0.00861)	-0.0476*** (0.00861)	-0.0465*** (0.00780)	-0.0464*** (0.00780)	-0.0419*** (0.00751)	-0.0504*** (0.00905)	-0.0463*** (0.00812)
Trade	0.00301** (0.00118)	0.00254* (0.00137)	0.00245* (0.00122)	0.00244* (0.00123)	0.00231* (0.00112)	0.00310** (0.00112)	0.00248* (0.00120)
Population growth	-0.190*** (0.0625)	-0.161** (0.0738)	-0.158** (0.0732)	-0.156** (0.0726)	-0.173** (0.0716)	-0.142* (0.0788)	-0.158** (0.0742)
Inflation (CPI)	-5.08e-05 (0.00147)	0.000659 (0.00134)	0.000701 (0.00129)	0.000668 (0.00129)	0.000501 (0.00126)	-0.000318 (0.00148)	0.000686 (0.00129)
Money growth	0.113*** (0.0193)	0.112*** (0.0220)	0.113*** (0.0212)	0.113*** (0.0228)	0.106*** (0.0212)	0.107*** (0.0195)	0.112*** (0.0220)
Size of government	-0.00735 (0.0298)	0.0146 (0.0345)	0.0140 (0.0346)	0.0133 (0.0344)	0.0166 (0.0362)	0.00184 (0.0310)	0.0158 (0.0363)
Constant	9.149*** (0.676)	9.979*** (0.503)	9.931*** (0.538)	9.870*** (0.558)	9.680*** (0.501)	9.646*** (0.574)	9.985*** (0.508)
Observations	474	474	474	474	474	474	474
Number of groups	32	32	32	32	32	32	32
Driscoll-Kraay	Yes						
Fixed effects	Yes						

Source: Author's calculations based on data from EFW database, PWT and WDI (2000 to 2018). Standard errors in parentheses with the Driscoll-Kraay fixed-effects estimator; *** denotes significance at 1%, ** denotes significance at 5%, * denotes significance at 10%.

4.3.2 Dynamic relationship between labour market flexibility and economic growth

Endogeneity issues are further addressed using the system generalized method of moments (GMM) technique⁹ and the results are shown in Table 8 below. Notice that the diagnostic tests reveal the absence of second-order serial correlation in disturbances (the p-value of the AR (2) test is greater than 5%) and the instruments are valid (the p-values of the Hansen test show that there is no problem with overidentification).

We find that the first lag of real GDP per capita growth term is very significant and positive, implying that previous real GDP per capita growth has a positive impact on current real GDP per capita growth values. We do not find evidence of convergence effects (negative coefficient of the lag of real GDP per capita). However, the coefficients of the variables of interest are insignificant. We do not find any evidence of the effect of labour market flexibility on economic growth on both the composite labour market flexibility index and its sub-components. Unsurprisingly, the model estimates negative effects of inflation rates on economic growth. Real GDP per capita growth is estimated to increase by an average of 0.0005% due to a percentage decrease in the rate of inflation. This finding is in conformity with the findings of Bittencourt et al. (2015), which highlight the detrimental effects of high inflation rates on economic growth in SSA.

9 The GMM models were estimated using Roodman's (2009) "xtabond2" command in Stata. All the regressors are considered endogenous and instrumented up to the second lag of the log of the dependent variable.

Table 8: Two-step system GMM estimator

Variables	(1) Ln (rgdp)	(2) Ln (rgdp)	(3) Ln (rgdp)	(4) Ln (rgdp)	(5) Ln (rgdp)	(6) Ln (rgdp)	(7) Ln (rgdp)
Ln (rgdp t-1)	0.9957*** (0.008)	0.9953*** (0.009)	0.9952*** (0.008)	0.9951*** (0.008)	0.9950*** (0.008)	0.9955*** (0.008)	0.9960*** (0.008)
Labour market flexibility	-0.0009 (0.002)						
Min. wage		0.0005 (0.001)					
Hiring and firing regulations			0.0016 (0.003)				
Centralized collective bargaining				-0.0028 (0.002)			
Hours regulations					0.0005 (0.002)		
MCW						-0.0012 (0.001)	
Conscription							-0.0002 (0.001)
Total unemployment	-0.0010 (0.001)	-0.0010 (0.001)	-0.0010 (0.001)	-0.0010* (0.001)	-0.0010 (0.001)	-0.0009 (0.001)	-0.0010 (0.001)
Trade	0.0000 (0.000)	0.0000 (0.000)	0.0000 (0.000)	-0.0000 (0.000)	0.0000 (0.000)	-0.0000 (0.000)	0.0000 (0.000)
Population growth	0.0050 (0.004)	0.0052 (0.004)	0.0047 (0.004)	0.0059 (0.004)	0.0052 (0.004)	0.0049 (0.004)	0.0052 (0.004)
Inflation (CPI)	-0.0005*** (0.000)						
Money growth	-0.0025 (0.002)	-0.0025 (0.002)	-0.0026 (0.002)	-0.0025 (0.002)	-0.0028 (0.002)	-0.0018 (0.002)	-0.0026 (0.002)
Size of government	0.0005 (0.003)	0.0001 (0.002)	-0.0002 (0.002)	0.0008 (0.002)	-0.0000 (0.002)	0.0001 (0.002)	0.0002 (0.003)
Constant	0.1147 (0.112)	0.1120 (0.116)	0.1144 (0.110)	0.1306 (0.101)	0.1177 (0.108)	0.1169 (0.104)	0.1083 (0.109)
Observations	531	531	531	531	531	531	531
Number of countries	37	37	37	37	37	37	37
AR 1 (p-value)	0.00789	0.00803	0.00788	0.00821	0.00798	0.00777	0.00792
AR 2 (p-value)	0.156	0.157	0.153	0.147	0.159	0.156	0.157
Hansen test (p-value)	0.393	0.381	0.375	0.410	0.367	0.399	0.375
Sargan test (p-value)	0.198	0.199	0.224	0.205	0.227	0.220	0.198
Number of instruments	26	26	26	26	26	26	26

Source: Author's calculations based on data from EFW database, PWT and WDI (2000 to 2019). Estimations are based on the two-step system GMM estimator with Windmeijer (2005) corrected standard errors; *** denotes significance at 1%, ** denotes significance at 5%, * denotes significance at 10%. AR 1 (2) denotes the Arellano-Bond test of first-order (second-order) autocorrelation in residuals based on the null hypothesis of the absence of first order (second order). The Hansen test has H_0 : overidentification restrictions are valid.

5. Conclusion and Policy Recommendations/Implications

Over the last decade, growth in African economies has not translated into the creation of jobs as shown in this paper. In an attempt to identify some possible tools fuelling economic growth, this paper showed that labour market flexibility is an important driver of real GDP growth in Africa. While most empirical studies have focused on advanced economies, this paper used a sample of 37 African countries from 2000 to 2019. The paper used composite labour market regulations and sub-components of labour market flexibility using six individual labour market indicators.

The paper estimated a positive effect of labour market regulations on real GDP growth. The findings from the study indicate that, after controlling for demographic and macroeconomic variables, increased labour market flexibility has a positive and significant effect on economic growth. Therefore, the study concludes that economies with rigid labour market regulations tend to discourage job creation, which limits economic growth. These results confirm labour market flexibility as one of the policy tools for economic growth. In particular, real GDP values are high in countries high hours regulations, flexible mandatory costs of worker dismissal and the absence of military conscription. These results are important for policymakers to formulate appropriate policies for enhancing economic growth. Since the dimensions of the labour regulations that most affects real GDP growth are mandatory costs of worker dismissal and hours regulations, the indication is that negotiations with trade unions at the labour market level should focus on liberalization of working hours and flexibility in dismissing workers. In line with this, policies that aim at enhancing flexibility of the labour market consequently enhance economic growth. Additionally, all forms of military conscription seem to be detrimental to economic growth. Parliaments and governments should liberalize stringent labor legislation. One practical method for making economies more appealing to foreign investment is labor market liberalization, which eventually boosts economic development and competitiveness.

Even though our results indicate an increased effect of labour market flexibility on economic growth, more research needs to be done. There should be further research analysing the effect of the individual labour market indicators on economic growth on a global scale. Additionally, future studies must examine channels through which labour market flexibility affects economic growth. Emphasis can be placed on FDI and unemployment as possible channels through which labour market regulations affect economic growth. Additionally, the variability of the model must be improved in further studies. Economic variables that have better predictive power for the variability of economic growth must be included.

Appendix

Diagnostic tests

Table A1: Hausman test (1)

Variables	(Random effects) Ln (rgdp)
Labour market flexibility	0.154*** (0.0255)
Total unemployment	-0.0326*** (0.00577)
Trade	0.00150 (0.00103)
Population growth	-0.0608 (0.0618)
Inflation (CPI)	-0.000201 (0.00102)
Money growth	0.0900*** (0.0122)
Size of government	-0.0149 (0.0188)
Constant	9.382*** (0.334)
Observations	573
Number of countries	37

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: authors' calculations

Table A2: Hausman test (2)

Variables	(Fixed effects) Ln (rgdp)
Labour market flexibility	0.162*** (0.0255)
Total unemployment	-0.0332*** (0.00577)
Trade	0.00183* (0.00103)
Population growth	-0.0660 (0.0626)
Inflation (CPI)	-0.000233 (0.00101)
Money growth	0.0922*** (0.0120)
Size of government	-0.0153 (0.0186)
Constant	9.482*** (0.268)
Observations	573
Number of countries	37
R-squared	0.212

Notes: Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Source: authors' calculations

Table A3:

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag(V_b-V_B))
	RE	FE	Difference	S.E.
Labour market flexibility	0.1537072	0.1622699	-0.0085627	0.0009624
Total unemployment	-0.0325557	-0.033183	0.0006273	0.0001504
Trade	0.0014971	0.0018339	-0.0003367	0.0001162
Population growth	-0.0607685	-0.0659965	0.005228	
Inflation (CPI)	-0.0002015	-0.0002334	0.0000319	0.0001821
Money growth	0.0900007	0.0921664	-0.0021657	0.0020025
Size of government	-0.0149239	-0.0152933	0.0003694	0.0028231
chi2(7)	(b-B)'[(V_b-V_B)^(-1)](b-B) = 71.74			
Prob>chi2	0.0000 (V_b-V_B is not positive definite)			

Notes: b = consistent under Ho and Ha; obtained from xtreg
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg
 Test: Ho: difference in coefficients not systematic
 Source: authors' calculations

Table A4: Cross-sectional dependence test

Pesaran's test of cross-sectional independence	62.127, Pr = 0.0000
Average absolute value of off-diagonal elements	0.738

Source: authors' calculations

Table A5: Heteroskedasticity test

chi2 (37)	19316.23
Prob>chi2	0.0000

Modified Wald test for groupwise heteroskedasticity in fixed-effects regression model
 H0: $\sigma(i)^2 = \sigma^2$ for all i
 Source: authors' calculations

Table A6: Serial correlation test

F (1, 35)	473.923
Prob > F	0.0000

Notes: Wooldridge test for autocorrelation in panel data

H0: no first-order autocorrelation

Source: authors' calculations

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