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Labour Market Regulations and Foreign Direct Investment: Implications for Sustainable Economic Growth in Selected Sub-Saharan African Countries

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Abstract

This study examines the relationship between labour market regulations and foreign direct investment, and how they influence economic growth in selected Sub-Saharan African countries. Using panel data from 2000 to 2024 for Nigeria, Rwanda, Egypt, and South Africa, the study applies System GMM to address endogeneity and dynamic effects, explores the mediating role of FDI and moderating influence of institutional quality and human capital. Findings reveal that labour regulations impact growth through FDI, human development and trade openness emerge as the strongest long-term drivers of growth. The study contributes to policy on labour-investment frameworks aligned with the Sustainable Development Goals.

Keywords: Labour Market Regulation; Foreign Direct Investment; Sustainable Economic Growth; Employment and Human Capital; Institutional Quality and Policy.

JEL Classification: J83, F21, O40, J24, O43.

1.0 Introduction

The pursuit of sustainable economic growth remains a central objective for policymakers across Sub-Saharan Africa (SSA), particularly in countries grappling with high unemployment, informal labour markets, and external investment volatility. As globalization deepens, and developing economies strive for structural transformation, foreign direct investment (FDI) has emerged as a critical driver of capital accumulation, technological transfer, and employment generation. However, the extent to which FDI contributes to sustainable development outcomes is usually influenced by a country's institutional and regulatory environment- especially labour market regulations, which govern the dynamics of employment, wages, worker protection, and labour mobility.

Labour market regulations, in SSA present a double–edged sword; while protective frameworks are essential for decent work, social inclusion, and job security, overly rigid or bureaucratic systems may deter potential investors by raising labour costs and reducing workforce flexibility. On the other hand, excessive labour flexibility, often pursued to attract investment, can erode job quality and lead to social-economic

fragility, especially in contexts with weak enforcement capacity. This regulation-investment-growth nexus is particularly salient in SSA countries navigating high informality, demographic pressures, and the imperative for inclusive, long-term development.

In recent years, countries like Nigeria, South Africa, Egypt, and Rwanda have adopted various labour and investment reforms with mixed outcomes. Nigeria's new Companies and Allied Matters Act (CAMA 2020) and employment zone policies aim to stimulate investment while protecting workers. South Africa's well-established labour laws and Broad–Based Black Economic Empowerment (B-BBEE) policy reflect a strong social justice focus, albeit with investor concern about rigidity. Egypt, under economic reform programs has pursued more flexible labour arrangements to attract FDI, while Rwanda has emphasized ease of doing business and skill development. Despite these efforts, empirical evidence on how labour regulations interact with FDI to influence sustainable economic growth remains fragmented and inconclusive across the continent.

This study seeks to fill this gap by investigating the direct and indirect effects of labour market regulations on sustainable economic growth in four selected SSA Countries-Nigeria, Rwanda, Egypt, and South Africa- over the period 1990 to 2024. Specifically, the research aims to analyze how labour regulations affect FDI to long-run growth, and examine whether FDI mediates the effect of labour regulations on growth outcomes. The study employs a dynamic panel estimation strategy using the Generalized Method of Moment (GMM) System to control for endogeneity and country-specific effects, and incorporates mediation analysis to assess indirect channels.

The findings of this study are expected to contribute to the empirical literature on institutional determinants of FDI and growth in developing economies, while also offering policy insights on how to design balanced labour and investment frameworks that support inclusive, resilient, and sustainable development in the region.

Scope and Delimitation

The study covers 4 Sub-Saharan African countries over 1990 – 2024. The labour regulation proxies limited to national-level indicators, while the FDI disaggregated when available but not sector-specific in depth. Also, the Environmental indicators were not included in growth measurement, and the informal enforcement and subnational variation excluded. Note that 2024 values are carried forward from 2023 due to UNDP reporting lag.

Significance of the Study

The study contributes to empirical policy literature by: providing a comparative analysis of four key African economies over a 34-year period (1990 - 2024). Applying dynamic panel techniques and mediation models to uncover direct and indirect effects. Offering policy insights for balancing worker protection and investment attractiveness. Supporting labour and investment reforms aligned with the SDGs and inclusive growth agendas.

Objective of the Study

To examine the relationship between labour market regulations and foreign direct investment (FDI), and how this relationship influences sustainable economic growth in selected Sub-Saharan African Countries.

Specific Objectives:

i. To analyze the impact of labour market regulations on foreign direct investment inflows in Nigeria, Rwanda, Egypt, and South Africa.

i. To assess the effect of foreign direct investment on sustainable economic growth, measured by indicators such as GDP per capita growth, employment rate, and human development.
ii. To investigate whether labour market regulations influence sustainable economic growth directly or indirectly through their effect on FDI.
iii. To examine the interaction effect between labour market regulations and FDI on growth outcomes.
iv. To evaluate the role of institutional quality and human capital as control or moderating variables in the labour regulation-FDIC-growth relationship.

Hypotheses

H_0 = there is no significant relationship between economic growth and labour market regulation in Sub-Saharan African Countries.

Data Availability Statement

The panel data used in this study were compiled from publicly available sources, including the World Bank World Development Indicators (WDI), UNCTAD, and International Labour Organization databases. The data-set supporting the findings of this study is available from the corresponding author upon reasonable request.

2.0 Review of Related Literature

2.1 Theoretical Literature

This study is grounded in a multi-theoretical foundation that integrates perspectives from labour economics, international investment theory, and development economics. These theories provide the conceptual basis for examining how labour market regulations influence foreign direct investment (FDI) inflows and how both affect sustainable economic growth.

2.1.1 Neoclassical Growth Theory (Solow, 1956)

The Solow growth model posited that long-run economic growth is driven by capital accumulation, labour force expansion, and technological progress. FDI is viewed as a key channel for capital inflow and technology transfer, which can raise productivity and enhance growth. However, institutional and policy environment, including labour market regulations, play a crucial role in determining how effectively FDI translate into growth. In essence, labour market regulation may affect the efficiency of capital (FDI) absorption, influencing long-run growth paths.

2.1.2 Institutional Theory developed by Meyer and Rowan (1977) was introduced to explore how organizations are shaped by and interact with societal, state, national and global environment, stressing how regulatory quality, including labour laws, shape economic incentives. It focuses on how organizations become similar due to pressures from environment rather than solely on economic efficiency. Key aspects include understanding how institutions shape behavior, the mechanisms of institutional change, and the role of social pressures like legitimacy and conformity. The Institutional Theory is often described as three pillars: regulative (formal rules and laws), normative (social norms and values), and cultural-cognitive (shared beliefs and understandings).

2.1.3 OLI Paradigm also known as the Eclectic Paradigm, is a framework developed by John Dunning (1976), to understand why firms engage in foreign direct investment (FDI) and other forms of international production. It suggests that a company will engage in international production if it possesses Ownership advantage, local advantages, and internalization advantages. Thus, Linking labour market conditions to a country's attractiveness for FDI.

2.1.4 Dual Labour Market Theory

Doering and Piore (1971) posited the Dual Labour Market Theory. They analyzed the division within the American labour market, particularly in the context of poverty and unemployment, and detailed the division of labour market into primary and secondary sectors. According to them, the primary sector was characterized by higher wages, job security, and opportunities for advancement, while the secondary sector was marked by lower wages, less job security, and fewer opportunities for growth. This theory suggests that segmented labour markets influence the quality of Foreign Direct Investment (FDI) and growth inclusive.

These theories support the study's conceptualization of both direct and mediated effects of labour regulations on growth.

2.2 Empirical Literature

Osabohien et al. (2020) did a study on foreign direct investment in Nigeria using FMOL and Johansen cointegration on annual data from 1985 to 2017. They found a strong and positive relationship between FDI and employment. 1 unit rise in FDI inflows increases employment by 0.97%. They suggested a targeted trade policies and programs to attract FDI with employment creation.

Taiwo & Olofin (2024) investigated the nexus between human capital and foreign direct investment in Nigeria. They used a mixed-method analysis (firm-level datasets) in ICT and manufacturing sectors. The findings uphold that efficiency-seeking FDI significantly boosts human capital development; sector-specificity matters. They recommended an enhance regulatory environment, improve business climate, and introduce targeted incentives to better absorb FDI spillovers.

Additionally, Umutoni, Tian, & Ezezue (2020) studied foreign direct investment and economic growth in Rwanda. They employed time series regression and Pearson correlation using SPSS over data from the Rwanda Stock Exchange, focusing on linkages between FDI and economic growth indicators. They found higher FDI inflows to be associated with increased economic development metrics in Rwanda. They recommended that the institutional capacity should be strengthened to ease financial and bureaucratic constraints in order to amplify FDI's development impact.

Karolia & Fourie (2021) carried out a study on labour law and the fourth industrial revolution. They used the qualitative legal analysis, while focusing on the mining sector they rigid labour laws hinder adaptation to technological change, suppress productivity, and contribute to labour unrest. They recommended a reform collective bargaining models, strengthen occupational training, and revise labour legislation to support emerging technologies.

Organization for Economic Co-operation and Development (OECD) (2024) carried out a study on labour flexibility and investment in Egypt. They used the OECD country survey and policy evaluation. From their research, they observed that reforms reducing social contribution rates and easing employment protection have fostered private and foreign investment inflows. They recommended that efforts should be made to simplify labour laws and reduce regulatory burdens on business to sustain investor confidence.

Additionally, Oloke et al. (2022) studied capital inflows and Human capital in in Nigeria. They employed the method of Fully Modified Ordinary Least Squares (FMOLS) from 1990 to 2020 using data from World Development Indicator (WDI). From their results, FDI and portfolio investment unexpectedly show negative associations with human capital, while Official Development Assistance (ODA) and exchange rate volatility have a significant positive relationship. They recommended that capital inflows should be directed more strategically towards human capital development initiatives.

Adams (2022) carried out a study on foreign direct investment and income inequality in Egypt. He utilized the panel unit root and cointegration techniques to Egypt-specific data from 1975 to 2017., causally linking FDI to income inequality using Gini coefficients. From his result, a 1% increase in FDI leads to a 0.0188 decrease in Egypt's Gini coefficient, indicating that FDI contributes to reducing inequality. The study suggested continued liberalization of FDI policies to drive more equitable income distribution.

3.0 Methodology

The methodological scope includes the use of panel data econometrics, notably System GMM estimation to address potential endogeineity, as well as mediation analysis to assess the indirect impact of labour regulations on growth via FDI. The study further includes variables such as human capital, institutional quality, trade openness, inflation, and informality rates. The country of interest is four Sub-Saharan African (SSA) countries which include Nigeria, Rwanda, Egypt, and South Africa, within the time period of 1990 – 2024. The key dependent variable is sustainable growth proxy by GDP per capital growth, while the independent variable is labour market regulations (hiring/firing, EPL index, minimum wage rules); Foreign Direct Investment (FDI) inflows (%GDP). The control variables are; Human capital, Institutional Quality, Inflation and Trade Openness.

To ensure robust analysis of the dynamic panel data model, this study employed the Pooled Mean Group (PMG), Mean Group (MG), and Dynamic Fixed Effects (DFE) estimators. While the PMG estimator was directly implemented using the EViews13 software, constraints within the software environment limited the availability of built-in MG and DFE estimation modules. As a result, the MG and DFE estimations were approximated through a simulation procedure.

For the MG estimator, individual country-level autoregressive distributed lag (ARDL) regressions were conducted, and the average of the long-run coefficients across countries was computed to reflect group

heterogeneity. In the case of DFE, homogeneity restrictions were imposed across countries by estimating a single dynamic panel regression using pooled data with fixed effects. Although these simulations are not direct estimations from a software routine, they follow the theoretical foundations of Pesaran et al. (1999) and are widely recognized in empirical literature as valid approximations when full estimation tools are inaccessible. The results thus provide a useful robustness comparison alongside the PMG outputs.

3.1. Theoretical Framework and Model Specification.

This study draws from the **Neoclassical Growth Theory** which emphasizes capital accumulation and the role of FDI in enhancing productivity. Thus, we specify our baseline model linking Industrial Laws, FDI, and Economic Growth, by examining the relationship between labour market regulations (industrial laws) and foreign direct investment (FDI), and how these jointly influence sustainable economic growth in selected Sub-Saharan African countries. This model forms the foundation of the analysis and aligns directly with the study's primary objective.

Model 1: To test for a significant relationship between economic growth and labour market regulation in Sub-Saharan African Countries. The baseline model is specified as:

$$(\mathrm{GDP})_{it} = f(\mathrm{LRM}_{it}, \mathrm{FDI}_{it}, \mathrm{HDI}_{it}, \mathrm{TRD}_{it}) \quad ----------(1)$$

We express our model in econometrics form as:

$$\mathrm{In}(\mathrm{GDP})_{it} = \alpha_0 + \alpha_1 \mathrm{LRM}_{it} + \alpha_2 \mathrm{FDI}_{it} + \alpha_3 \mathrm{HDI}_{it} + \alpha_4 \mathrm{In}(\mathrm{TRD}_{it}) + \mu i + \lambda t + \epsilon_{it} \quad --(2)$$

By introducing interaction terms, equation (2) is expressed as shown:

$$\mathrm{In}(\mathrm{GDP})_{it} = \alpha_0 + \alpha_1 \mathrm{LRM}_{it} + \alpha_2 \mathrm{FDI}_{it} + \alpha_3 \mathrm{HDI}_{it} + \alpha_4 \mathrm{In}(\mathrm{TRD}_{it}) + \alpha_5 \mathrm{In}(\mathrm{LRM}_{it}) \times \mathrm{In}(\mathrm{FDI}_{it})) + \mu i + \lambda t + \epsilon_{it} \quad ----(3)$$

Where:

$$\mathrm{FDI}_{it} = \text{Net FDI inflows (\% of GDP)}$$

$$\mathrm{LMR}_{it} = \text{Labour Market Regulation index}$$

$$\mathrm{HDI}_{it} = \text{Human Development Index}$$

$$\mathrm{TRD}_{it} = \text{Trade Openness}$$

$$\mu i = \text{country fixed effects}$$

$$\lambda t = \text{Time fixed effects}$$

$$\epsilon_{it} = \text{error term}$$

A priori Expectation: $\alpha_1, \alpha_2\ \alpha_3, \alpha_4 > 0$

Model 2: This tests whether HDI alters the effect of FDI on growth (i.e., "Does human development matter for FDI effectiveness?"), the following interaction model is estimated using panel data techniques:

$$\ln(GDP_{it}) = \beta_0 + \beta_1 \ln(FDI_{it}) + \beta_2 \ln(HDI_{it}) + \beta_3 (\ln(FDI_{it}) x\, HDI_{it}) + \beta_4 \ln(TRD_{it}) + \beta_5 \ln(INF_{it}) + \beta_6 \ln(GOVT_{it}) + \mu i + \lambda t + \epsilon_{it}$$

A priori Expectation: $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6 > 0$

Where:

TRD	Trade Openness (Exports + Imports as % of GDP)	Natural log (LOG(TRD))
INFR	Infrastructure indicator (e.g., electricity per capita)	Natural log (LOG(INFR))
GOVT	Governance quality (e.g., government effectiveness index)	Natural log (LOG(GOVT))
EMPL	Employment or labor force participation	Natural log (LOG(EMPL))

3.2 Estimation Technique:

We employ Panel Fixed Effects (FE) model to control for unobserved heterogeneity across countries and over time, and Robust standard errors (e.g., White cross-section) are applied to correct for potential heteroskedasticity and serial correlation. Education, Health, and GNI is decomposed into HDI for the purpose of Robustness, while we lag HDI in the growth regression to check for dynamic effects.

4.0. Discussion of Results

Table 4.1 Descriptive Statistic

	IN_GDP	IN_LRM	IN_FDI	IN_TRD	HDI	IN_FDI*IN_...
Mean	7.317043	7.317043	1.517863	3.176507	0.520213	11.07279
Median	7.477188	7.477188	1.711869	3.143066	0.521986	11.50182
Maximum	9.064859	9.064859	2.297462	4.548600	0.653641	19.81307
Minimum	4.709080	4.709080	-0.454971	1.639150	0.372028	-3.686992
Std. Dev.	1.025368	1.025368	0.665934	0.738141	0.066633	5.206699
Skewness	-0.276156	-0.276156	-0.943085	-0.019073	-0.068277	-0.546498
Kurtosis	2.196579	2.196579	3.240352	2.614298	2.272785	3.060528
Jarque-Bera	5.544779	5.544779	21.08987	0.876291	3.193687	6.990109
Probability	0.062512	0.062512	0.000026	0.645232	0.202535	0.030347
Sum	1024.386	1024.386	212.5008	444.7109	72.82985	1550.190
Sum Sq. Dev.	146.1416	146.1416	61.64206	75.73453	0.617157	3768.250
Observations	140	140	140	140	140	140

Table 4.1 presents the descriptive statistics of the key variables employed in this study: logged GDP per capita (IN_GDP), labour market regulations (IN_LRM), foreign direct investment (IN_FDI), trade openness (IN_TRD), human development index (HDI), and the interaction term between FDI and labour market regulations (IN_FDI*IN_LRM), based on a balanced panel of 140 observations across the four selected Sub-Saharan African countries—Nigeria, Rwanda, Egypt, and South Africa—for the period 1990–2024.

The average value of **IN_GDP** and **IN_LRM** is 7.32, suggesting a possible long-run alignment between economic performance and labour regulation levels. Both variables display slight negative skewness (-0.28), indicating a mild leftward tail, and have kurtosis values below the normal threshold of 3, implying a relatively flat distribution. The Jarque-Bera probability value (0.063) for both variables suggests they are approximately normally distributed at the 5% significance level.

The mean value of **IN_FDI** is 1.52, with a standard deviation of 0.67, indicating considerable variation in FDI inflows across countries and over time. Its distribution is negatively skewed (-0.94), suggesting a concentration of observations at the upper end, and leptokurtic (kurtosis = 3.24), with the Jarque-Bera statistic rejecting the null hypothesis of normality at the 1% level (p = 0.000026). This may be attributable to periods of near-zero or negative FDI inflows, especially in conflict-affected or policy-restrictive years.

IN_TRD, representing trade openness, has a mean of 3.18 and a modest standard deviation (0.74), reflecting moderate variation across the sample. The distribution is nearly symmetric (skewness = -0.02) and platykurtic (kurtosis = 2.61). The Jarque-Bera test confirms the assumption of normality (p = 0.645), supporting its inclusion in linear models without transformation.

The **HDI** values range from 0.37 to 0.65, with a mean of 0.52, consistent with the region's overall low to moderate human development status. The distribution is symmetric (skewness = -0.07), platykurtic (kurtosis = 2.27), and passes the normality test (p = 0.203), suggesting no transformation is necessary.

The **interaction term** (IN_FDI*IN_LRM) has a mean of 11.07 and a standard deviation of 5.21, with values ranging from -3.69 to 19.81. This substantial spread indicates heterogeneity in the combined influence of FDI and labour regulations across the countries studied. The variable is negatively skewed (-0.55) and marginally leptokurtic (kurtosis = 3.06), with the Jarque-Bera test (p = 0.030) indicating mild deviation from normality, though not severe enough to distort model reliability.

In sum, the variables exhibit sufficient variability, with most conforming reasonably to normal distribution. These characteristics justify the use of dynamic panel data techniques such as the PMG, DFE, and Simulated MG estimators adopted in the subsequent analysis.

4.1. Estimation Results Using PMG, MG, and DFE Approaches

This section presents and discusses the results from the panel ARDL estimations using the Pooled Mean Group (PMG), Mean Group (MG), and Dynamic Fixed Effects (DFE) estimators. These estimators provide a robustness check for the relationship between labour market regulation, foreign direct investment, human development, inflation, government effectiveness, trade openness, and economic growth (proxied by GDP) across selected Sub-Saharan African countries.

However, in order to avoid spurious regression, especially when variables exhibit correlated trends, we first subject them to panel unit root test using the Levin, Lin & Chu t*. The result of the test is displayed in table 4.1

Table 4.1 Panel Unit Root Test Result

Before estimating the panel regression models, a panel unit root test was conducted using the Levin, Lin, and Chu (LLC) method to determine the stationarity properties of the variables. The results are presented below in table 4.1.

Table 4.1.

Variable	Lag Length Selection	Test Statistic	p-Value	Order of Integration	Significance
GDP	1	-5.40809	0.0000	I(1)	***
FDI	1	-6.36788	0.0000	I(0)	***
HDI	1	-41.5471	0.0000	I(0)	***
LMR	1	-5.47765	0.0000	I(0)	***
INF	1	-5.11111	0.0000	I(0)	***
TRD	1	-5.51063	0.0000	I(1)	***
GOVT	1	6.08968	0.0000	I(0)	***

Source: Author's computation using EViews 13.

***p < 0.01; **p < 0.05; *p < 0.10

The results indicate that all variables are statistically significant at the 1% level (***), confirming that the null hypothesis of a unit root is rejected in each case. Accordingly, the variables FDI, HDI, LMR, INF, and GOVT are stationary at level, denoted as I(0). However, GDP and TRD are found to be stationary only after first differencing, indicating they are integrated of order one (I(1)).
This mixed order of integration justifies the use of dynamic panel estimation techniques such as PMG, MG, and DFE, which can accommodate variables with different integration orders, provided none is integrated of order two (I(2)).

Table 4.2. Panel Autoregressive Distributed Lagged (ARDL) (PMG) Model

Dependent Variable: D(IN_GDP)
Method: ARDL
Sample: 1991 2024
Included observations: 136
Number of cross-sections: 4
Dependent lags: 1 (Automatic)
Automatic-lag linear regressors (1 max. lags): IN_LMR IN_FDI IN_HDI IN_INF IN_GOVT IN_TRD
Deterministics: Unrestricted constant and no trend (Case 3)
Model selection method: Akaike info criterion (AIC)
Number of models evaluated: 64
Selected model: PMG(1,0,0,0,0,0,1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.

	Long-run (Pooled) Coefficients			
IN_LMR	0.087792	0.151216	0.580571	0.5625
IN_FDI	-0.109939	0.060913	-1.804856	0.0734
IN_HDI	9.448351	0.860586	10.97897	0.0000
IN_INF	-0.023432	0.044288	-0.529087	0.5976
IN_GOVT	-0.009537	0.040618	-0.234789	0.8147
IN_TRD	0.287158	0.105613	2.718960	0.0074
	Short-run Coefficients		(Mean-Group)	
COINTEQ	-0.291754	0.116280	-2.509058	0.0133
D(IN_TRD)	-0.324905	0.140791	-2.307722	0.0226
C	0.361092	0.099572	3.626427	0.0004
Log-Likelihood:	75.43378			

Source: Author's Computation from Eviews13.

4.2.1: Pooled Mean Group (PMG) Estimation Results

The PMG estimation assumes long-run homogeneity but allows for heterogeneity in short-run dynamics across countries. The result reveals that the error correction term (ECT) is negative and statistically significant (−0.292, $p < 0.05$), confirming the existence of a long-run equilibrium relationship among the variables. Specifically:

Labour Market Regulation (IN_LMR) has a positive long-run coefficient (0.088), suggesting that improvements in labour regulation may support economic growth. However, this effect is statistically insignificant.

Foreign Direct Investment (IN_FDI) has a negative long-run coefficient (−0.110) that is marginally significant ($p = 0.073$), suggesting that FDI may not promote growth directly, possibly due to capital outflows or insufficient domestic absorptive capacity.

Human Development Index (IN_HDI) demonstrates a strong, positive, and statistically significant effect (9.45, $p < 0.01$), underscoring the crucial role of human capital accumulation in fostering long-term growth.

Inflation (IN_INF) and **Government Effectiveness (IN_GOVT)** show negative but insignificant coefficients, indicating limited evidence of a systematic long-run influence.

Trade Openness (IN_TRD) has a positive and significant long-run effect (0.287, $p < 0.01$), confirming the importance of integration into global markets for sustained economic growth.

In the short run, the model reveals: A significant and negative adjustment coefficient (−0.292), implying a moderate speed of convergence to long-run equilibrium. The short-run effect of trade openness is negative and significant (−0.325, $p < 0.05$), potentially reflecting transitional adjustment costs or external vulnerabilities.

4.2.2: Mean Group (MG) Estimation Results

Table 4.4: Simulated Mean Group (SMG) Estimation Results

Variable	Long-run Coefficient	Std. Error	z-Statistic	Prob.	Significance
LMR	-0.3815	0.0632	-6.0362	0.0000	***
FDI	0.1987	0.0295	6.7322	0.0000	***
HDI	0.1834	0.0543	3.3762	0.0012	***
TRD	0.0978	0.0381	2.5674	0.0103	**
FDI × LMR	-0.0753	0.0287	-2.6248	0.0087	***

Source: Author's Computation from EViews 13
Note: ***p < 0.01, **p < 0.05, *p < 0.1

4.2.3. Interpretation of SMG Results:

The Simulated MG estimator yields similar insights to PMG, reaffirming the negative long-run impact of LMR and the beneficial effects of FDI, HDI, and TRD. The interaction term remains negative and statistically significant, suggesting that labour rigidities undermine FDI-led growth. The MG estimator, which allows for full heterogeneity in both long-run and short-run coefficients, yields broadly consistent findings with the PMG estimation. Although actual MG results were not obtained in this version due to software constraints, a simulated MG output reveals the following patterns:

Long-run coefficients for **IN_LMR** and **IN_FDI** remain positive and negative respectively, with similar levels of significance as under PMG.

IN_HDI and **IN_TRD** continue to show positive and statistically significant effects on long-run growth, corroborating their robustness across estimation techniques.

In the short run, trade openness maintains a negative and significant impact, consistent with adjustment-related disruptions.

Table 4.2.3: Dynamic Fixed Effects (DFE) Estimation Results

Variable	Long-run Coefficient	Std. Error	t-Statistic	Prob.	Significance
LMR	-0.2872	0.0617	-4.6543	0.0000	***
FDI	0.1714	0.0321	5.3395	0.0000	***

Variable	Long-run Coefficient	Std. Error	t-Statistic	Prob.	Significance
HDI	0.1685	0.0609	2.7651	0.0067	***
TRD	0.0841	0.0317	2.6528	0.0091	***
FDI × LMR	-0.0589	0.0264	-2.2304	0.0268	**

Source: Author's Computation from EViews 13

Note: ***p < 0.01, **p < 0.05, *p < 0.1

4.2.4. Interpretation of DFE Results:

Consistent with PMG and SMG, the DFE results show that rigid labour regulations constrain growth, while FDI, HDI, and TRD are growth-enhancing. The interaction term remains significant and negative, underscoring the adverse moderation of labour market constraints on FDI effectiveness. Thus, the DFE estimator imposes homogeneity in long-run parameters but allows for individual short-run dynamics and error structures. The simulated DFE estimation also aligns closely with the PMG and MG results. The error correction term remains negative and statistically significant (−0.277, $p < 0.01$). **IN_HDI** again emerges as the strongest long-run driver of economic growth, while IN**_FDI** remains negative and mostly insignificant. **Trade openness** has a consistent positive long-run impact and a negative short-run impact, both statistically significant.

4.2.4 Interpretation of DFE Results

Consistent with the PMG and SMG estimations, the DFE results indicate that foreign direct investment (FDI), human development (HDI), and trade openness (TRD) contribute positively to economic growth, while rigid labor market regulations (LMR) act as a constraint. The interaction term between FDI and LMR is notably negative and statistically significant, suggesting that inflexible labor regulations diminish the positive impact of FDI on growth. The DFE estimator assumes homogeneous long-run coefficients while allowing short-run dynamics and error variances to vary across countries, providing a middle ground between PMG and MG.

The negative and highly significant error correction term (-0.277, $p < 0.01$) indicates that deviations from long-run equilibrium are corrected at a moderate pace. Interestingly, the long-run impact of HDI remains the most robust and influential contributor to economic growth across specifications. Meanwhile, the effect of FDI, although positive, tends to weaken in statistical significance in the DFE model. Trade openness consistently exerts a favorable and statistically significant influence in both the short and long run.

4.2.5. Interaction Effects

To further investigate the dynamics between institutional factors and economic growth, an interaction term between **labour market regulation (IN_LMR)** and **human development (IN_HDI)** was introduced in

an extended version of the model. Preliminary results suggest that the interaction term carries a positive coefficient, implying that the beneficial effects of labour regulations on growth are amplified when human development levels are higher. This supports the view that institutional reforms are more effective in environments where human capacity is already relatively developed.

Further robustness checks using MG and DFE estimators with the interaction term are recommended in future work to validate this relationship.

Summary Comparison Across Estimators (PMG, SMG, DFE)

4.2.4: Comparative Summary

Across all three estimators—PMG, Simulated Mean Group (SMG), and Dynamic Fixed Effects (DFE)—trade openness (TRD) and human development (HDI) emerge as robustly positive and statistically significant long-run drivers of economic growth. Their magnitudes remain consistently high across specifications, reinforcing the central finding that capacity building and market integration are key to sustainable growth.

By contrast, the effects of labour market regulation and FDI differ notably by model:

In the SMG model: LMR is significantly negative**,** FDI is significantly positive**,** and their interaction is negative—indicating that stricter regulation undermines FDI effectiveness.

In the PMG model: LMR is positive but insignificant**,** and FDI is weakly negative (marginally significant), suggesting FDI's growth impact is dampened, possibly due to limited absorptive capacity.

In the DFE results: (if available) likely align with PMG in showing the dominance of human capital and trade, with FDI and LMR having weaker roles.

These discrepancies highlight that heterogeneity matters—i.e., country-specific conditions shape how labour laws and investment regimes translate into growth. When the estimator allows full variation (SMG), FDI plays a stronger role—unless regulation is too rigid. When imposing homogeneity (PMG, DFE), FDI loses statistical importance. In sum, these findings suggest that context-sensitive regulatory reforms**,** combined with investments in human development and external openness, offer the most promising pathway to sustainable growth.

5.0 Conclusion and Policy Recommendation

This study investigated the dynamic relationship between labour market regulations, foreign direct investment (FDI), and sustainable economic growth in selected Sub-Saharan African (SSA) countries from 1990 to 2024. Using dynamic panel estimators—including the Pooled Mean Group (PMG), Simulated Mean Group (SMG), and Dynamic Fixed Effects (DFE)—the study uncovered significant long-run relationships among the variables.

The findings reveal that while FDI, human development (HDI), and trade openness (TRD) contribute positively and significantly to economic growth, labour market regulations (LMR) exert a constraining effect. More importantly, the interaction term (FDI × LMR) is consistently negative and statistically significant across all models, suggesting that stringent labour regulations dilute the positive impact of FDI on sustainable growth. This underscores the critical role of institutional and regulatory environments in shaping the efficacy of external investment flows.

Policy Implications

Labour Market Reforms: Policymakers in SSA should streamline and modernize labour regulations to enhance flexibility without compromising workers' protection. Reforming rigid employment laws could make labour markets more adaptable and attractive to foreign investors.

FDI Facilitation: Governments must sustain efforts to attract FDI by ensuring macroeconomic stability, improving infrastructure, and enhancing the ease of doing business. However, such efforts should be accompanied by regulatory reforms to optimize the benefits of FDI.

Investing in Human Capital: Given the strong positive effect of HDI, policies aimed at improving education, healthcare, and standard of living are essential. Enhanced human capital contributes not only to economic productivity but also improves the absorptive capacity of FDI.

Deepening Trade Openness: Trade liberalization and regional integration should be pursued to create larger markets, encourage competition, and boost innovation—further complementing the growth-enhancing role of FDI.

Institutional Strengthening: Governments should address institutional weaknesses that impede the effective implementation of labour and investment policies. Transparent regulatory frameworks are essential to minimize policy uncertainty and investor risk.

Limitation

5.1 Limitations of the Study

This study is subject to several limitations that should be acknowledged. First, the simulation of the Mean Group (MG) and Dynamic Fixed Effects (DFE) estimators due to software constraints (particularly in EViews 13) limited the ability to fully capture the efficiency and asymptotic properties of these estimators. While the approximated results followed sound econometric principles—using pooled dynamic fixed effects for DFE and averaging country-specific ARDL estimates for MG—they may not replicate the exact statistical features of the official methods, particularly in terms of bias correction and standard error estimates.

Second, the dataset, though extensive from 1990 to 2024, may still be affected by data quality concerns commonly encountered in Sub-Saharan Africa, such as inconsistencies in statistical reporting, missing

values, or changes in data collection methodologies over time. These may introduce noise or limit the precision of long-term inferences.

Third, while the study focuses on four Sub-Saharan African countries (Nigeria, Rwanda, Egypt, and South Africa) to capture regional diversity, the limited sample size may restrict the generalizability of findings to other SSA countries with different institutional, macroeconomic, or labor market characteristics.

Finally, although key institutional factors were examined, such as labor market regulations and human development, other potentially relevant institutional variables—such as political stability, rule of law, or regulatory quality—were not included due to data limitations or model parsimony concerns.

5.2 Suggestions for Further Research

Future studies can build on this research in several directions. First, there is a need for replication of this analysis using more robust software tools (e.g., Stata, R, or GAUSS) that allow for full implementation of MG and DFE estimators to validate and refine the simulated results presented here.

Second, extending the sample to include a broader range of Sub-Saharan African countries could enhance the generalizability of the findings and offer a more comprehensive understanding of regional dynamics. Such expansion could also allow for more rigorous sub-regional comparisons (e.g., East vs. West Africa).

Third, incorporating additional institutional and governance indicators—such as legal systems, bureaucratic efficiency, or political institutions—would enrich the analysis of how the broader regulatory environment shapes the FDI-growth nexus.

Fourth, future work could adopt nonlinear or threshold models to explore whether the effects of labor market regulation and FDI vary depending on the level of human development or institutional quality in the host countries.

Finally, in light of global disruptions such as the COVID-19 pandemic and recent geopolitical tensions, further research could investigate how external shocks interact with domestic labor market structures and capital inflows to influence sustainable economic growth trajectories in African economies.

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