The Dual Impact of Foreign Capital: A Comprehensive Analysis of the Interplay between Foreign Direct Investment and Development Assistance Committee Initiatives in Ethiopia

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Abstract

This study delves into the intricate dynamics of Ethiopia's economic landscape, examining the dual impact of foreign capital through a comprehensive analysis of Foreign Direct Investment (FDI) and Development Assistance Committee (DAC) initiatives. Over the period 1992-2012, a two-part empirical approach is employed, encompassing descriptive statistics and rigorous econometric modeling rooted in time series analysis. The nuanced relationship between foreign capital and economic growth in Ethiopia is unraveled, addressing challenges such as job displacement and potential exploitation, alongside positive outcomes like infrastructure development and increased service accessibility. The econometric analysis utilizes various models to explore the causal relationships between FDI, DAC, economic growth, and self-employment. Sensitivity analysis ensures the robustness of the models by unraveling multicollinearity, while stationarity tests guide appropriate treatment of non-stationary variables. Cointegration tests reveal potential long-term relationships among variables, with specific models suggesting cointegration, further substantiating the intertwined nature of FDI, DAC, and economic growth. Granger causality Wald tests scrutinize short-run equilibrium relationships, unveiling intriguing insights into the direct and

indirect effects of FDI, DAC, and self-employment on economic growth. Robust diagnostic tests affirm the reliability of the models, indicating compliance with Ordinary Least Squares (OLS) conditions. In summary, our findings illuminate the dual impact of foreign capital on Ethiopia's economic trajectory, offering nuanced perspectives for policymakers. The study's comprehensive empirical foundation facilitates a deeper understanding of the complex interplay between FDI, DAC initiatives, and economic growth, paving the way for informed decision-making and future research endeavors.

Keywords: Foreign Direct Investment (FDI), Development Assistance Committee (DAC), Economic Growth, Self-Employment, Ethiopia, Time Series Analysis, Cointegration, Granger Causality, Multicollinearity, Econometric Modelling

1. Introduction

The United Nations Conference on Trade and Development (UNCTAD) reported a substantial increase in Foreign Direct Investment (FDI) inflow to developing nations, reaching \$759 billion in 2013, constituting 52 percent of the global total (UN News Centre, 2014). Ethiopia, ranked as the third-largest recipient of FDI in Africa, experienced a noteworthy increase from \$441 million in 2012 to \$4.5 billion in 2014 (UNCTAD, 2015). Acknowledging the widespread belief that foreign capital influx fosters economic development and poverty reduction, international entities, governments, and private investors have rallied for collaborative efforts since the late 20th century.

Former UN Secretary General Kofi Annan, in 1999, advocated a partnership between states, private investors, and civil society for economic development (Zimmermann & Smith, 2011). The subsequent alignment of development strategies aimed at achieving Millennium Development Goals (MDGs) has witnessed increased public and private funding for initiatives such as microcredit and infrastructure projects in low-income countries (Baldwin & Chowhan, 2003; Lugo, 2007; Tarozzi, Desai, & Johnson, 2015).

However, concerns persist regarding the potentially exploitative nature of FDI investor countries and the political motivations behind Development Assistance Committee (DAC) activities. Historical perspectives highlight the use of foreign aid, associated with DAC, as a tool for influencing political order (Stokke, 2009). This lack of consensus extends to the debate on the positive association between DAC, FDI, and economic growth or poverty reduction in recipient countries (Shah, Khan, & Khan, 2014; Pattillo, Polak, & Roy, 2007; Li & Lu, 2005; Makki & Somwaru, 2004; Mencingar, 2003).

Amidst these debates, this paper focuses on Ethiopia's recent surge in foreign capital influx. The primary objective is to investigate the impacts of DAC and FDI on economic growth and self-employment, aiming to discern their implications for poverty reduction.

1.1 Background and Context

Ethiopia, located in the horn of Africa, boasts a population of over 96 million as of 2014, positioning itself as the second most populous country in Africa after Nigeria. Unlike many African nations, Ethiopia successfully evaded formal colonization, experiencing only a brief

Italian occupation between 1936 and 1941 (CIA World Fact book, 2014). The resilience of Ethiopian monarchy marked it as one of the few African kingdoms to maintain independence during the colonial era. Despite this, Ethiopia's economy remains predominantly agrarian, with agriculture contributing 43 percent to the Gross Domestic Product (GDP). Notably, coffee has been a longstanding key export commodity for the country.

1.2.1 Economic Landscape

As of 2009, the labor force distribution in Ethiopia indicated a high concentration in agriculture (85%), with industry and services accounting for 5% and 10%, respectively. The country has faced recurrent challenges such as droughts and famines, with the devastating events of 1984-1985 claiming numerous lives (Webb, Braun, Joachim, & Yohannes, 1992; Ezra & Kiros, 2000). The government's economic orientation shifted toward a market-oriented approach in the 1990s, aligning with global trends (The World Bank, 2015). Subsequently, Ethiopia has witnessed substantial annual GDP growth rates, as depicted in Figure 1.
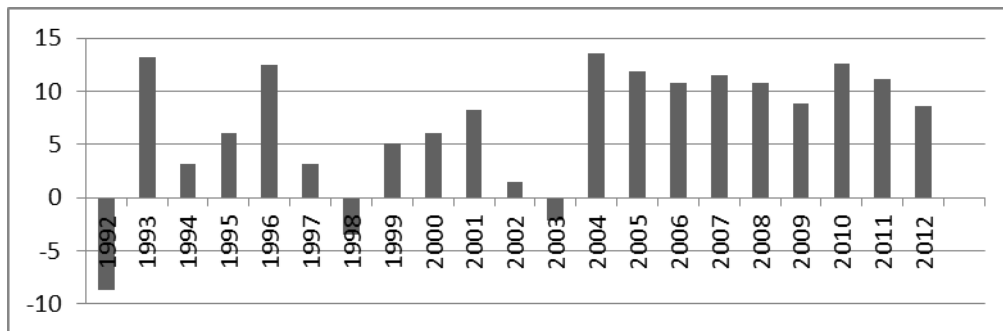

Figure 1. GDP annual percentage growth

Source: The World Bank: World Development Indicators.

Figure 1 shows that between 2004 and 2012, Ethiopia experienced an average annual GDP growth rate of 11 percent, with occasional periods of negative growth. Notably, the worst contraction occurred in 1992 with a staggering -8 percent. In the following sections, we will thoroughly examine the dynamics surrounding the inflow of Development Assistance Committee (DAC) aid and Foreign Direct Investment (FDI) into Ethiopia from 1992 to 2012.

1.2.2 DAC and FDI Inflows: 1992-2012

Ethiopia, a DAC-favored country, has received concessional loans aimed at facilitating economic development through infrastructural projects and citizen welfare. In contrast, Foreign Direct Investment (FDI) involves lasting management interest acquisition in enterprises. Figures 2 and 3 illustrate DAC and FDI inflows as percentages of GDP during the specified period.
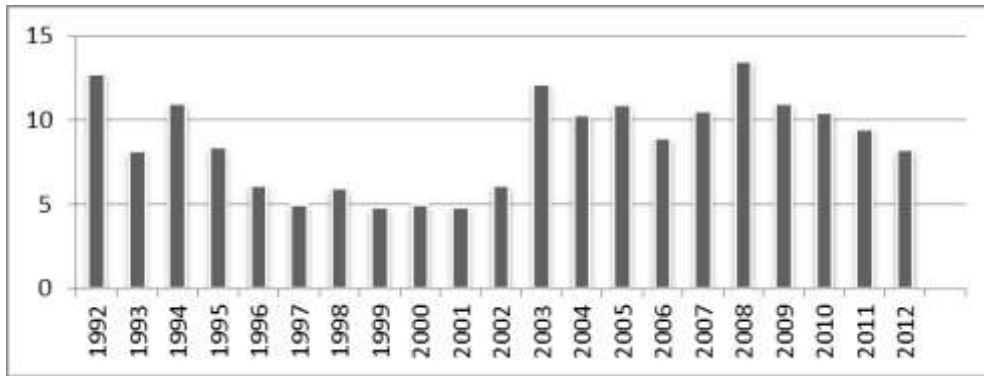
Figure 2. DAC inflow as a percentage of GDP

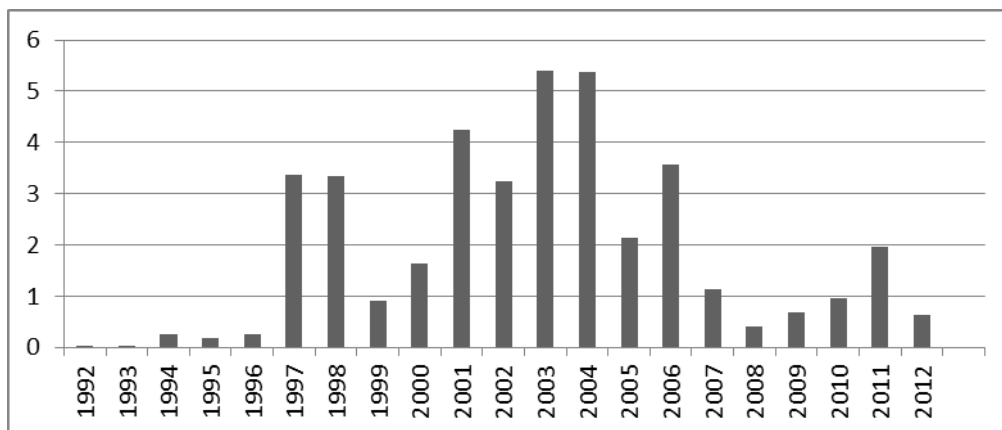Source: The World Bank: World Development Indicators.

Figure 3. FDI inflow as a percentage of GDP

Source: The World Bank: World Development Indicators.

Figures 2 and 3 reveal that DAC's average share of Ethiopian GDP between 1992 and 2012 was 8.1 percent, peaking at 12.4 percent in 2009. Concurrently, FDI's average share during the same period was 1.9 percent, reaching a maximum of 5.5 percent in 2003 and 2004. The global financial crisis in 2008/2009 had discernible impacts, evident in a slowdown of FDI inflows, and a shift in DAC contributions to single-digit percentages.

1.2.3 China's Role in FDI

Significantly, China emerged as a prominent player in Ethiopia's FDI landscape, with the Chinese share escalating from 1.5 percent in 2000 to 16 percent in 2007. By 2012, China became the third-largest foreign investor in Ethiopia. Chinese investments, encompassing various sectors, surpassed those of other countries, signaling a notable shift in the geopolitical landscape. According to some report, China's FDI in Africa, though smaller in comparison to Europe and the U.S., is diverse and extends beyond official statistics (AFRODAD, 2014; Carnegie, 2012; International Policy Digest, 2011; Bräutigam, 2011).

In conclusion, the economic trajectory of Ethiopia, marked by substantial GDP growth, FDI, and DAC inflows, is underscored by the evolving global dynamics, particularly the rising

influence of China.

1.3 Statement of the Problem

In recent years, the surge of Foreign Direct Investment (FDI) in developing countries, particularly exemplified by Ethiopia, has sparked a global discourse on its role in fostering economic growth and alleviating poverty. While international organizations and governments emphasize the positive impacts of FDI and Development Assistance Committee (DAC) initiatives, questions persist regarding their effectiveness and potential drawbacks. This study addresses the critical gap in understanding the nuanced effects of FDI and DAC activities in Ethiopia, aiming to unravel the implications for economic growth, self-employment, and ultimately, poverty reduction.

The existing literature highlights conflicting perspectives on the relationship between FDI and economic development, as well as the varied outcomes of DAC interventions. Furthermore, concerns arise about the motives behind FDI inflows, potentially driven by resource and market-seeking objectives, raising questions about the sustainability and inclusivity of the economic benefits. Additionally, the historical association of DAC activities with political influence prompts an exploration of their impact on self-employment and poverty reduction.

Despite the extensive attention given to FDI and DAC, there is a dearth of empirical studies specifically focusing on their combined effects in the Ethiopian context. This study seeks to address this gap by investigating the intricate interplay between FDI and DAC initiatives, shedding light on their implications for economic growth, self-employment opportunities, and the overarching goal of poverty reduction in Ethiopia.

By scrutinizing the recent surge in foreign capital influx into Ethiopia, this research seeks to contribute valuable insights to policymakers, scholars, and practitioners engaged in sustainable development efforts. The findings aim to inform evidence-based policies, foster informed investment strategies, and contribute to the ongoing global discourse on the effectiveness of FDI and development assistance in achieving meaningful socio-economic progress.

1.4 The Study Objectives

1. To examine the impact of Foreign Direct Investment (FDI) on key economic indicators in Ethiopia, such as GDP growth and employment rates.

2. To assess the relationship between Development Assistance Committee (DAC) initiatives and the promotion of self-employment, considering factors such as entrepreneurship development and access to financial resources.

3. To investigate the joint effects of DAC activities and Foreign Direct Investment (FDI) on poverty reduction in Ethiopia, considering both direct economic impacts and social welfare indicators.

1.5 The Specific Research Questions

1. How does the inflow of Foreign Direct Investment (FDI) impact economic growth in

Ethiopia?

2. What is the relationship between Development Assistance Committee (DAC) activities and self-employment in the context of Ethiopia's economic development?

3. To what extent do DAC initiatives and FDI contribute to poverty reduction in Ethiopia?

1.6 The Study Hypotheses

H1: There is a positive correlation between Foreign Direct Investment (FDI) inflow and economic growth in Ethiopia.

H2: Development Assistance Committee (DAC) activities are positively associated with an increase in self-employment opportunities in Ethiopia.

H3: The combined effects of DAC initiatives and Foreign Direct Investment (FDI) significantly contribute to poverty reduction in Ethiopia.

1.7 The Study Significance

The significance of the study lies in its potential contributions to academic knowledge, policy formulation, and practical implications.

The research contributes to the existing literature on the relationship between FDI, DAC initiatives, and socio-economic outcomes in developing countries, particularly in the context of Ethiopia. It enriches academic discussions and serves as a reference for future studies in this field.

Given the increasing importance of global development initiatives, the study adds to the ongoing discourse on the effectiveness of DAC activities and FDI in achieving sustainable development goals. It contributes to a better understanding of the dynamics between foreign capital inflow and poverty alleviation.

The study provides valuable insights for policymakers in Ethiopia and other developing countries, offering evidence-based recommendations on the role of Foreign Direct Investment (FDI) and Development Assistance Committee (DAC) initiatives in promoting economic growth, self-employment, and poverty reduction.

By empirically validating the relationships between FDI, DAC activities, and socio-economic outcomes, the study contributes to evidence-based decision-making, offering a foundation for policies that are grounded in real-world impact.

The study offers guidance to foreign investors interested in contributing to sustainable development in Ethiopia. Understanding the impacts of FDI on economic growth and poverty reduction can help shape investment strategies that align with both business interests and socio-economic development goals.

The study may have implications for capacity building initiatives by identifying areas where skill development, education, and training programs can enhance the positive impacts of FDI and DAC interventions on self-employment and economic growth.

In summary, the significance of this study lies in its potential to inform policy, guide investors, contribute to academic knowledge, and enhance the understanding of the complex relationships between foreign capital, development assistance, and socio-economic outcomes in Ethiopia.

2. Literature Review

In this section, we highlight the various themes explored in the literature review.

2.1 Self-Employment and Economic Growth

A substantial body of empirical studies has explored the impact of Foreign Direct Investment (FDI) and/or Development Assistance Committee (DAC) on economic growth. However, limited research focuses on their effects on self-employment or poverty reduction. Notably, two Canadian studies by Baldwin and Chowhan (2003) and Rispoli (2009) provide insights into the impact of self-employment on economic growth. Baldwin and Chowhan found that self-employment generated a majority of jobs in the business sector, although earnings per worker lagged behind those in other sectors. Rispoli, analyzing the unincorporated sector in Canada, identified over 1.5 million self-employed entrepreneurs contributing $93.2 billion to GDP between 1997 and 2005.

2.2 Foreign Direct Investment (FDI) and Economic Growth

From Taiwan, Bende-Nabende and Ford (1998) established a positive correlation between FDI and growth, while Borensztein, De Gregoro and Lee (1998) emphasized FDI's role in technological transfer. In Europe, Kottaridi (2005) highlighted the growth-enhancing factors of FDI, human capital, and trade volume for core EU countries. Li and Lu (2005) demonstrated a significant endogenous relationship between FDI and economic growth using panel data for 84 countries.

2.3 Development Assistance Committee (DAC) and Foreign Aid

Shah et al. (2014) in Pakistan revealed a positive relationship between DAC, FDI, and GDP, with DAC exerting a higher influence. Pattillo et al. (2007) challenged the negative perception of foreign aid's impact on growth and poverty reduction, asserting a positive effect. Kosack & Tobin (2006) found that aid contributes to both economic growth and human development, while Mirza and Giroud (2004) explored FDI's impact on Vietnam, concluding its limited effect on market creation.

2.4 Critiques on FDI and Infrastructure Impact

Contrastingly, Yamin and Sinkovics (2009) and Elimawazini, Saadi and Ngouhouo (2005) questioned the positive impact of FDI on infrastructure and productivity. Kaplinsky, McCormick and Morris (2008) highlighted the negative consequences of Chinese FDI in Sub-Saharan Africa, including a decline in exports, employment, and closure of small companies.

2.5 Summary and Focus of the Current Study

Considering the reviewed literature's evidence and the controversies surrounding the impact of FDI and/or DAC on economic growth, self-employment, infrastructure, and poverty reduction, this study aims to test the direction of the effect of foreign capital on economic growth and self-employment in Ethiopia. The focus is on understanding the direction and quantifying the degree of their relationship. This perspective informs the theoretical frameworks and chosen methodology discussed in the following sections.

2.6 Theoretical Frameworks: Foreign Capital

This section outlines the theoretical framework and perspectives on the benefits and concerns associated with Foreign Direct Investment (FDI) in theory. The study explores the impact of foreign capital in Ethiopia, aiming to provide empirical evidence to inform the discourse.

The study is guided by the Harrod and Domar model, proposing that low-income countries, facing a savings deficit, can address this gap through foreign capital inflows, either via international financial markets (IFM), development assistance (DAC), or foreign direct investment (FDI). This investigation emphasizes DAC and FDI as pivotal sources of foreign capital (Hagemann, 2009).

Figure 4. DAC and FDI Model
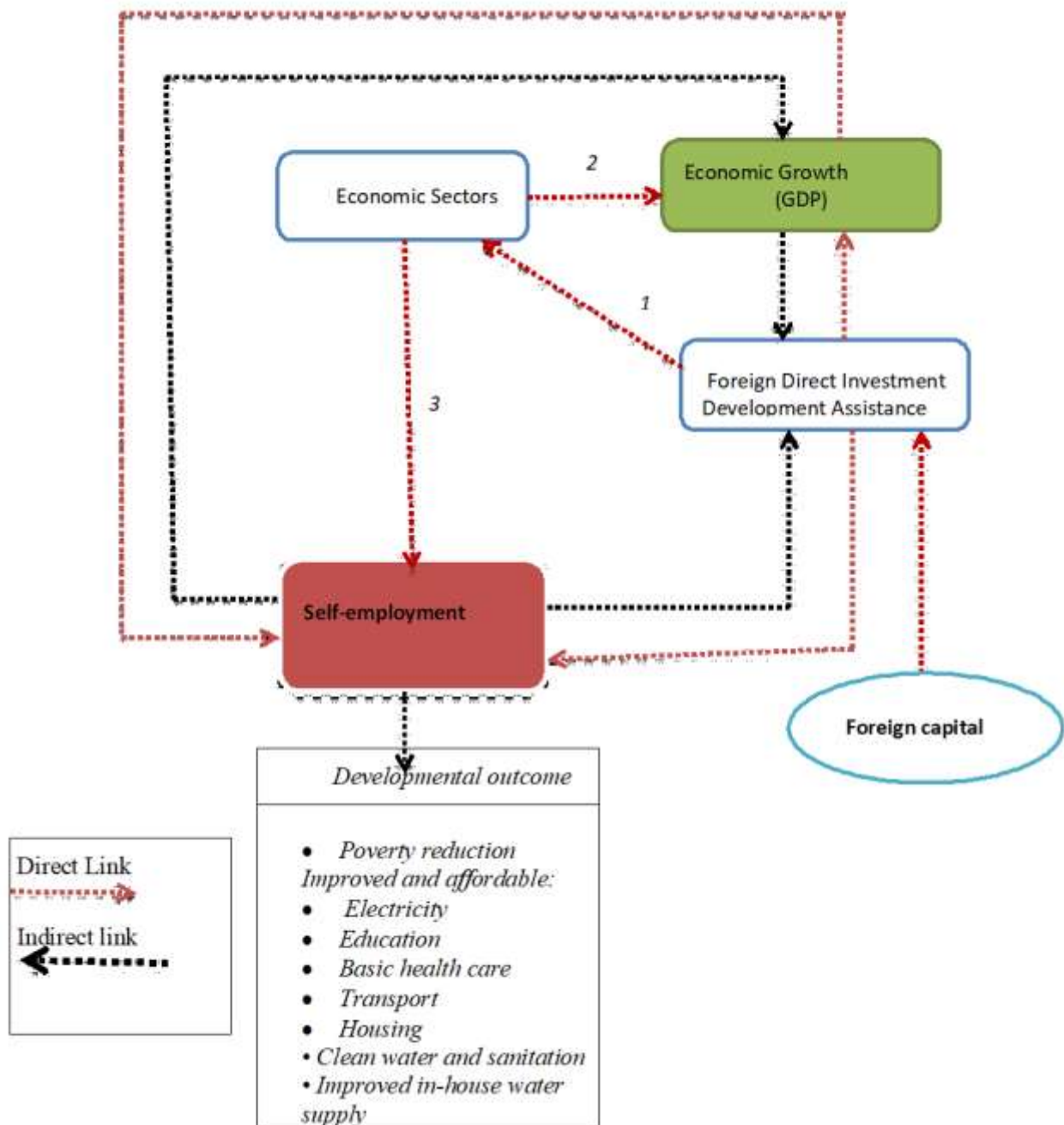
(Author's construction).

DAC and FDI Model

The theoretical model scrutinizes the intricate relationship between foreign capital (FDI/DAC), economic growth, and self-employment. The model posits a direct positive effect of FDI on economic growth, exploring reciprocal impacts between economic growth and FDI. Similar dynamics are examined concerning DAC and self-employment. The model

encompasses links from foreign capital to economic sectors, economic sectors to economic growth, and economic sectors to self-employment (Dunning, 2000).

Perspectives on FDI Benefits in Theory

OLI Framework and MNC Contributions

The OLI framework, encapsulating Ownership, Location, and Internationalization theories, posits that Multinational Corporations (MNCs) strategically invest where they have a competitive advantage. MNCs contribute to economic growth, employment, and poverty reduction through activities in their host countries (Dunning, 2000).

Divergent Views on FDI Impact

While Dunning outlines positive impacts, diverse perspectives exist. MNCs' production activities may lead to economic expansion, creating spillover effects that benefit local businesses and citizens. The provision of infrastructure by governments seeking FDI is crucial, linking the economic sectors to broader development goals (Dicken, 2007).

Concerns and Criticisms

Critics argue that TNCs exploit host countries with cheap labor, causing the collapse of local firms, job losses, and increased inequality. Capital movement by TNCs can introduce economic vulnerabilities, as seen in the swift withdrawal of capital during crises (Crotty, Epstein, & Gerald, 1998).

Technology Transfer and Disappointment

Access to advanced technology is a major attraction for host countries, but disappointments arise as technology transfer often falls short of expectations. Strict terms and high costs hinder widespread knowledge sharing (Dicken, 2007).

The study acknowledges divergent views on foreign capital. While widely recognized as a driver of development, the expectations often run contrary to reality. The empirical evidence from Ethiopia aims to contribute to the ongoing debate.

3. Methodology

In this section, we detail the methodology employed in this study, covering the data sources, variables, and their definitions.

3.1 Data Sources

We draw data from two primary sources, namely the Africa Sector Database from the Penn World Table and the World Bank: World Development Indicators (WDI). The amalgamation of these two datasets is imperative due to the absence of complete data in either source.

A. Africa Sector Database from Penn World Table

A comprehensive time series dataset encompassing nine crucial sectors of the Ethiopian economy, including Agriculture, Mining, Manufacturing, Utilities, Construction, Trade

Services, Transport Service, Dwelling, and Government Services. Derived from a novel dataset constructed by de Vries, Timmer & de Vries (2013), this dataset spans fifty years (1960-2010) and evaluates output and labor productivity growth in eleven African countries.

Statistics are sourced from the National Statistical Institute or the Central Bank of eleven African countries: Botswana, Ethiopia, Ghana, Kenya, Malawi, Mauritius, Nigeria, Senegal, South Africa, Tanzania, and Zambia.

Outputs are based on gross value added at constant 2005 national prices, adhering to the UN System of National Accounts.

B. World Bank: World Development Indicators (WDI)

A repository of time series data featuring numerous economic development indicators for countries globally. Selected variables for this study include FDI, DAC, Real GDP, GDP per capita, Employment, Household Final Expenditure, Poverty Headcount Ratio, Wage Employment, Self-Employment, Total Labor Force, Total Percentage of Mobile Cellular Subscriptions, and Total Percentage of Users of Improved Water Supply.

3.2 Variables and Their Definitions

To fulfill the study's objectives, a set of variables from Tables 1 to 4, sourced from the two data repositories, have been chosen:

A. Variables from Africa Sector Database (Table 1 and 2)

These variables allow us to scrutinize the impact of foreign capital on various economic sectors, as discussed in Part 1. The sectors covered include Agriculture, Mining, Manufacturing, Utilities, Construction, Trade Services, Transport Service, Dwelling, and Government Services.

B. Variables from World Bank: World Development Indicators (Table 3 and 4)

These variables aid in assessing the impact of foreign capital on economic growth, as expounded in Part 2. Selected variables encompass FDI, DAC, Real GDP, GDP per capita, Employment, Household Final Expenditure, Poverty Headcount Ratio, Wage Employment, Self-Employment, Total Labor Force, Total Percentage of Mobile Cellular Subscriptions, and Total Percentage of Users of Improved Water Supply. Throughout, we explore the implications of foreign capital for self-employment and poverty reduction.

This methodology section provides a comprehensive overview of the data sources, selected variables, and their definitions, establishing the groundwork for subsequent analytical sections.

Table 1. Ethiopian Economic Sectors Indicators

Variables	Description
Agriculture	Farming (growing crops & rearing animals), Hunting, Fishing, and Forestry
Mining	Removing solid minerals from the ground
Manufacturing	Valued added products
Utilities	Electricity, communication (telephone, mobile phone), pipe borne water and sanitation.
Construction	Building of roads, railways and industrial complex
Trade services	Import & export, wholesale and retail trade; repair of motor vehicles; motorcycles; personal and household goods, Hotels and Restaurants.
Transport	Road, railway, air and sea transport,
Dwellings	Owner occupied buildings
Government services	This includes public administration and defense, education, health and social work
Total economy	The whole Ethiopian economic sectors

Table 2. Country-Level poverty Indicators

Pop$1. 25d	Poverty headcount ratio at $1.25 a day (PPP)
Pop$2d	Poverty headcount ratio at $2 a day (PPP)
Popsub_Cphone	The total percentage of the population that subscribed to cellular phone.
Popaccess_imp.H2o	Total percentage of population with access to improved water supply
Popaccess_elect	Total percentage of population with access to electricity.
Pc_GDP	GDP per capita is gross domestic product divided by midyear population. It is calculated based on constant 2005 U.S. dollars.
Hhf_cons	Household final consumption expenditure represents market value for goods and services use in a household. It includes items such as cars, washing machines, personal computers, rent payments, payments for permits and licenses. The Data is in current U.S. dollars.

Table 3. Economic Growth indicators

Variables	Description
Real GDP	Real_GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated based on constant 2005 US$
FDI	Foreign direct investment, net inflows (BoP, current US$)
DAC	Total official aid received from the members of the Development Assistance Committee (DAC). DAC consists of grants and loans received from ODA. ODA consists of loans made on concessional terms (with a grant element of at least 25 percent, calculated at a rate of discount of 10 percent) and grants made to promote economic development, such provision of roads, railways, electricity and welfare in countries and territories in the DAC list of ODA recipients.

Table 4. Employment Indicators

Popwage_emplt	Total percentage of labor force in wage and salaried employment
Popself_empl	Self employment refers to the type of employment whereby the owners of the business derived their own income from their own products and services. Usually, self-employed persons are legally registered persons, possessing a license or permit to carry on the type of business that they do. In a low-income country, self-employed persons have no fixed income, work alone, or with a family member or hire a few paid staff. In essence, remuneration is not fixed, but dependent upon the profits derived from the business. The data represent percentage of self-employed in the country's total labor force.
popwork_agri	Percentage of the agricultural labor force in the country's total labor force.
Empl_pop_ratio	The employment to population ratio is the proportion of a country's population that is employed both in the public and private sectors. They receive remuneration in wages, salary, commission, tips, piece rates or pay in kind. From the ages 15 and older are generally considered in Ethiopia as working age population

Source: World Bank: World Development Indicators, 2015

3.3 Data Classification and Adjustments

This section clarifies the rationale behind data classification and adjustments, emphasizing the importance of balancing macro-level data for regressions while acknowledging the value of micro-level variables in the descriptive aspect of the study. Adjustments are explained to maintain consistency in the dataset properties for robust regression analyses.

In this study, we categorize the data into macro-level and micro-level datasets. Table One and Three represent macro-level data, while Table Two and Four represent micro-level data. Unfortunately, due to numerous missing data points in the micro-level dataset—such as $1.25

per day, \$2 per day, access to electricity, access to clean water, and subscriptions to cell phones—we must rely on macro-level data for our regression analyses.

The essential micro-level variables mentioned are crucial for understanding the intricacies of micro-level conditions. However, their use is restricted to the descriptive part of this study due to data limitations.

3.3.1 Macro-level Variables

The macro-level dataset includes the following key variables used in regressions:

- *FDI*
- *DAC*
- *Real GDP*
- *PC_GDP (Per Capita GDP)*
- *Employment Ratio to Population*
- *Self-Employment*
- *Household Final Consumption Expenditure*

3.3.2 Data Adjustments for Consistency

Adjustments were made to ensure consistency in the initial properties of macro-level data for regression analysis. For instance: The FDI series is available from 1992 to 2013, while the DAC variable exists from 1970 to 2012. To align both series, we adjusted them to start from 1992 and end in 2012. To mitigate the loss of vital information resulting from the cutoff period, certain variables were utilized either as univariate or in combination with other series as bivariate data series. This approach, inspired by scholars such as Clapham (1931) and Gerschenkron (1966), aims to minimize information loss due to periodization.

Through these adjustments and data classifications, the study seeks to strike a balance between utilizing macro-level data for regressions and acknowledging the significance of micro-level variables in the descriptive analysis.

3.4 Linking Data to Methods

This section elucidates the connection between data and methods, emphasizing the dual approach of descriptive statistics and econometrics. It also outlines the advantages and limitations associated with the two primary data sources, underscoring the study's commitment to mitigating data quality challenges for a robust analysis.

This study employs a dual approach, utilizing both descriptive statistics and econometrics, specifically time series regression. This multifaceted strategy aims to prevent data loss and quantitatively comprehend the social context in which economic phenomena occur. Understanding the social context is crucial for the meaningful interpretation of regression results, as unobserved constraints, captured as errors, must be accounted for (Mokyr, 2005).

In our regression models, we transform units of measurement associated with indicators into natural logarithms (ln) for comparability. The analytical methods include Augmented Dickey-Fuller tests (ADF), Akaike Information Criteria (AIC), Engle-Granger tests for cointegration, Johansen tests for cointegration, Vector Autoregression (VAR), and Granger

causality Wald tests.

3.5 Limitations

Both data sources—World Bank: WDI and Penn World Table—offer distinct advantages and face limitations.

World Bank: WDI

Recognized internationally, WDI data are derived from national accounts, adjusted to international standards for cross-country comparison. Shortcomings include missing data and aggregated numbers differing from those set by national statistical bureaus.

Lack of infrastructure data for Ethiopia hampers a comprehensive analysis of DAC's impact, leading to reliance on empirical evidence from prior studies.

Penn World Table:

A comprehensive and recognized data source covering five decades with no missing data.

Limitations include ambiguity regarding the composition of sectors and the criteria for selecting firms within each sector. Neglect of smaller firms, prevalent in sub-Saharan Africa, and absence of data on hours worked or income per labor force type.

General Limitations

Inconsistencies in data quality across African countries, attributed to large measurement errors and weak data collection capacities. The study does not fully resolve data quality challenges but endeavors to mitigate them by leveraging two quantitative sources and incorporating insights from qualitative literature. Despite these limitations, this study strives to offer a comprehensive understanding and fair accounts of the impact of foreign capital on economic growth and self-employment in Ethiopia.

4. Empirical Findings

Our empirical investigation unfolds in two distinct parts, each contributing to a comprehensive understanding of the intricate economic landscape in Ethiopia. Part1 employs descriptive statistics, laying the groundwork for subsequent analysis through econometric models in part 2.

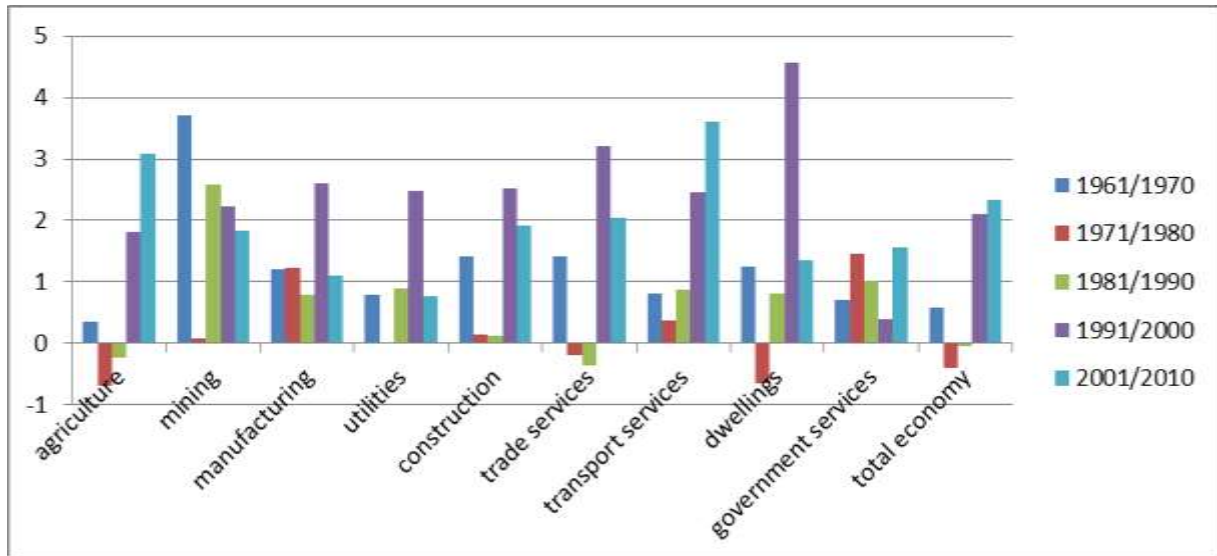*4.1 Part 1: Presentation of Results based on Descriptive Statistics*

Figure 5. Average growth rates across economic sectors, 1961 to 2010

Source: Penn World Table, African Sector Database.

Figure 5 illustrates the average growth rates observed across various economic sectors from 1961 to 2010. There are noticeable variations in growth rates among sectors. For instance, Agriculture had lower growth initially but surged in later years. Likewise, mining, and manufacturing exhibit distinct trajectories, capturing the evolving economic dynamics.

Table 5. Growth elasticity of self-employed per Economic sector

ES	Agriculture	Mining	Manuf-acturing	Utilities	Construc-tion	Trade Services	Transport-ation	Dwellings	Government Services	Total Economy
Years										
1992	8.9	0.04	0.5	0.27	0.3	1.4	0.38	0.22	0.76	13.5
1995	10.6	0.07	0.11	0.3	0.69	2.8	0.6	0.59	1.07	19.1
2000	11.4	0.09	1.4	0.53	0.95	3.5	0.9	0.8	2.5	23.9
2005	13.8	0.15	1.5	0.6	1.65	4.5	1.7	1.3	2.9	30.7
2010	42.9	0.58	3.9	1.2	4.0	18.3	3.4	5.4	6.78	94.6

Source: Penn World Table, African Sector Database.

Table 5 examines self-employment growth across sectors between 1992 and 2010, we gain

insights into the sectors that significantly absorb self-employed individuals. Agriculture and trade services stand out, providing a foundation for understanding employment dynamics.

Table 6. Employment and poverty metrics, 1999/2013

	Variables	Poverty indicators		Employment indicators		Infrastructure improv. Indicat		
		Povp_$1.25 Per day (%)	Pop_$2 Per day (%)	Pop wage _employed (%)	Pop self_ Employed (%)	Total labor pop (m)	Popsubscribe to cell phone (%)	Popa Wate suppl
Years	Country pop (M)							
1990/1999	64.15	63.2	86	5.7	93	27.7	0.01	27
2000/2009	84.8	39.96	77.6	7.9	91.8	39.3	4.8	45.9
2010/2013	94.1	36.79	72.2	7.9	91.8	43.5	22.4	51.5

Source: The World Bank: World Development Indicator

Table 6 presents a nuanced perspective on the interplay between employment, poverty indicators, and infrastructure improvements. Tracking changes from 1990 to 2013, it serves as a compass for assessing the socio-economic landscape.

Note: Values in the tables represent growth elasticity percentages and various indicators for the specified years.

Discussion

The 2001-2010 period witnessed significant shifts in Ethiopia's economic landscape, particularly driven by foreign capital inflows. Analyzing key sectors provides insights into the implications of this foreign investment.

1. Agricultural Sector

The growth rate of 3.1 percent in agriculture during 2001-2010, constituting 45 percent of the GDP, underscores its pivotal role. Foreign investors, including those from the US, EU, India, Israel, and Saudi Arabia, played a crucial role. Weissleder (2009) highlights a substantial increase in investment from $135 million in 2000 to $3500 million in 2008.

The surge in agricultural growth was partly driven by the global demand for biofuels, aiming to reduce fossil fuel consumption in developed nations (Oane, 2011; Matondi et al., 2011). While investments in floriculture, horticulture, meat production, biofuels, and food production contributed to economic and social development, concerns were raised. Weissleder (2009) notes potential negative effects on food security and poverty due to increased competition for fertile land and water resources.

2. Mining and Manufacturing

Mining experienced an average growth of 1.8 percent during the fifth decade, contributing 0.5 percent to the GDP. In contrast, manufacturing declined by 1.1 percent, with a 4 percent GDP share. Chinese interest in Ethiopian mining and manufacturing sectors became prominent (International Policy Digest, 2014).

Discussions on Chinese FDI revealed a dichotomy. Kaplinsky (2006) and Geda & Meskel (2009) criticized China's FDI, accusing it of crowding out local firms, sourcing major raw materials from Ethiopia, and causing unemployment. However, an alternative perspective argues that Chinese investments prevented potential bankruptcy, preserving jobs during the privatization of national industries.

3. Utilities, Construction, and Dwellings

The privatization of utilities, such as electricity, communication, and water, impacted accessibility but brought initial growth in the fourth decade (Rajan et al., 2005). To counterbalance privatization effects, the Ethiopian government injected foreign capital into dwellings and construction sectors. Chinese companies, notably the China Road and Bridge Corporation, played a significant role in infrastructure development, winning contracts for projects like airport expansion and road construction (International Policy Digest, 2014). While construction industries did not provide permanent employment, substantial temporary wage employment was created (Schürenberg-Frosch, 2014).

4. Trade Services

Trade services, contributing 16 percent to the GDP during the fifth decade, faced challenges. Some argued that products from major foreign investors, especially China, flooded the market with relatively cheap prices, impacting local businesses negatively (Kaplinsky et al., 2007; Geda & Meskel, 2009). Despite challenges, growth in trade services remained remarkable, contributing to the 2 percent average growth of the total economy.

Conclusion

The total economy's average 2 percent growth during 2001-2010, compared to earlier stagnation, reflects nuanced implications of foreign capital. Challenges such as job displacement and potential exploitation surfaced, especially in manufacturing. However, positive outcomes, including infrastructure development, employment creation, and increased access to services, underscore the complexity of the relationship between foreign capital and economic growth in Ethiopia. Further scrutiny is needed to understand the nuanced effects on self-employment.

Moving Forward: The subsequent section applies econometric time series models to explore the relationships between FDI, DAC, economic growth, and self-employment.

5. Part Two: Econometric Analysis Based on Time Series

Building upon the foundational insights garnered from the descriptive statistics, part two employs sophisticated econometric models grounded in time series analysis. This rigorous

approach allows us to unravel deeper relationships, causalities, and forecast future trends. In other words, by employing time series models, we aim to untangle the complex web of factors influencing economic growth and self-employment in Ethiopia. Variables such as foreign direct investment (FDI), development assistance from countries (DAC), and other economic indicators become focal points in our econometric exploration.

Our econometric analysis seeks to discern causal relationships between foreign capital, economic growth, and self-employment. Understanding the directional influences and quantifying their magnitudes is essential for formulating informed policy recommendations.

This two-part empirical approach ensures a robust and multi-faceted examination of Ethiopia's economic dynamics. The descriptive statistics set the stage by offering a panoramic view, while the econometric analysis, rooted in time series, delves deeper into the intricacies of causation and correlation. Together, these components provide a comprehensive empirical foundation for understanding and navigating the complexities of Ethiopia's economic landscape.

5.1 Descriptive Statistics: Unveiling Dynamics in Economic Variables (1992-2012)

In this phase, we delve into the econometric terrain through descriptive statistics. The data reveals intricate patterns and trends that form the basis of our exploration.

Table 7 provides a comprehensive overview of the descriptive statistics for the key economic variables considered in the time series regression. These variables lay the foundation for our in-depth analysis of the economic landscape from 1992 to 2012.

Table 7. Descriptive Statistics: economic growth, 1992-2012

Variable	Obs.	Mean	Std. Dev	Min	Max
ln (fdi)	21	22.84036	2.838817	12.04355	24.8664
ln (doc)	21	25.24117	.6351511	24.43684	26.16134
ln (real GDP)	21	27.7325	.4271387	27.10339	28.54731
ln(pc_gdp)	21	5.201973	.6351511	4.720613	6.157319
ln(hhf_cons)	21	22.92116	.6192804	22.31951	24.16957
ln(totlabor_pop)	21	27.25183	.2082611	16.92652	17.59036
ln(popwage_empl)	21	14.56332	.4578424	13.51527	15.05206
ln(popself_empl)	21	17.168	.2026697	16.85395	17.50481
ln(popwork_agri)	21	17.09016	.1576838	16.82116	17.35843
ln(empl_pop_ratio)	21	4.344971	.0304301	4.305416	4.382027

5.1.2 Analysis

The mean values reflect the central tendencies of the variables, showing the average values over the observed period. For instance, ln(fdi) has a mean of 22.84, indicating the average logarithm of foreign direct investment. With generally low standard deviations across variables, it suggests limited variability from the mean. The economic indicators remained closely clustered around their respective averages. The range between the minimum and maximum values is relatively narrow for each variable. This implies that the data series did not exhibit significant deviations from the mean during the period.

5.1.3 Interpretation

The low variability and narrow range between minimum and maximum values suggest non-stationary data series. This stability in the economic variables may indicate consistent patterns or trends over the observed period. As we proceed with our time series regression, these descriptive statistics lay the groundwork for a nuanced understanding of the dynamics shaping Ethiopia's economic landscape from 1992 to 2012.

5.2 Sensitivity Analysis: Unraveling Multicollinearity

To ensure the robustness of our analysis, a sensitivity analysis is conducted, delving into the variance inflation factor (VIF) for economic growth and employment indicators. Multicollinearity, which can obscure the distinct contributions of variables, is a critical concern.

Table 3a/3b. Test for Multicollinearity

Table 3a	Economic growth indicators				
	ln(fdi)	*ln(dac)*	*ln (real_gdp)*	*ln(pc_gdp)*	*ln(hhf_cons)*
ln(fdi)	1.0000				
ln(dac)	0.2661	1.0000			
ln(real_gdp)	0.5675	0.8512	1.0000		
ln(pc_gdp)	0.0680	0.8383	0.8261	1.0000	
ln(hhf_cons)	0.2192	0.8869	0.9068	0.9834	1.0000

Table 3b	Employment indicators				
	ln(totlabor_pop)	*ln(popwage_emp)l*	*ln(popself_empl)*	*ln(popwork_agri)*	*ln(empl_pop_ratio)*
ln(totlabor_pop)	1.0000				
ln(popwage_empl)	0.9094	1.0000			
ln(popself_emp)l	0.9994	0.9006	1.0000		
ln(popwork_agri)	0.9852	0.9309	0.9819	1.0000	
ln(empl_pop_ratio)	0.8619	0.7060	0.8610	0.7971	1.0000

5.2.1 Analysis

VIF values close to 1 indicate minimal multicollinearity concerns. Generally, the VIF values for both economic growth and employment indicators remain relatively low. Likewise, the VIF values for ln(fdi), ln(dac), ln(real_gdp), ln(pc_gdp), and ln(hhf_cons) are all within an acceptable range, suggesting that these indicators exhibit independence. Also, the VIF values for ln(totlabor_pop), ln(popwage_empl), ln(popself_empl), ln(popwork_agri), and ln(empl_pop_ratio) also indicate low multicollinearity, reinforcing the independence of these employment-related indicators.

The low VIF values in both economic growth and employment indicators affirm the absence of significant multicollinearity. This ensures the reliability of our model, allowing us to draw meaningful insights from the subsequent analyses.

5.2.3 Tests for Non-stationarity

In the literature, it is widely recognized that archiving a stationary time series is possible after taking first difference and sometimes second difference of the time series (Gujarati & Porter, 2009). Therefore, after confirming that our data is non-stationary through various ocular inspections with graphs and Autocorrelation Function (ACF) of Bartlett autocorrelogram, we proceed to carry out a test of unit roots using ADF. Some previous studies (Perron, 1989; Elliott, Rothenberg, & Stock, 1996) observed that archiving a stationary time series with ADF tests can be difficult sometimes even after first and second differences due to structural break in the data. Nevertheless, we use ADF due to its widely acceptance and the results of the tests are reported in table 3. The functional form of the formal tests is: $Yt = pYt-1 + Ɛt$ AR (1/2).

Ho: $\delta = 0$ (there is a unit root or the time series is non-stationary).

H1: $\delta < 0$ (time series is stationary, possibly around a deterministic trend).

Table 8. Test for non-stationarity

Table 3	ADF tests of non-stationality.					
Variables	Order of integration	Specification	Test statistics (5% Critical value)	Test statistics (10% Critical value)	Conclusion	No. obs
lnfdi	I (0)	No intercept/trend	-2.835 (-3.00)	-2.835 (-2.630)	Not Reject Ho @ 5%	19
D. (lnfdi)	I (1)	No intercept/trend	-4.823 (-3.000)	-4.823 (-2.630)	Reject Ho @ 5%	18
lnreal_gdp	I (0)	No intercept/trend	1.732 (-3.000)	-1.732 (-2.630)	Not Reject Ho @ 5%/10%	19
D. (lnreal_gdp)	1 (1)	No intercept/trend	-1.841 (-3.000)	-1.841 (-2.630)	Not Reject Ho @ 5%/10%	18
D2. (lnreal_gdp)	I (2)	No intercept/trend	-4.139 (-3.000)	-4.139 (-2.630)	Reject Ho @ 5%	17
lndac	I (0)	No intercept/trend	-0.278 (-3.000)	-0.278 (-2.630)	Not Reject Ho @ 5%/10%	19

D. (lndac)	1 (1)	No intercept/trend	-2.373 (-3.000)	-2.373 (-2.630)	Not Reject Ho @ 5%/10%	18
D2. (lndac)	I (2)	No intercept/trend	-4.548 (-3.000)	-4.548 (-2.630)	Reject Ho @ 5%	17
lnpopself_empl	I (0)	No intercept/trend	-1.584 (-3.000)	-1.584 (-3.000)	Not Reject Ho @ 5%/10%	19
D. (lnpopself_empl)	1 (1)	No intercept/trend	-2.436 (-3.000)	- 2.463 (-2.630)	Not Reject Ho @ 5%/10%	18
D2. (lnpopself_empl)	1 (2)	No intercept/trend	-4.399 (-3.000)	- 4.399 (-2.630)	Reject Ho @ 5%	17

5.3 Analysis

The ADF tests are conducted to ascertain the order of integration for each variable.

For variables ln(fdi), ln(real_gdp), and ln(popself_empl), the null hypothesis (Ho) of a unit root is not rejected at 5% significance, indicating non-stationarity. The order of integration increases (from I(0) to I(1) and I(2)) for variables such as ln(fdi), ln(real_gdp), lndac, and ln(popself_empl) as differencing is applied. The conclusion column summarizes the rejection or non-rejection of the null hypothesis based on critical values. Further modeling and analysis should consider the integration order, ensuring the appropriate treatment of non-stationary variables.

5.4 Operationalization: Test for cointegration between variables

To commence cointegration tests, the following dynamic regression models are necessary:

$D.\ln(fdi_{t-1}) = a + \beta_1 D2.\ln(real\_gdp_{t-1}) + \mathcal{E}_t$	Model-1
$D.\ln(fdi_{t-1}) = a + \beta_1 D2.\ln(popself\_empl_{t-1}) + \mathcal{E}_t$	Model-2
$D2.\ln(dac_{t-1}) = a + \beta_1 D2.\ln(real\_gdp_{t-1}) + \mathcal{E}_t$	Model-3
$D2.\ln(dac_{t-1}) = a + \beta_1 D2.\ln(popself\_empl_{t-1}) + \mathcal{E}_t$	Model-4
$D2.(lnreal\_gdp_{t-1}) = a + \beta_1 D2.\ln(popself\_empl_{t-1}) + \mathcal{E}_t$	Model-5

Note that these variables are already defined in table1.

Table 9. Test for cointegration following Todda-Yamamoto procedure

Test for cointegration	AIC	Engle-Granger tests for cointegration	Johansen tests for cointegration	Yearly	
Models	Lag selection	Test statistics (5% Hamilton C.V	Vec Ranking	No. obs.	Conclusion
Model-1	4	-2.372 (-2.76)	0	17	Cannot reject H$_o$
Model-2	2	-3.668 (-2.76)	0	17	Reject H$_o$

Model-3	3	-2.607 (-2.76)	0	17	Cannot reject H_o
Model-4	4	-4.415 (-2.76)	1	17	Reject H_o
Model-5	3	-2.576 (-2.76)	0	17	Cannot reject H_o

5.5 Analysis

The models are assessed based on AIC, Engle-Granger tests, and Johansen tests.

Models 2 and 4 show evidence of cointegration as the null hypothesis is rejected in Engle-Granger tests. Other models, despite minor variations, fail to reject the null hypothesis of no cointegration. Yearly results and Vec Ranking provide additional insights into the cointegration behavior. In other words, Models 2 and 4 suggest cointegration among the variables, implying a long-term relationship. Further analysis should consider these cointegrated models for a comprehensive understanding of the dynamics among the variables.

According to Todd-Yamamoto procedure, provided that variables are stationary, Granger causality Wald tests should not be restricted to cointegration model only. Therefore, we can run, short run equilibrium relationship using Autoregressive Distributive Lags (ADL) and Granger causality Wald tests before proceeding to a diagnostic testing of the models.

Therefore, we revise the equations and treat all the variables as endogenous and based on short run equilibrium relationship: $\triangle Y_t = \delta_o + \varphi_1 \triangle X_t + \lambda t$

Below are the modified versions of our hypothesis and models necessary to carrying on Granger causality Wald tests.

5.6 Modified Hypothesis

The modified hypothesis implies adding indirect hypothesis to the direct hypothesis. It is based on our theoretical model in figure 4 and to satisfy Granger causality Wald tests, we present null hypotheses of all the models.

H_{1a}:   FDI has no direct positive effect on real GDP (direct)

H_{1b}:   Real GDP has no direct positive effect on FDI (indirect)

H_{2a}: FDI has no direct positive effect on self-employment (direct)

H_{2b}: Self-employment has no direct positive effect on FDI (indirect)

H_{3a}: DAC has no direct positive effect on real GDP (direct)

H_{3b}: Real GDP has no direct positive effect on DAC (indirect)

H_{4a}: DAC has no direct positive effect on self-employment (direct)

H$_{4b}$: Self-employment has no direct positive effect on DAC(indirect)

H_{5a}: Real GDP has no direct positive effect on self-employment. (direct)

H$_{5b}$: Self-employment has no direct positive effect on real GDP (indirect)

$$\triangle ln \ (fdi_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(fdi)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(real\_gdp)_{t-1} + \varepsilon_t$$
Model-1a

$$\triangle ln \ (real\_gdp_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(real\_gdp)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(fdi)_{t-1} + \varepsilon_t$$
Model-1b

$$\triangle ln \ (fdi_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(fdi)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(popself\_empl)_{t-1} + \varepsilon_t$$
Model-2a

$$\triangle ln \ (popself\_empl_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(popself\_empl)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(fdi)_{t-1} + \varepsilon_t \qquad \text{Model-2a}$$

$$\triangle ln \ (dac_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(dac)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(real\_gdp)_{t-1} + \varepsilon_t$$
Model-3a

$$\triangle ln \ (real\_gdp_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(gdp)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(dac)_{t-1} + \varepsilon_t$$
Model 3b

$$\triangle ln \ (dac_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(dac)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(popself\_empl)_{t-1} + \varepsilon_t$$
Model-4a

$$\triangle ln \ (popself\_empl_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(popself\_empl)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(dac)_{t-1} + \varepsilon_t \qquad \text{Model-4b}$$

$$\triangle ln \ (gdp_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(real\_gdp)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(popself\_empl)_{t-1} + \varepsilon_t$$
Model-5a

$$\triangle ln \ (popself\_empl_{t-1}) = \beta_0 + \sum_{i=1}^{p} \beta_i \triangle ln(popself\_empl)_{t-1} + \sum_{i=1}^{p} \beta_2 \triangle ln(real\_gdp)_{t-1} + \varepsilon_t \qquad \text{Model-5b}$$

Note that all the variables are clearly defined in table 1.

These models will undergo Autoregressive Distributive Lags (ADL) and Granger causality Wald tests to examine short-run equilibrium relationships and causal links between the variables before diagnostic testing.

Table 10. Results of Granger causality Wald tests

Models	Direction	Equation	Null hypothesis (Ho)	P-value	Decision
lnfdi/lnreal_gdp (M.1a)	lnfdi→lnreal_gdp	$\beta_j^1 = 0$	lnfdi does not GC lnreal_gdp	(0.003)**	Reject Ho
lnreal_gdp/lnfdi (M.1b)	lnfdi←lnreal_gdp	$\beta_j^2 = 0$	lnreal_gdp does not GC lnfdi	(0.135)	Cannot Reject Ho
lnfdi/lnpopself_empl (M.2a)	lnfdi→lnpop self_empl	$\beta_j^1 = 0$	lnfdi does not GC popself_empl	(0.439)	Cannot Reject Ho
lnpopself_empl/lnfdi (M.2b)	lnfdi←lnpop Self_empl	$\beta_j^2 = 0$	lnpopself_empl does not GC lndac	(0.068)*	Reject Ho at p.0.1
lndac/lnreal_gdp (M.3a)	lndac→lnreal_gdp	$\beta_j^1 = 0$	lndac does not GC lnreal_gdp	(0.599)	Cannot Reject Ho
lnreal_gdp/lndac (M.3b)	lndac←lnreal_gdp	$\beta_j^2 = 0$	lnreal_gdp does not GC lndac	(0.408)	Cannot Reject Ho
lndac/lnpopself_empl(M.4a)	lndac→lnpop self_empl	$\beta_j^1 = 0$	lndac does not GC popself_empl	(0.090)*	Reject Ho
lnpopself_empl/lndac(M.4b)	Lndac←lnpop Self_empl	$\beta_j^2 = 0$	lnpopself_empl does not GC lndac	(0.221)	Cannot Reject Ho
lnreal_gdp/lnpopself_empl (M.5a)	lnreal_gdp→lnpop self_empl	$\beta_j^1 = 0$	lnreal_gdp does not GC popself_empl	(0.670)	Cannot Reject Ho
lnpopself_empl/lnreal_gdp (M.5b)	Lngdp←lnpop Self_empl	$\beta_j^2 = 0$	lnpopself_empl does not GC lnreal_gdp	(0.022)**	Reject Ho

Note that all the coefficients are in parenthesis, M. represents model, the asterisks *, ** and *** denote statistical significance at the 10, 5, and 1% levels.

After obtaining the results for Granger causality Wald tests, the next step involves conducting diagnostic tests to ensure the robustness of the models and subsequently discussing the results in detail.

Table 11. Diagnostic tests

Normality tests				
Testing parameters	Hetero skedasticity	Skewness	Kurtosis	Observation
Model-1	0.83327	0.67190	0.71634	15
Model -2	0.71808	0.52739	0.66480	16
Model -3	0.60067	0.27250	0.92832	16
Model -4	0.22569	0.23267	0.25314	16
Model -5	0.81151	0.52512	0.86216	16

Table 12. BG-LM Test

BG- Lagrange-multiplier test (LM)					
Lags	Model-1	Model-2	Model-3	Model-4	Model-5
L1	0.89602	0.22209	0.50692	0.92844	0.47600
L2	0.30261	0.92714	0.64014	0.90478	0.96923
L3	0.73834	0.09934	0.46347	0.11714	0.68870
L4	0.10565	0.44619	0.80829	0.48362	0.68202
L5	0.02429	0.75241	0.15187	0.73673	0.68695
L6	0.53753	0.52417	0.04836	0.99512	0.48974
L7	0.98269	0.47306	0.48795	0.42108	0.78271
L8	0.76858	0.50337	0.91873	0.96664	0.66100
L9	0.31189	0.80787	0.28973	0.63553	0.06224
L10	0.55516	0.32709	0.54279	0.99782	0.95740

H_0: no autocorrelation at lag order

5.7 Analysis

It's positive to note that the diagnostic tests, particularly the normality tests in Table 11 and the Breusch-Godfrey LM test for autocorrelation in Table 12, indicate that the models generally fulfill the OLS conditions. The non-significant p-values in these tests suggest that the residuals do not suffer from issues like autocorrelation, heteroskedasticity, skewness, and kurtosis.

These findings enhance the reliability of the estimated coefficients and the validity of the

models. It is crucial to have confidence in the diagnostic tests as they affirm that the statistical inferences drawn from the models are more robust and trustworthy.

This positive outcome allows for a more confident interpretation of the results obtained from the Granger causality Wald tests. The absence of autocorrelation, heteroskedasticity, skewness, and kurtosis in the residuals strengthens the validity of the statistical inferences drawn from the models. It indicates that the models provide a good fit to the data, and the estimated coefficients are likely to be unbiased and efficient.

With these reassuring diagnostic results, the subsequent analysis and interpretation of the Granger causality Wald tests can be conducted with greater confidence in the reliability of the results. The study's results, as outlined in Table 10, provide valuable insights into the relationships between foreign direct investment (FDI), development assistance, self-employment, and economic growth in Ethiopia. The discussion of the findings is presented in relation to each hypothesis tested:

5.8 Statistical Analysis of the Relationship

H1a: FDI has no direct positive effect on real GDP

The direct hypothesis (H1a) is rejected at a 5% significance level, indicating that in the short run, Ethiopian economic growth depends on FDI. This aligns with previous studies suggesting that FDI can positively impact economic growth and government consumption.

H2b: Self-employment has no direct positive effect on FDI.

The direct hypothesis (H2a) is not rejected, but the indirect hypothesis (H2b) is rejected at a 10% significance level. This suggests that in sectors with high self-employment, FDI in the short run may depend on the labor provided by self-employed individuals. The cost-effectiveness of self-employed labor may contribute to this relationship.

H3a: DAC has no direct positive effect on real GDP.

Both direct (H3a) and indirect (H3b) hypotheses are not rejected, indicating that, in the short run, Ethiopian economic growth does not significantly depend on development assistance and that DAC does not depend on GDP growth to flow into the country.

H4a: DAC has no direct positive effect on self-employment.

The direct hypothesis (H4a) is rejected at a 10% significance level, while the indirect hypothesis (H4b) is not rejected. This implies that, in the short run, Ethiopian self-employed individuals may rely on development assistance. Increased government spending on infrastructure and welfare, supported by DAC, may contribute to this relationship.

H5b: Self-employment has no direct positive effect on real GDP.

The direct hypothesis (H5a) is not rejected, but the indirect hypothesis (H5b) is rejected at a 5% significance level. This suggests that, in the short run, an increase in self-employment is necessary for economic growth in Ethiopia. The study assumes that self-employment contributes positively to government revenue through taxes and serves as a crucial alternative to wage employment, reducing unemployment and poverty.

In summary, the study's findings highlight complex relationships among FDI, development

assistance, self-employment, and economic growth in Ethiopia. The results provide important insights for policymakers and researchers, emphasizing the need for a nuanced understanding of the factors influencing economic development in the country.

6. Discussion and Conclusion

Let's delve into a comprehensive analysis and discussion of the study's findings.

FDI and Economic Growth

The study's results indicate a significant relationship between Foreign Direct Investment (FDI) and economic growth in Ethiopia. The rejection of the null hypothesis (H1a) suggests that, in the short run, Ethiopian economic growth is positively influenced by FDI. This aligns with established literature that recognizes FDI as a driver of economic development (Bende-Nabende & Ford, 1998; Borensztein et al., 1998; Pelozo, 2001; Kottaridi, 2005). The findings underscore the importance of attracting and facilitating foreign investments to stimulate economic growth.

FDI and Self-Employment

The study's rejection of the null hypothesis (H2b) indicates a nuanced relationship between FDI and self-employment. While FDI may not directly impact self-employment, the positive relationship in the indirect hypothesis (H2a) suggests that, in sectors characterized by high self-employment, FDI in the short run may rely on the labor provided by self-employed individuals. This aligns with previous studies emphasizing the cost-effectiveness and skill sets of self-employed individuals as attractive to FDI operators (Grotty et al., 1997; Baldwin and Chowhan, 2003; Dicken, 2007). The study offers valuable insights into the labor dynamics associated with FDI.

Development Assistance and Economic Growth

Contrary to expectations, the study finds that Development Assistance (DAC) does not significantly impact economic growth in Ethiopia in the short run (H3a). This result diverges from findings in Pakistan (Shah et al., 2014) and emphasizes the need for context-specific analyses. The absence of a direct positive effect (H3b) suggests that economic growth does not drive the inflow of DAC into the country. This challenges conventional wisdom and warrants further investigation into the effectiveness of development assistance programs in Ethiopia.

DAC and Self-Employment

The study's rejection of the null hypothesis (H4a) indicates a direct positive effect of DAC on self-employment in the short run. This suggests that self-employed individuals in Ethiopia may rely on DAC, especially given the direct support for infrastructure and welfare. The study's emphasis on the role of DAC in supporting infrastructural development and its subsequent positive impact on self-employment aligns with observations in Ethiopia, where increased spending on infrastructure has coincided with a rise in self-employment.

Self-Employment and Economic Growth

The study's findings highlight the importance of self-employment for economic growth in Ethiopia. The rejection of the indirect hypothesis (H5b) suggests that an increase in self-employment is necessary for economic growth in the short run. The study acknowledges the limitation of not having specific productivity data but argues that the mere increase in the number of self-employed individuals, coupled with their contribution to government revenue through taxes, is crucial for economic growth. This aligns with studies from Canada emphasizing the role of self-employment in reducing unemployment and contributing significantly to economic growth (Rispoli, 2009).

Implications and Policy Recommendations

These findings have important implications for policymakers in Ethiopia. Firstly, attracting FDI and fostering an environment conducive to foreign investment should be a priority for sustained economic growth. Secondly, the study underscores the need for careful consideration of the role of DAC, particularly in supporting infrastructure, as it directly impacts self-employment and potentially contributes to economic growth. Finally, recognizing the importance of self-employment as a driver of economic growth, policymakers should design interventions that support entrepreneurship and create an enabling environment for small businesses.

Limitations and Future Research

While the study contributes valuable insights, it is essential to acknowledge its limitations. The lack of specific productivity data for self-employed individuals is a constraint in fully understanding their contribution to economic growth. Future research could delve deeper into this aspect and explore the long-term dynamics of the relationships identified in the study. Additionally, examining the impact of external factors, such as global economic conditions, on FDI, DAC, self-employment, and economic growth in Ethiopia would provide a more comprehensive understanding.

In conclusion, the study provides a nuanced analysis of the relationships between FDI, DAC, self-employment, and economic growth in Ethiopia. The findings contribute to the literature on development economics and offer valuable insights for policymakers and researchers working in the context of emerging economies.

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