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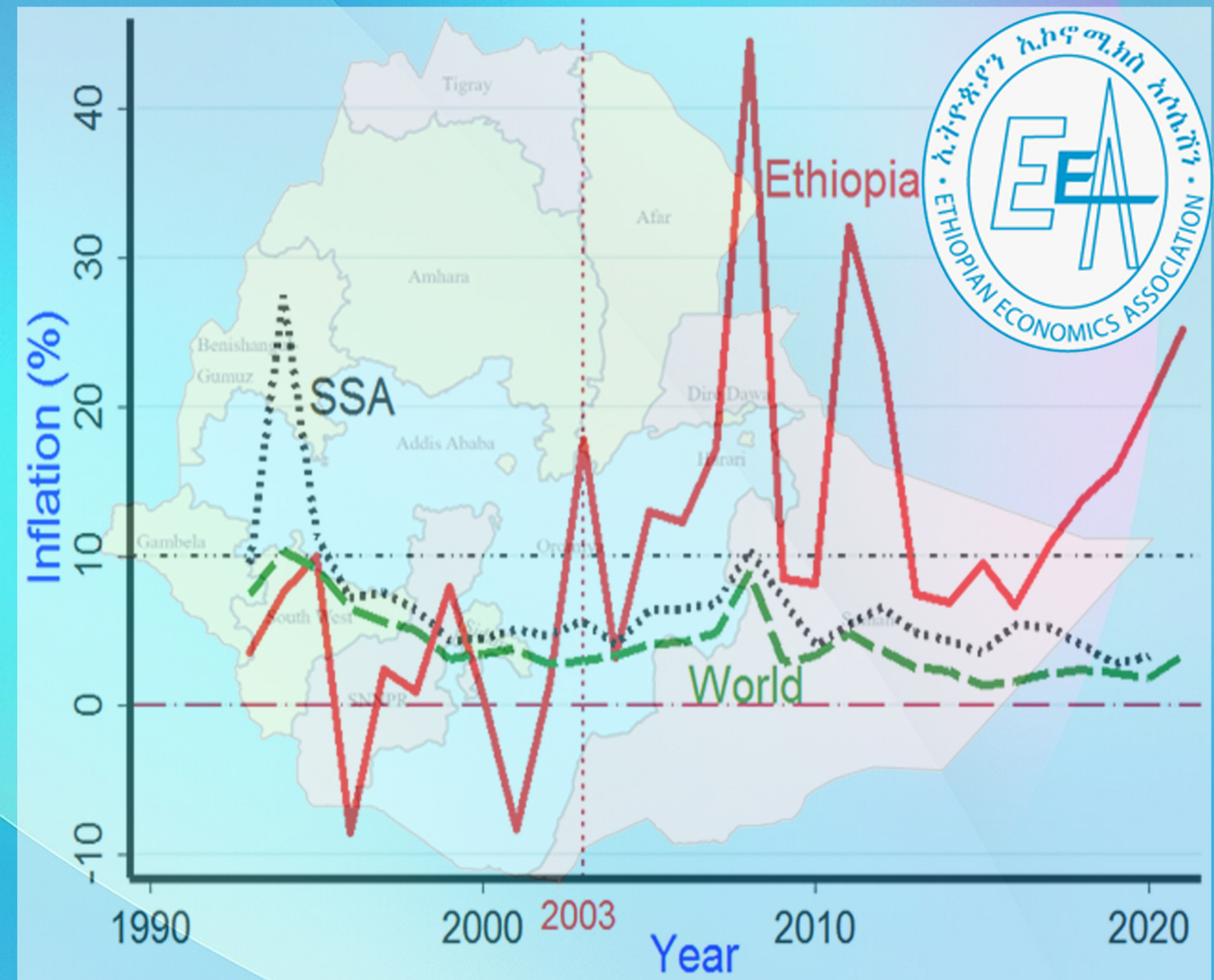
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INFLATION AND THE ETHIOPIAN ECONOMY

Constraints, Drivers, Costs and Policy Options



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FOREWORD

The Ethiopian Economics Association (EEA) is a non-profit, non-partisan and independent professional association established in 1991 with the primary aim of promoting development of the economics profession, contributing to policy formulation and implementation process of Ethiopia through research, training and capacity strengthening, organizing policy dialogue forums.

I am very privileged to introduce this timely and pertinent book addressing the key challenges that the Ethiopian economy has been facing over the last decade – inflation and associated shocks. Inflation is like cancer. Cancer gradually consumes the body and if unabated could kill the person. Similarly, inflation if unchecked depletes the welfare of citizens; distorts the effectiveness of economic policies and reforms the country is formulating and implementing.

In this book, findings of a rigorous diagnosis of several macroeconomic variables that contribute to and exacerbate inflation are presented. The book shows that many sectors and subsectors are contracting due to the inflationary trend, which could lead to economic stagnation. I believe that the analyses and recommendations will inform economic policy makers to review the existing policies and reforms and formulate new ones that could lead to stable prices.

I also believe that like many other EEA publications, this book will be a valuable reference for students and teachers of public and private higher learning institutions. The EEA is committed to undertake other similar studies deemed relevant to enhance growth and development which will guide structural and economic transformation in Ethiopia.

Finally, I would like to thank the principal researchers and support staff of EEA for their dedication and professionalism in undertaking such a rigorous research and generating policy relevant recommendations.

Amdissa Teshome (PhD)

President
Ethiopian Economics Association (EEA)

EXECUTIVE SUMMARY

1. Introduction

Since the beginning of the last decade, inflation has become one of the overriding economic challenges in Ethiopia. The government and other stakeholders have conducted several studies and policy interventions on selected macroeconomic variables to identify possible solutions for tackling the inflationary problem.

Currently, Ethiopia is one of the most inflationary countries of the world. This calls for an urgent need to design a comprehensive approach to control inflation, which requires identification of the underlying structural factors and their long-run patterns and relationships in causing and exacerbating inflation. This study identified and measured the underlying drivers, dynamics, and costs of inflation and suggested relevant policy options that can address the challenge.

2. Methodology

Conceptual framework

The methodology is anchored on conceptual and empirical frameworks of inflation dynamics and constructs the problem with root causes of the inflationary trend. It has deconstructed the inflation problem into six major causes (Aggregate Supply, Aggregate Demand, Goods Market, Money Market, Governance, and the Environment). The six major causes of inflation are further deconstructed into 43 hypothesized root causes for further investigation.

Sources of data

Cross-sectional, timeseries (covering around 30 years), and panel data from various official, national and international sources are utilized for the study. The main data sources are Central Statistical Agency (CSA), National Bank of Ethiopia (NBE), the World Bank, United Nations Industrial Development Organization (UNIDO),

Food and Agriculture Organization of the United Nations (FAO), United Nations Conference on Trade and Development (UNCTAD), Bertelsmann Stiftung, Armed Conflict Location and Event Data Project (ACLED) of the Council on Foreign Relations (CFR), International Fund for Agricultural Development (IFAD), Property Rights Alliance, Transparency International, World International Property Organization (WIPO), the Fragile States Index, the Global Economy, and Trading Economics.

Methods of data analysis

Parametric and nonparametric methods are employed to analyze the data. Nonparametric methods include descriptive statistics, graphics, Gini decomposition of aggregate variables (for estimating relative and absolute shares and elasticity of components), and food balance sheet to analyze domestic aggregate supply. Generalized Least Squares (GLS) method is used to estimate the model of inflation dynamics and to identify the longrun determinants. Regression-based decomposition methods are also applied to measure the absolute and relative shares of predicted components of aggregate variables. To identify binding constraints and entry points, differential diagnostics of (shadow) prices of important macroeconomic variables and benchmarking of Ethiopia's performance with regional and global achievement are widely employed.

3. Supply-side Constraints and Drivers

Economic transformation

The pattern of economic transformation in the last two decades is declining with very limited economic status. In 2022, Ethiopia is characterized by poor socioeconomic development level and increasingly poor (flawed) economic performance. Inflation was strongly driven by poor economic performance and development.

Aggregate output

The share of real agricultural output from the total aggregate output has been considerably declining over the period. The service

sector has rather grown faster than the growth of the production sectors, consequently leading to shortage of aggregate supply in the economy. The inflationary trend is associated with the shortfall in aggregate domestic supply. Growth of real output was mainly attributable to agriculture. The industrial and service sectors have shown declining annual growth, leading to a net decline in the growth of real GDP.

Growth of real GDP in the production sectors is an indication of economic growth where prices are stabilized. When annual growth of real GDP is below 11 percent, consumer prices in Ethiopia tend to rise. To stabilize consumer prices, GDP in agriculture is expected to grow by about 7 percent or higher annual rates. Annual growth of industrial GDP is found to be inflationary. To boost supply of industrial outputs and stabilize prices in domestic markets, Ethiopia needs to reduce production costs and realize 13 percent or higher annual growth rates. As expected, annual growth of the service GDP has clear positive relationship with inflation. Growth in the service sectors is expected to increase income of households and demand for more products. If the production and service sectors are not growing comparably, the imbalance between aggregate supply and aggregate demand causes inflationary trend.

Productive capacity

Productive capacity of the country is proxied by the multidimensional productive capacity index (PCI), which measures productive capacities and constructs a multidimensional index that can provide specific insights and diagnostics of productive capacity development of the country. The annual growth of productive capacity of Ethiopia was contracting. Such economic contraction in the presence of inflationary trend is a clear indication of stagnation caused by inappropriate economic policies.

Decomposition results of the aggregate PCI show that overall productive capacity in Ethiopia over the last two decades was enhanced by human capital (60.8%), transport (31.6%), structural change (20.8%), ICT (9.6%), and institutions (8.8%). On the other hand, the contribution of natural capital (-28.9%), energy (-2.5%),

and the private sector (0%) to overall productive capacity was negative or negligible.

Growth of productive capacity is found to stabilize prices, verifying that the inflationary trend was driven by the decline in the growth of productive capacity over the period. To stabilize prices and control inflation, it is required to enhance growth of production and domestic aggregate supply of both food and nonfood products.

Agricultural production and supply

Output per capita growth of nearly all crops has exhibited negligible or negative trends over the study period. Significant proportion of crop output is mainly attributable to cereals, roots and tubers, and pulses. Greatest proportion of the shortfall in aggregate supply of cereals is attributable to the decline in crop production. The production of wheat, barley, and maize has shown substantial decline over the period whereas maize and sorghum production has exhibited negligible changes. Domestic supply of pulses, oilcrops, fruits, and vegetables is adversely affected by the decline in production. Substantial proportion of pulses and vegetables is exported and this in turn affected domestic supply. The production of oil crops oil was contracted by about three-fourth. There is no domestic production of soyabean oil. On the other hand, import of soyabean and vegetable oils was significantly increased.

With the exception of beef, production per capita of livestock products has contracted considerably over the period. The stock of cattle has also shown substantial decline. Domestic supply of livestock products is mainly attributable to own production. Production of meat has shown serious decline causing very high stock variation in domestic supply and rising meat prices. There were no significant changes in the production of other livestock products such as eggs and milk.

Industrial production

The growth of industrial real output has exhibited sharp decline since 2016. As a result, Ethiopia is one of the bottom five African counties with very low GDP share of manufacturing value-added.

Rights and access to land

Rights and access to land in Ethiopia is increasingly deteriorating over the period. It has particularly decreased from 96 percent in 2016 to 21 percent in 2022. Land, as the primary production input, access and the rights to it are significantly denied, consequently leading to contraction of agricultural production and real estate activities expected to considerably cause inflation of food items and housing services in the country. Ethiopia is one of the bottom 14 countries of the world (ranked 114th out of 129) with strongly limiting property rights, verifying that land rights are increasingly denied over time.

More limited access and rights to land are expected to constrain investment and housing, thereby causing inflation of products and services produced by firms using land as their major factor of production. There is strong negative relationship between inflation and access and rights to land in Ethiopia. Relaxation of policy constraints related to access and rights to land will help boost production and aggregate supply, and to control inflation.

Innovation

Knowhow and technology are the primary binding constraints for production and economic transformation in Ethiopia. In 2021, out of 132 countries, Ethiopia is ranked 129th, indicating that the country is one of the bottom three countries of the world in using innovation inputs. It is also ranked 107 in producing innovation outputs. The pattern of innovation for Ethiopia is also continuously declining, verifying that limited knowhow and technology are increasingly constraining innovation and economic transformation.

Imports

Regardless of the rising demand for import, import of goods and services was considerably and consistently contracting over the period. In 2020, the country was one of the top 10 African countries with very low imports. The share of food exports (% of merchandise export) was increasing with increasing rate until it reaches its highest value far above 90 percent. Proportion of export of goods and services (to the GDP) was drastically and consistently contracting.

Foreign exchange

The rapid fall of the value of ETB in the last decade was particularly important in considerably aggravating inflation of both producer and consumer prices. Exchange rate was causing inflation particularly for higher values of devaluation (20 or higher since 2018). However, the forex reserve per capita in Ethiopia has shown significant growth patterns and reached its maximum of USD 32 until it contracted since 2016. There is nonlinear relationship between inflation and forex reserve. Lower levels of foreign currency reserve cause inflation, whereas higher values of forex reserve help stabilize prices, which may ensure more imports to fill shortfalls in domestic supply and control inflation.

Taxes and tariffs

Ethiopia is one of the bottom 10 African countries with very low tax revenue share of GDP. The tax revenue is mainly attributable to taxes on goods and services; on international trade; and on income, profits and capital gains. The country is also one of the top 10 African countries with high tax rates on international trade and high import tariffs, which have adversely affected domestic prices of imported goods. Consequently, the annual growth of tax revenue and inflation of consumer prices have shown clear co-movement and positive relationship over the period.

Violence and conflicts

After 2015, both political violence and conflicts targeting civilians were significantly increased in Ethiopia. In 2021 alone, the number of political violence was surprisingly raised to 1529, while conflicts targeting civilians were increased to 424. These conflicts adversely and considerably affected production and distribution (redistribution) of goods and pushed prices up. As the number of conflicts increases, annual inflation rate rapidly increases for the fact that domestic supply of goods and services is substantially and adversely affected due to constrained production and distribution, and devastation of production sites and industrial establishments.

The incidence of political violence and conflicts are found to be driven by group grievance and factionalism, which also lead to

increasing security threats. Ethiopia is the second top African country with very high group grievance, indicating that the country is more divided compared to its counterparts in Africa. Due to the high level of group grievance, the country is more vulnerable to domestic violence and conflicts, causing rising cost of living and inflationary trends. Group grievance index for Ethiopia is rapidly increasing in the last couple of years, which warns that the country is increasingly divided due to differences in access to services and resources and political inclusion. There is strong positive relation between inflation and group grievance.

Moreover, Ethiopia is one of the top 13 African countries with very high index of factionalized elites, suggesting that its institutions are highly fragmented across regions and ethnic groups, and is expected to have high level of inefficiencies and ineffectiveness of public services. It is also one of the top 10 African countries with very high security threats. Compared to the African and the world average, the country is characterized by high security threats where investment is constrained, production is contracted, and prices of goods and services are skyrocketed.

4. Demand-side Constraints and Drivers

Monetary and fiscal stability

Monetary and fiscal stability in Ethiopia has been falling in the last two decades. Though monetary policy is recognized as objective of economic policy, it has not been consistently pursued over time. Institutional independence of monetary authorities is also compromised and prone to political influence. Fiscal stability follows nearly the same pattern mainly due to inconsistent budgetary policies and insufficient policy to promote fiscal stability.

Money supply

Growth of money supply in Ethiopia over the last three decades is rising with an increasing rate. Annual growth of money supply was increasingly higher, (as high as 44.3 percent of GDP in 2019). Compared to the growth of real GDP (6.4%) in the same year, this level of annual growth of money supply is excessively high, which

surely causes inflationary trend. The empirical link between inflation and annual growth of money supply is strongly positive and exponentially growing, indicating that unreasonably very high injection of money into the financial market has caused inflation. Annual growth of money supply higher than 12 percent has been inflating prices in Ethiopia.

Saving interest rates

Interest rates in Ethiopia are not determined by the interaction of the demand for and supply of funds. Ethiopia is one of the bottom 10 African countries with low deposit interest rates. Low interest rates are likely to cause inflation. It is also one of the bottom 10 African countries with very low negative real interest rates. Lower saving rates do not motivate people to save their money into banks, and they rather tend to spend and invest more. If there is no economic stagnation, high investment is expected to lead to expansionary economic process where production is expanded and prices are stabilized.

Lending interest rates

Lending interest rates affect supply and demand. High lending rates have adversely affected investment, employment, output, income, and welfare, thereby depleting purchasing power of citizens. Though the country is supposed to pursue expansionary economic policy, inappropriate monetary policy has stagnated investment and output and created contraction in aggregate demand arising from unemployment. Positive real interest rates ensuring investment and price stabilization can be realized by adjusting saving and lending rates. To control inflation, raising real interest rates to the Africa's average (or at least positive) may be one of the monetary policy measures to be considered by policy makers.

Investment

High inflation rate is expected to affect capital preservation of foreign direct investment (FDI). It affects profitability as higher prices can lead to increased costs and lower profits, suggesting that stable inflation rate is desirable to attract FDI. During the last decade,

capital investment (% of GDP) in Ethiopia has exhibited a declining trend. Capital investment reached its maximum at 40.7 percent of GDP but fell below 30.8 percent since 2020. Compared to the size of the economy, the growth of capital investment is contracting. Yearly fluctuations of FDI around the longrun zero trend resulted in negligible effects of FDI on inflation. Compared to the African and the world averages, Ethiopia has become one of the bottom 12 African countries with low investment freedom.

Consumption

Final real consumption expenditure by households and nonprofit institutions serving households (NPISHs) has shown considerable growth over the period. Household surveys clearly show that growth of real consumption expenditure by households was increasing in the last decade and caused shifts in aggregate demand thereby causing inflation of consumer prices. About 87 percent of the total final real consumption expenditure was attributable to households and the remaining 13 percent to the government. The empirical link between inflation and private consumption expenditure clearly shows their strong positive relationship. Economic growth in Ethiopia has caused growth of private income and expenditure where aggregate demand is grown, prices are pulled up, and demand-pull inflation is partly prevailed.

The growth pattern of government final real consumption expenditure in Ethiopia shows negative but weak relationship with annual inflation. The government's investment and expansionary policy might have led to such positive impacts on economic growth through price stabilization roles.

Exports

The export of goods and services (% of GDP) was contracting by about 135% within 10 years (2011-2020). This drastic decline in foreign earnings might have been related to the contracting production of export goods and devaluation of local currency in making exports cheaper. Proportion of food exports (% of merchandize exports) between 1998 and 2007 was also declining with significant fluctuations. Increased food exports and declining

production significantly and adversely affected domestic aggregate supply, leading to inflated prices of food items. Annual growth of net exports was primarily negative and fluctuating over the period. Disproportionate rise of imports and the declining share of exports are the primary sources of instability of trade balance.

Consequently, Ethiopia is one of the bottom 10 African countries with very low exports (with export of 7.1 percent of its GDP), compared to the African (29.4%) and the world (40.6%) averages. The effect of growth of net exports on inflation is paradoxically positive, where rise in net exports was causing inflation. This is because export growth in Ethiopia is realized by the export of goods with supply shortfalls in domestic markets and other factors such as exchange rate devaluation and scarcity of forex reserve.

Corruption

The growth of corruption perception in Ethiopia is clearly perceived over the last 15 years. Since 2007, corruption was increasing and contributing more to the inflationary trend in Ethiopia. Because corruption has a negative impact on growth and investment, it induces an indirect cost of inflation. Corruption increases inequality, decreases accountability and political responsiveness, and produces rising frustration and adversity among citizens, thereby forcing them to more likely accept or demand illegal and illiberal tactics in the economy. The empirical link between inflation and corruption suggests that positive annual growth of corruption strongly inflates prices in Ethiopia. The top 10 areas of corruption which drive the inflationary challenge in Ethiopia, in order of importance, are capital expenditure, private expenditure, government expenditure, recurrent expenditure, lending, security apparatus, tax, demand deposits, service and industrial sectors.

5. Dynamics and Determinants of Inflation

Producer prices

Development of producer prices, measured by produce price index (PPI), shows that inflation of agricultural producer prices was mainly attributable to cereals (39.4%) followed by livestock products (17.9%), and cash crops (11.7%).

Consumer prices

In 2022, Ethiopia has become one of the top ten inflationary countries of the world. The greatest proportion of consumer price developments (57%), measured by consumer price index (CPI), is mainly caused by food and non-alcoholic beverages, whereas the remaining 43 percent by nonfood components. The top five sources of food price inflation are bread and cereals (42%), vegetables (19.2%), oils and fats (14.1%), meat (12.5%) and food products (9.9%). Inflation of prices of nonfood items are mainly attributable to housing and basic utilities (34.9%), furnishing and household equipment (13.4%), clothing and foot-ware (13%), and alcoholic beverages (12.8%). Policy measures designed to stabilize consumer prices should give due focus on such components of food and nonfood items.

Determinants of inflation

Six longrun determinants of inflation dynamics for which adequate timeseries data are available are considered for parametric analysis. The econometric analysis of longrun determinants of inflation in Ethiopia, which explain 65 percent of the dynamics are identified to be annual growth of real output in agricultural and service sectors, growth of money supply, and lending rates. Growth in agricultural GDP and lending rates were the longrun factors stabilizing consumer prices. On the other hand, growth of service GDP, growth of money supply, and other exogenous factors (captured by the constant term) were primary causes of inflation in Ethiopia. The top four macroeconomic variables highly driving the level and dynamics of inflation in Ethiopia are lending interest rate (-452%), money supply (190%), saving rate (142%), and service GDP (73%).

6. Effects of Inflation

Welfare regime

Welfare regime of the country is strongly eroded by the inflationary trend in the country. The country is characterized by flawed welfare regime with rudimentary social safety nets and unequal opportunities.

Consumption effects

Inflation in Ethiopia has differentiated effects on consumption expenditure of households. The inflationary trend has highly and adversely affected the major regional states, including SNNP (-20.3%), Oromia (-20%), Tigray (-19.9%), Amhara (-19.6%), and Afar (-15.7%). Hence, policy measures designed to control inflation should consider regional characteristics affecting prices. Unlike those in the higher two income quintiles, households in the lowest three income quintiles (1st, 2nd, and 3rd) were differently and adversely affected by inflation. They have experienced a welfare loss ranging from 4 to 13.4 percent. Households in the highest two income quintiles (4th and 5th) have rather enjoyed 4 to 13 percent welfare gains.

Poverty effects

Analysis of real consumption expenditure of households revealed that inflation in Ethiopia has caused considerable redistribution of income and changes in the prevalence of relative poverty among households. Relative poverty rates were increased in both rural and urban areas of the country. Over the period, changes in relative poverty rates were estimated to be higher in Gambella (23%), SNNP and Afar (22%), Oromia (20%), and Tigray (14%). Elasticity of poverty to income growth arising from poverty alleviation measures has also been significantly reduced, thereby adversely affecting effectiveness of poverty alleviation measures.

7. Recommendations

Eight binding constraints and drivers of inflation are identified for policy intervention and reform options: (1) Low productive capacity; (2) Limited access and rights to land; (3) Negative real interest rates; (4) High import tariffs; (5) Excessive money supply; (6) Domestic violence and conflicts; (7) Corruption; and (8) Low innovation. Both short-term and long-term interventions are recommended to address the inflationary challenge in Ethiopia. The following measures require policy interventions and reforms at different time horizons:

Immediate measures

1. Supply and Price Stabilization Board (SPSB) should be established to formulate supply management of strategic goods and services, design and implement price stabilization schemes, and prepare anti-inflation guidelines and directives within three- to five-years program of fighting inflation.
2. Allowing Franco Valuta for importing strategic commodities such as pharmaceuticals, construction materials, food staples (with shortfalls in domestic supply), agricultural and industrial inputs, and technological products.
3. Raising saving rates and reducing lending rates to ensure positive real interest rates enhancing investment, production and supply in the context of expansionary economic policy.
4. Reducing import tariffs to increase imports, fill supply shortfalls in domestic markets, reduce costs of imported production inputs, thereby to stabilize prices of imported consumer goods and input factors.
5. Controlling growth of money supply based on the annual growth of real GDP will enable to balance the disequilibrium between aggregate supply and aggregate demand.
6. Controlling domestic violence and conflicts to boost production and supply which will ensure smooth distribution of goods and services, increase FDI, aid, and development assistance.

Medium- and long-term measures

7. Increasing access and rights to land for boosting production in all sectors and to improving domestic supply of goods and services.
8. Improving multidimensional productive capacity for increasing production and supply to addressing the supply constraints causing inflationary trends.
9. Use and production of innovation inputs and outputs to ensure growth and sustainability of productivity growth, competitiveness of exports, and structural and economic transformation.
10. Fighting corruption to reduce inequality, improve accountability and political responsiveness, avoid frustration and adversity among citizens, and control illegal and immoral tactics for reducing adverse effects on growth and investment.

1. INTRODUCTION


Over the last decade, since 2010 in particular, inflation has been the overriding welfare challenge in Ethiopia. Attempts by the government to keep inflation at single-digit has remained quite impossible. Sizeable body of literature put inflationary trend in Ethiopia to be one of the top policy challenges of the economy. It is also asserted to be the result of structural problems and disequilibrium in major macro trends adversely affecting aggregate supply and demand in domestic markets.

Subsistence agricultural production, growing share of the service sector, very small GDP share of manufacturing output, small GDP share of export of raw agricultural commodities, huge demand for imports (consumer, intermediate inputs, and capital goods), high and increasing trade deficit, and marked shortfalls in foreign currency reserve are among the defining features of the economy. Such long-term policy effects accompanied by other socioeconomic shocks have dragged the economy to many underlying impediments, including high and ever-increasing inflation which has considerably depleted the welfare of citizens. The country has become one of the top 10 countries of the world characterized by an inflationary economy.

Policy interventions on selected macroeconomic variables including prices, interest rates, demonetization of currency, and exchange rate have been proven to be less effective to controlling inflation in Ethiopia. There is an urgent need to design a comprehensive approach to control inflation which requires identification of the underlying structural factors and their longrun patterns and relationships.

The overall objective of this study is, therefore, to investigate the causes and costs of inflation and identify policy options deemed relevant to address the challenge. The study is particularly intended to address the following objectives:

- a. Identify the major and root causes or drivers of inflation and measure their relative importance;
- b. Examine the levels and patterns of inflation at production and consumption levels;

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- c. Identify the longrun and underlying determinants of inflation and measure their relative importance;
 - d. Investigate the major and differential effects of inflation on main actors in the economy; and
 - e. Propose policy recommendations deemed relevant to control inflation in Ethiopia.

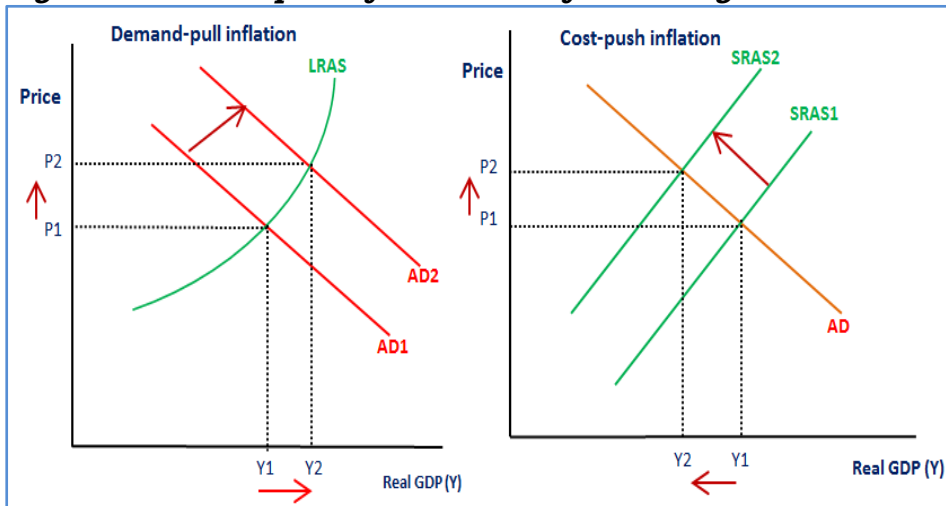
2. DATA AND METHODS

2.1. Conceptual Frameworks

The sources of inflation depicted in theoretical and empirical literature are considered to design the conceptual framework of this study. The sources of inflation are divided into two broad categories, namely cost-push and demand-pull inflation (Figure 2.1).

Demand-pull inflation is caused when aggregate demand (AD1) increases or shifts to a higher level (AD2). If aggregate demand increases (Y1 to Y2), price increases, and hence, the shift in demand to the right pulls the price to a higher level (from P1 to P2). Demand-pull inflation is caused due to increased demand arising from higher disposable income. Rise in market prices may be generally related to higher wages, reduced interest rates, increased money supply, printing money, increased public spending, reduced taxes, and high prices in international markets.

Figure 2.1: Conceptual framework of the study



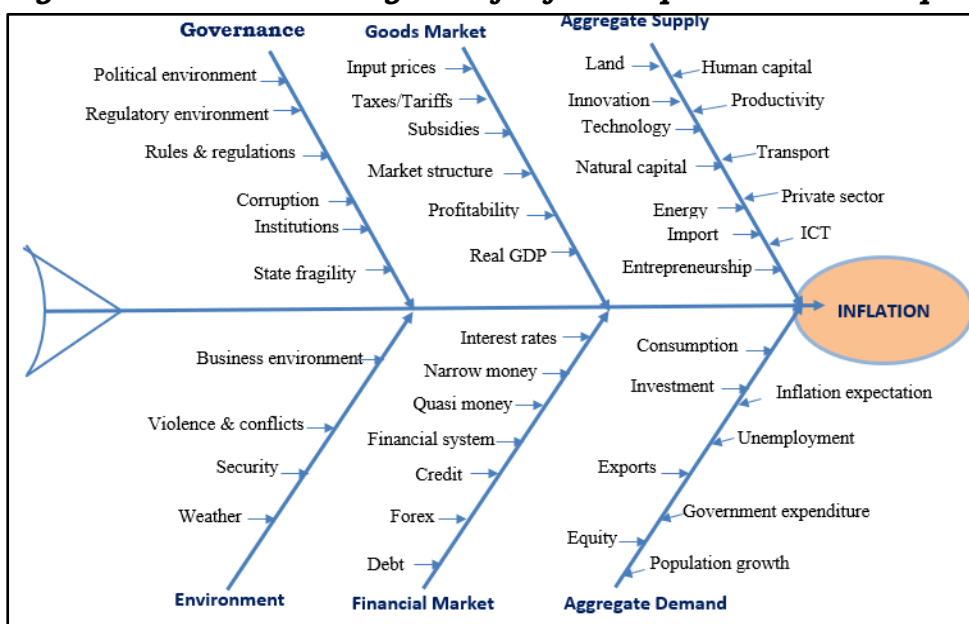
Source: Authors' design based on theory (2021).

Cost-push inflation, on the other hand, is caused if the shortrun aggregate supply (SRAS) curve shifts to the left (from SRAS1 to SRAS2). The contraction of SRAS from a higher level (SRAS1) to a lower level (SRAS2) pushes the price to a higher level (from P1 to P2),

and hence, leads to cost-push inflation. Cost-push inflation is generally caused by reduced aggregate supply arising from increased costs of production. Factors affecting costs of production may include higher wages, lower productivity, devaluation of currency making imported inputs more expensive, higher value-added tax (VAT), rising house prices, high prices in international markets, hoarding of stock, and the associated inflation expectations of individuals and firms.

In addition to the goods market, the conceptual framework of the role of investment and saving (IS) and liquidity-preference and money supply (LM) (or IS-LM) is considered to practically explain the concepts of aggregate demand (AD) and aggregate supply (AS) (AD-AS) in the goods market.

Figure 2.2: Fishbone diagram of inflation problem in Ethiopia



Source: Authors' sketch based on expected causes of inflation (2021).

To effectively address the inflation problem and characterize agents who will engage in the policy intervention process, construction of the problem with its causes and effects is vital. The expected major and root causes of inflation in Ethiopia are identified to strengthen the conceptual framework of analysis. The six primary factors causing inflation are hypothesized to be aggregate supply,

aggregate demand, goods market, financial market, governance, and the environment. The six major factors are further decomposed into their 43 hypothesized root causes and binding constraints using a fishbone diagram (Figure 2.2).

2.2. Sources of Data

Cross-sectional, timeseries and panel data are utilized are used to investigate the inflationary and other macro trends since 1993. The datasets utilized from these institutions are briefly described below.

Bertelsmann Stiftung: Data on Bertelsmann Transformation Index (BTI) for the period 2006-2022 is used for assessing economic transformation.

Central Statistical Agency (CSA): Central Statistical Agency (CSA) of Ethiopia was the official source of data utilized to investigate consumer and producer prices and inflation in Ethiopia.

Council on Foreign Relations (CFR) (Armed Conflict Location and Event Data Project (ACLED): It is a disaggregated data collection, analysis, and crisis mapping project which collects the dates, actors, locations, fatalities, and types of all reported political violence and protest events around the world. Timeseries data of ACLED is utilized in this study.

FAOSTAT: The Food and Agriculture Organization (FAO) of the United Nations was the major official source of data used to assess variables related to agriculture and food products. Databases on annual agricultural production, import and export, food balance, and producer price developments were utilized.

Fragile States Index (FSI) /Fund for Peace: It is an annual ranking of 178 countries based on the different pressures impacting their levels of fragility. Timeseries data on state fragility is utilized in this study.

International Fund for Agricultural Development (IFAD): It is a specialized agency of the United Nations, dedicated to eradicating poverty and hunger in developing countries. Timeseries data on index of access and rights to land is utilized in this study. This indicator measures the extent to which the institutional, legal, and market framework provides secure land tenure and equitable access to land in rural areas.

Macrotrends: Timeseries data on investment and unemployment rate is used in this study.

National Bank of Ethiopia (NBE): The study has utilized annual and quarterly timeseries data on different components of money supply and private and public expenditure in Ethiopia.

Property Rights Alliance: It is the publisher of the International Property Rights Index (IPRI) covering 129 countries, which scores the underlining institutions of a strong property rights regime: the legal and political environment, physical property rights, and intellectual property rights. Timeseries data of IPRI is utilized in this study.

The Global Economy: It is an online platform which serves researchers, business people, academics, and investors who need economic data on foreign countries. It provides up-to-date numbers for GDP, inflation, credit, interest rates, employment, and other indicators. It also presents over 300 selected indicators from official sources. Data on indicators and country rankings for Ethiopia are utilized.

The World Bank (WB): The study utilized the WB database and World Development Indicators (WDI) collection for Ethiopia since 1960. Indicators deemed to be relevant to analyze inflation in Ethiopia were selected and utilized from the list of about 1440 indicators. The living standards measurement survey (LSMS) data for all the four waves were also utilized to investigate changes in consumption expenditure patterns of households over the years.

Trading Economics: It provides historical data and forecasts for more than 20 million economic indicators, exchange rates, stock market indexes, government bond yields and commodity prices for 196 countries. Data on some indicators are used in this study.

Transparency International: Transparency International is a global movement working in 100 countries to end the injustice of corruption by promoting transparency, accountability and integrity. Timeseries data on corruption perception index (CPI) is utilized in this study.

United Nations Conference on Trade and Development (UNCTAD): Timeseries data on productive capacity of countries is utilized to investigate the multidimensional productive capacity and resources of Ethiopia (human, natural, energy, information communication technology (ICT), institutions, transport, private sector, and structural change).

United Nations Industrial Development Organization (UNIDO): The United Nations Industrial Development Organization (UNIDO) was the other official data source on Competitive Industrial Performance (CIP) index for Ethiopia and its counterparts. Timeseries data of indicators on CIP, national aggregates and indices on manufacturing were utilized in the study.

World International Property Organization (WIPO): It publishes the Global Innovation Index (GII) taking the pulse of the most recent global innovation trends comprising around 80 indicators and over 130 countries and ranks the innovation ecosystem performance of economies around the globe. Timeseries data on GII is utilized in this study.

2.3. Methods of Data Analysis

Modeling and analysis of data on inflation is generally challenging. It is particularly difficult when other economic variables do not move with exact patterns with inflation. If they adjust for

inflation only after a time lag, inflation can cause blurred price signals, unintended redistributions of income, and difficulties in long-term planning. Many economic variables in Ethiopia do not show clear relationships with inflation.

To analyze the available data on inflation and other economic variables, both parametric and non-parametric methods were employed. Graphic and descriptive analyses of data were extensively employed to investigate the trends, co-movements and correlations of hypothesized variables with inflation. Comparative analysis across countries and regions was also widely employed to identify the relative position of Ethiopia. Parametric analysis was particularly employed to identify longrun determinants of inflation and to measure their relative significance in causing inflation and to propose forecasting models suitable to addressing the problem in Ethiopia.

2.3.1. Food balance sheet

The major component of the consumption bundle of consumers contributing the lion's share in consumer prices in Ethiopia is food. One of the sources of food price inflation in the supply-side is the level of total food supply (food available for consumption) which was calculated using the food balance sheet formula as follows (FAO, 2001):

$$y = y_0 + (y_m + y_p) - (y_x + y_s + y_f + y_w + y_z) - y_e$$

Where:

y = Food available for consumption, aggregate supply

y_0 = Starting food stocks

y_m = Quantity imported

y_p = Quantity produced

y_x = Quantity exported

y_s = Quantity used for seed

y_f = Quantity used for animal feed

y_w = Quantity wasted

y_z = Other non – food uses

y_e = Ending stock.

The timeseries of major food items and groups was assessed for the change in the aggregate supply of food and their movement was investigated with inflation of consumer prices to identify food items with supply shortfalls related to production, export, import and other components.

2.3.2. Regression-based decomposition

In order to measure the importance of each source or component, aggregate variables with adequate sample size are decomposed using regression-based decomposition method. Aggregate variables such as aggregate outputs, instability of import and export values, tax revenue, private and government consumption expenditure, instability of trade balance, inflation of producer prices, inflation of general, food, and nonfood consumer prices are decomposed using this method.

In regression-based decomposition, aggregate variables are decomposed by their predicted components. The decomposition technique estimates models of total of an aggregate variable as a function of covariates or sources of variation and predict the contribution of each covariate, the constant, and of the residual to the total variation. The contribution of sources to the aggregate variable is shown by decomposing the total variation by the predicted contributions of sources.

There are two approaches for the decomposition of an aggregate variable by sources: the Shapley approach based on the expected marginal contribution of sources, and the Analytical approach based on algebraic developments that express total variation as a sum of the contributions of sources.

Suppose the aggregate variable y and set of sources or covariates $X = \{x_1, x_2, \dots, x_k\}$. Using a linear model specification, we can have (Araar & Duclos, 2008):

$$y = X'\beta + \varepsilon$$

Where β and ε , respectively, denote the coefficients (contributions) to be estimated and the error term.

Decomposing total variation with the analytical approach assumes that the aggregate variable is the horizontal sum of variations contributed by each source. Accordingly, the contributions of all the sources, the constant, and the residual add up to one.

2.3.3. Gini decomposition

In cases where regression-based decomposition is less relevant due to inadequate observations or different model specifications, nonparametric methods of decomposition were employed. One of the widely applied nonparametric methods employed in this study is the distributional method known as Gini decomposition. This method was widely employed to measure the contribution, correlation, marginal effects, and elasticities (% changes) of the sources of aggregate variables (with small sample size). Aggregate variables decomposed using this method include productive capacity, crop production, livestock production, meat production, aggregate supply of crops (cereals, pulses, oilcrops, fruits and vegetables, edible oils), and aggregate supply of livestock products.

The Gini index of an aggregate variable can be written as:

$$G = \sum_{k=1}^k S_k G_k R_k$$

Where G is the Gini index, S_k is the share of the k^{th} source and measures the relative importance of the source to the aggregate variable, G_k is the source Gini corresponding to the distribution¹ of the aggregate variable from source k , R_k represents the correlation between the source variable k with the distribution of the aggregate variable and measures the strength and direction of the linear relationship between the source and the distribution of aggregate variable.

¹ Distribution in this case refers to variability of the sources over time, not across units. The Gini coefficient is a statistical tool typically used to measure distribution such as income inequality. However, it can be applied to any data with an unequal distribution across space or (successive) time periods.

2.3.4. Poverty analysis

One of the major effects of inflation is redistribution of income and wealth among different subgroups of the society. The benefits and costs of inflation make one group to benefit and leave the other to lose. The costs and benefits realized as a result of the inflationary process in the last decade were investigated to identify possible policy interventions.

Real consumption expenditure is considered as an indicator of economic wellbeing in this study. The Foster-Greer-Thorbecke (FGT) index of poverty was used to analyze the incidence of consumption poverty arising from consumption shocks due to inflation. As one of the measures proposed by Foster et al. (1984), it may generally be written as:

$$P_a = \frac{1}{N} \sum_{i=1}^N \left(\frac{G_i}{z} \right)^a, \quad a \geq 0$$

where G is the number of population subgroups, N is the sample size, α is a measure of the sensitivity of the index to poverty and the poverty line. When parameter $\alpha = 0$, P_0 is simply the headcount index. When $\alpha = 1$, the index is the poverty gap index P_1 , and when α is set equal to 2, P_2 is the poverty severity index.

The FGT poverty index (P) can also be decomposed by population subgroups as follows (Araar & Duclos, 2013):

$$\hat{P}(z, \alpha) = \sum_{g=1}^G \hat{\phi}(g) \hat{P}(z; \alpha, g)$$

Where $\hat{P}(z, \alpha, g)$ is the estimated FGT index of subgroup g , $\hat{\phi}(g)$ is the estimated population share of subgroup g , $\sum_{g=1}^G \hat{\phi}(g) \hat{P}(z; \alpha, g)$ is the estimated absolute contribution of subgroup g to total poverty,

and $\sum_{g=1}^G \hat{\phi}(g) \hat{P}(z; a, g)$ is the estimated relative contribution of subgroup g to total poverty.

The total alleviation of FGT poverty into a sum of the contributions generated by separate income/expenditure components can also be decomposed. Total alleviation is maximal when all individuals have an income/expenditure greater than or equal to the poverty line. A negative sign on a decomposition term indicates that an income component reduces poverty.

Assume that there exist K income/expenditure sources and that s_k denotes source k . The FGT index is defined as (Araar & Duclos, 2013):

$$\hat{P}\left(z; a, y = \sum_{k=1}^K s_k\right) = \frac{\sum_{i=1}^n \left(1 - \frac{y_i}{z}\right)_+^a}{\sum_{i=1}^n w_i}$$

where w_i is the weight assigned to individual i , y is the income/expenditure level, and n is sample size.

This estimates the share in total consumption expenditure of each source k and the absolute and relative contributions of each source k to the value of $\left(\hat{P}_{-1}\right)$.

Growth elasticity of poverty (GEP) is the percentage reduction in poverty rates associated with a percentage change in mean income or expenditure. The information on the responsiveness or sensitivity of poverty measures to changes in income or expenditure is relevant to evaluate the likely impacts of poverty reduction measures. The overall GEP, when growth emanates exclusively from growth within a group k (within that group, inequality neutral), is estimated by (Araar & Duclos, 2007):

$$GEP = \begin{cases} -\frac{zf(k, z)}{F(z)} & \text{if } \alpha = 0 \\ \alpha \frac{\bar{P}(k, z; \alpha) - \bar{P}(k, z; \alpha - 1)}{\bar{P}(z, \alpha)} & \text{if } \alpha \geq 1 \end{cases}$$

where z is the poverty line, k is the population subgroup in which growth takes place, $f(k, z)$ is the density function at level of income or expenditure z of group k , and $F(z)$ is the headcount.

2.3.5. Inequality analysis

In this study, inequality indices are decomposed by expenditure sources, population sub-groups, and other predicted components. There are two approaches to decompose inequality by income/expenditure sources: the analytical and the Shapley approach. The analytical approach employed in this study decomposes the (usual) relative or the absolute Gini index by consumption components. The Shapley approach decomposes inequality indices into a sum of the contributions generated by separate expenditure components (Araar & Duclos, 2013).

The relative or the absolute Gini index is also decomposed by population sub-groups. To determine the contribution of each subgroup to the total population inequality, the Gini index was decomposed as follows (Araar & Duclos, 2013):

$$I = \underbrace{\sum_{g=1}^G \phi_g \varphi_g I_g}_{\text{Between}} + \underbrace{\bar{I}}_{\text{Within}} + \underbrace{R}_{\text{Overlap}}$$

where ϕ_g is the population share of group g in G population sub-groups, φ_g is the expenditure share of group g , \bar{I} is the between-group inequality (when each individual is assigned the average income of his group), and R is the residue implied by group expenditure overlap.

2.3.6. Modeling inflation dynamics

A time series is a dataset that tracks a sample over time which particularly allows one to see what factors influence certain variables from period to period. In order to conduct a timeseries analysis, we

face two important practical challenges of testing for unit roots and the need to change a nonstationary timeseries to stationary.

Inflation is the major predictable or trend component of a timeseries. However, estimation of a trend component requires that the data is stationarized. Techniques of making a nonstationary timeseries to stationary eliminate the trend component and the effect of inflation over time. The best option to estimate the effect of inflationary trends is to estimate trend models at nominal values of the variables under study.

Annual inflation rate of consumer prices (%) model, which suffers from first-order serial correlation, can be estimated using a generalized least-squares (GLS) estimator (Cochrane & Orcutt. 1949, Green 2018). Under the assumption of the most common autocorrelated error process in timeseries, the first-order autoregressive processes, the linear regression model can be specified as follows:

$$y_t = x_t\beta + u_t$$

y_t = Measure of inflation (annual % at year t)

x_t = Matrix of determinants at year t

β = Column vector of parameters to be estimated

u_t = Error term satisfying $u_t = \rho u_{t-1} + e_t$.

t = Time in year.

The residuals, e_t , are independent and identically distributed as $N(0, \sigma^2)$. The covariance matrix (Ψ) of the error term u can then be written as:

$$\Psi = \frac{1}{1 - \rho^2} \begin{bmatrix} 1 & \rho & \rho^2 & \dots & \rho^{T-1} \\ \rho & 1 & \rho & \dots & \rho^{T-2} \\ \rho^2 & \rho & 1 & \dots & \rho^{T-3} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ \rho^{T-1} & \rho^{T-2} & \rho^{T-3} & \dots & 1 \end{bmatrix}.$$

Where ρ (rho) is the autocorrelation coefficient of residuals.

2.3.7. Differential diagnostics

Prices of binding constraints

In principle, the (shadow) price of a binding constraints is relatively high indicating that the factor is relatively scarce. If a factor is scarce or in short supply, the society will be willing to pay more for it. Reforms related to relaxation of the binding constraints are expected to lead to significant changes in the outcome variable, inflation in this case. Unless the binding constraint is resolved or relaxed, reforms will end up with unexpected results.

Benchmarking

Benchmarking is a tool for assessing and comparing performance in order to achieve continuous improvement. In this case it is the process of measuring products, services, and processes against some standards or indicators achieved at regional and global levels. To identify the binding constraints and design feasible growth strategies and reforms for controlling inflation, Ethiopia's performance on the selected macroeconomic variables is benchmarked against regional and global achievements. Important variables with relatively poor performance are considered highly constrained and selected for entry points.

2.4. Definition of Variables

The major variables hypothesized to be related to inflation are defined below.

2.4.1. Inflation model

Dependent variables

Inflation of consumer prices (annual %): Annual inflation of consumer prices is the dependent variable used to measure the level and dynamics of inflation in Ethiopia. It measures prices of purchases by consumers.

Inflation of agricultural producer prices (annual %): Annual inflation of agricultural producer prices is the dependent variable used to measure the level of inflation of producer prices in Ethiopia. It measures prices of sales received by farmers.

Explanatory variables

Growth of real output (annual %): Growth of real output in production sectors and inflation are negatively correlated. Annual growth of sectoral value-added (%) for the two sectors (agriculture and industry) are assumed to be the major supply-side determinants of consumer price inflation in Ethiopia. Increasing real output in these sectors makes the shortrun supply to rise and consumer prices to fall.

Growth of real output in service (annual %): Increasing real output in the service sector increases shortrun supply of the services and real income (or purchasing power) of consumers. The rise in real income affects aggregate demand to shift and consumer prices to rise, leading to demand-pull inflation.

Official exchange rate (ETB per USD): The official exchange rate of local currency (ETB per USD) is assumed to be one of the determinants of inflation in the demand-side. The exchange rate affects domestic consumer prices by making import price expensive and export prices cheaper. Imported consumer and capital goods are assumed to be adversely affected by devaluation of the exchange rate. Outputs produced from expensive production inputs will be expensive in both domestic and export markets. Increasing devaluation of the local currency makes consumer prices to rise.

Growth of money supply (annual %): Annual growth of money supply, proxied by broad money (sum of narrow² and quasi money), is hypothesized to be one of the demand-pull factors making aggregate demand to rise. Shifts in aggregate demand causes consumer prices to rise. Rising money supply increases expenditure, and hence, rising demand pulls prices higher.

Bank interest rates (%): Interest rates influence the direction of inflation, manage growth, and keep unemployment low and wages high. High saving interest rates motivate people to save their money into banks, which will reduce circulating in the market, leading to stable prices. On the other hand, high lending rates adversely affect investment because people tend to save their money into banks, which will lead to contractionary economic process, inflation.

Unemployment (annual %): Inflation and unemployment are expected to have an inverse relationship, as represented by the Phillips curve. Low levels of unemployment cause inflation.

Growth of public debt (annual %): Economic theory postulates that inflation causes the value of a currency to decline over time and lets debtors pay lenders back with money that is worth less than it was when they originally borrowed it. Higher inflation reduces the real value of the government's outstanding debt while increasing the tax burden on capital investment due to lack of inflation indexing. However, there is no clear-cut empirical evidence on the positive or negative relationship between public debt and inflation. Public debt in Ethiopia is hypothesized to have positive or negative effects on inflation.

Population growth (%): Growth in population is generally expected to have a positive and systematic relationship with inflation. As the

² Narrow money supply includes those monies that are very liquid (money outside banks and demand deposits) such as cash, checkable (demand) deposits, and traveler's checks. Quasi money supply is less liquid in nature, including savings and time deposits, certificates of deposits, and money market funds.

population grows, it increases the total demand in the market and prices tend to rise.

Growth of tax revenue (annual %): When inflation rises, the nominal amount of capital income rises. Real tax rates are applied to sources of nominal capital income, leading to higher taxable nominal income and reduces real income of businesses. Growth in tax or tax revenue is expected to increase costs of product and cause inflation.

2.4.2. Decomposition models

In order to measure the contribution of each source, aggregate variables are decomposed into their constituent parts using either Gini or regression-based decomposition methods. If the sample size is adequate, they are decomposed using regression-based methods. On the other hand, Gini decomposition is employed to decompose aggregate variables with small sample sizes.

Productive capacity: Productive capacity index (PCI) (%) measures productive capacities in an economy and constructs a multidimensional index that can provide country-specific insights and diagnostics of productive capacity development. The overall productive capacity has eight dimensions: human capital, natural capital, energy, transport, private sector, information communication technology (ICT), institutions, and structural change. In order to estimate the contribution of each dimension, the overall productive capacity is decomposed to its eight dimensions using Gini decomposition method.

Aggregate output: Aggregate outputs per capita (constant ETB) is measured by real value-added. To measure the contribution of each sector (agriculture, industry, service), aggregate value-added per capita is decomposed into sectoral value-added per capita using regression-based method.

Crop production: To estimate the contribution of each source, crop production per capita (quintals) is decomposed into the major sources

of crop production (cereals, pulses, oilcrops, vegetables, fruits, roots and tubers) using Gini decomposition method.

Meat production: To estimate the contribution of each source, meat production per capita (kgs) is decomposed into the major sources (beef, shoat meat, poultry meat, and camel meat) using Gini decomposition.

Livestock production: To measure the contribution of each source, livestock production per capita (measured in tropical livestock unit) is decomposed into its major sources of livestock (cattle, shoat, camel, and poultry birds) using Gini decomposition

Aggregate supply of agricultural products: In order to measure the contribution of each source, domestic aggregate supply of agricultural products (1000 tons) is decomposed into the major uses of products including own production, import, export, processing, losses, food, animal feed, seed, other uses (nonfood), stock variation, and residuals. The aggregate variables decomposed into these sources are cereals (wheat and products, barley and products, maize and products, sorghum and products), pulses, oilcrops, fruits, vegetables, edible oils, and livestock products (meat (all), mutton and goat meat, eggs, cow milk).

Instability of import and export prices: To measure the sources of instability of import and export prices (measured by value index), value indices are decomposed into the major expected sources of instability (unit value, quantity, constant, and residuals) using regression-based decomposition methods.

Tax revenue: To measure share of each source to total tax revenue of the government, Gini decomposition method is used to decompose tax revenue (% of GDP) into the major tax sources, including taxes on international trade; taxes on income, profits, and capital gains; taxes on goods and services; and other taxes.

Consumption expenditure: To estimate the share of each expenditure source, total final real consumption expenditure (million ETB) is decomposed into its major sources (households, government, constant, residuals) using regression-based method.

Instability of trade balance: To assess the relative importance of sources of instability of trade balance, regression-based method is employed to decompose trade balance into export, import, constant and residuals.

Inflation of agricultural producer prices: To estimate the relative importance of each source, Gini decomposition method is employed to decompose produce price index (PPI) into the 10 major sources of agricultural price variation: cereals, livestock products, cash crops, oilseeds, livestock, pulses, potato and other tubers, vegetables, spices, and fruits.

General inflation: To estimate the relative share of food and nonfood components to the dynamics of general inflation (measured by general CPI), regression-based decomposition method is employed.

Food inflation: To estimate the share of each source in affecting inflation of food prices using regression-based method, inflation of consumer prices of food (CPI for food) is decomposed into the nine food items (bread and cereals; vegetables; oils and fats; meat; food products; sugar, honey, chocolates, and confectionaries; fruits; milk, cheese, and eggs; and nonalcoholic beverages), constant, and the residuals.

Non-food inflation: To estimate the share of each source of inflation of nonfood items, consume price index for nonfood (CPI for nonfood) is decomposed into the 10 nonfood components (housing, water, electricity, gas and others; furnishing, housing equipment, and related; clothing and food-ware; alcoholic beverages; miscellaneous nonfood products; restaurants and hotels; health; transport; recreation and culture; communication; and education), constant, and residuals.

Poverty and inequality: Gini decomposition method is employed to measure the share each source in affecting poverty and inequality (%). Accordingly, poverty and inequality are decomposed by regional states, areas of residence (rural and urban), and the five income quintiles

Elasticity of poverty: Elasticity of poverty (%) with respect to growth and inequality is decomposed across four periods or panels of data (2011, 2103, 2015, 2018/2019) using Gini method of decomposition.

3. SUPPLY-SIDE CONSTRAINTS AND DRIVERS

The Ethiopian economy is commonly asserted to be supply-constrained. Supply shortfalls are one of the primary causes of inflation with multiple structural constraints in the supply-side and the decline in the shortrun aggregate supply arising from factors related to low productive capacity; low production and productivity; forex and devaluation of currency; rising production costs due to rising wages, high taxes and import tariffs, and rising import prices of intermediate goods used for production; domestic violence and conflicts, lack of innovation inputs and outputs; corruption; and hoarding and inflation expectations; to mention a few. The relationships of these and other variables with inflation are investigated in this section.

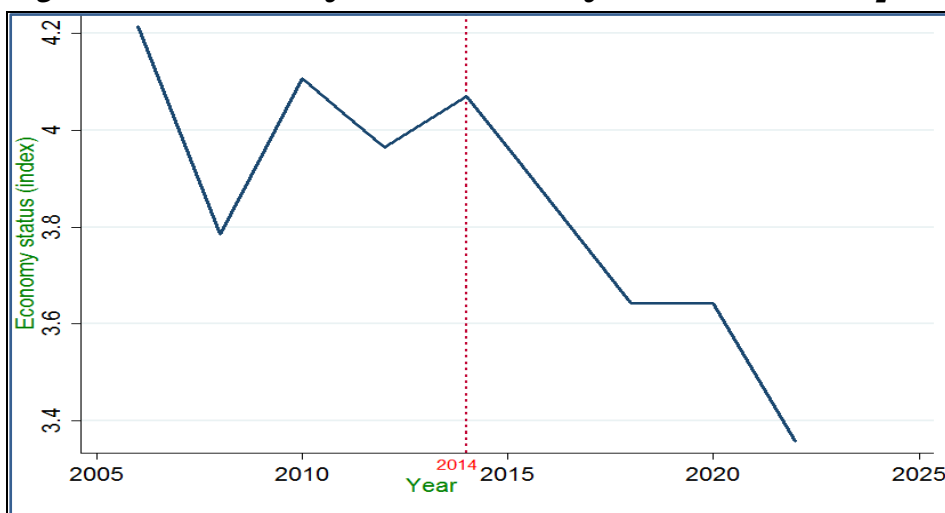
Inflation in the supply-side may be driven by lower relative growth of aggregate supply or contractionary processes in the economy leading to cost-push inflation. Cost-push inflation is generally caused by reduced aggregate supply arising from increased costs of production. If the growth of aggregate supply lags behind the growth of aggregate demand, prices will generally rise. However, if production and aggregate supply are contracting in the presence of rising output prices, such economic phenomenon is the phase of a business cycle known as contraction. In the latter case, the economy as a whole is said to be in an economic recession. Contractionary process in the economy generally occurs after the business cycle peaks, but before it becomes a trough. An economic contraction with inflationary process is known as stagflation mainly arising from economic policies.

In this section, the expected supply-side constraints causing inflation in Ethiopia are investigated and their relative importance measured. The major variables examined include sectoral output, productive capacity, agricultural and industrial production, aggregate domestic supply, import, foreign exchange, and taxes and protectionism.

3.1. Economic Transformation

The Economy Status Index, computed by the Bertelsmann Transformation Index (BTI) over the last 17 years (2006-2022) identifies the stand of around 137 transition and developing countries of the world on their path toward a social market economy. The economy status index for Ethiopia depicts sharp decline since 2014 (Figure 3.1). This is the period when inflation was clearly prevailed in the economy. The intended economic transformation in Ethiopia was rather reversed over the period. The economic transformation index decreased from 4.3 in 2006 to 3.4 in 2022, making the country to fall under the category of very limited economy status. Its rank was accordingly reduced from 96 in 2006 to 116 in 2022.

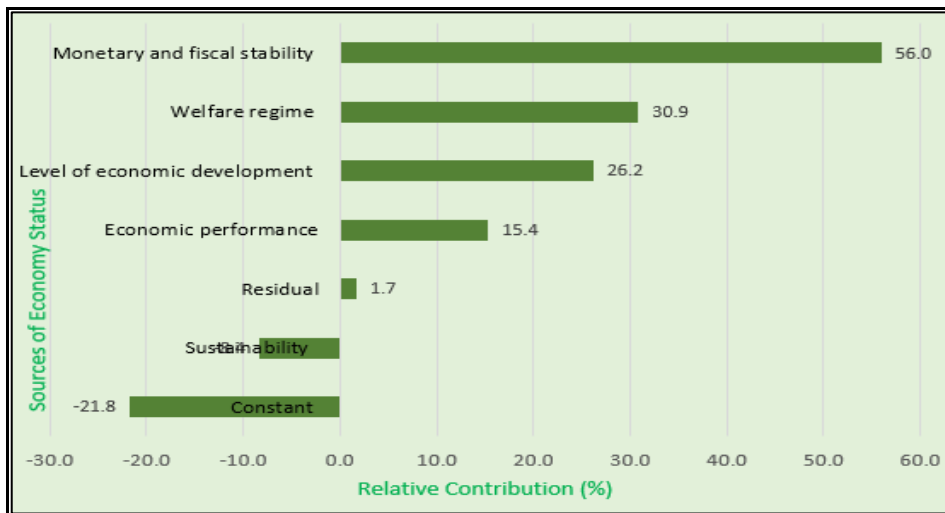
Figure 3.1: Pattern of economic transformation in Ethiopia



Source: Computed from BTI data of Bertelsmann Stiftung (2022).

To identify the relative importance and contribution of various factors determining economic transformation, the overall economy status index was decomposed (Figure 3.2). The top determinants of economy status of the country were monetary and fiscal stability (56%), welfare regime (30.9%), level of economic development (26.2%), and economic performance (15.4%). Sustainability and other exogenous factors were adversely affecting economic transformation in Ethiopia.

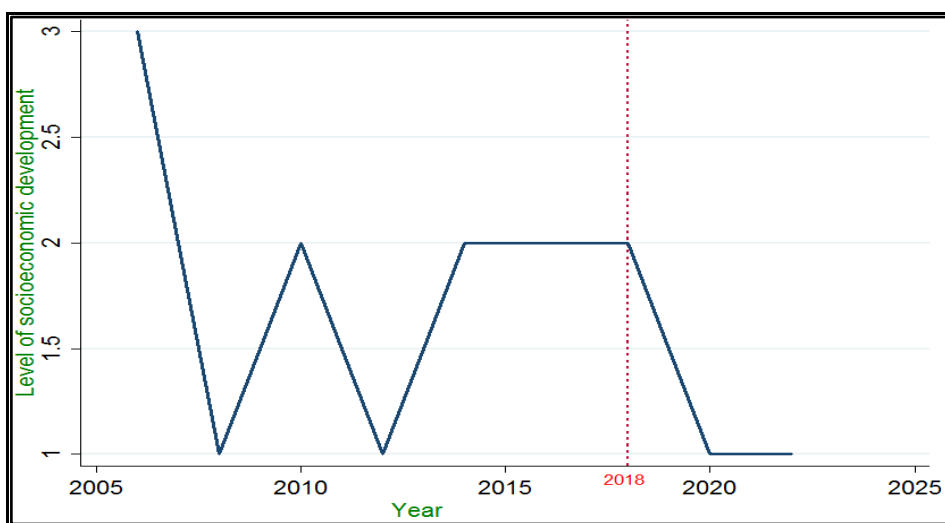
Figure 3.2: Relative contribution of variables to economic transformation



Source: Computed from BTI data of Bertelsmann Stiftung (2022).

The level of economic development, determined by socioeconomic development, also indicates the sharp and substantial fall since 2018 (Figure 3.3). The highest level of socioeconomic development recorded in 2006 (three) has fallen to 1 (one) in 2022, denoting poor socioeconomic development level.

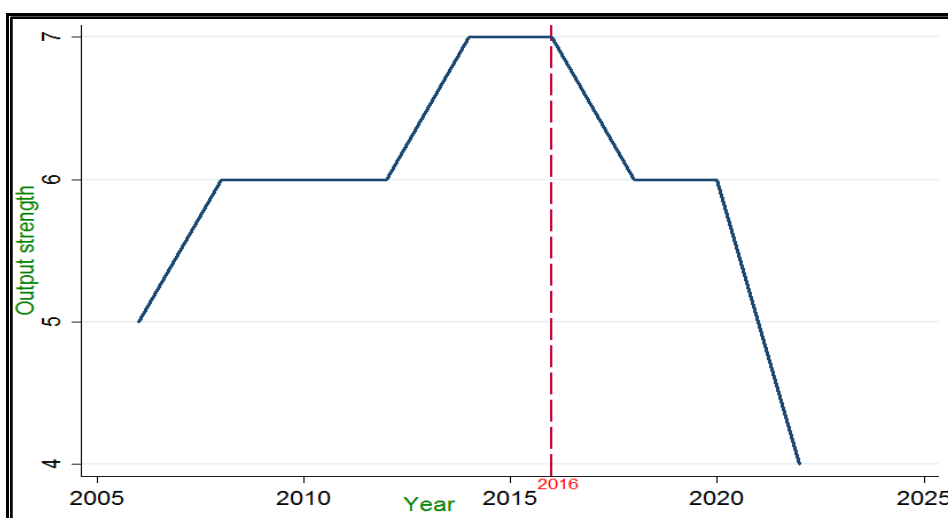
Figure 3.3: Decreasing pattern of socioeconomic development



Source: Computed from BTI data of Bertelsmann Stiftung (2022).

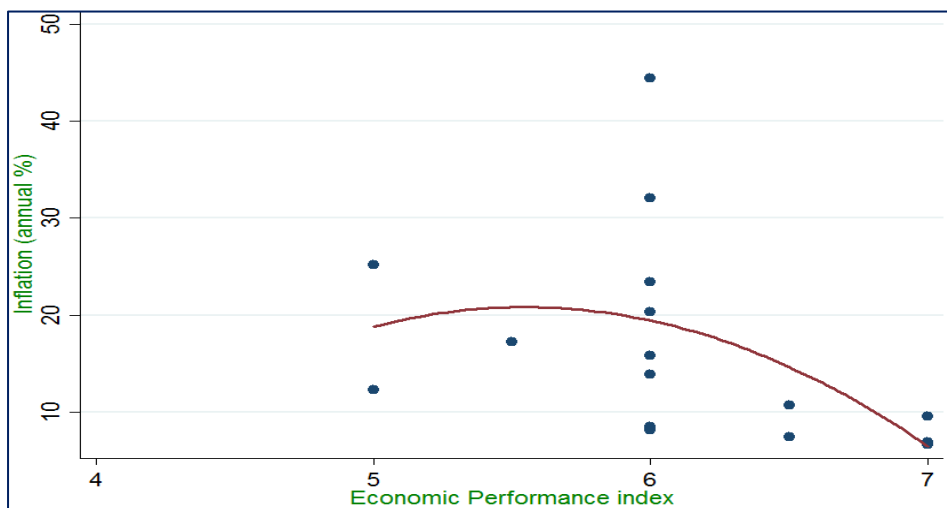
The maximum economic performance index for Ethiopia, proxied by output strength, was recorded at 6.5 in 2013 and 2017, but decreased to 4 in 2022 (Figure 3.4). The level of economic performance in 2022 is regarded as poor. The potential causes of such poor economic performance include stagnant GDP per capita growth rate, high unemployment levels, low price stability, unbalanced budget, rising debt, and volatile current account position.

Figure 3.4: Increasingly poor (flawed) economic performance



Source: Computed from BTI data of Bertelsmann Stiftung (2022).

The empirical link between economic performance and inflation is clearly negative (Figure 3.5). Inflation in Ethiopia was significantly driven by poor economic performance. Good economic performance enables to boost production and aggregate supply for stabilizing prices.

Figure 3.5: Poor economic performance causes inflation

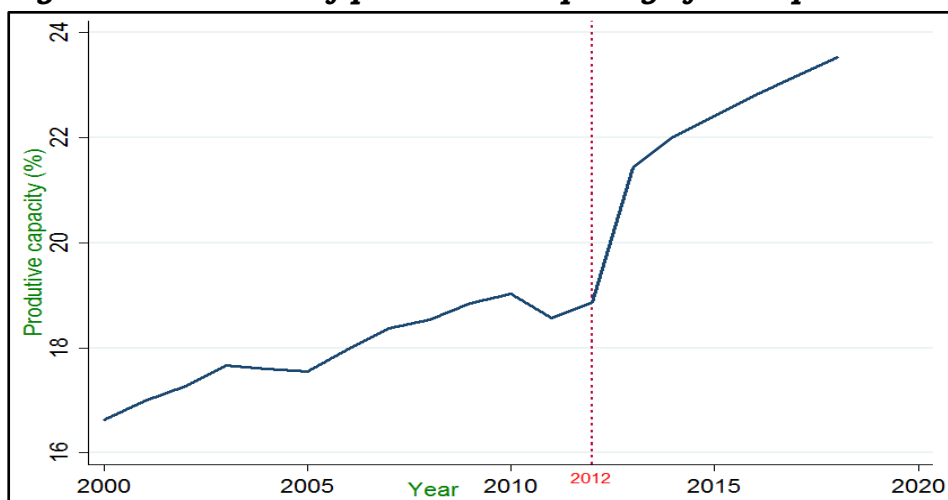
Source: Computed from BTI data of Bertelsmann Stiftung (2022).

3.2. Productive Capacity

Productive capacity is the productive resources, entrepreneurial capabilities, and production linkages that together determine a country's ability to produce goods and services that will help it grow and develop. The productive capacity index (PCI) measures productive capacities in an economy and constructs a multidimensional index that can provide country-specific insights and diagnostics of productive capacity development (UNCTAD, 2021). It has eight dimensions: human capital, natural capital, energy, transport, private sector, information communication technology (ICT), institutions, and structural change.

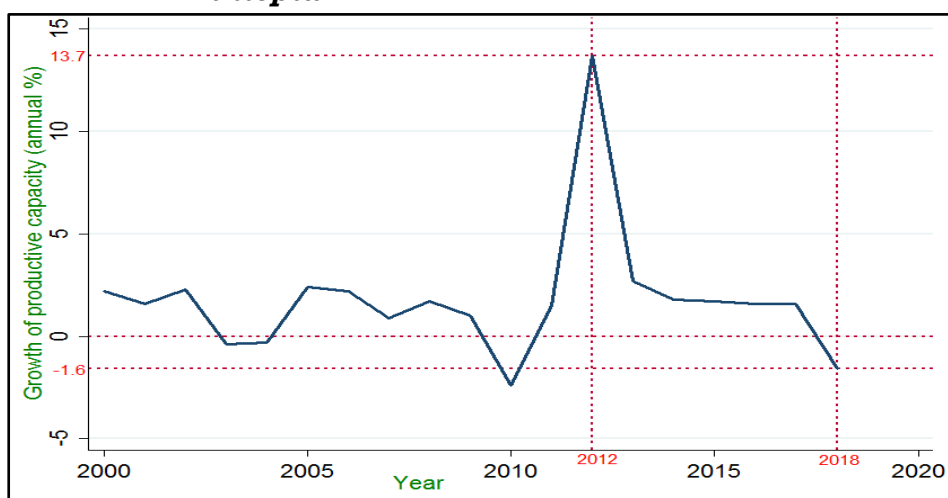
In 2018, Ethiopia was one of the bottom 22 African countries with very low productive capacity and ranks 174th in the world (out of 199 countries). Its productive capacity (23.5%) is far below the world average (32.2%) and other SSA countries, such as Mauritius (37.4%), Trinidad and Tobago (36.7%), Namibia (29.5%), Lesotho (29.2%), and Djibouti (27.4%).

The pattern of overall productive capacity of Ethiopia was growing at different rates in the past two decades (since 2000) (Figure 3.6). It was particularly growing faster since 2012.

Figure 3.6: Pattern of productive capacity of Ethiopia

Source: Computed from data in UNCTAD (2022).

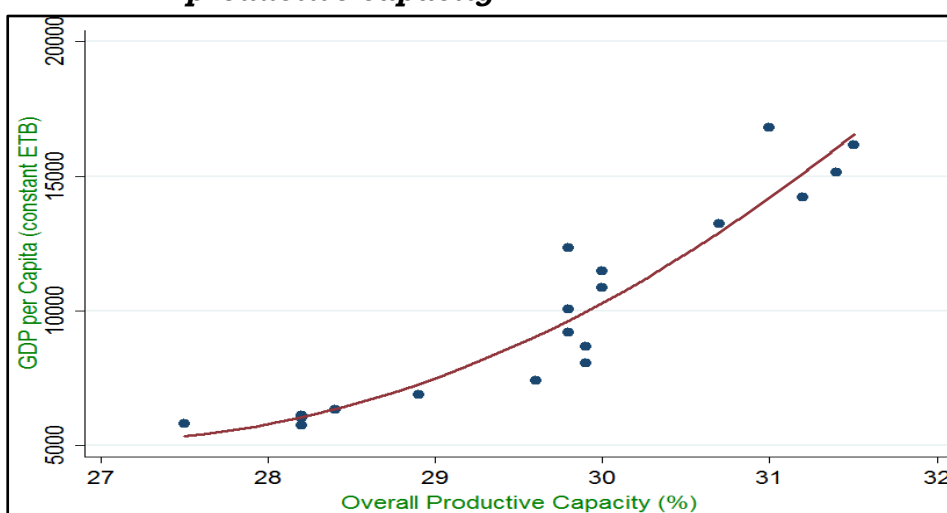
The annual growth of productive capacity of the country was contracting or unchanged over the last two decades (Figure 3.7). The maximum annual growth registered in 2012 (13.7%) decreased to negative 1.6 percent in 2018, verifying that contraction of overall production and aggregate supply has led to inflationary trends. Economic contraction in the presence of inflationary trend is a clear indication of stagnation caused by inappropriate economic policies.

Figure 3.7: Growth pattern of overall productive capacity in Ethiopia

Source: Computed from data in UNCTAD (2022).

Predictive capacity is expected to boost production and supply in all sectors and address supply shortfalls. The empirical link between productive capacity and GDP per capita shows their strong exponential link (Figure 3.8). The current inflationary trend mainly arising from supply constraints and shortfalls can be addressed by deploying the available productive capacities and enhancing emerging dimensions of productive capacities such as ICT.

Figure 3.8: GDP per capita is highly elastic with respect to productive capacity

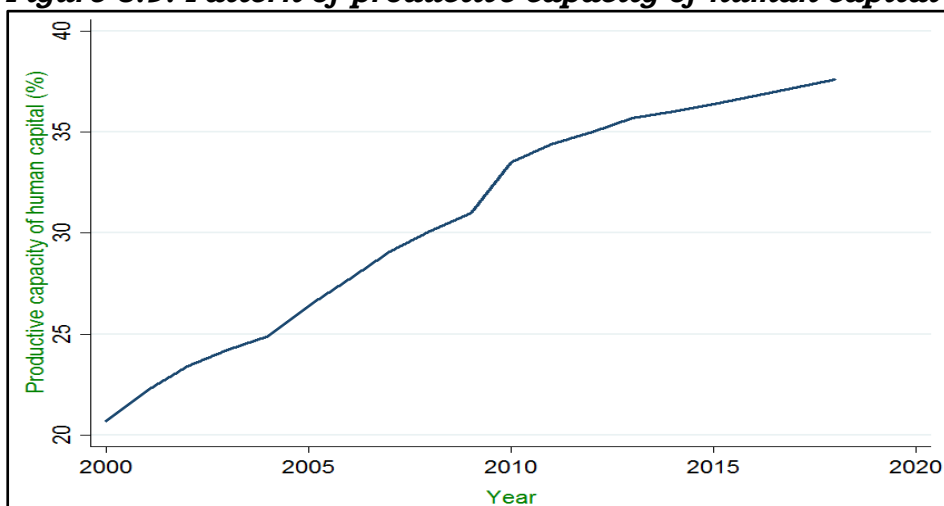


Source: Computed from data in UNCTAD and the World Bank (2022).

3.2.1. Dynamics of productive capacities

Human Capital

Human capital captures the education, skills and health conditions, the overall research and development, and gender dimensions. Human capital was uniformly growing over the period suggesting that improvement in overall productive capacity was mainly attributable to human capital in Ethiopia (Figure 3.9). However, there is huge untapped potential of human resource (62.4%) to increase productive capacity of the country.

Figure 3.9: Pattern of productive capacity of human capital

Source: Computed from data in UNCTAD (2022).

Natural Capital

Natural capital estimates the availability of extractive and agricultural resources (including rents generated from the extraction of the natural resource), less the cost of extracting the resource. Dependence of a country on specific commodities is captured by material intensity, which measures the materials needed for the production, processing, and disposal of a unit of a good or service.

There is inverse relationship between natural capital and material intensity (Figure 3.10). The pattern of natural capital in Ethiopia was drastically declining from 72.1 percent in 2003 to 61 percent in 2018. Over time, material intensity is decreasing due to the decline in natural resources, indicating the declining share of natural capital in the production capacity of the country. However, the country has 39 percent more productive capacity to further boost production. The contraction in the productive capacity of natural capital is caused by the increasingly limited rights and access to land in Ethiopia (see the findings in the next subsections). Rights and access to land, the most important natural resource and factor of production in all sectors, is increasingly denied, thereby leading to contractionary processes.

Figure 3.10: Pattern of productive capacity of natural capital

Source: Computed from data in UNCTAD (2022).

Energy

Energy measures the availability, sustainability and efficiency of power sources related to use and access, losses in distribution and renewability of energy components and sources, and the GDP generated by oil to proxy optimal energy systems. Productive capacity of energy is very low in Ethiopia (16.4% in 2018) (Figure 3.11). The maximum energy productive capacity was registered at 17.2 percent in 2009, which decreased thereafter. The country is more expected to improve energy availability (use and access), efficiency, and ensure an optimal mix of power sources.

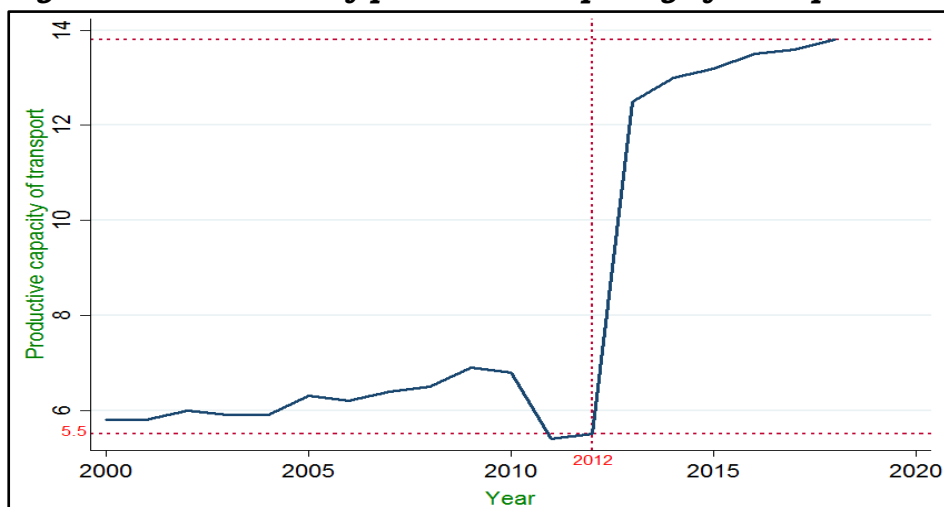
Figure 3.11: Pattern of productive capacity of energy

Source: Computed from data in UNCTAD (2022).

Transport

Transport measures the capability of a system to take people or goods from one place to another which may be as the capillarity of roads and railways network, and air connectivity. The transport productive capacity of Ethiopia is very low (13.8% in 2018) with drastic growth since 2012 (Figure 3.12). In order to ensure movement of goods and people for efficient production and distribution, the country is badly required to improve its transport capability in roads, railways, and air connectivity.

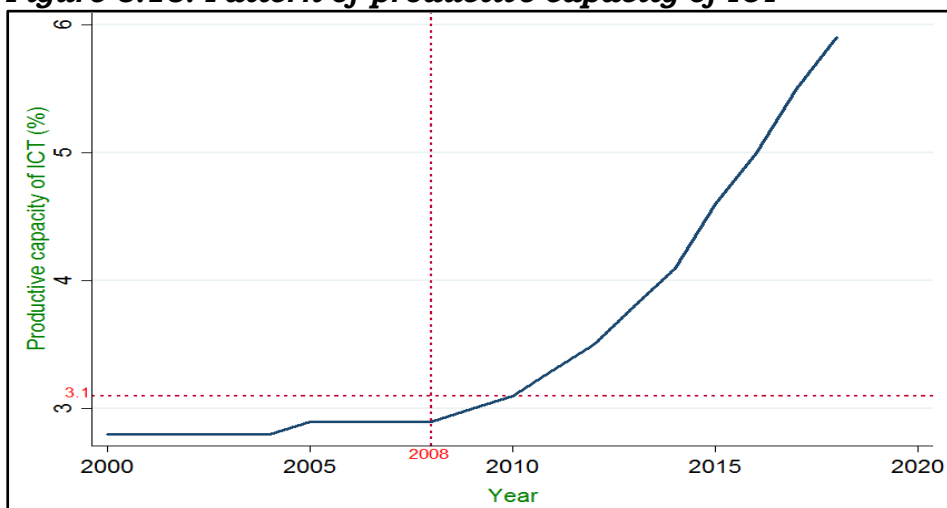
Figure 3.12: Pattern of productive capacity of transport



Source: Computed from data in UNCTAD (2022).

Information and Communication Technology (ICT)

Information and Communication Technology (ICT) measures the accessibility and integration of communication systems within the population, which includes fixed line and mobile phones users, internet accessibility and server security. The ICT productivity capacity of Ethiopia is negligible but with increasing trend since 2008 to reach its maximum at 5.9 percent (Figure 3.13). The country is required to significantly improve access and integration of ICT for boosting production and supply.

Figure 3.13: Pattern of productive capacity of ICT

Source: Computed from data in UNCTAD (2022).

The Private Sector

Private sector is used to proxy the ease of cross-border trade (including time and monetary costs to export and import), and the support to businesses in terms of domestic credit, velocity of contract enforcement, and time required to start a business. Productive capacity of the private sector was increasing (with fluctuations) until it started to decline since 2010 (Figure 3.14).

Figure 3.14: Pattern of productive capacity of the private sector

Source: Computed from data in UNCTAD (2022).

Institutions

Institutions aim at measuring political stability and efficiency through its regulatory quality, effectiveness, success in fighting criminality, corruption and terrorism, and safeguard of citizens' freedom of expression and association. Productive capacity of institutions was increasing until it reached the maximum at 36.7 percent and started to decline since 2014 (Figure 3.15).

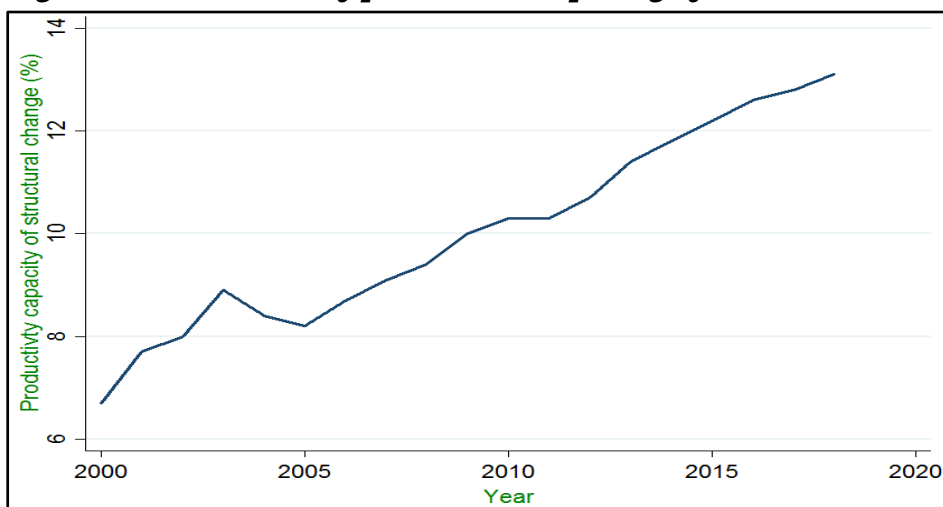
Figure 3.15: Pattern of productive capacity of institutions



Source: Computed from data in UNCTAD (2022).

Structural Change

Structural change is measured by the movement of labor and other productive resources from low-productivity to high-productivity economic activities. This shift is measured by the sophistication and variety of exports, the intensity of fixed capital, and the weight of industry and services on total GDP. Structural change can also be observed within a given sector if the binding constraints in the sector are identified and effectively addressed. Structural change in Ethiopia is increasing over the period (Figure 3.16).

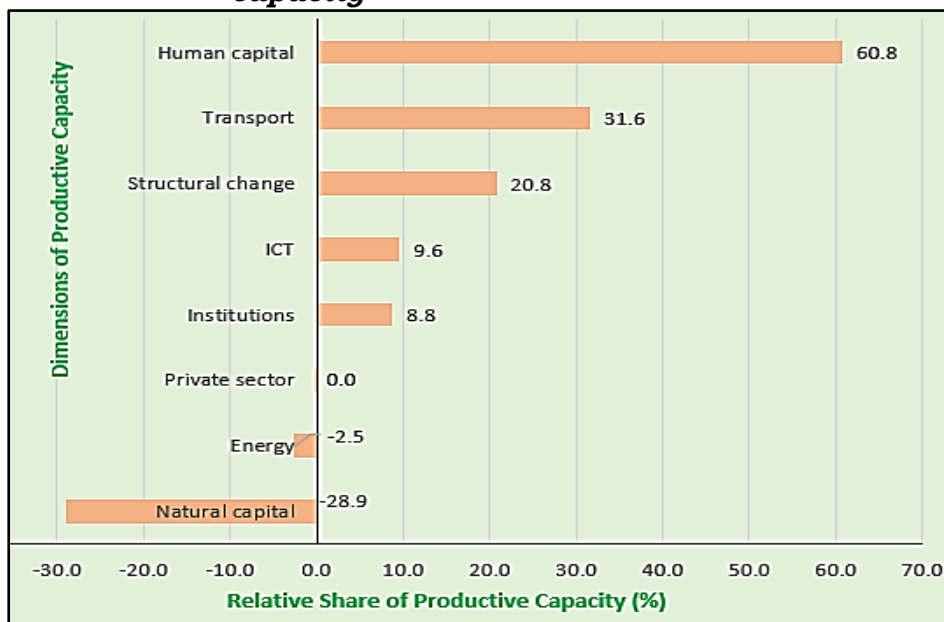
Figure 3.16: Pattern of productive capacity of structural change

Source: Computed from data in UNCTAD (2022).

3.2.2. Share and elasticity of productive capacities

Decomposition of the aggregate productive capacity into the eight productive capacities shows that the relative shares of the top three dimensions of productive capacity over the last two decades are human capital (60.8%), transport (31.6%), and structural change (20.8%) (Figure 3.17). However, the shares of natural capital (-28.9%), energy (-2.5%), and the private sector (0%) are negative, indicating that they were not used against for productive purposes. The results suggest the urgent need to improve productive capacity with a particular focus to natural resource (access and rights to land), access and use of energy, and active engagement of the private sector in the production process.

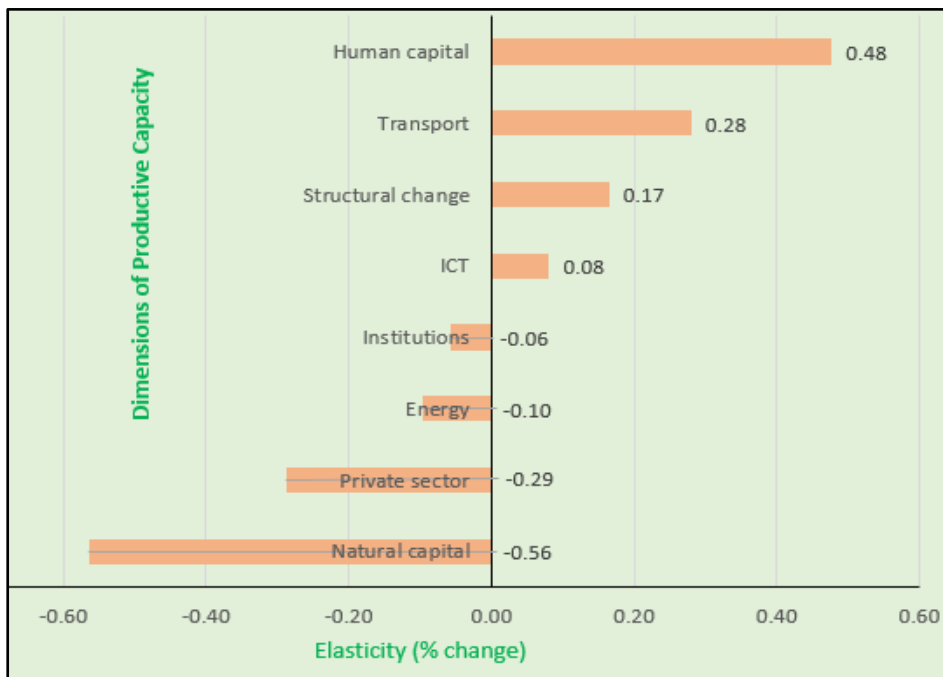
Figure 3.17: Shares of productive capacities to aggregate capacity



Source: Computed from data in UNCTAD (2022).

The elasticities of the eight dimensions of productivity capacity over the last two decades have important policy implications (Figure 3.18). Aggregate productive capacity is less elastic with respect to many of the productive capacities. A unit percentage increase in human capital, transport, structural change, and ICT, respectively, rise overall productive capacity by 0.48, 0.28, 0.17, and 0.08 percentage points. Elasticities of overall productive capacity with respect to the other four dimensions of productive capacity are negative. Natural capital (-0.56%), the private sector (-0.29%), energy (-0.1%), and institutions (-0.06%) are adversely affecting overall productive capacity. Half of the productive capacities in Ethiopia have contractionary effects on overall productive capacity. The most important natural capital in Ethiopia, land for instance, is severely constrained by increasingly limited access and rights to it. The constraints related to the private sector, institutions, as well as energy need due focus to exploit their productive role. Growth of production capacity and aggregate supply are not expected with contractionary trends in such important factors.

Figure 3.18: Elasticity (% change) in productive capacities (2000-2018)

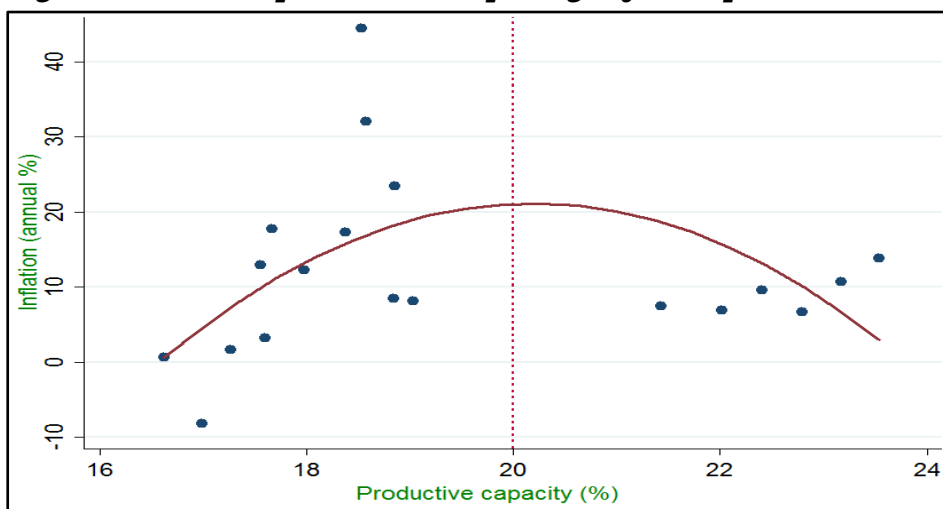


Source: Computed from data in UNCTAD (2022).

3.2.3. Productive capacity and inflation

The empirical link between inflation and productive capacity shows nonlinear relationship (Figure 3.19). Over the last two decades, overall productive capacity below 20 percent and the associated shortfall in aggregate output were inflating prices in Ethiopia. The result clearly verifies that inflation was partly driven by contracting output arising from productive capacity. In order to boost production and aggregate supply, the country should significantly improve its productive capacity in different dimensions and control the inflationary trend.

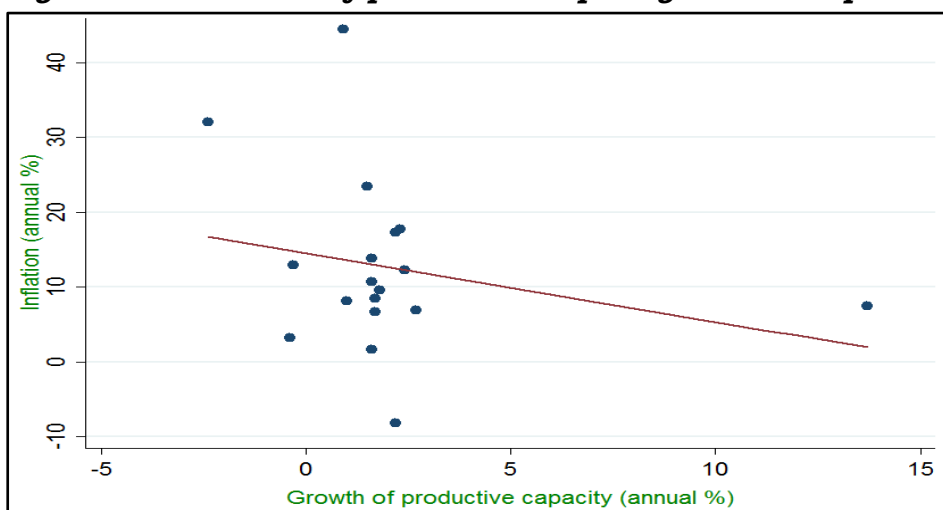
Figure 3.19: Low productive capacity inflates prices



Source: Computed from data in UNCTAD (2022).

Inflation was found to be strongly and negatively related with annual growth of productive capacity (Figure 3.20). The inflationary trend was driven by the decline in the growth of productive capacity of the country over the period. To stabilize prices and control inflation, it is obviously required to enhance growth of production and domestic aggregate supply of both food and nonfood products.

Figure 3.20: Growth of productive capacity stabilizes prices



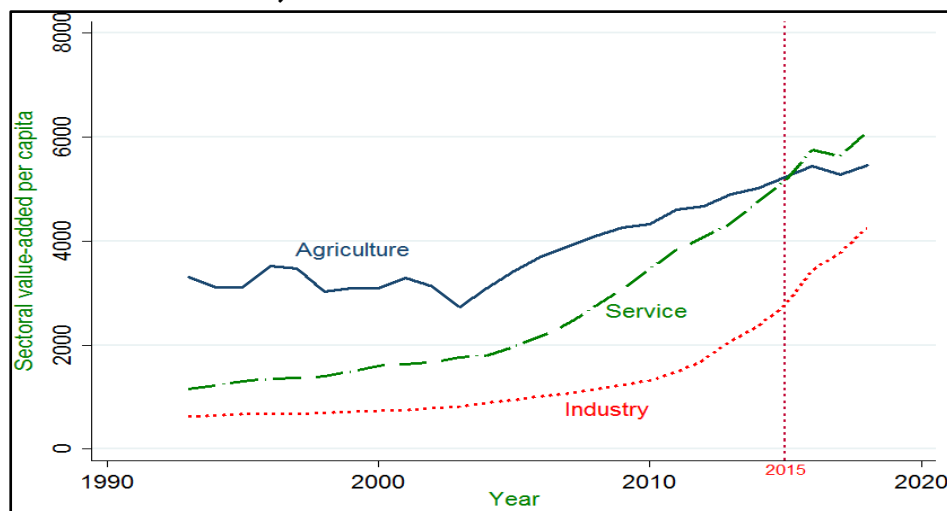
Source: Computed from data in UNCTAD (2022).

3.3. Aggregate Output and Industrial Structure

3.3.1. Sectoral value-added

Aggregate output is expected to shift due to changes in input prices, wages, and productivity. The sectoral value-added per capita patterns depicted clearly indicate that there are structural shifts in the production and supply of products (Figure 3.21). The value-added per capita trend shows that growth of the service sector is faster than the growth in agriculture, verifying faster growth of aggregate demand than aggregate supply. The service sector increases aggregate demand to rise, which is expected pull consumer prices higher.

Figure 3.21: Sectoral value-added per capita trends (constant ETB)

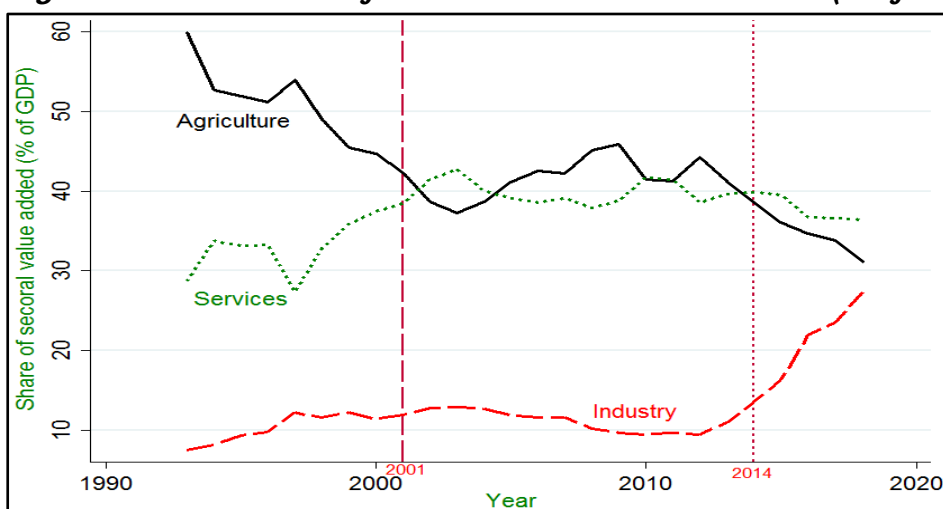


Source: Computed from data in the World Bank (2021).

The decline in the value-added per capita without the rise in the value-added of the industrial sector is a greater policy challenge. As aggregate demand rises/shifts more than the shifts in aggregate supply (agriculture and industry), the economy is expected to be in an inflationary process. At this stage, the agricultural sector would have been significantly linked with and transformation made to the industrial sector.

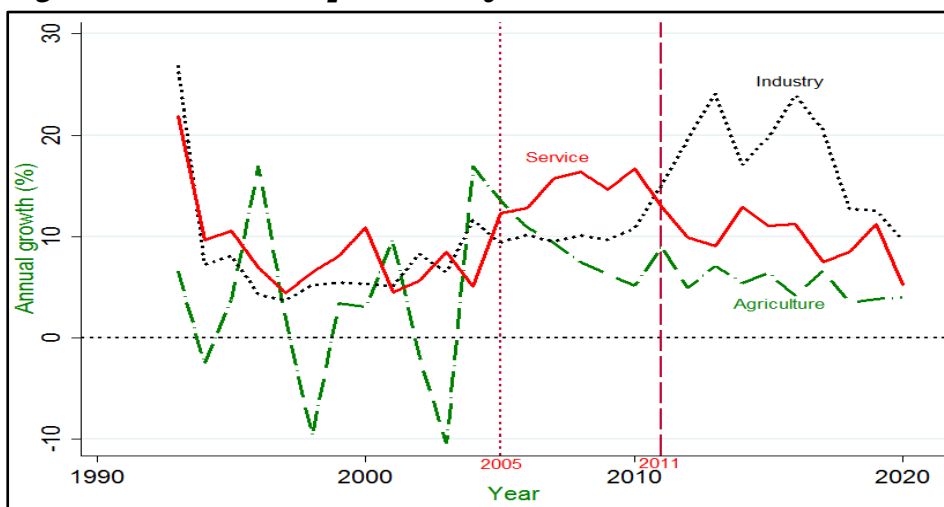
Between 2001 and 2014, the agricultural and the service sectors were competing to take the lead in the economy. After 2014, however, the service sector has taken the lead (Figure 3.22). Due to faster relative growth of the service sector than the production sector (agriculture and industry), consumer prices are expected to rise. As a result of inappropriate economic policies, the Ethiopian economy is changed from agriculture-led to service-led economy, showing economic stagnation with contractionary and inflationary trends.

Figure 3.22: Patterns of sectoral value-added shares (% of GDP)



Source: Computed from data in the World Bank (2021).

A significant decline in the spread of economic activities across sectors in the economy lasting longer than a few months and visible in real GDP, employment, and industrial production may be considered as a symptom of economic recession. The annual growth patterns of sectoral GDP demonstrate that agriculture was growing at a lower rate compared to the other two sectors (Figure 3.23). To change the economic structure in such a way that aggregate supply is comparable to aggregate demand, growth of the production sectors (agriculture and manufacturing) should grow at a faster rate and stabilize prices.

Figure 3.23: Growth patterns of sectoral GDP

Source: Computed from data in the World Bank (2021).

Over the last three decades, agriculture, on average, covers about 43 percent of the national GDP per capita followed by service (32.8%) and industry (17.8%) (Table 3.1). It is also shocking evidence to see that a unit percentage increase in agricultural GDP per capita reduces GDP per capita by 0.20 percent, clearly verifying that agriculture is rapidly contracting. The same percentage increase in industry and service GDP per capita increases GDP per capita by about 0.11 percent. The evidence particularly has an important implication in that GDP per capita in the production sectors (industry and agriculture) was contracting (by 0.09%), leading to negligible changes (0.02%) in overall GDP in the last three decades.

Table 3.1: Decomposition results of value-added by sector (1993-2019)

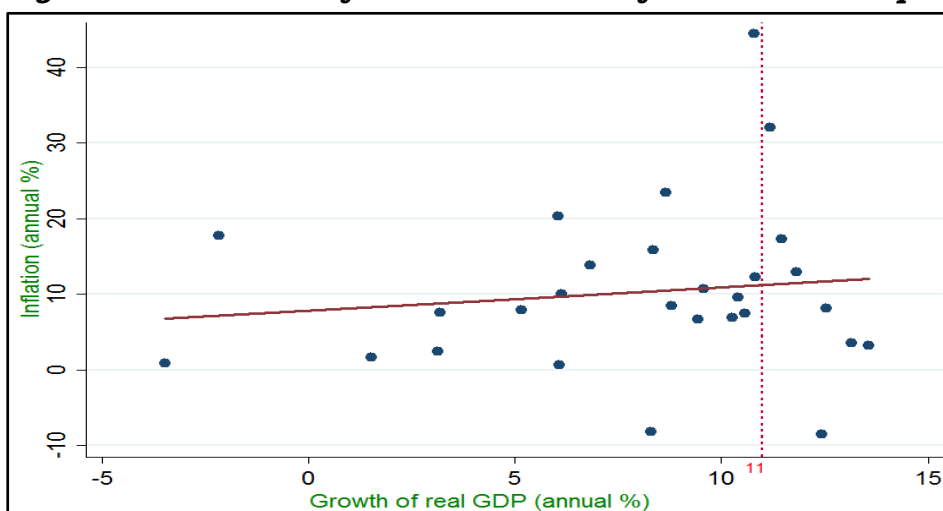
| Sectoral output per capita | GDP Share | Elasticity (% change) |
|--------------------------------|-----------|-----------------------|
| Agriculture | 0.429 | -0.203 |
| Industry | 0.178 | 0.111 |
| Service | 0.328 | 0.109 |
| % Change in production sectors | | -0.092 |
| Net % change in GDP | | 0.017 |

Source: Computed from data in the World Bank (2021).

3.3.2. Output growth and inflation

Economic growth, the rate of change of real gross domestic product (GDP), is expected to be negatively related with inflation dynamics. More aggregate output results in more aggregate domestic supply wherein prices are stabilized through the reduced mismatch between supply and demand in the market. In the last three decades, Ethiopia has generally shown two-digit economic growth with significant fluctuations.

Figure 3.24: Growth of service-led GDP inflates consumer prices



Source: computed from data in the World Bank (2021).

Growth of real GDP is an indication of economic growth where prices are stabilized. However, the diagnostic results demonstrate the pattern of weak positive relationship of annual growth of real GDP with inflation of consumer prices (Figure 3.24). When annual growth of real GDP is below 11 percent, consumer prices tend to rise. To stabilize consumer prices in domestic markets, real GDP should grow at annual rate higher than 11 percent.

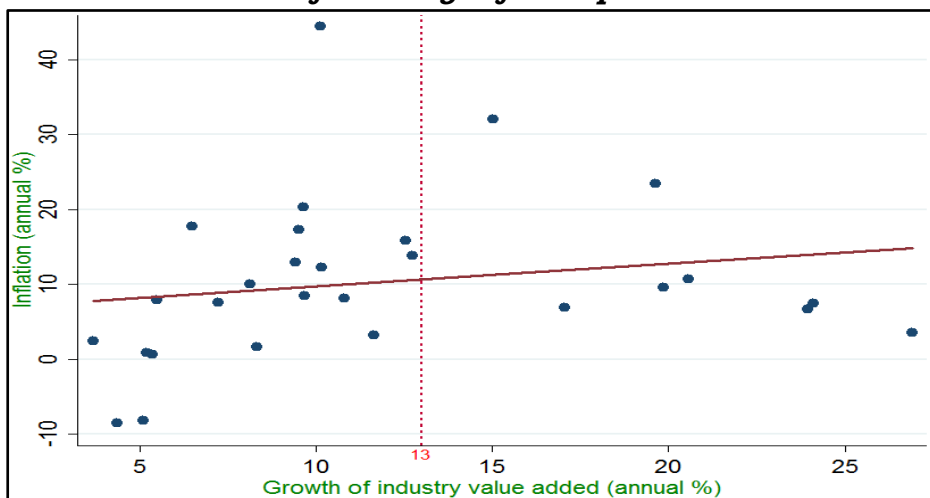
Further diagnostics of the relationship between growth of sectoral GDP and inflation has shown different trends across sectors. There is a long run weak negative relationship between growth in agriculture and inflation (Figure 3.25). To stabilize consumer prices,

Figure 3.25: High growth of agricultural GDP stabilizes prices



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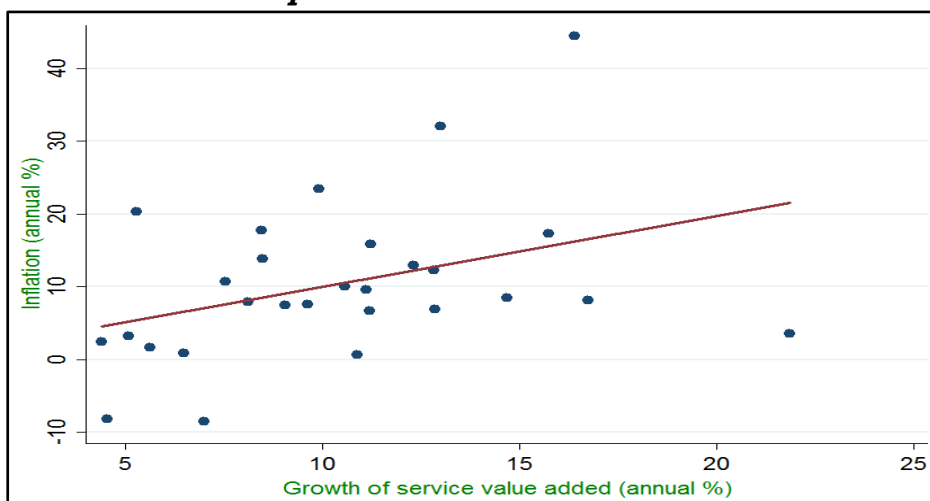
Figure 3.26: Growth of industrial GDP with small share of manufacturing inflates prices



Source: computed from data in the World Bank (2021).

As expected, annual growth of service GDP has clear positive relationship with inflation (Figure 3.27). The growth in the service sectors is expected to increase income of households and demand for more products. If the production and service sectors are not growing comparably, the imbalance between aggregate supply and demand causes inflationary trends.

Figure 3.27: Growth of service GDP inflates consumer prices in Ethiopia



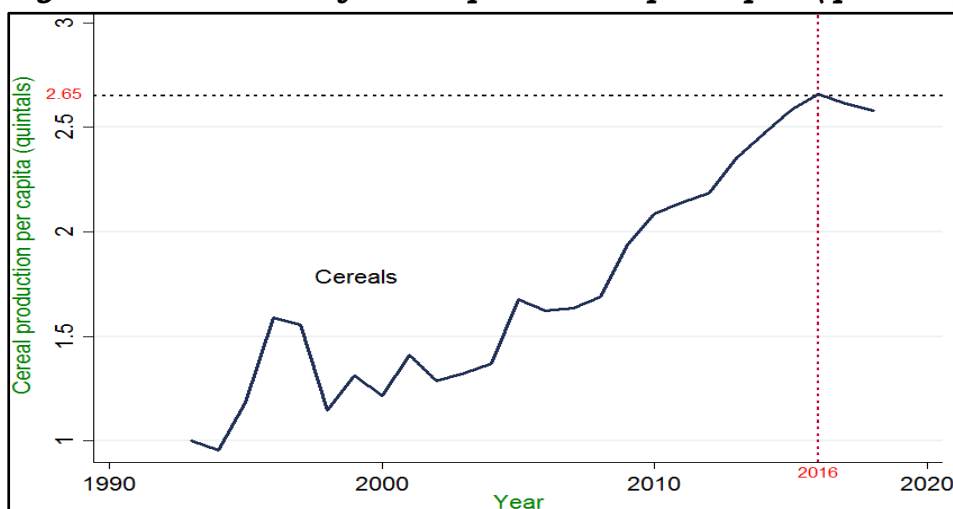
Source: computed from data in the World Bank (2021).

3.4. Agricultural Production

3.4.1. Crop production

Production of crops is generally decreasing in the last decade. Cereal production per capita was increasing until 2016 and reached its maximum level at 2.65 quintals per capita (Figure 3.28). Cereal accounts for the largest proportion of the consumption bundle of households in Ethiopia. Consequently, the contraction of cereal production and supply is supposed to be the primary source of the recent food price inflation in Ethiopia.

Figure 3.28: Trends of cereal production per capita (quintals)



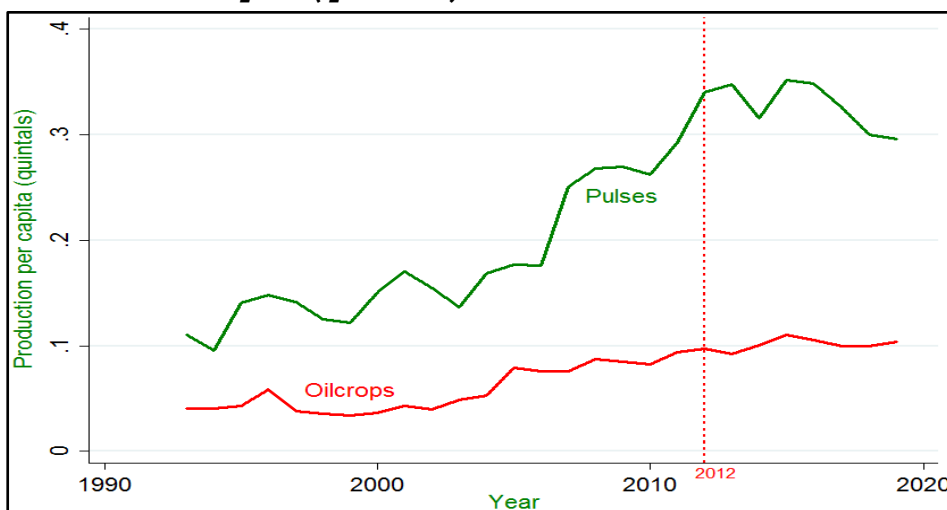
Source: Computed from data in FAOSTAT (2021).

The production of other major grain crops (pulses and oilcrops) was declining even before the contraction of cereal production. Production per capita of pulses has started to decline since 2012 (Figure 3.29). Pulses are major staples for Ethiopian households requiring due focus to boosting their production and curbing the prevailing problems constraining their production and productivity.

Production of oilcrops was slightly increasing until 2012 and remained nearly unchanged thereafter. Oilcrops are major inputs for production of edible oils, which have significantly constrained the

production of manufactured goods and the supply of edible oils, causing high consumer prices in Ethiopia. Production per capita of both pulses and oil crops showed continuous reduction after 2015, which may be one critical cause for the current price rise in the country.

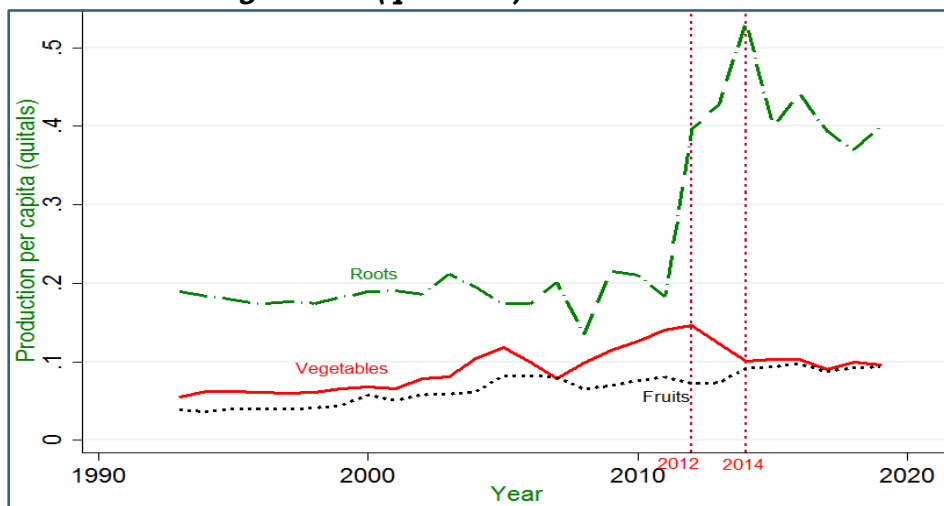
Figure 3.29: Trends of pulses and oilcrops production per capita (quintals)



Source: Computed from data in FAOSTAT (2021).

It is worrisome to see the decline in the production of roots and tubers, fruits and vegetables, which are supposed to have adequate supply with reasonable consumer prices in Ethiopia for the fact that the country is endowed with proper agroecology and land for producing these crops more than two times a year. Unlike such expectations, however, the production per capita of all these three groups of commodities has been contracting since 2012 (Figure 3.30). It seems a big policy challenge to see the production of all crops (including the less preferred food items) contracting with inflationary process, leaving consumers without possibilities of shifts in consumption bundles or substitutions.

Figure 3.30: Production per capita trends of fruits, roots, and vegetables (quintals)



Source: Computed from data in FAOSTAT (2021).

Decomposition of total crop production per capita into six subgroups shows that cereal production accounted for 72 percent followed by roots and tubers (10.2%) and pulses (8.9%) (Table 3.2). Other crops including oilcrops, vegetables and fruits cover minimal share (below 4%) in the Ethiopian crop production system. Crop production in the last three decades was generally inelastic with respect to changes in the production of all crops. Cereals and vegetables were particularly contracting over the period. There was no significant positive change in crop production, suggesting that supply of such commodities is strongly constrained by supply-side factors.

Table 3.2: Sources of crop production per capita (quintals) (1993-2019)

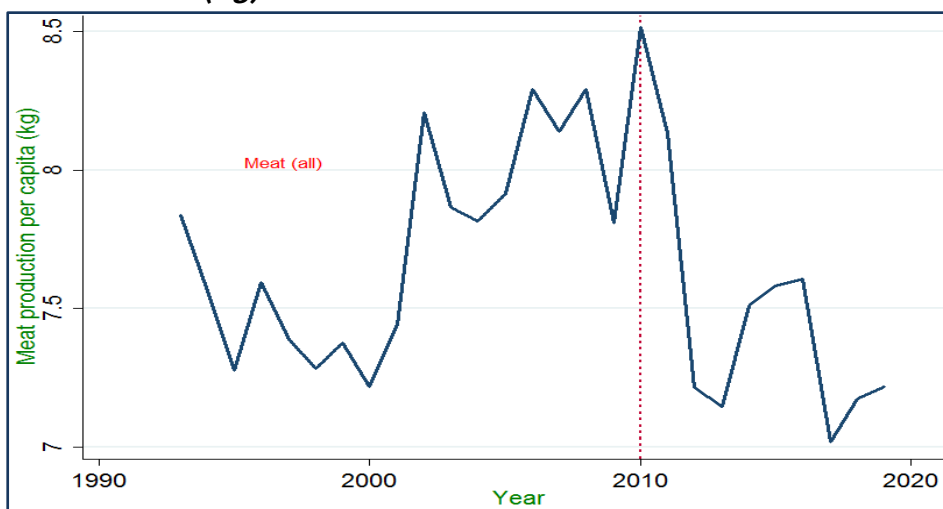
| Sources of crop production | Share | Elasticity (% change) |
|----------------------------|-------|-----------------------|
| Cereal | 0.717 | -0.012 |
| Pulses | 0.089 | 0.016 |
| Oil crops | 0.028 | 0.005 |
| Vegetables | 0.037 | -0.014 |
| Fruits | 0.027 | -0.004 |
| Roots and tubers | 0.102 | 0.009 |

Source: Computed from data in FAOSTAT (2021).

3.4.2. Livestock products

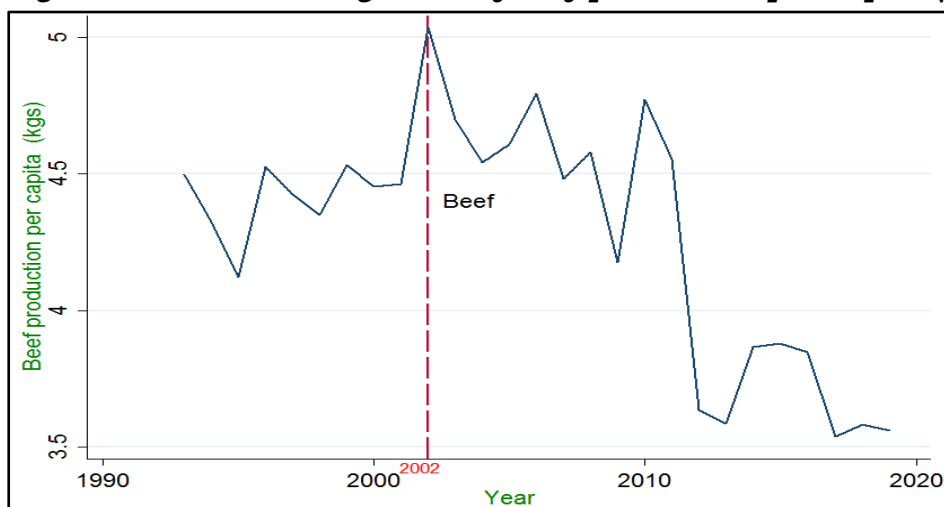
Meat production in Ethiopia is generally in a contractionary trend. Annual per capita production of meat (all) reached its maximum at 8.5 kilograms in 2010. After 2010, it has shown a decline and reached 7.2 kgs (Figure 3.31).

Figure 3.31: Decreasing trend of meat production per capita (kg)



Source: Computed from data in FAOSTAT (2021).

The contraction of other meat products is also consistent with overall meat production per capita. With the exception of shoat meat, the production of other meat products has registered significant decline in the last decade. Beef production per capita reached its maximum in 2002 (5 kgs), then shown consistent contraction and reached its minimum (3.6 kgs) in 2019 (Figure 3.32).

Figure 3.32: Decreasing trend of beef production per capita (kg)

Source: Computed from data in FAOSTAT (2021).

Regression-based decomposition of meat production per capita into its major sources measures the relative importance of each source of meat production (Table 3.3). The primary sources of meat production per capita in Ethiopia is beef, covering about 58 percent of the total production, followed by shoat meat (16.5%) and poultry meat (7%). Production of beef meat has relatively more share in Ethiopia.

Table 3.3: Decomposition results of meat production per capita (kg) (1993-2019)

| Sources of meat production per capita (kg) | Share | Relative contribution |
|--|--------|-----------------------|
| Beef | 0.584 | 1.023 |
| Sheep and goat (shoat) meat | 0.165 | 0.187 |
| Poultry meat | 0.070 | -0.006 |
| Camel meat | -0.004 | -0.003 |
| Constant | 0.184 | -0.221 |
| Residual | 0.000 | 0.020 |

Source: Computed from data in FAOSTAT (2021).

The pattern of total livestock³ resource of the country in the last decade has generally shown growth until 2010, but considerable decline thereafter (Figure 3.33). This decline in livestock resource is worrisome and remains a primary cause of supply shortfall and inflation of animal products in Ethiopia.

Figure 3.33: Pattern of livestock holding per capita (TLU)



Source: Computed from data in FAOSTAT (2021).

Decomposition of livestock production into major sources of livestock in Ethiopia shows that cattle cover 86.2 percent of the total livestock, followed by shoats (10.4%), camel (2.3%), and poultry birds (1.1%) (Table 3.4). This indicates a positive trend in the production of shoats (21%) and camel (6.8%). Production of poultry birds has shown negligible changes during this period.

³ To standardize the measure and aggregation of livestock production, livestock production in heads is converted to tropical livestock units (TLU) at a rate of 0.7 for cattle, 0.1 for shoats, 1.25 for camel, and 0.01 for poultry birds.

Table 3.4: Sources of livestock production (TLU) (1993-2019)

| Sources of livestock production (TLU) | Share | Elasticity (% change) |
|--|--------------|------------------------------|
| Cattle | 0.862 | -0.275 |
| Shoat | 0.104 | 0.210 |
| Camel | 0.023 | 0.068 |
| Poultry birds | 0.011 | -0.003 |

Source: Computed from data in FAOSTAT (2021).

3.5. Supply of Agricultural Products

Prices are determined by the interaction of aggregate supply and aggregate demand in the product market. Domestic aggregate supply of agricultural products in Ethiopia is differently affected by a number of factors including production, import and export, losses, and product used for food, processing, seed, and animal feed. Identification of the major components of domestic aggregate supply and estimation of their relative share is vital to design appropriate policy interventions for addressing the imbalance in the domestic marketing systems and controlling inflation. To generate such policy-relevant scientific evidence, major commodity groups in the food system are decomposed into their major sources of variation.

The major agricultural product significantly affecting food prices in Ethiopia is cereals. For the five-years period (between 2014 and 2018), cereal production covers 97 percent of the domestic aggregate supply (Table 3.5). About 66.5 percent of the domestic aggregate supply is used for food. Other sources of variation in domestic aggregate supply include import (7.9%) and nonfood uses (22.6%). The change in stock variation in cereals was huge, about 0.5 percent for a unit percentage rise in stock, which calls for urgent measures to stabilize food prices and long-run interventions to address the structural problem in the supply-side. If cereal production increases by a unit percentage, aggregate supply of cereals rather decreases by 0.44 percent, suggesting that cereal production was contracting over the period. Cereal supply was inelastic and negative for most of the sources of cereal supply.

Table 3.5: Domestic aggregate supply cereals (1000 tons)

| Components of aggregate supply of cereals | Supply share (%) | % Change (Elasticity) (2014-2018) |
|--|-------------------------|--|
| Production | 97.0 | -0.44 |
| Import | 7.9 | -0.09 |
| Export | 0.0 | -0.015 |
| Processing | 1.5 | 0.03 |
| Losses | 3.2 | -0.02 |
| Food | 66.5 | 0.00 |
| Animal feed | 4.5 | 0.03 |
| Seed | 1.7 | -0.02 |
| Other uses (nonfood) | 22.6 | -0.04 |
| Stock variation | 4.7 | -0.49 |
| Residuals | -0.1 | 0.01 |

Source: Computed from data in FAOSTAT (2021).

About 99 percent of the domestic supply of meat is covered by domestic production and the entire supply is used for food (Table 3.6). Aggregate supply of meat was highly and negatively elastic over the period. When meat production increases by a unit percentage, its aggregate supply was contracted by 1.4 percent. There is huge stock variation (1.3% fall) in domestic aggregate supply of meat making meat prices unaffordable by consumers.

Table 3.6: Sources of domestic aggregate supply of meat (1000 tons)

| Components of aggregate supply of all meat | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 98.7 | -1.38 |
| Import | 0.2 | 0.01 |
| Export | 2.3 | -0.08 |
| Food | 100.0 | 0.00 |
| Stock variation | -3.5 | -1.34 |

Source: Computed from data in FAOSTAT (2021).

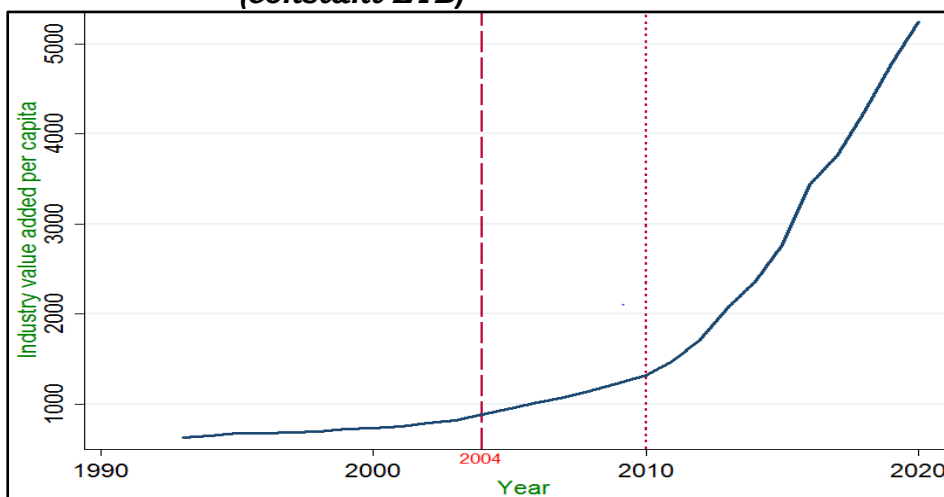
3.6. Industrial Production

The industrial sector in Ethiopia includes manufacturing, mining, and construction. Industrial production was very low due to the limited focus given to the sector.

3.6.1. Industry value-added

Though the overall share in the GDP of the country is low, the industrial sector in Ethiopia was motivated, and the pattern of industry value-added per capita was increasing with decreasing rate between 2004 and 2010 and with increasing rate thereafter (Figure 3.34).

Figure 3.34: Pattern of industry value-added per capita (constant ETB)

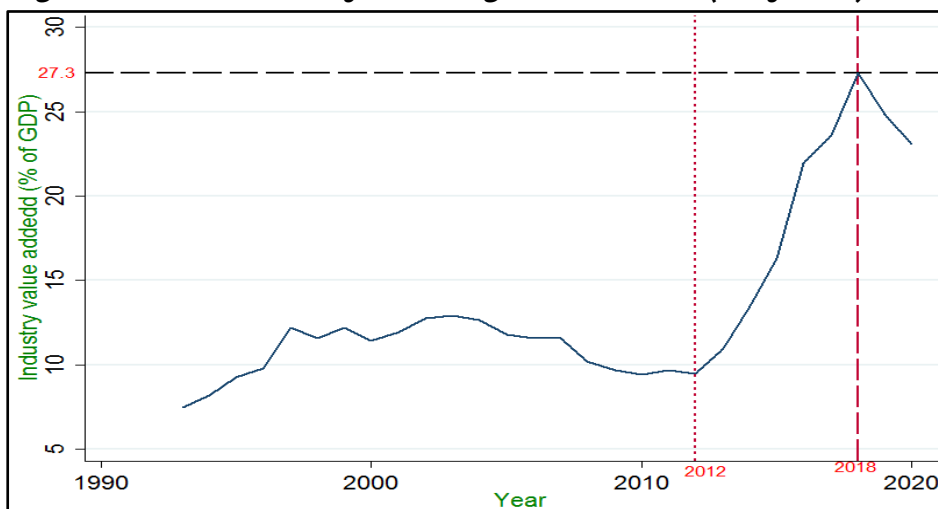


Source: Computed from data in the World Bank (2021).

Industrial production in Ethiopia has a lower GDP share compared to the share of the other two sectors (agriculture and services). The share of the sector to the GDP was very low and declining before 2012 and reached its maximum at 27.3 percent in 2012 (Figure 3.35). To identify the reasons behind the declining share of the sector after 2018, it requires due policy analysis and investigation. Coupled with declining share of the agricultural value-added discussed above,

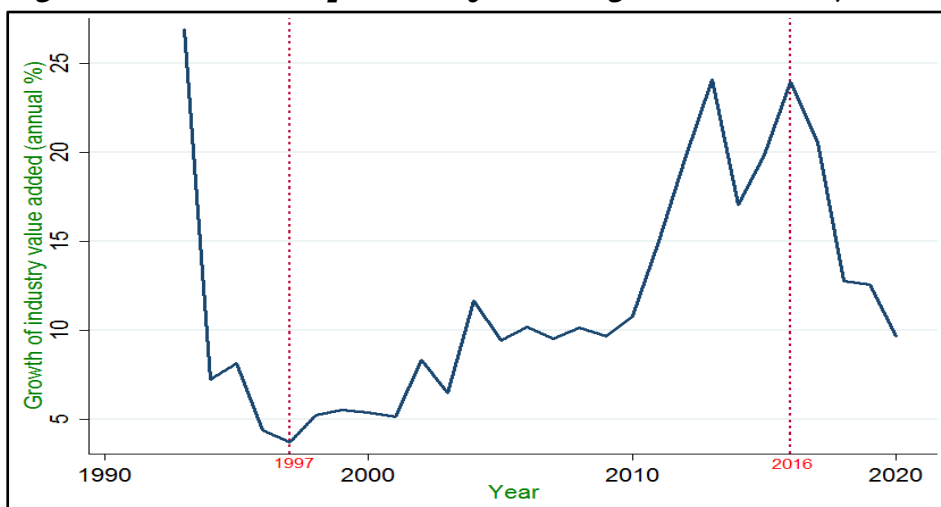
the decline in the share of the industrial sector could lead to contracting aggregate supply of industrial products that would finally result in more inflationary trends.

Figure 3.35: Pattern of industry value-added (% of GDP)



Source: Computed from data in the World Bank (2021).

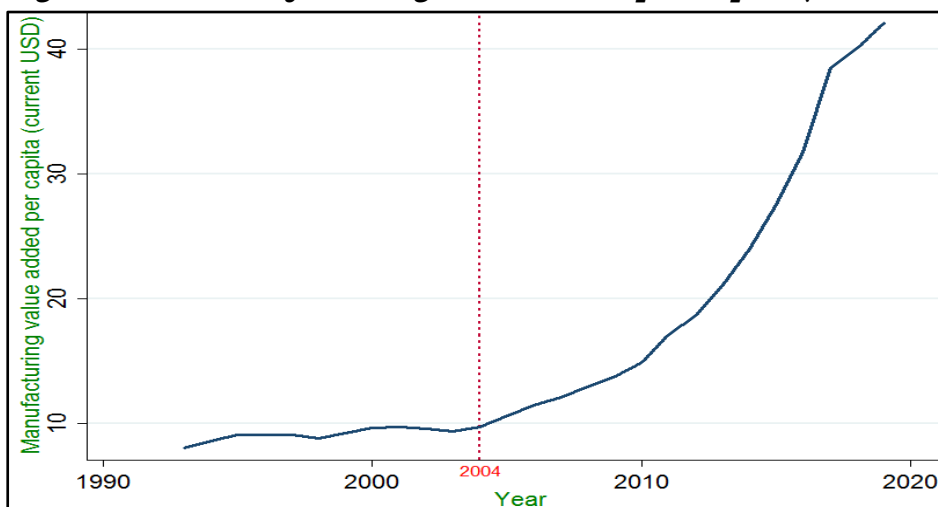
The growth of the industrial sector in Ethiopia is highly inconsistent which calls for due industrial policy focus. The industry value-added was increasing with fluctuation between 1997 and 2016 (Figure 3.36). After 2016, however, annual growth of the industrial sector was drastically decreasing, requiring the need to identify the constraints related to the sector.

Figure 3.36: Growth pattern of industry value-added (Annual %)

Source: Computed from data in the World Bank (2021).

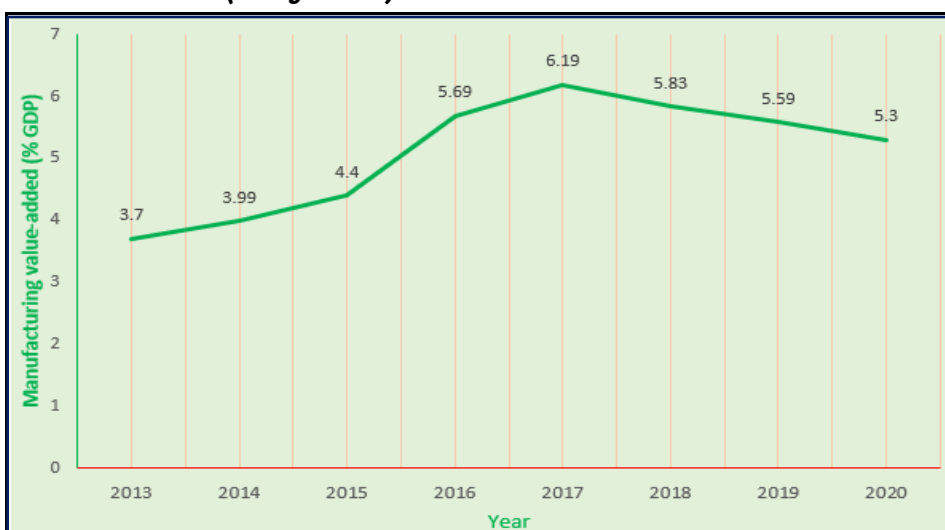
3.6.2. Manufacturing value-added

Manufacturing is an important subsector of the industrial sector which was given limited policy focus over years in Ethiopia. Currently, the subsector is the primary focus of the government in ensuring rapid industrial development. Performance of the manufacturing sector is separately investigated to identifying the aggregate supply shortfall causing inflation of consumer prices of industrial products (Figure 3.37). The manufacturing value-added per capita was exponentially growing from about USD 10 in 2004 to USD 42 in 2019.

Figure 3.37: Manufacturing value-added per capita (current USD)

Source: Computed from data in UNIDO (2021).

The pattern of manufacturing value-added shows growth until 2017 followed by consistent decline thereafter (Figure 3.38). Regardless of the need to boost manufacturing value-added and the required policy focus given to the subsector, the declining GDP share of the manufacturing value-added is disappointing.

Figure 3.38: Pattern of manufacturing value-added share (% of GDP)

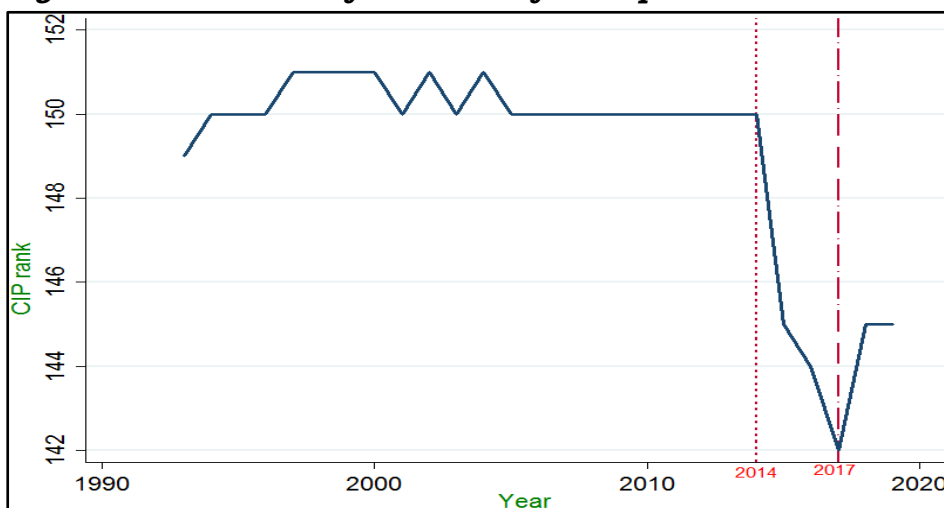
Source: Computed from data in UNIDO (2021).

3.6.3. Industrial performance

The Competitive Industrial Performance (CIP) Index is a measure benchmarking the ability of countries to produce and export manufactured goods competitively. It captures the competitive performance of about 172 countries worldwide included in the index, relative to their performance in previous years and compared to that of the rest of the world.

Out of the five CIP status (top, upper middle, middle, lower middle, and bottom), Ethiopia falls in the bottom category. However, its CIP rank is improving in the latest years (Figure 3.39). Out of 172 countries, Ethiopia was ranked over 150 before 2014. After 2014, industrialization was given better focus and the country's rank was slightly improved to 142 in 2017. The rank has been declining once again after 2017.

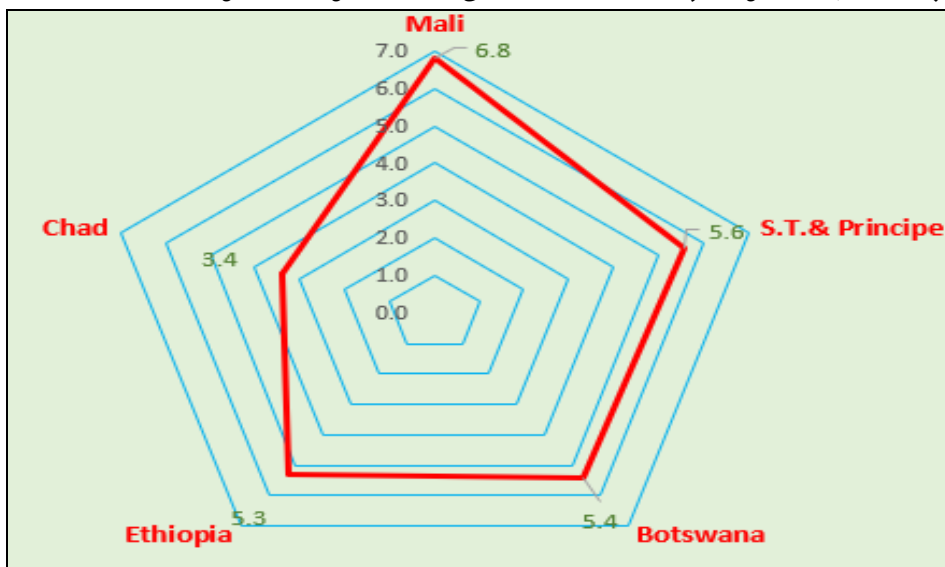
Figure 3.39: Pattern of CIP rank of Ethiopia



Source: Computed from data in UNIDO (2021).

Ethiopia is one of the bottom five African countries with very low GDP share of manufacturing value-added (Figure 3.40). Its share is 5.3 percent, which is by far lower than the African average (12.5%).

Figure 3.40: Bottom five African countries with very low share of manufacturing value-added (% of GDP, 2020)



Source: Computed from data in the Global Economy (2021).

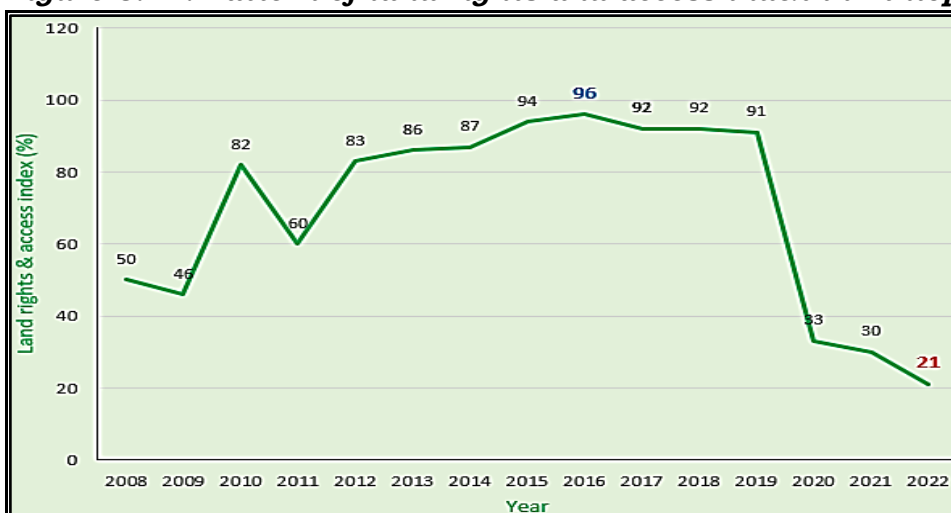
3.7. Rights and Access to Land

Secure land tenure has a number of roles in economic development. It gives long-term incentives to invest and save, improves access to important public services, allows for more productive use of time and money than protecting land rights, facilitates use of land for collateral, and contributes to social stability and good local governance. The level of land rights and access can be measured by the weighted average of three indicators: access to land, and days and cost to register property. This indicator measures the extent to which the institutional, legal, and market framework provides secure land tenure and equitable access to land in rural areas comprising four components: (a) the effectiveness of the land tenure system; (b) the effectiveness of land markets; (c) the equitable management of communal lands; and (d) the existence of gender-based impediments to access land (IFAD, 2018).

Assessment of the rights and access to rural land for Ethiopia suggests that it is increasingly deteriorating (Figure 3.41). Rights and access to land has particularly decreased from 96 percent in 2016 to

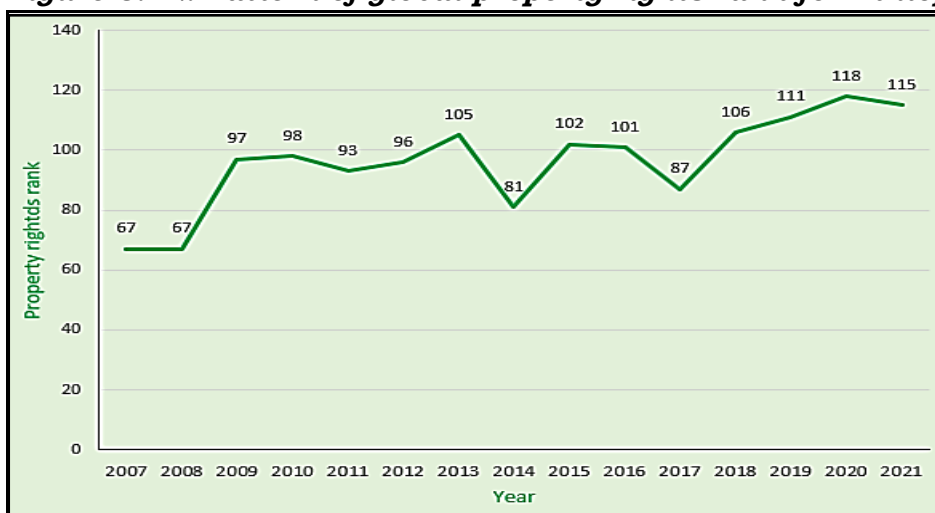
21 percent in 2022. Land, as the primary production input, access and the rights to it are significantly denied, consequently leading to contraction of agricultural production and real estate activities considerably causing inflation of food items and housing services in Ethiopia.

Figure 3.41: Pattern of land rights and access index in Ethiopia



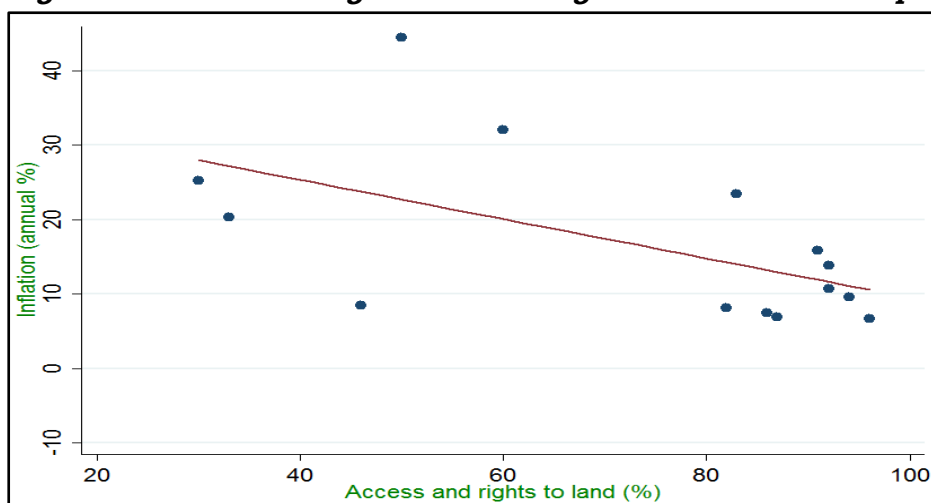
Source: International Fund for Agricultural Development (IFAD) (2021).

The international property rights index (IPRI), which measures the underlining institutions of a strong property rights regime for intellectual and physical property rights, covering 129 countries is also very low for Ethiopia. Ethiopia is one of the bottom 14 countries of the world (ranked 114th) with strongly limiting property rights (Figure 3.42). Evidence shows that property rights in Ethiopia are increasingly deteriorating, verifying that land rights are more denied over time. More limited land rights are expected to constrain access to land for investment and housing, thereby causing inflation of products and services using land as their major input factor.

Figure 3.42: Pattern of global property rights rank for Ethiopia

Source: Computed from data in Property Rights Alliance (PRA) (2021).

The relationship between inflation and access and rights to land in Ethiopia is identified to be strongly negative (Figure 3.43). Relaxation of policy constraints affecting access and rights to land will help boost production and supply, stabilize prices, and control inflation. In order to boost agricultural production and supply and housing facilities for stabilizing prices, access and rights to land should be significantly improved.

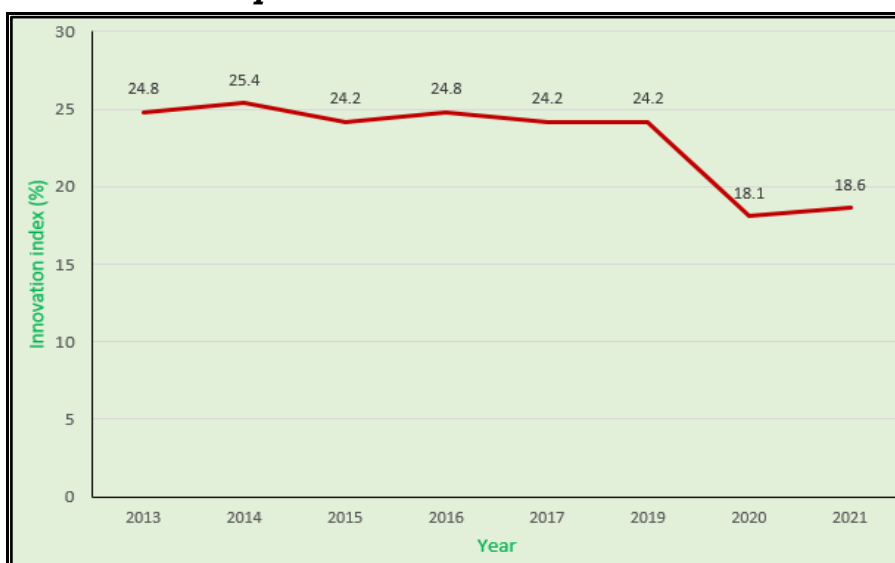
Figure 3.43: Increasing access and rights to land stabilizes prices

Source: Computed from data in IFAD (2022).

3.8. Innovation

Knowhow and technology are the primary binding constraints for production and economic transformation in Ethiopia. Out of 132 countries, the Global Innovation index (GII) evaluates Ethiopia as one of the bottom 10 countries of the world, ranked 126 with 18.6 index value (out of 100) (GII, 2021). In 2021, Ethiopia's innovation input is ranked at 129, suggesting that the country is one of the bottom three countries of the world in using innovation inputs. It is also ranked 107 in producing innovation outputs. The pattern of innovation for Ethiopia is also continuously declining indicating that knowhow and technology are increasingly constraining innovation and economic transformation (Figure 3.44).

Figure 3.44: Ethiopia's performance in innovation of inputs and outputs



Source: Computed from data in the Global Innovation Index (GII) 2021.

Table 3.7: Comparative status of Ethiopia in innovation inputs and outputs (2021)

| Innovation indicators | Innovation index (Out of 100) | Status (132 countries) |
|-----------------------------------|--|-----------------------------------|
| Innovation inputs | | |
| Human capital & research | 10.5 | Bottom 7 |
| Infrastructure | 24.6 | Bottom 12 |
| Market sophistication | 26.1 | Bottom 2 |
| Institutions | 48.4 | Bottom 16 |
| <i>Input rank</i> | | <i>Bottom 3</i> |
| Innovation outputs | | |
| Creative outputs | 8.7 | Bottom 6 |
| Business sophistication | 14.5 | Bottom 7 |
| Knowledge & technology outputs | 16.2 | Bottom 51 |
| <i>Output rank</i> | | <i>Bottom 25</i> |
| Overall GII | 18.6 | Bottom 6 |

Source: Global Innovation Index 2021 (2022).

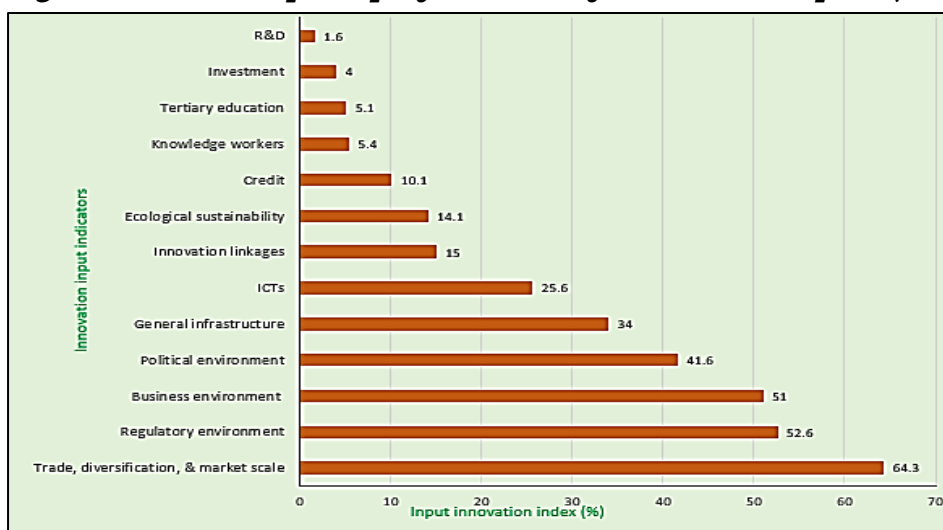
Though Ethiopia is highly constrained by both innovation inputs and outputs to ensure more production and supply, it is particularly adversely affected by scarcity of innovation inputs like human capital and technological inputs (Table 3.7). It is one of the bottom three countries of the world in using innovation inputs. It is highly required to use inputs which have been more constraining innovation. Use of human capital or know and modern technology are the two most binding constraints the country should address.

3.8.1. Innovation inputs

There are 13 innovation inputs selected for differential diagnostics on Ethiopia. These innovation input indicators measure performance in institutions, human capital and research, infrastructure, market and business sophistication. The top five binding innovation input constraints in Ethiopia are identified to be research and development (R&D), investment, tertiary education, knowledge workers, and credit (Figure 3.45). In order to boost

production and productivity for addressing the inflationary problem arising from supply shortfalls in Ethiopia, these input scarcities constraining human capital, knowhow, and technology should be significantly relaxed.

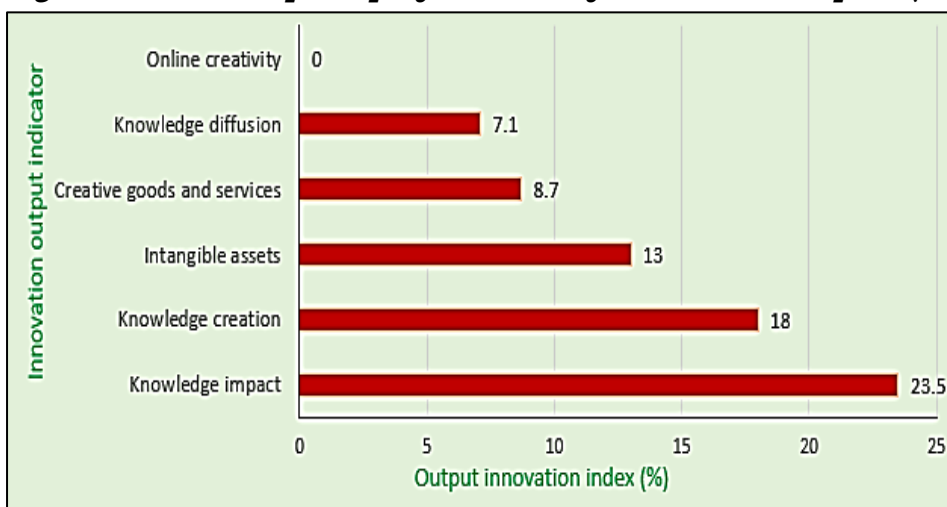
Figure 3.45: Ethiopia's performance of innovation inputs (2021)



Source: Computed from data in Global Innovation Index 2021 (2022).

3.8.2. Innovation outputs

The production of innovation outputs in Ethiopian is also very low (Figure 3.46). With the exception of knowledge creation and impact, other outputs are far below the national average GII index (18.6%). There is no online creativity of any outputs, and knowledge diffusion of innovation outputs and production of creative goods and services is extremely weak.

Figure 3.46: Ethiopia's performance of innovation outputs (2021)

Source: Computed from data in Global Innovation Index 2021 (2022)

3.9. Imports

3.9.1. Trade openness

Trade openness refers to the orientation of a country's economy in the context of participation in international trade. The degree of openness is measured by the actual size of registered imports and exports of an economy normalized by GDP. Ethiopia is one of the bottom 10 African countries with low trade openness (31.2% (Table 3.8). Regardless of the ever-growing trade deficit, its openness is still very low compared to its counterparts in Africa (76.9%) and in the entire world (94.3).

Table 3.8: Bottom 10 African countries with low trade openness (2018)

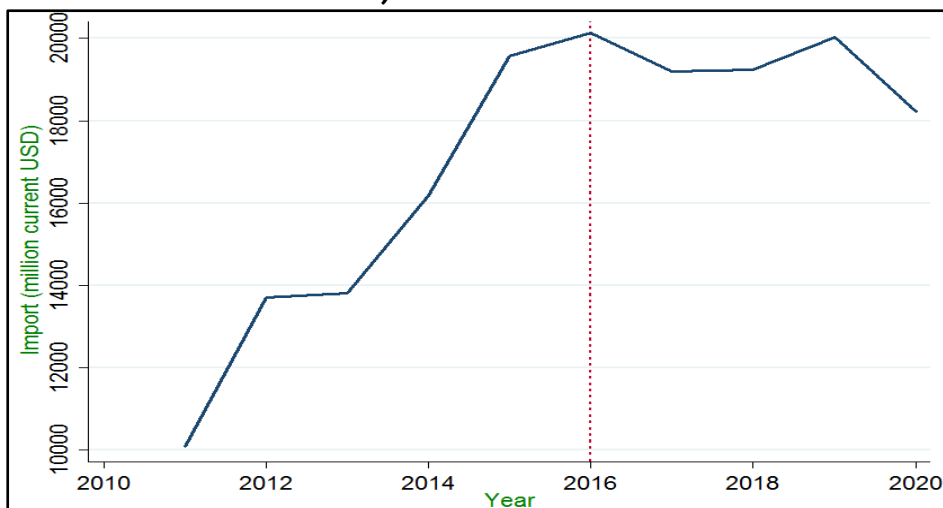
| Country | Openness (% GDP) |
|-------------------------------|-------------------------|
| Sudan | 21.8 |
| Zimbabwe | 30.6 |
| Ethiopia | 31.2 |
| Tanzania | 32.6 |
| Nigeria | 33.0 |
| Kenya | 36.2 |
| Uganda | 36.7 |
| Niger | 37.5 |
| Burundi | 39.2 |
| Cameroon | 43.0 |
| Africa average (50 countries) | 76.9 |
| World average (176 countries) | 94.3 |

Source: Computed from data in the Global Economy (2021).

3.9.2. Import patterns

Shortfalls in domestic aggregate supply are expected to be filled by imports from the international market. The import of goods and services (% of GDP) in Ethiopia has shown contraction after 2016 (Figure 3.47). As the size of the economy increases, shortage in domestic aggregate supply couldn't be filled by imports mainly due to the serious scarcity of foreign currency reserve.

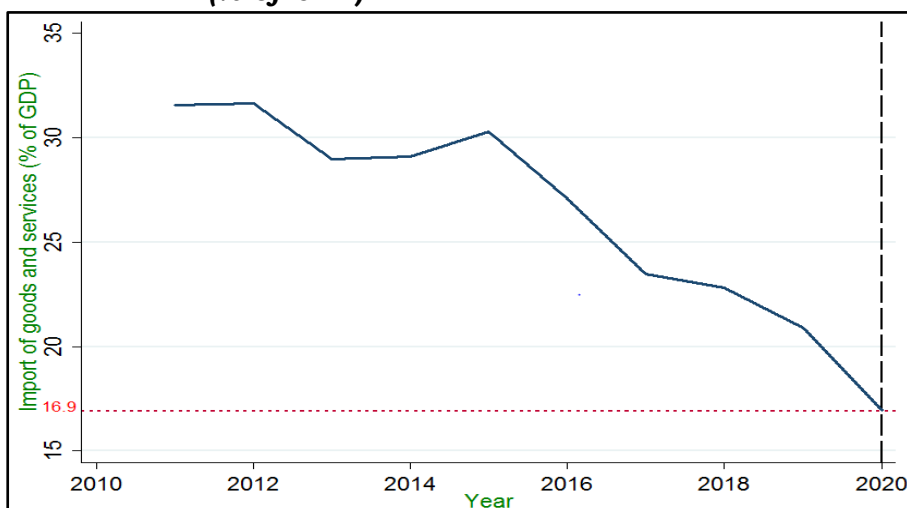
Figure 3.47: Pattern of import of goods and services (current million USD)



Source: Computed from data in the World Bank (2021).

The import of goods and services (% of GDP) required by the country was consistently and drastically declining over the period. The share of imports was contracting from 31.6 percent in 2011 to 16.9 percent in 2020 and aggregate supply was halved, which was not filled by imports of manufactures (Figure 3.48).

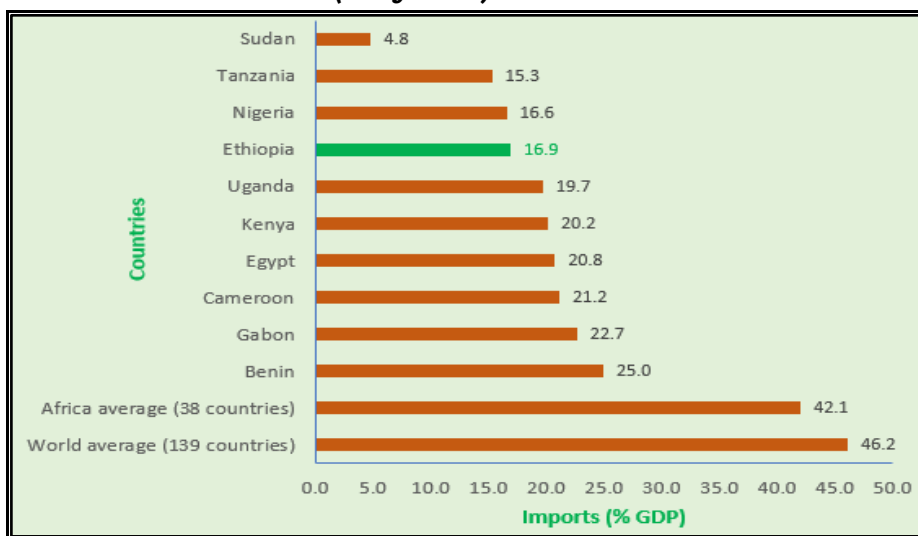
Figure 3.48: Decreasing trend of import of goods and services (% of GDP)



Source: Computed from data in World Bank (2021).

Regardless of the rising demand for imports, import of goods and services was considerably and consistently decreasing over the period. In 2020, the country was one of the top 10 African countries with very low imports (Figure 3.49).

Figure 3.49: Bottom 10 African countries with very low imports in 2020 (% of GDP)



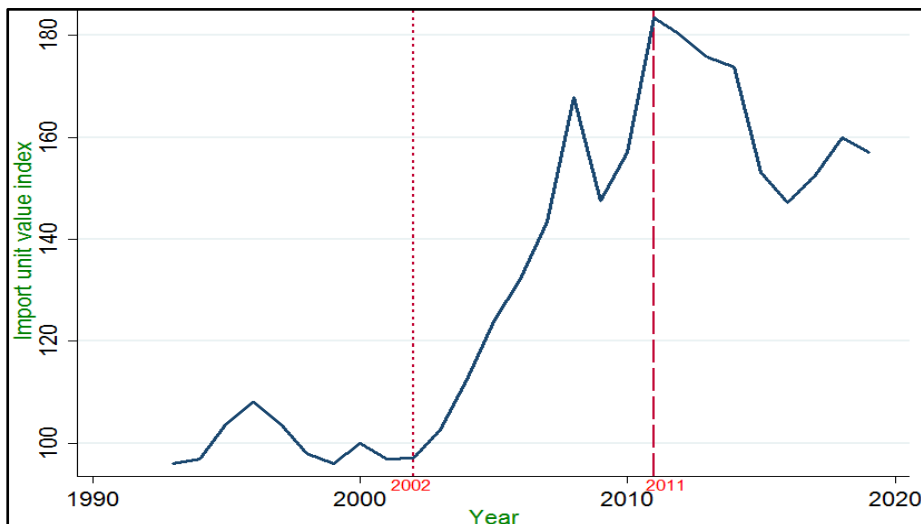
Source: Computed from data in the Global Economy (2021).

3.9.3. Import price and quantity

Unit value index is a price index that measures average value changes in a heterogeneous cluster of units. It is a price index which measures the change in the average value of units that are not homogeneous, and which may be affected by changes in the mix of items (or quantities) as well as by changes in their prices.

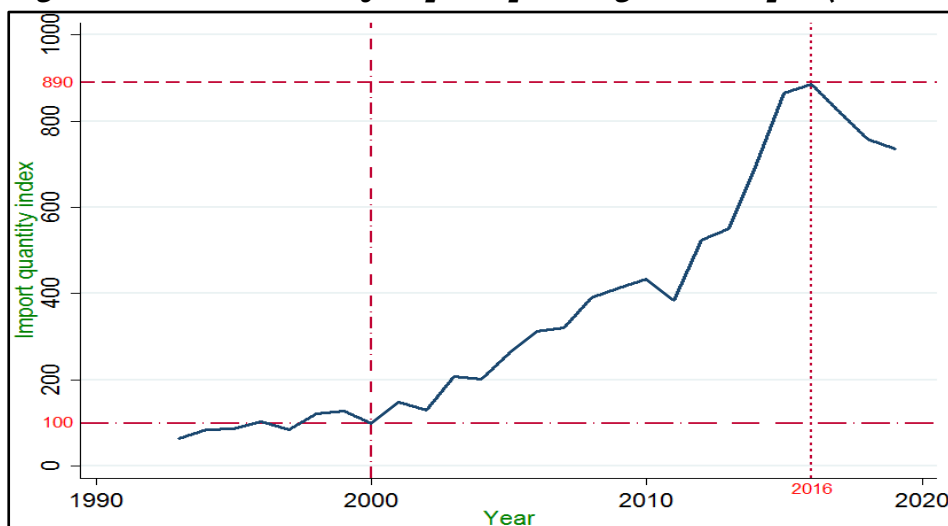
The import unit value index characterizes changes in the price level of imported goods and services within the reporting period against the base period. The import unit values, as measures of price changes in the foreign trade balance, clearly show increasing trend between 2002 and until 2011 and contracting thereafter (Figure 3.50). This decline may be attributable to both value and quantity of imports of the country.

Figure 3.50: Pattern of import prices (unit values) in Ethiopia (2000=100)



Source: Computed from data in the World Bank (2021).

Import quantity index, on the other hand, is the ratio of the import value index to the corresponding unit value index. The growth of imports was very slow until 2000 (Figure 3.51). Since 2000, import was significantly increasing at an increasing rate until it started to contract in 2016 (rise in quantity index from 100 in 2000 to 890 in 2016). After 2016, import was drastically declining which might be arising from the shortage of foreign currency reserve to import demanded by the country. Between 2000 and 2016, regardless of the relative shortage, quantity of import increased by about ninefold.

Figure 3.51: Patterns of import quantity in Ethiopia (2000=100)

Source: Computed from data in World Bank (2021).

3.9.4. Instability of import values

To estimate the level of contributions of price and quality to the rise of import values, the import value index was decomposed into its unit value and quantity by using regression-based methods. The results indicate that 64 and 96 percent of the variations in import value were attributable to the changes in unit values and quantities (Table 3.9). Other factors had also a share of 60% to the decline in import values. Rises in unit values and quantities relatively contributed 0.1 percent and 0.5%, respectively. The second highest contribution to the decline of import value (0.38%) was other factors (including exchange rate).

Table 3.9: Sources of import price (value index) instability in Ethiopia

| Source of instability of import value | Share | Relative contribution |
|---------------------------------------|-------|-----------------------|
| Unit value | 0.64 | 0.10 |
| Quantity | 0.96 | 0.53 |
| Constant | -0.60 | 0.38 |
| Residual | 0.00 | -0.01 |

Source: Computed from data in the World Bank (2021).

3.10. Exchange Rate

Foreign exchange rates and inflation are highly correlated. The degree of adjustment of domestic prices to exchange rate movements is key to understanding inflation dynamics and guiding monetary policy in an economy. However, the exchange rate pass-through to inflation considerably varies across economies and over time.

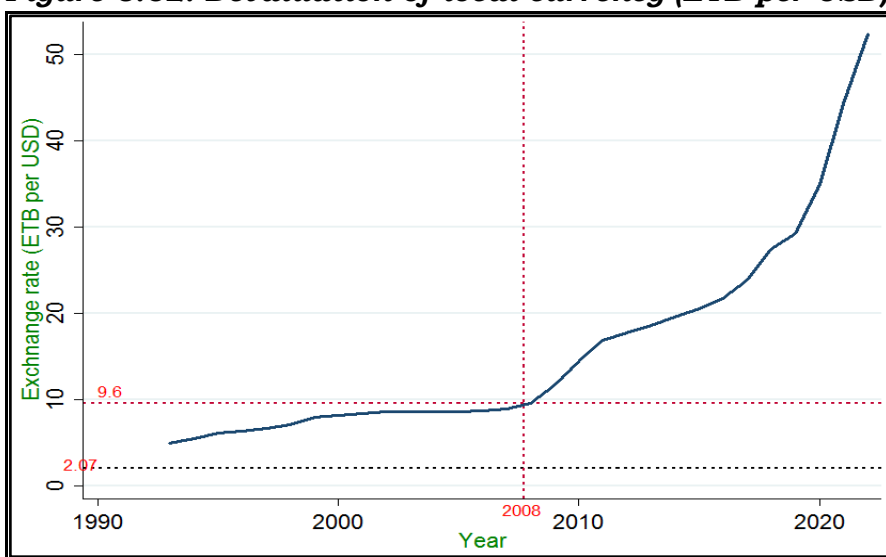
3.10.1. Nominal exchanger rate

Devaluation of currency has multidimensional consequences leading to inflationary trends. Devaluation influences domestic output including supply-side effects, shifts in expenditure patterns, income and wealth redistribution, and interest rate effects. One of the major inflationary impacts of devaluation is rising prices of imports and stimulating greater demand for domestic products, thereby aggravating inflation. Devaluation may deplete investors' confidence in the economy and adversely affects the country's ability to secure foreign investment. More expensive imports and cheaper exports lead to lower quantity of imports, and increased quantity of exports, consequently, both leading to rising aggregate demand and higher inflation. The level of inflation may determine its effects on economic growth.

Many countries of the world today, including developing countries, use flexible exchange rate regime with different levels. Both fixed and flexible exchange rate regimes have their own costs and benefits on the overall economic performance of countries. Fixed exchange rate regime is conceptually helpful to eliminate uncertainty and risks, reduce speculation, prevent depreciation of currency, attract foreign investment, easily adopt macroeconomic policies, and to control inflation. It is also disadvantageous in that it requires adequate foreign exchange reserves, leads to loss of domestic objectives of growth and full employment and limited exposure to the international competitive environment.

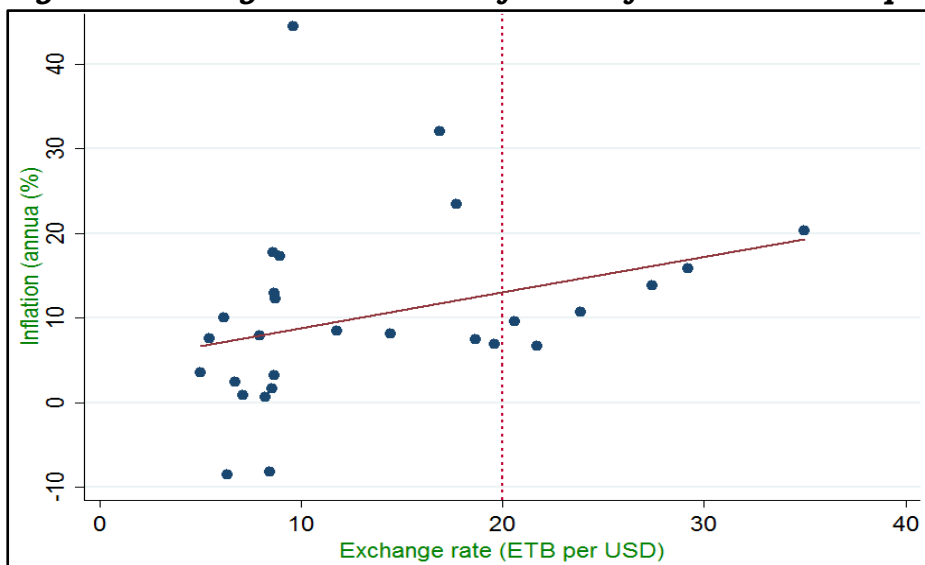
The pattern of exchange rate (ETB per USD) over the past three decades demonstrates the increasing fall of local currency Ethiopia (Figure 3.52). After the downfall of the Socialist regime in 1991, devaluation of local currency was increasing with decreasing rate until 2008, but kept increasing with increasing rate thereafter. Between 1991 and 2020 alone, ETB was devalued by about 2426 percent, about 121 percent annually.

Figure 3.52: Devaluation of local currency (ETB per USD)



Source: Computed from data in the World Bank (2021).

The rapid fall of the value of ETB in the last decade was particularly important to considerably aggravate inflation of both producer and consumer prices in Ethiopia. Investigation of the relationship between exchange rate and annual inflation of consumer prices clearly shows that exchange rate (ETB per USD) was causing inflation particularly for higher values of devaluation (20 or higher) (Figure 3.53).

Figure 3.53: High devaluation of ETB inflates consumer prices

Source: Computed from data in the World Bank (2021).

3.10.2. Real effective exchanger rate (REER)

Real effective exchange rate (REER) is the weighted average of a country's currency in relation to an index of basket of other major currencies. It describes the relative strength of a currency and is used to measure the relative external trade competitiveness of a country.

The REER for Ethiopia is increasing since 2020 indicating the continuous loss of trade competitiveness (Figure 3.54). The REER index (2010=100) reached its maximum value of about 150 in 2019. Currency devaluation in Ethiopia is not successful because the country is losing its external competitiveness as devaluation increases. Currency devaluation based on the exchange rate in the parallel market has been ineffective and led to continuous loss of external competitiveness.

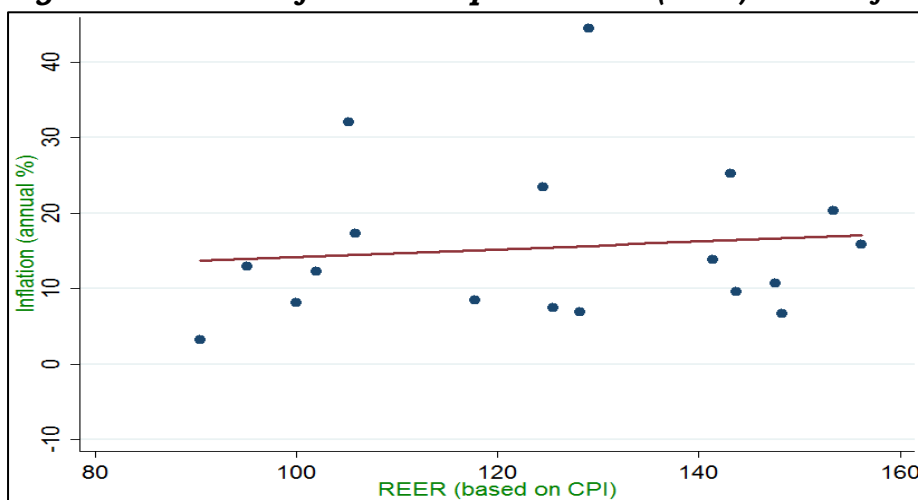
Figure 3.54: Pattern of increasing REER indicating loss of trade competitiveness (2010=100)



Source: Computed from data in Trading Economics.

The empirical link between REER, as a measure of trade competitiveness, and inflation is positive (Figure 3.55). Loss of trade competitiveness arising from currency devaluation has been aggravating inflation of prices in Ethiopia. The evidence calls for the need to critically investigate realization of the intended objectives of devaluation and to propose alternative options of exchange rate regime in Ethiopia.

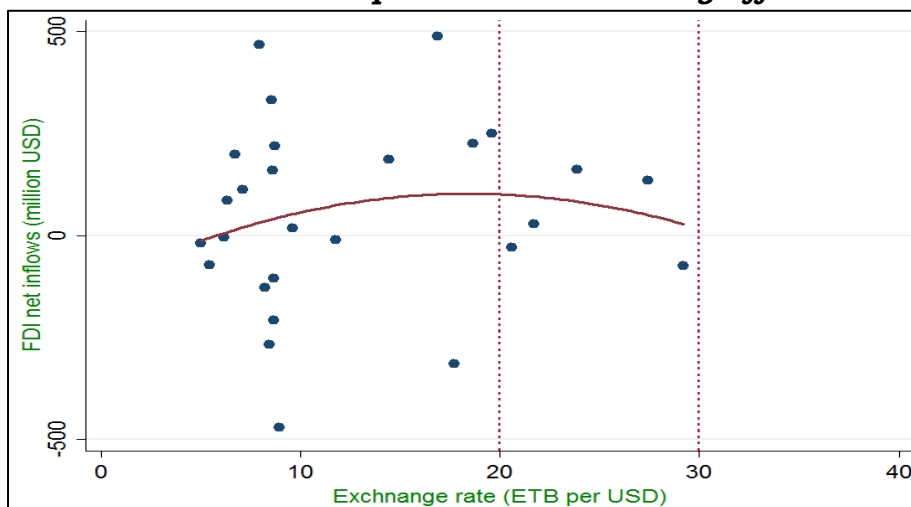
Figure 3.55: Loss of trade competitiveness (REER) drives inflation



Source: Computed from data in Trading Economics and the World Bank.

High devaluation of local currency is also found to adversely affect foreign direct investment (FDI) (Figure 3.56). High devaluation erodes investment confidence and lead contraction of FDI. Currency devolution particularly higher than ETB 20 per USD was causing fall of FDI.

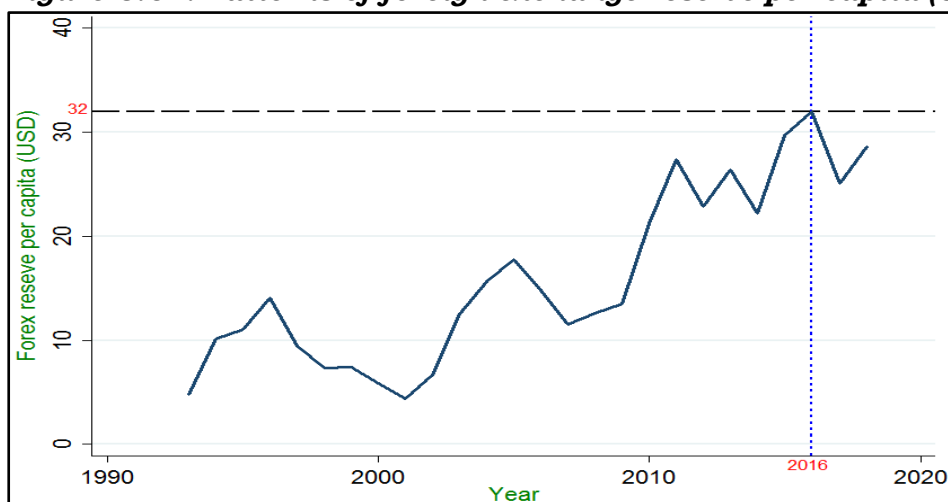
Figure 3.56: High devaluation of local currency and loss of trade competitiveness adversely affects FDI



Source: Computed from data in Trading Economics and the World Bank.

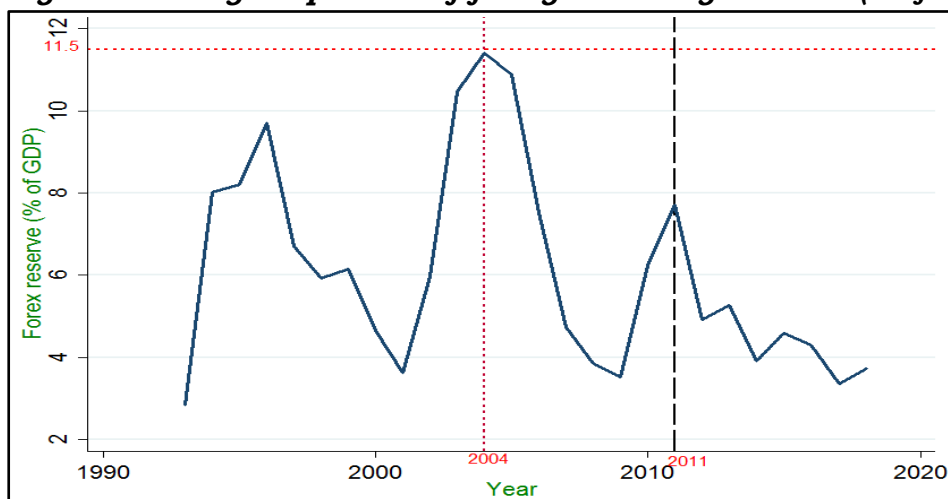
3.11. Forex Reserve

Regardless of devaluation of the local currency, the forex reserve per capita in Ethiopia shows significant growth patterns and reached its maximum of USD 32 in 2016 (Figure 3.57). However, it is still very low compared to the size of the economy and the volume of demand for imports and debt obligations of the country.

Figure 3.57: Patterns of foreign exchange reserve per capita (USD)

Source: Computed from data in the World Bank (2021).

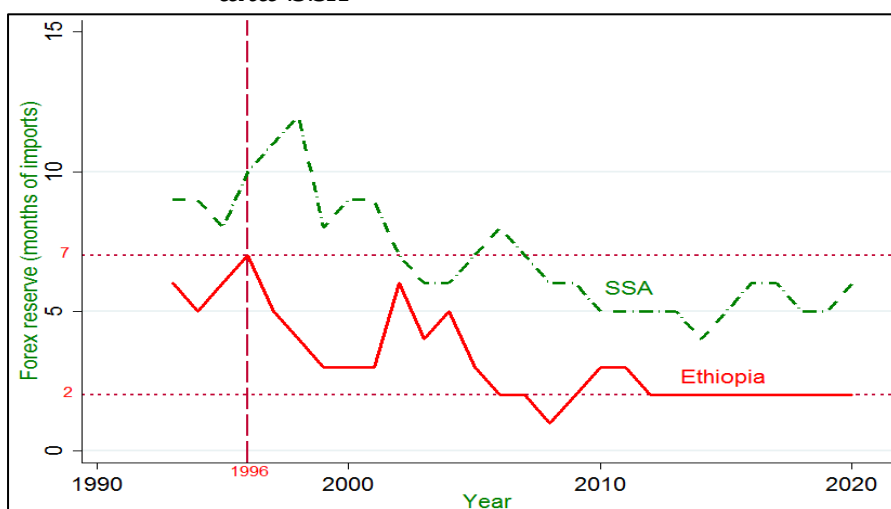
The pattern of forex reserves (% of GDP) depicted below shows cyclic fluctuations with a maximum value of 11.5 percent in 2004 and a minimum value of 2.3 percent in 2020 (Figure 3.58). There is no stable and reliable source of forex for Ethiopia to import required goods and services and to overcome other obligations related to forex. The shortage of forex reserve is expected to constrain imports and forces volume of imports to fall and domestic prices to rise.

Figure 3.58: Cyclic pattern of foreign exchange reserve (% of GDP)

Source: Computed from data in The World Bank (2021).

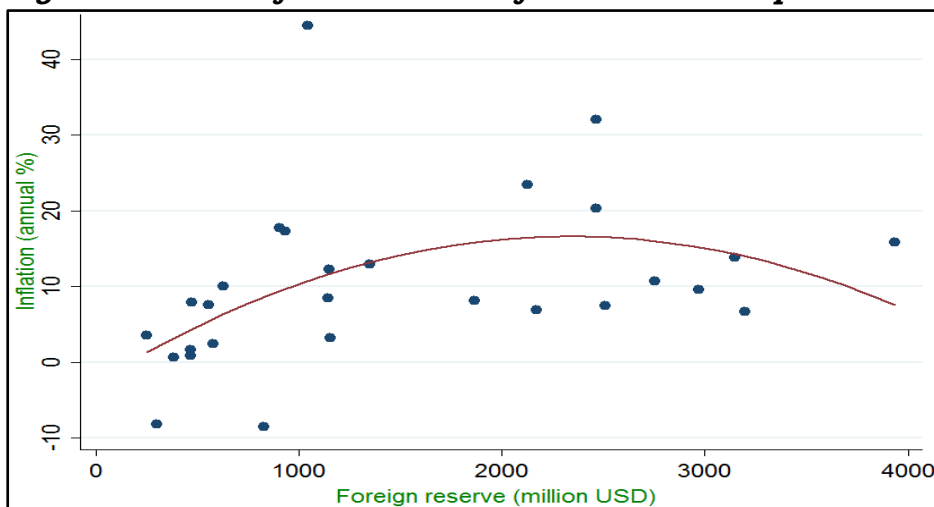
The total forex reserve for Ethiopia is continuously contracting over the years creating serious difficulties for imports and external debt obligations. The maximum forex reserve (in months of imports) realized was seven months in 1996 (Figure 3.59). However, since then, it has been continuously contracting to reach its minimum value at two months from 2012 to 2020. It is expected that the forex reserve might be even below two months after 2020. Ethiopia's forex reserve is by far below the average reserve in SSA.

Figure 3.59: Total reserves in months of imports for Ethiopia and SSA



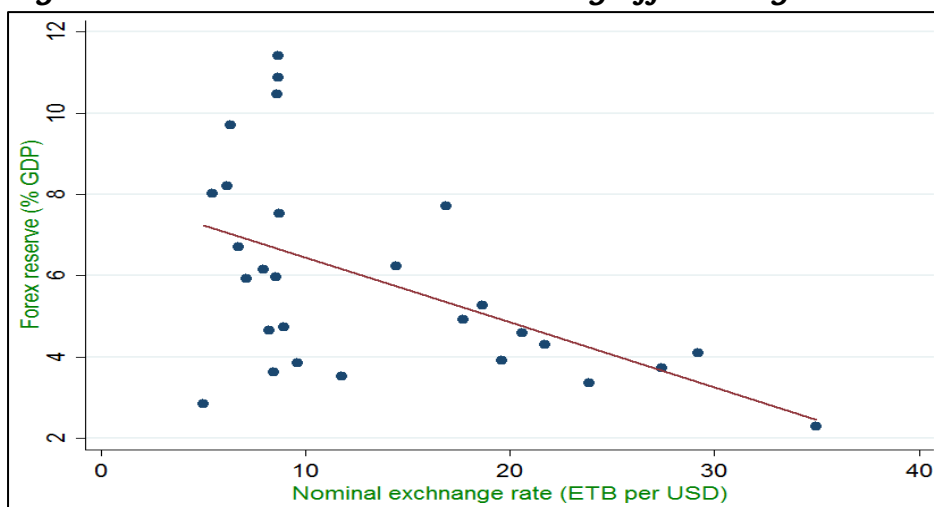
Source: Computed from data in The World Bank (2021).

The patterns of foreign currency reserve and inflation of annual consumer prices indicate that they have nonlinear relationship (Figure 3.60). Lower levels of foreign currency reserve drive inflation because the country cannot fill shortfalls in aggregate supply if there is no adequate forex reserve to import what is required in domestic markets. However, for higher values of forex reserve, there is negative relationship which may enable to import more and drive domestic aggregate supply to stabilizing prices.

Figure 3.60: Low forex reserve inflates consumer prices

Source: Computed from data in the World Bank (2021).

Forex reserve in Ethiopia is also found to be strongly and adversely affected by devaluation of local currency (Figure 3.61). Devaluation causes loss of external trade competitiveness and declining foreign earnings. Coupled with instable aid, official development assistance, contracting individual remittances, and FDI, the country has faced serious forex reserve constraint to satisfy demand for basic imports.

Figure 3.61: Forex reserve is adversely affected by devaluation

Source: Computed from data in the World Bank (2021).

3.12. Taxes and Tariffs

3.12.1. Tax revenue

Ethiopia was also one of the bottom 10 countries of Africa with very low tax revenue (% GDP). It has collected a total tax revenue of 6.7 percent of its GDP, which is considerably low compared to the average rate in Africa (15.6%) and the world (17.4%) (Table 3.10). The country is expected to have more diversified tax base to mobilize more resources.

Table 3.10: Bottom 10 African countries with very low tax revenue in 2019 (% of GDP)

| Rank | Country | Tax revenue (% GDP) |
|-------------------------------|-------------|---------------------|
| 1. | Ghana | 12.2 |
| 2. | Malawi | 12.2 |
| 3. | Ivory Coast | 12.0 |
| 4. | Gabon | 11.5 |
| 5. | Madagascar | 10.5 |
| 6. | G. Bissau | 9.5 |
| 7. | Angola | 9.4 |
| 8. | Eq. Guinea | 9.3 |
| 9. | Ethiopia | 6.7 |
| 10. | Somalia | 0.0 |
| Africa average (24 countries) | | 15.6 |
| World average (115 countries) | | 17.4 |

Source: Computed from data in the Global Economy (2021).

The overall tax revenue in Ethiopia was considerably decreasing from 11.3 percent in 1998 to 6.7 percent in 2019 (Figure 3.62). The contracting tax revenue is relayed to contracting trade in goods and services observed over the years. Compared to the size of the economy, the fiscal effects of declining tax revenue are multiple and lead to complications in fiscal measures.

Figure 3.62: Contracting tax revenue in Ethiopia (% GDP)

Source: Computed from in the World Bank (2021).

In order to identify and measure the relative share of tax categories, the overall tax revenue mobilized by the country was decomposed (Table 3.11). Taxes on goods and services take the highest share (38.3%) followed by taxes on international trade (33.4%) and taxes on income, profits and capital gains (28.2%). The decomposition results verify that taxes on international trade are very high, making the country's export to the international market less competitive and its import more expensive in domestic markets.

Table 3.11: Sources of tax revenue (1993-2019)

| Sources of tax (ETB) | Tax share | Relative contribution |
|--|-----------|-----------------------|
| Taxes on international trade | 0.334 | 0.281 |
| Taxes on income, profits and capital gains | 0.282 | 0.293 |
| Taxes on goods and services | 0.383 | 0.427 |
| Other taxes | 0.002 | 0.000 |

Source: Computed from in the World Bank (2021).

3.12.2. Taxes on international trade

The extent to which countries are protecting their economies from international competition is reflected by their trade policies related to taxes, tariffs and non-tariff barriers. The relative level of tax rates on international trade in Ethiopia was compared to its counterparts in Africa (Table 3.12). It is one of the top 10 African countries with very high tax rates on international trade. The tax rate in Ethiopia on international trade is 15.2 percent, which is significantly higher compared to the African (11.8%) and nearly threefold compared to the world average (5.6%).

Table 3.12: Top 10 African countries with high tax rates on international trade (% of total revenue, 2019)

| Rank | Countries | Tax rate (% of revenue) |
|-------------------------------|-------------|-------------------------|
| 1. | Somalia | 31.4 |
| 2. | Namibia | 30.0 |
| 3. | Botswana | 25.8 |
| 4. | Ivory Coast | 24.9 |
| 5. | G. Bissau | 18.2 |
| 6. | Togo | 15.9 |
| 7. | Ethiopia | 15.2 |
| 8. | Gabon | 14.9 |
| 9. | Madagascar | 11.9 |
| 10. | Lesotho | 11.4 |
| Africa average (24 countries) | | 11.8 |
| World average (114 countries) | | 5.6 |

Source: Computed from data in the Global Economy (2021).

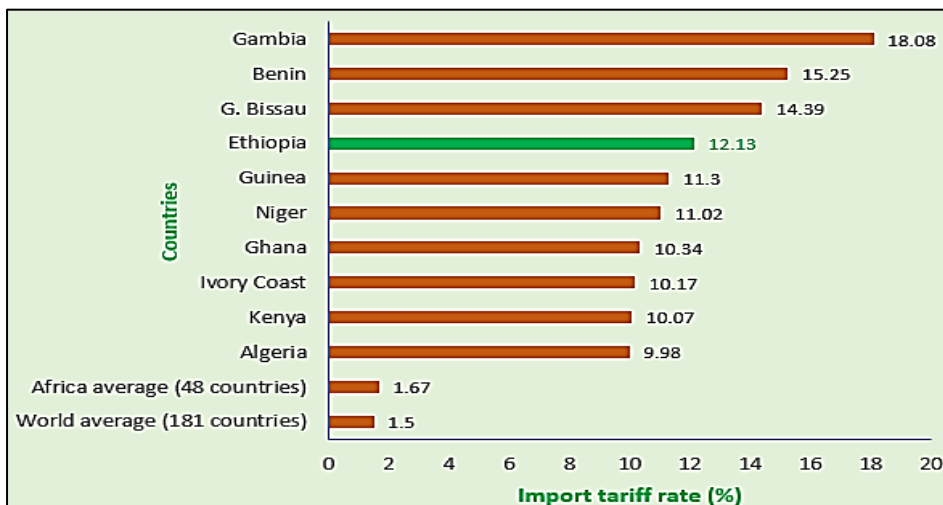
Import duties indicate variations in protectionism across countries. Import tariff in Ethiopia were decreasing until 2012, but significantly raised thereafter (Figure 3.63). Rising tariff rates obviously inflate prices of imported goods and services.

Figure 3.63: Pattern of import tariff rate in Ethiopia

Computed from data in the World Bank (2021).

Ethiopia is one of the top 10 countries of the Africa with very high import tariff/duty rates (Figure 3.64). The average import tariff rate in Ethiopia is 12.1 percent, which is considerably higher compared to the rate in Africa (1.7%) and the world (1.5%). Such high tariff rates are expected to inflate prices of imported goods. Prices of imported goods will be more expensive and rising as the country imports more. Inflation of imported goods is one of the challenges the country is expected to address. Due to the shortage of foreign currency reserve and the stifled competition arising from importers are more likely to determine domestic prices of imported goods higher than the expected prevailing price.

Figure 3.64: Top 10 African countries with very high import tariff/duty rates (all products)



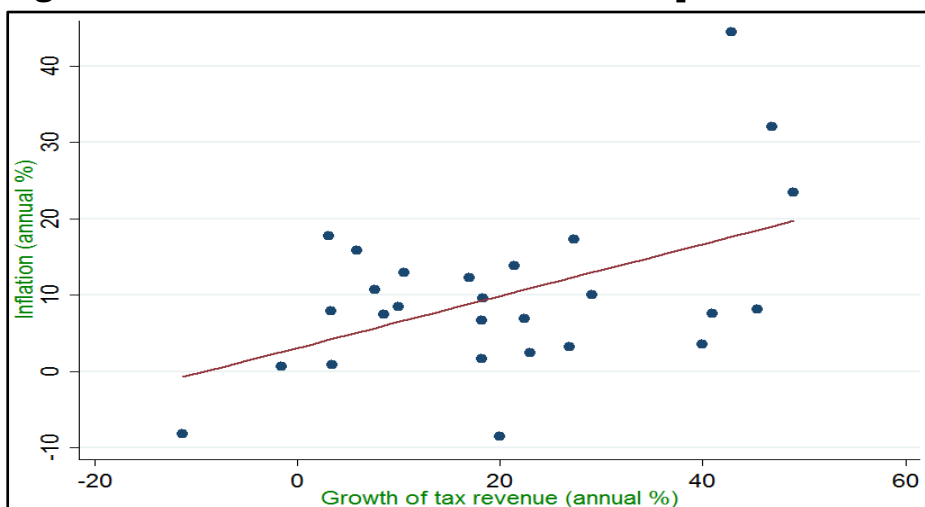
Note: The top 10 are identified by the rate in 2018 but the world average is computed for different years.

Source: Computed from data in the World Bank (2021).

3.12.3. Taxes and inflation

When inflation rises, the nominal amount of capital income rises, even though the real value is unchanged. Real tax rates are applied to sources of nominal capital income, leading to higher tax obligations even if income remains unchanged in real terms.

The relationship between inflation and annual growth of tax revenue depicts weak positive relationship (Figure 3.65). The inflationary trend in Ethiopia has consequently led to rising taxes. In return, the rise in tax revenue leads to rising prices of goods and services. Both inflation and tax payments reinforce each other to cause higher inflation and depletion of welfare of citizens. However, for higher growth rates of tax revenue, the relationship is nonlinear and blurred.

Figure 3.65: Growth of tax revenue inflates prices

Source: Computed from data in the World Bank (2021).

3.13. Violence and Conflicts

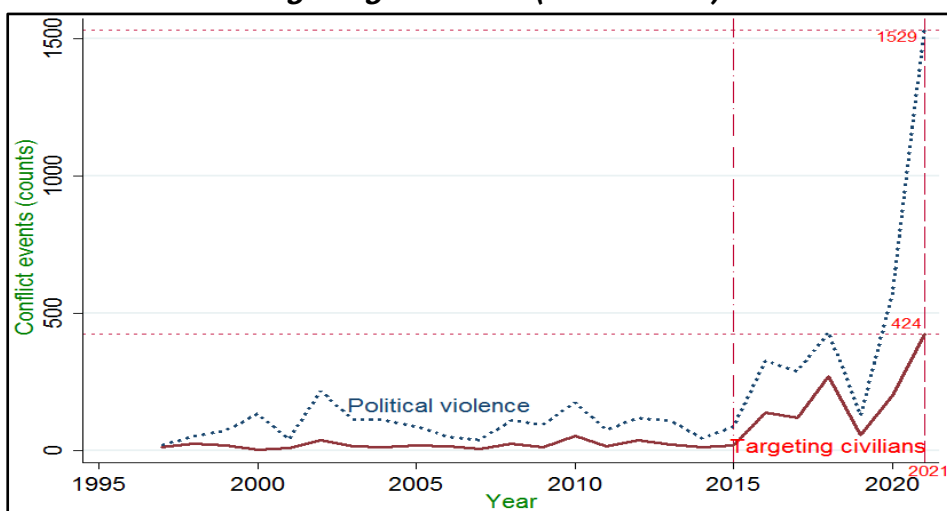
Domestic violence and conflict events among citizens, ethnic groups or other population subgroups may be caused and aggravated by a number of factors, in turn causing multiple adverse effects on production, markets, and prices. Such events include political violence and conflicts targeting civilians leading to security threats, displacement of persons, and fatalities. Violence and conflict events may be related to unpredictable policies, laws, rules, and regulations; conflicting resources, group-interests, perceptions, goals, and roles; and the desire for power.

Violence and conflicts adversely affect socioeconomic activities of citizens, households, social groups, firms, and the government and lead to economic recession. They particularly adversely affect aggregate supply by interfering with production, distribution, supply, and marketing of products and services. If incidence of conflicts in a country occurs widely and frequently, they cause inflation.

3.13.1. Incidence of violence and conflicts

Political violence and conflicts targeting civilians are the most common conflict events in Ethiopia. Incidence of conflict events was very low until 2015 (Figure 3.66). However, after 2015, both political violence and conflicts targeting civilians were significantly increased. In 2021 alone, the number of political violence was surprisingly raised to 1529, while conflicts targeting civilians were increased to 424. These domestic conflict events have adversely affected domestic supply of goods and services and pushed prices up since 2015, when inflation was highly pronounced. Domestic conflicts targeting civilians are relatively more correlated with inflation mainly because such conflict events in Ethiopia are related to ethnic conflicts within and among regional states. These conflicts adversely and considerably affected production and distribution (redistribution) of goods in the country.

Figure 3.66: Patterns of political violence and conflicts targeting civilians (1997-2021)

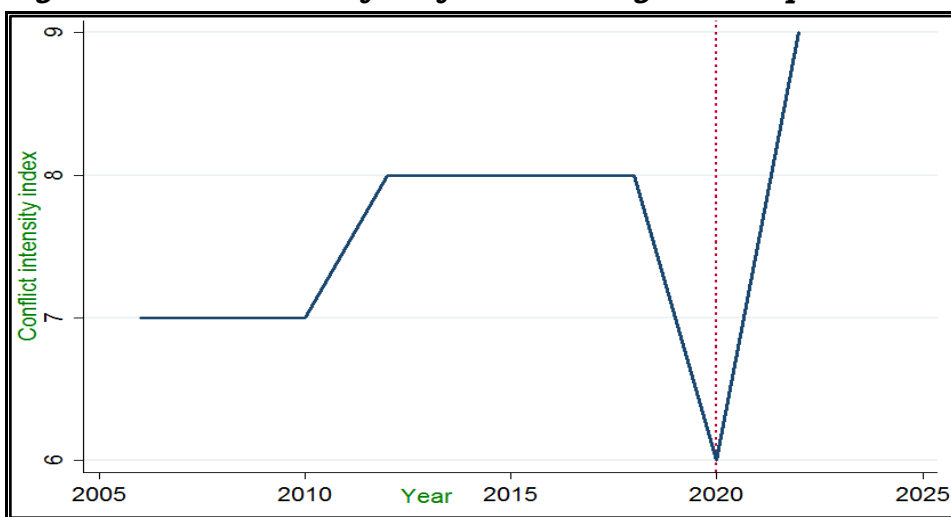


Source: Computed from data in Council on Foreign Relations (CFR) (2022).

Just after the coming power of the incumbent administration, the intensity of conflicts was falling (to 6 points) in 2019 (Figure 3.67). However, conflicts were increasingly widespread and the intensity

reached its maximum at 9 points (out of 10) in 2022. This level of conflict intensity is interpreted as a situation of civil war or a widespread violent conflict based on social, ethnic or religious differences.

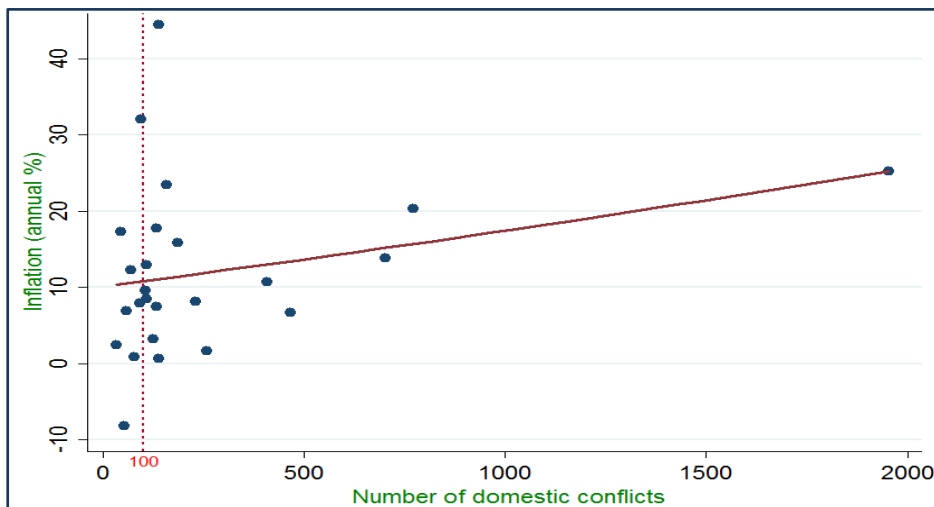
Figure 3.67: Patterns of conflict intensity in Ethiopia



Source: Computed from BTI data of Bertelsmann Stiftung (2022).

The relationship between inflation and incidence of conflicts due to political violence and conflicts targeting civilians varies with the number of incidences (Figure 3.68). Relatively smaller number of conflicts per year are expected and do not cause inflation because their adverse effects on production and supply and distribution of outputs would be negligible. However, as the number of conflicts increases, over 100 in this case, annual inflation rate rapidly increases as the domestic supply of goods and services is substantially and adversely affected due to restricted production and distribution, and devastation of production sites and industrial establishments.

Figure 3.68: More incidence of domestic conflicts blows up inflation



Source: Computed from data in CFR (2022)

3.13.2. Group grievance

Group grievance is a measure of divisions (based on social or political characteristics between different groups in a society), and their role in access to services or resources, and political inclusion. Such level of grievance is measured by group grievance index, wherein higher value indicates higher division of the societal groups in a country.

In 2021, Ethiopia is the second top African countries with very high group grievance (Table 3.13). It is relatively more divided country (with index value of 9.5) compared to its counterparts in Africa (index value 6.25) and the entire world (index value 5.68). Due to the high level of group grievance, the country is more vulnerable to domestic violence and civil conflicts causing rising cost of living and inflationary trends.

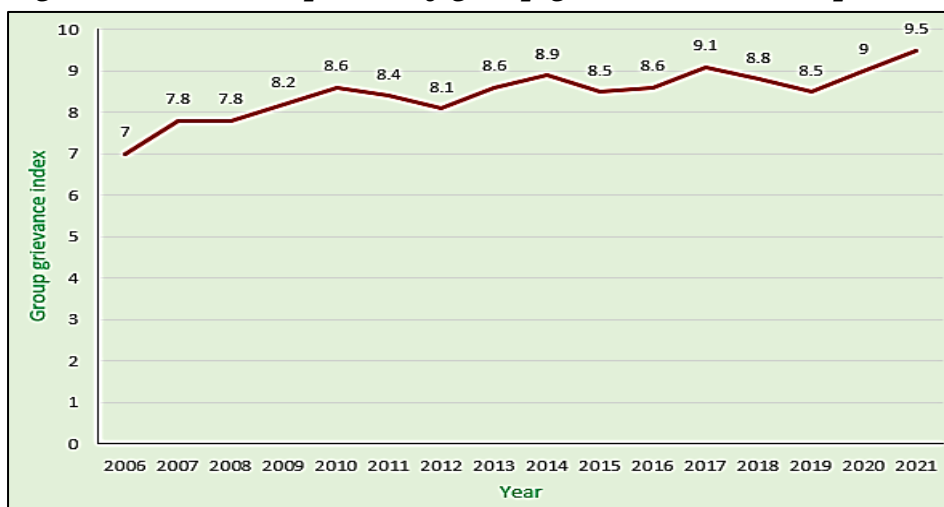
Table 3.13: Top five African countries with very high group grievance (2021)

| Rank | Country | Group grievance index (out of 10) |
|-----------------|----------|-----------------------------------|
| 1 st | Rwanda | 9.6 |
| 2 nd | Ethiopia | 9.5 |
| 3 rd | Sudan | 9.3 |
| 4 th | DR Congo | 9.0 |
| 5 th | Guinea | 8.9 |
| Africa average | | 6.25 |
| World average | | 5.68 |

Source: The Global Economy (2022).

Moreover, the group grievance index for Ethiopia is rapidly increasing in the last couple of years, which warns that the country is increasingly divided due to differences in access to services and resources and political inclusion (Figure 3.69). These divisions are sources of major conflicts consuming scarce resources, devastating production and supply channels, depleting investment confidence, reducing FDI, and aggravating inflation.

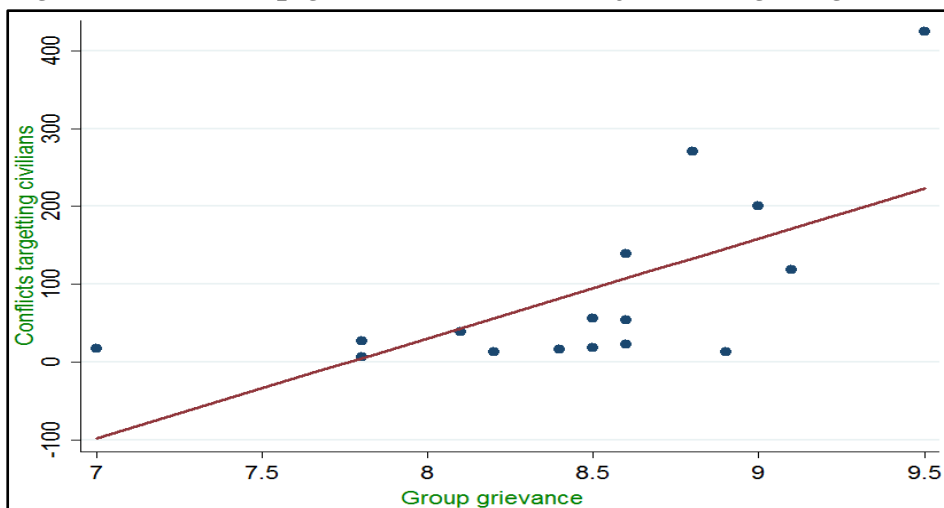
Figure 3.69: Development of group grievance in Ethiopia



Source: Computed from data in the Fragile States Index and CFR (2022).

The empirical link between group grievance and conflicts targeting civilians clearly shows their positive relations (Figure 3.70). Increasing group grievance is the primary factor triggering conflicts particularly targeting civilians in Ethiopia.

Figure 3.70: Group grievance drives conflicts targeting civilians



Source: Computed from data in the Fragile States Index and CFR (2022)

The index of refugees and internally displaced persons is an indicator used to measure the pressure upon states or countries caused by forced displacement of large communities as a result of social, political, environmental or other causes, displacement within countries, and refugee flows into others.

Ethiopia (with index value of 9.1) is one of the top six African countries with very high number of internally displaced persons and refugees. This is the result of domestic conflicts widely prevailed in most parts of the country particularly during the last decade (Table 3.14). The problem is worrisome when compared to the African (6.43 index value) and the world average (4.7). In addition to the multiple adverse effects on welfare of citizens, displacement of persons is expected to adversely affect production, supply, and marketing of products thereby causing inflation.

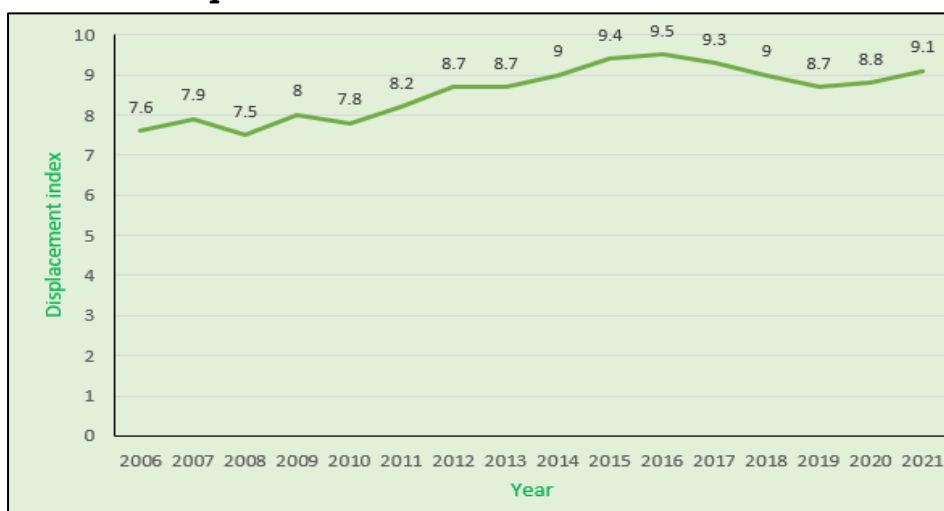
Table 3.14: Top six African countries with very high displacement and refugee

| Rank | Country | Refugees and displaced persons index (2021) |
|-----------------|-----------|---|
| 1 st | DR Congo | 10.0 |
| 2 nd | CA Africa | 9.7 |
| 3 rd | Sudan | 9.4 |
| 4 th | Chad | 9.3 |
| 5 th | Somalia | 9.2 |
| 6 th | Ethiopia | 9.1 |
| Africa average | | 6.43 |
| World average | | 4.7 |

Source: Computed from data in the Global Economy (2021).

Internal displacement of persons caused by domestic violence and conflicts in Ethiopia is increasing (Figure 3.71). Such domestic shocks are expected to increasingly aggravate inflation in Ethiopia.

Figure 3.71: Pattern of refugees and internal displacement of persons

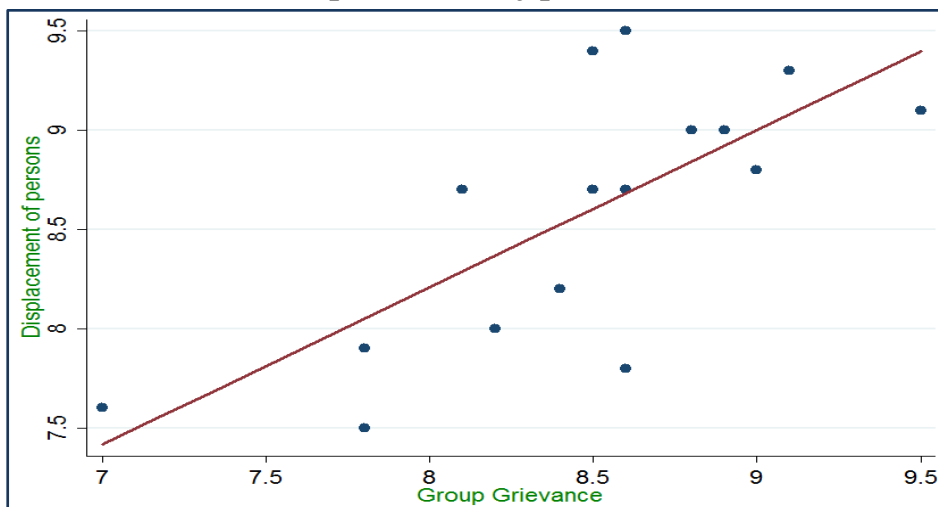


Source: Computed from data in the Fragile States Index and CFR (2022)

The empirical link between internal displacement of persons and group grievance demonstrates the positive association between

them (Figure 3.72). Group grievance strongly causes domestic conflicts displacing persons and aggravating inflation.

Figure 3.72: Group grievance exacerbates internal displacement of persons



Source: Computed from data in the Fragile States Index and CFR (2022).

3.13.3. Factionalism

Factionalism is a condition in which a group, organization, or government is split into two or more smaller groups with differing and often opposing opinions or interests. The fragmentation of state institutions by ethnicity, class, clan, race, religion and/or brinksmanship between ruling elites can be measured by index of factionalized elites.

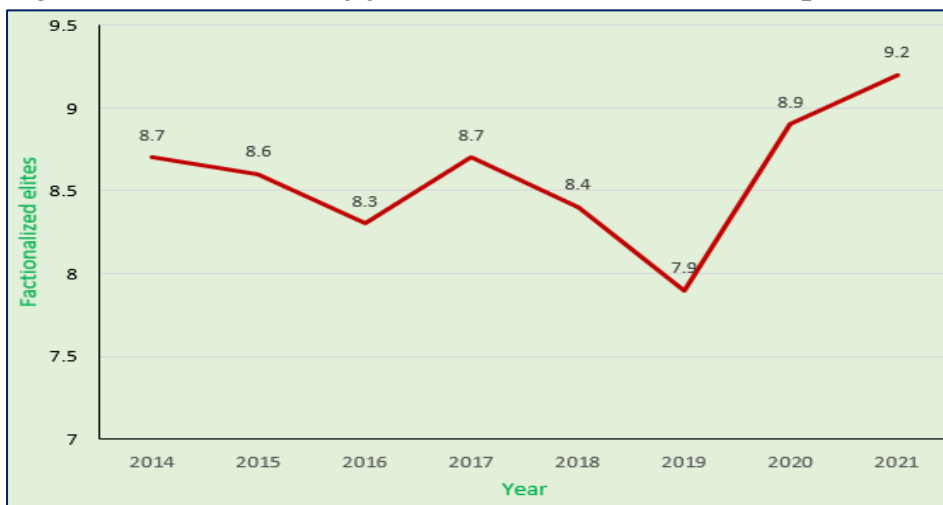
Ethiopia is one of the top 13 African countries with very high index of factionalized elites (index value 9.2) indicating that institutions are highly fragmented across regions and ethnic groups (Table 3.15). The index highlights many expected consequences, including high inefficiencies and ineffectiveness of public services arising from institutional fragmentation.

Table 3.15: Top 13 African countries with very high factionalism and institutional fragmentation

| Rank | Country | Factionalized elites index (2021) |
|------------------|----------------|--|
| 1 st | Somalia | 10.0 |
| 2 nd | Zimbabwe | 10.0 |
| 3 rd | Guinea | 9.9 |
| 4 th | CA Africa | 9.7 |
| 5 th | G. Bissau | 9.6 |
| 6 th | Ivory Coast | 9.6 |
| 7 th | Nigeria | 9.6 |
| 8 th | Chad | 9.5 |
| 9 th | DR Congo | 9.5 |
| 10 th | Libya | 9.4 |
| 11 th | Cameroon | 9.3 |
| 12 th | Niger | 9.3 |
| 13 th | Ethiopia | 9.2 |
| Africa average | | 7.7 |
| World average | | 6.6 |

Source: The Global Economy (2021).

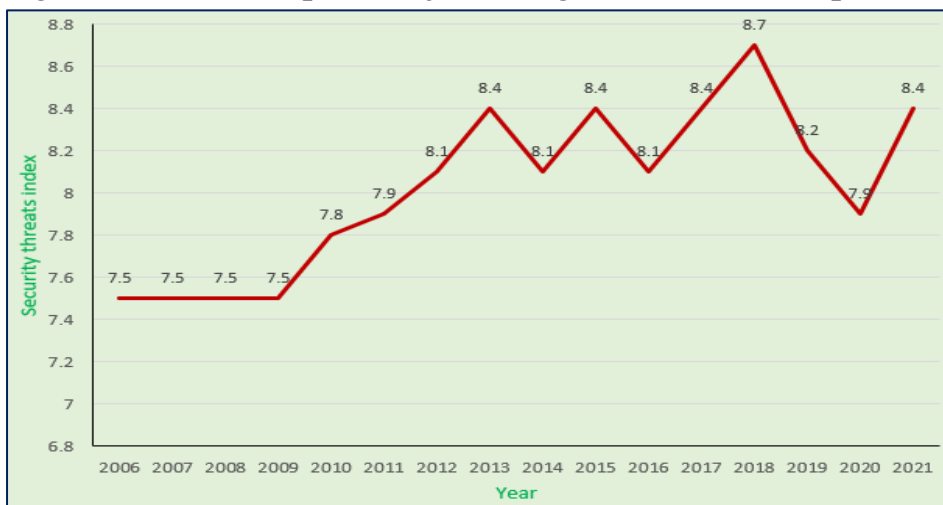
Further investigation also shows that factionalism in Ethiopia is increasing, particularly in the last couple of years (after 2019) (Figure 3.73). Increasing development of factionalism and fragmentation of institutions leads to increasing production costs and poor quality of public services. If government institutions are not efficient in providing services, the inefficiency effects will be multiplied in the economy to increasingly cause rising costs and inflation.

Figure 3.73: Pattern of factionalized elites in Ethiopia

Source: Computed from data in the Fragile States Index (2022).

3.13.4. Security threats

Security threat is an indicator of a security apparatus which considers the security threats to a state, such as bombings, attacks, rebel movements, coups, or terrorism and takes into account organized crime and perceived trust of citizens in domestic security. The indicator is measured by security threats index which varies from 0 (low) to 10 (high). The higher the value of the security threats index, the more the threats in the country. Since 2009, security threats in Ethiopia are increasing (Figure 3.74).

Figure 3.74: Development of security threats in Ethiopia

Source: Computed from data in the Fragile States Index (2022).

In 2021, Ethiopia (with index value of 8.4) has become one of the top 10 African countries with very high security threats (Table 3.16). Compared to the African (6.59) and the world average (5.29), Ethiopia is characterized by high security threats where investment is constrained, production is contracted, and prices of goods and services are sky-high.

Table 3.16: Level of security threats in Ethiopia (2021)

| Rank | Country | Security threats index |
|------------------|--------------|------------------------|
| 1 st | Libya | 9.6 |
| 2 nd | Mali | 9.6 |
| 3 rd | Somalia | 9.3 |
| 4 th | Burkina Faso | 9.0 |
| 5 th | Chad | 8.9 |
| 6 th | Niger | 8.9 |
| 7 th | Nigeria | 8.8 |
| 8 th | DR Congo | 8.6 |
| 9 th | Zimbabwe | 8.6 |
| 10 th | Ethiopia | 8.4 |
| Africa average | | 6.59 |
| World average | | 5.29 |

Source: Computed from data in the Global Economies (2021).

4. DEMAND-SIDE CONSTRAINTS AND DRIVERS

The major demand-side variables related to inflation in Ethiopia are investigated in this section. Money supply, interest rates, investment, consumption, export, corruption, public debt, unemployment, and population growth are the major variables expected to have systematic relationship with inflation.

4.1. Monetary and Fiscal Stability

The primary factor determining economic transformation in Ethiopia is monetary and fiscal stability. Economic transformation was declining mainly because monetary and fiscal instability was continuously worsening over the study period (Figure 4.1). The monetary stability index registered in 2006 (7.5) has sharply fallen to 4.5 in 2022. This index suggests that monetary and fiscal stability in Ethiopia is flawed.

Figure 4.1: Pattern of monetary and fiscal stability in Ethiopia



Source: Computed from BTI data in Bertelsmann Stiftung (2022).

The decomposition of monetary and fiscal stability into the two sources verifies that monetary stability and other exogenous factors

were the top sources of economic stability in Ethiopia (Table 4.1). Fiscal stability policies and measures undertaken were against economic stability.

Table 4.1: Relative contribution of factors to monetary and fiscal stability

| Source of economic stability | Relative contribution (%) |
|------------------------------|---------------------------|
| Monetary stability | 1440 |
| Fiscal stability | -197 |
| Other factors (constant) | -1197 |
| Residual | 54 |
| Total | 100 |

Source: Computed from BTI data in Bertelsmann Stiftung (2022).

The monetary stability index for Ethiopia recorded at 8 in 2006 has fallen to 5 in 2022 (Figure 4.2). The index in 2022 suggests that ‘monetary stability is recognized as objective of economic policy, but has not been consistently pursued over time’. Institutional independence of monetary authorities is also compromised, and prone to political influence.

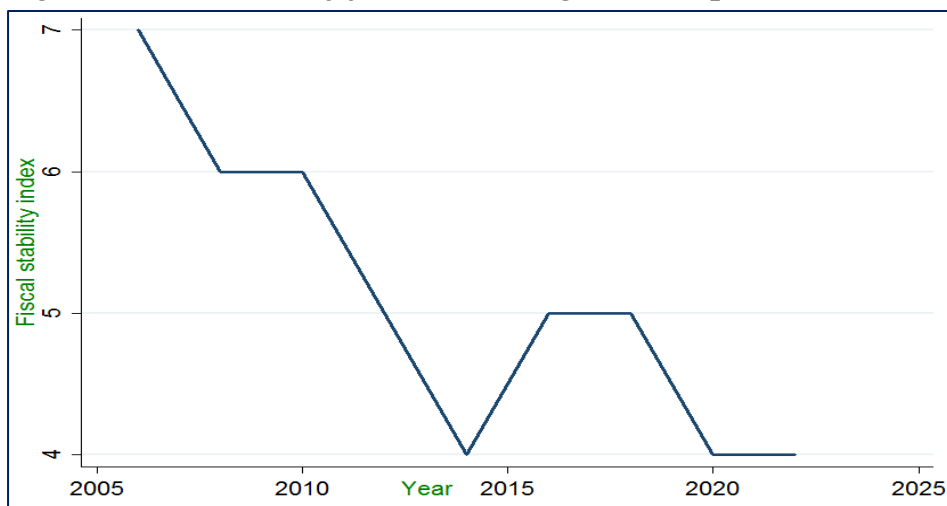
Figure 4.2: Pattern of monetary stability in Ethiopia



Source: Computed from BTI data in Bertelsmann Stiftung (2022).

The fiscal stability index recorded in 2006 (seven) has fallen to 4 in 2022 (Figure 4.3). This level of fiscal stability index suggests the presence of inconsistent and insufficient budgetary policies to promote fiscal stability in Ethiopia.

Figure 4.3: Pattern of fiscal stability in Ethiopia



Source: Computed from BTI data in Bertelsmann Stiftung (2022).

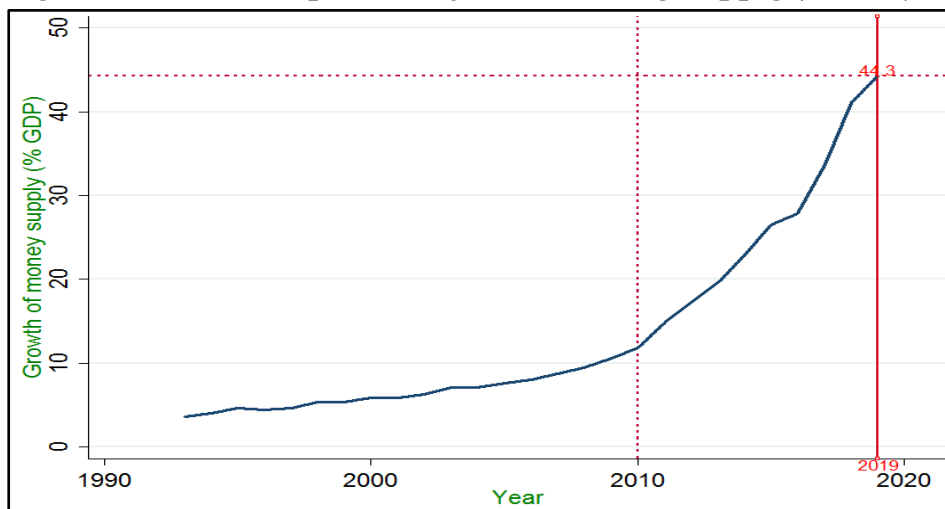
4.2. Money Supply

Economic theory postulates a direct relationship between money supply in the economy and price levels of goods and services sold. If money supply grows faster than the growth in real output, it will cause inflation because there is more money chasing the same number of goods. Increase in monetary demand causes firms to set prices higher. An increase in money supply is also expected to lower deposit interest rates and generates more investment and puts more money in the hands of consumers, thereby stimulating expenditure and aggravating inflation. Businesses respond by ordering more raw materials and increasing production.

The pattern of growth of broad money supply in Ethiopia over the last three decades is particularly rising with an increasing rate since 2010 (Figure 4.4). The annual growth of money supply was increasingly higher and reached its maximum at 44.3 percent of GDP

in 2019. Compared to the growth of real GDP in the same year (6.4%), this level of annual growth of money supply is surprisingly high, which is undoubtedly expected to cause inflationary trend.

Figure 4.4: Growth pattern of broad money supply (% GDP)

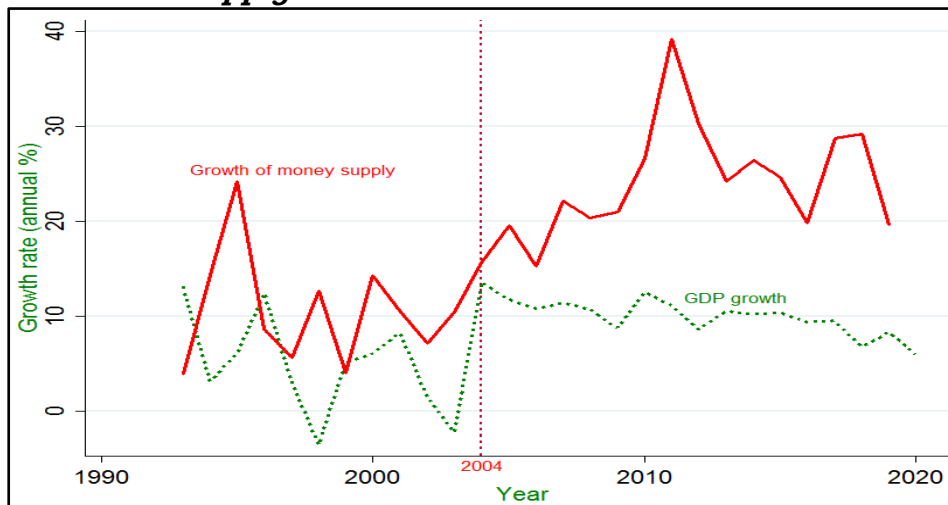


Source: Computed from data in the World Bank (2021).

Responsible governments are expected to allow annual growth of money supply based on the growth of real GDP depending on the economic policy they pursue. A country with expansionary monetary policy, like Ethiopia, may allow annual growth of money supply to be slightly higher than the growth in real GDP. This will keep aggregate demand slightly higher and create motivation for more investment and production.

The growth patterns of real GDP and broad money supply in Ethiopia show unacceptably high injection of money into the economy (Figure 4.5). The gap between annual growth rates of money supply and real GDP was particularly widening since 2004. For most of the years after 2004, the annual growth of real GDP was below 10 percent, whereas money supply was allowed to grow at about 20 to 30 percent, making the economy highly inflationary. The successive growth of money supply particularly implies that the government has created an inflationary economy by inappropriate and irresponsible utilization of its monetary instruments.

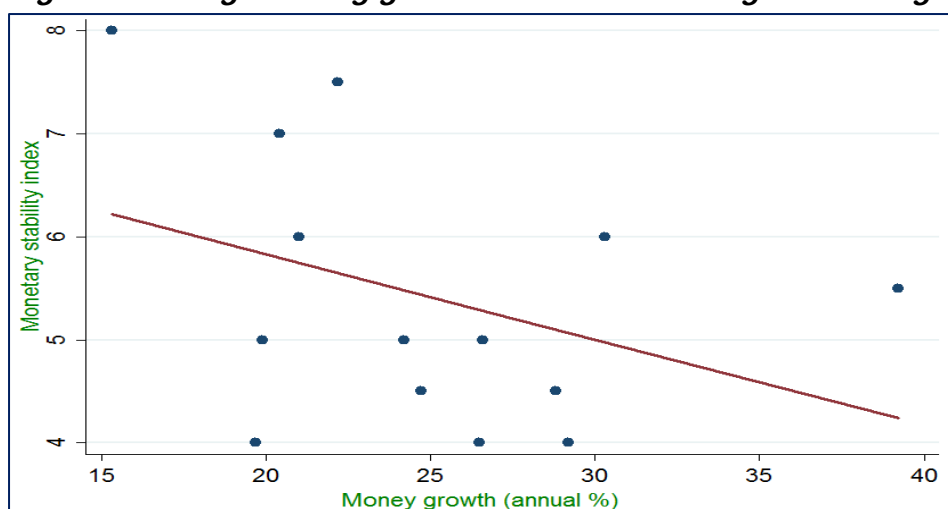
Figure 4.5: Patterns of annual growth rates of GDP and money supply



Source: Computed from data in the World Bank (2021).

The empirical link between growth of money supply and monetary stability clearly verifies that money growth was strongly causing monetary instability in Ethiopia (Figure 4.6 |). Unacceptable level of money growth in the economy has created uncontrollable inflationary trends. Monetary authorities are expected to responsibly manage the supply of money in line with the economic growth the country has realized.

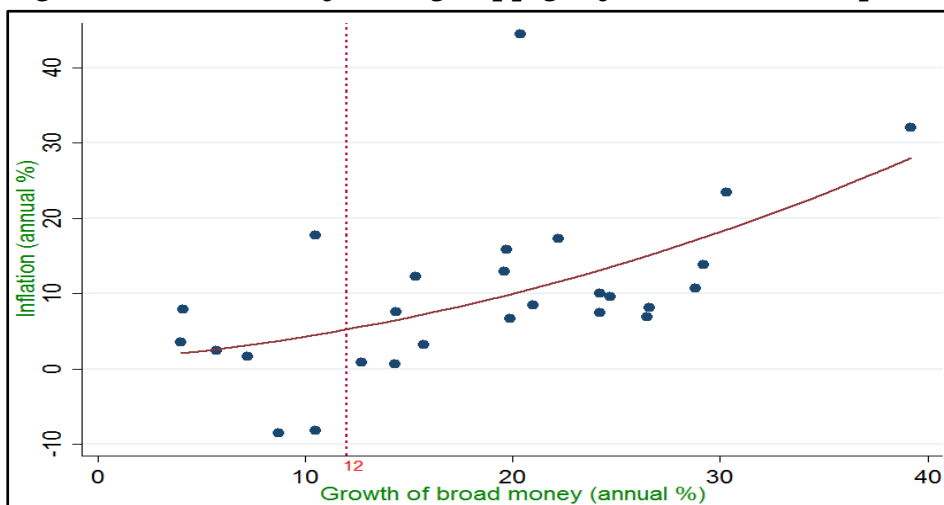
Figure 4.6: High money growth causes monetary instability



Source: Computed from data in the World Bank (2021).

The patterns of annual inflation of consumer prices plotted with annual growth of broad money supply depicts that money supply was strongly causing inflation (Figure 4.7). Annual growth of broad money supply higher than 12 percent was inflating prices in Ethiopia. The strong positive relationship implies that considerable proportion of inflation in Ethiopia was caused by huge supply of money in the market. It is required to identify the optimal level of money, which enhances economic growth without causing high inflation. However, determination of the optimal level of growth of money supply using longer time series data covering both deflationary and inflation periods may end up with misleading results.

Figure 4.7: Growth of money supply inflates consumer prices



Source: Computed from data in the World Bank (2021).

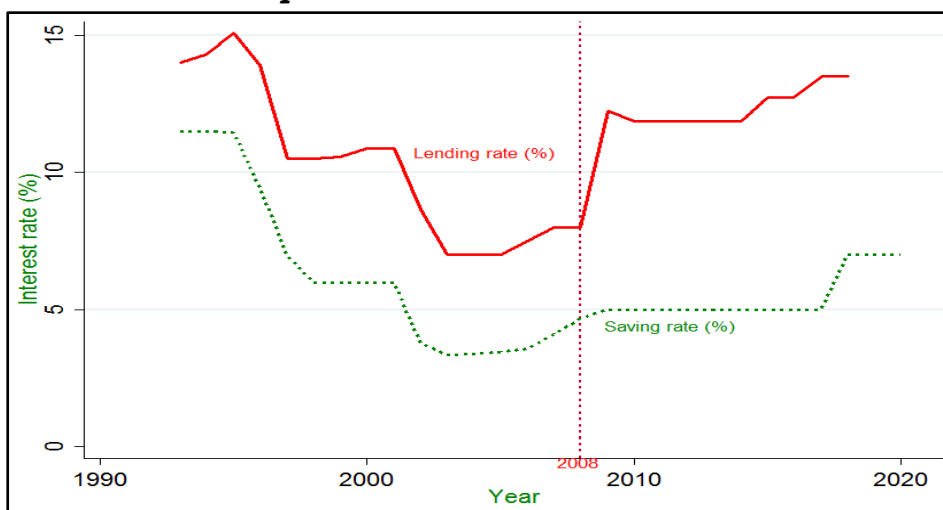
4.3. Interest Rates

The opportunity cost of capital is the return on saving or investment that an owner of funds gives up when choosing to use funds for saving or investment. If financial markets are competitive, the return an investor gives up when saving funds into banks is the opportunity cost, which is a very real cost of capital. There is a general tendency for interest rates and the rate of inflation to have an inverse relationship. When interest rates are low, the economy grows, and inflation increases.

4.3.1. Dynamics of interest rates

In Ethiopia, however, both saving and lending rates are not determined by the supply of and demand for funds and are fixed for several years (Figure 4.8). Both saving and lending rates were decreasing until 2008 with fixed rates for a couple of years.

Figure 4.8: Patterns of saving and lending interest rates in Ethiopia



Source: Computed from data in the NBE (2021).

Interest rates in Ethiopia are not determined by the interaction of the demand for and supply of money. Moreover, Ethiopia is one of the bottom 10 African countries with low deposit interest rates (Table 4.2). Low interest rates are likely to cause inflation.

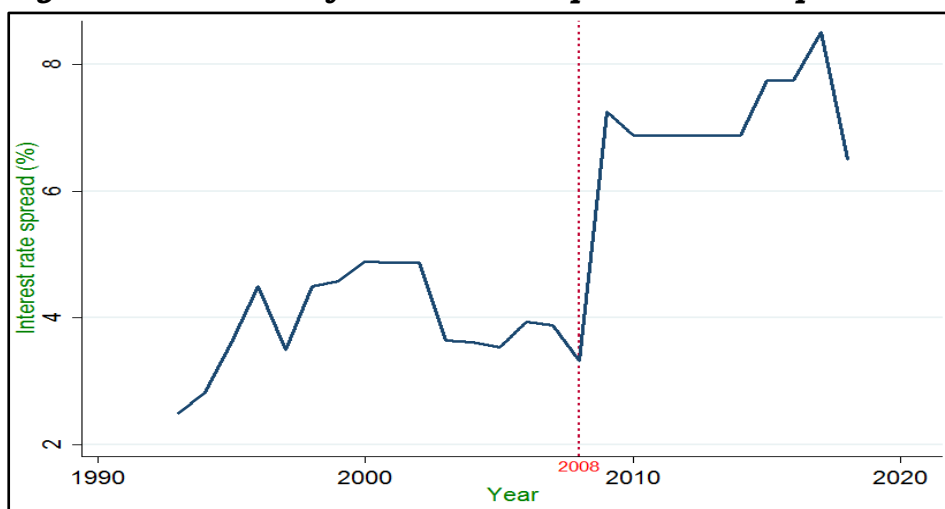
Interest rate spread is the difference between interest rate charged by banks on loans and the interest rate paid for deposits. The dynamics of interest rate spread in Ethiopia was changed since 2008 when it was allowed to rise (Figure 4.9). This considerable rise in the interest rate spread was maintained by increasing the lending rate, which protects banks and constrains investment.

Table 4.2: Bottom 10 African countries with low deposit interest rates (2020-2021)

| Rank | Country | Deposit interest rate (%) |
|-------|--------------|---------------------------|
| 1st. | Madagascar | 13.75 |
| 2nd. | Uganda | 8.65 |
| 3rd. | Zambia | 8.11 |
| 4th. | Sierra Leone | 8 |
| 5th. | Rwanda | 7.64 |
| 6th. | Tunisia | 7.59 |
| 7th. | Egypt | 7.5 |
| 8th. | Ethiopia | 7.5 |
| 9th. | Kenya | 6.97 |
| 10th. | Angola | 6.2 |

Source: Computed from data in the Global Economy (2021).

Figure 4.9: Pattern of interest rate spread in Ethiopia

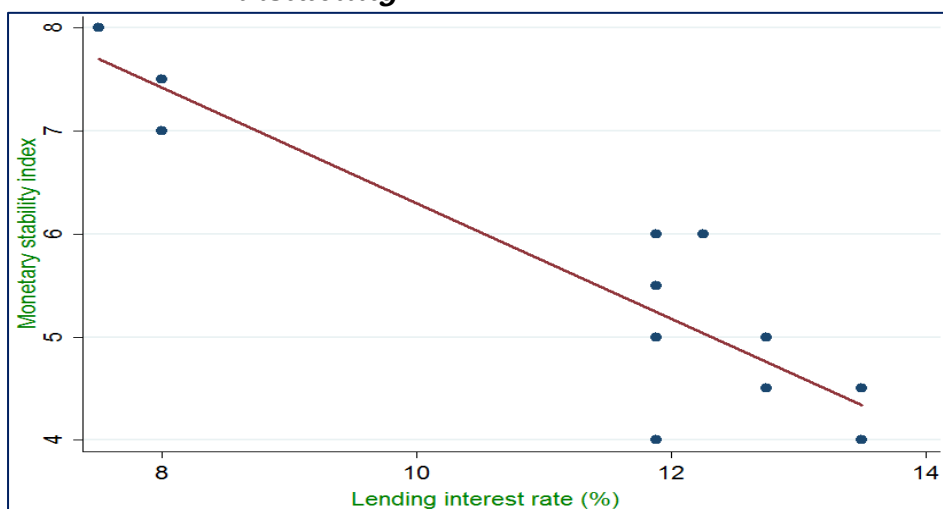


Source: Computed from data in the NBE (2021).

The empirical link between interest rate spread and monetary stability in Ethiopia is strongly negative (Figure 4.10). Higher lending rates prevailed in Ethiopia have strongly caused monetary instability by adversely affecting investment, production, and aggregate supply. Regardless of their effort for competition and financial innovation, the increasing gap between lending and saving interest rates has

protected banks to make good profits. On the other hand, this protection is expected to have adverse effects on investment and employment. The evidence suggests the urgent need to give due focus on monetary instruments for price stabilization in Ethiopia.

Figure 4.10: High lending interest rate causes monetary instability



Source: Computed from data in the NBE (2021).

A real interest rate is an interest rate adjusted to remove the effects of inflation reflecting the real cost of funds to the borrower and the real yield to the lender or to an investor. Ethiopia is also one of the bottom 10 African countries with very low negative real interest rate (-27.3%) (Table 4.3). Ethiopia has exceptionally very low real interest rate compared to its counterparts in Africa with positive real interest rates (9.5%) and the world average (7.3%). To control inflation, raising real interest rates to the Africa's average (or at least positive) may be one of the monetary policy measures to be considered.

Table 4.3: Bottom 10 African counties with low real interest rates (2021)

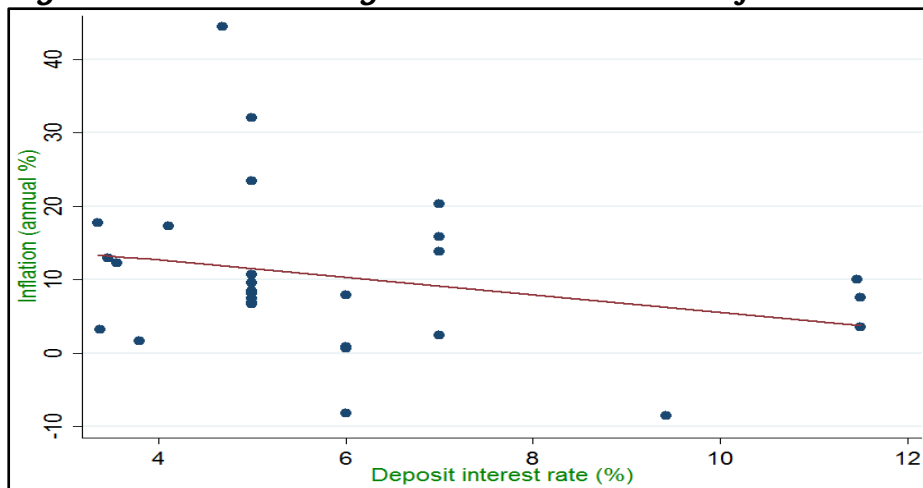
| Rank | Country | Real interest rate (%) |
|-------------------------------|--------------|------------------------|
| 1. | Egypt | 5.5 |
| 2. | Nigeria | 5.4 |
| 3. | Swaziland | 5.1 |
| 4. | Angola | 4.0 |
| 5. | Kenya | 3.4 |
| 6. | South Africa | 2.3 |
| 7. | Namibia | 2.1 |
| 8. | Burundi | 0.3 |
| 9. | Zambia | -10.0 |
| 10. | Ethiopia | -27.3 |
| Africa average (24 countries) | | 9.5 |
| World average (94 countries) | | 7.3 |

Source: Computed from data in the Global Economy and Trading Economics (2021)

4.3.2. Interest rates and inflation

As expected, the relationship between inflation and saving interest rate is negative (Figure 4.11). Lower saving rates do not attract people to save their money into banks; it rather motivates expenditure and investment. If there is no economic stagnation, high investment will lead to expansionary economic process where production and supply are expanded and prices stabilized.

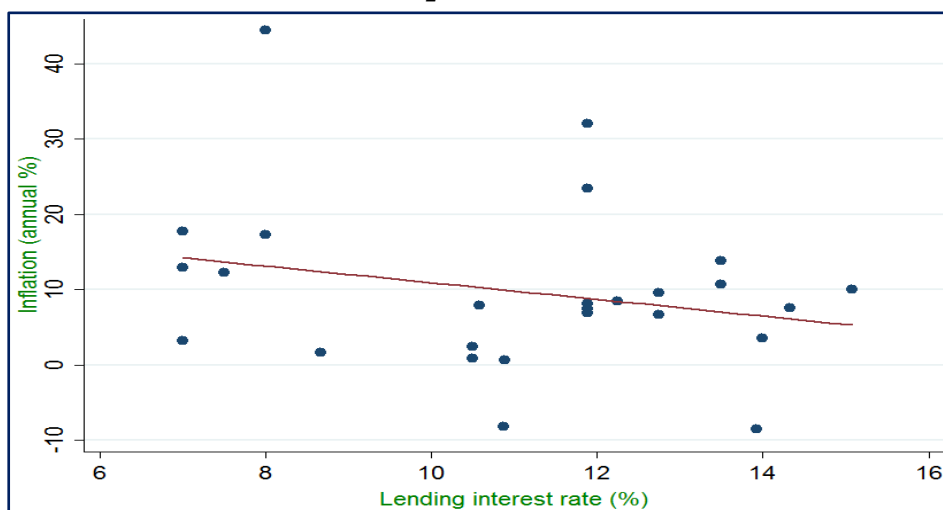
Figure 4.11: Low saving interest rate causes inflation



Source: Computed from data in the NBE (2021).

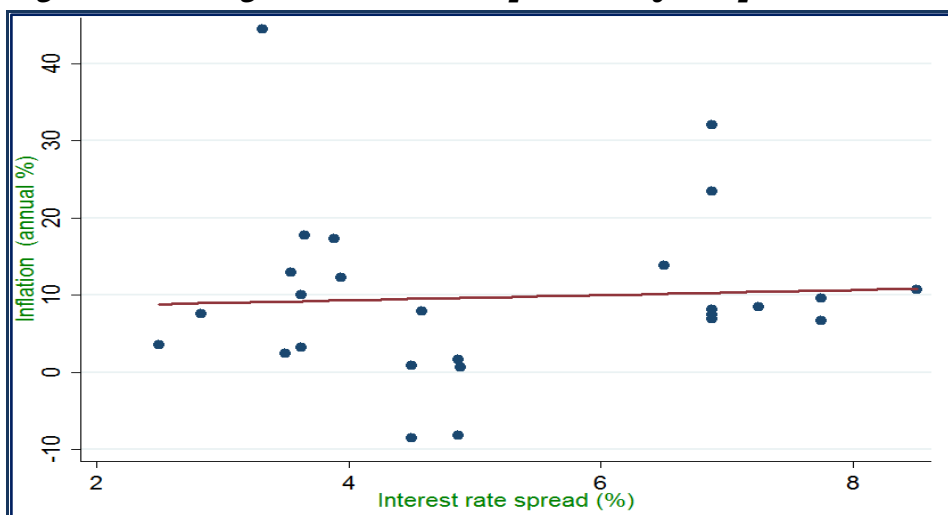
On the other hand, lending rates have two channels of transmission to affect both supply and demand. High lending rate adversely affects investment whereby production is contracted in the supply-side and demand is constrained due to increased unemployment (arising from reduced investment), which reduces the real income of citizens. Higher lending rates were constraining investment and production in Ethiopia, leading to contractionary economic process wherein supply is contracted and prices are inflated (Figure 4.12). The net effect of lending rates on inflation is determined by the level of its contractionary effects on both aggregate supply and aggregate demand. Positive real interest rates ensuring investment and price stabilization can be realized by adjusting both saving and lending rates.

Figure 4.12: High lending interest rate constrains investment but stabilizes prices



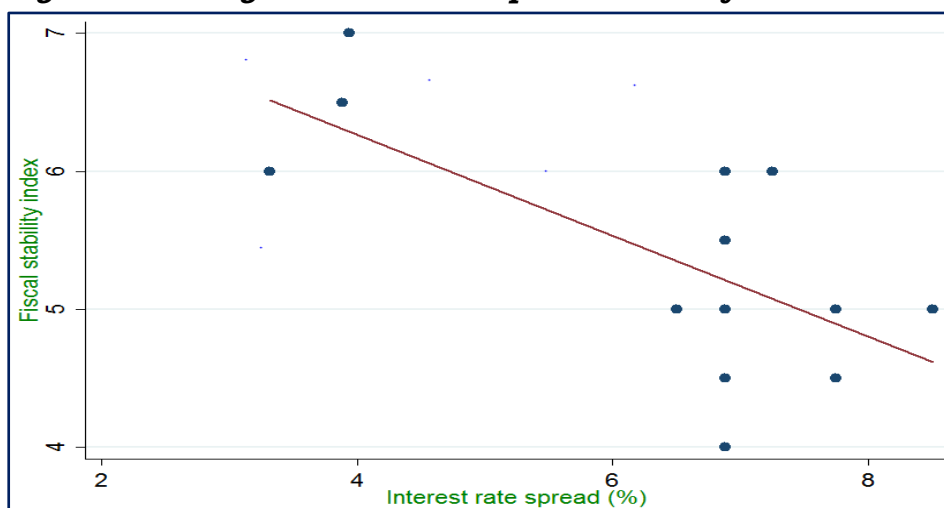
Source: Computed from data in the NBE (2021)

The empirical link between inflation and interest rate spreads over the study period shows positive relationship (Figure 4.13) Bank interest rates were causing inflation in Ethiopia. The very low saving rate with the disproportionate rise in lending rates have positively contributed to rising inflation.

Figure 4.13: High interest rate spreads inflate prices

Source: Computed from data in the NBE (2021)

High interest rate spread also causes fiscal instability in Ethiopia (Figure 4.14). Because interest rates are the major macroeconomic variables in affecting investment and employment, the wider interest rate spread has considerably aggravated fiscal instability in Ethiopia.

Figure 4.14: High interest rate spread causes fiscal instability

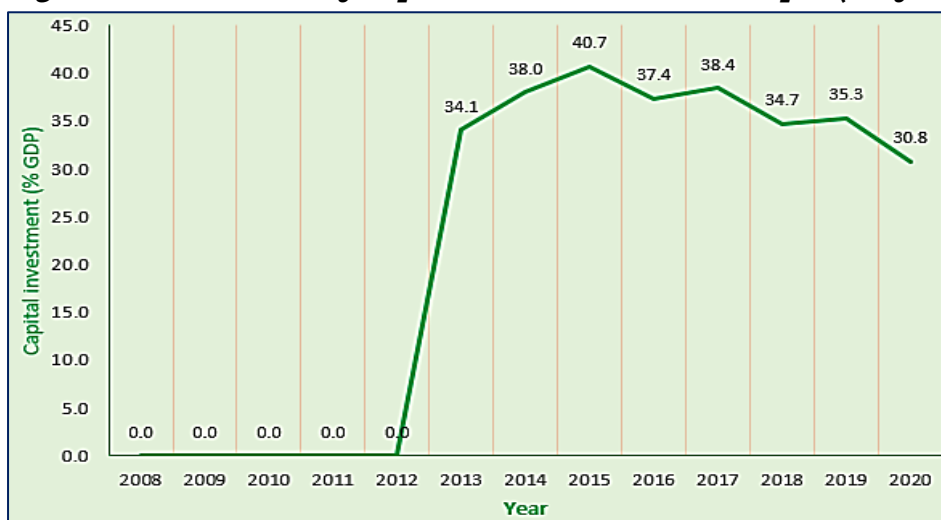
Source: Computed from data in the NBE (2021)

4.4. Investment

A high inflation rate is expected to affect capital preservation of foreign direct investment (FDI). It affects profitability as higher prices can lead to increased costs and lower profits, suggesting that stable inflation rate is desirable to attract FDI. FDI is also used as a hedging tool, mitigating the effects of inflation even in the absence of formal hedging mechanisms. FDI reduces the real negative effects of inflation.

During the last decade, capital investment (% of GDP) in Ethiopia has exhibited a declining trend (Figure 4.15). Capital investment reached its maximum at 40.7 percent of GDP but fell below 30.8 percent since 2020. Compared to the size of the economy, the growth of capital investment is declining.

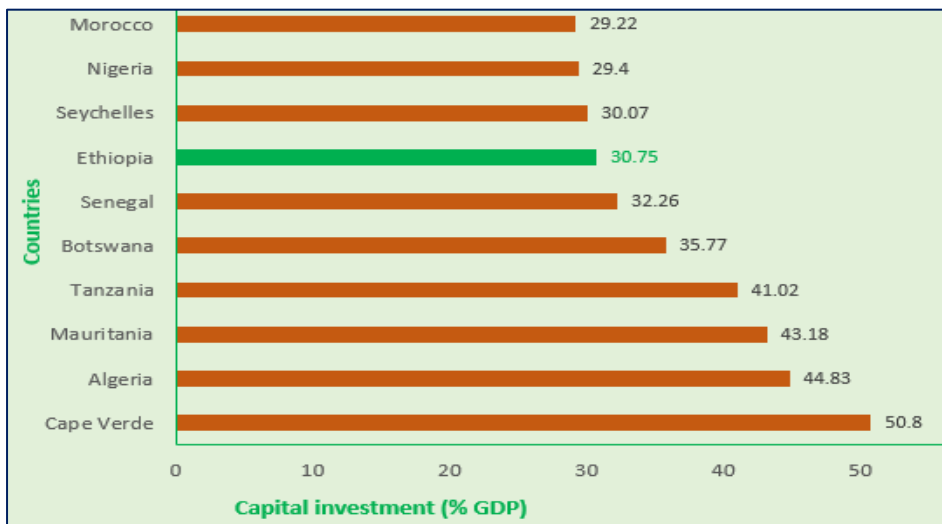
Figure 4.15: Pattern of capital investment in Ethiopia (% of GDP)



Source: Computed from data in the World Bank (2021).

However, compared to its counterparts, Ethiopia was one of the top 10 African countries with high capital investment in 2020 (Figure 4.16). The paradox is that such capital investments are fluctuating and inconsistent to stabilize domestic prices.

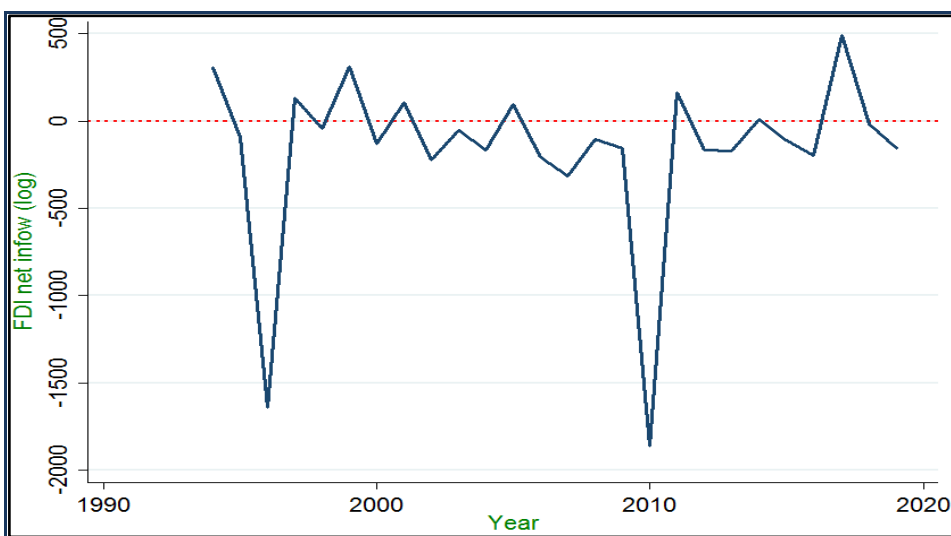
Figure 4.16: Top 10 African countries with high capital investment in 2020 (% of GDP)



Source: Computed from data in the Global Economy (2021).

The longrun trend of FDI in Ethiopia is nearly zero (Figure 4.17). Yearly fluctuations around the longrun trend result in negligible effects of FDI on inflation.

Figure 4.17: Pattern of FDI net inflows (log, current USD)



Source: Computed from data in the World Bank (2021).

Investment freedom is an important condition for free movement of resources across sectors within and outside a country. Individuals and firms would be allowed to move their resources into and out of specific activities. Ethiopia is one of the bottom 12 countries with low investment freedom with an investment freedom index of 30 (out of 100), which is by far lower compared to the African (40) and the world (49) averages (Table 4.4).

Table 4.4: Bottom 12 African countries with low investment freedom (2021)

| Country | Investment freedom Index (2021) |
|-------------------------------|---------------------------------|
| Ethiopia | 35 |
| Mozambique | 35 |
| R. of Congo | 35 |
| Algeria | 30 |
| Angola | 30 |
| Cameroon | 30 |
| DR Congo | 30 |
| G. Bissau | 30 |
| Zimbabwe | 25 |
| Libya | 5 |
| Sudan | 5 |
| Eritrea | 0 |
| Africa average (50 countries) | 40 |
| World average (117 countries) | 49 |

Source: Computed from data in the Global Economy (2021).

4.5. Consumption

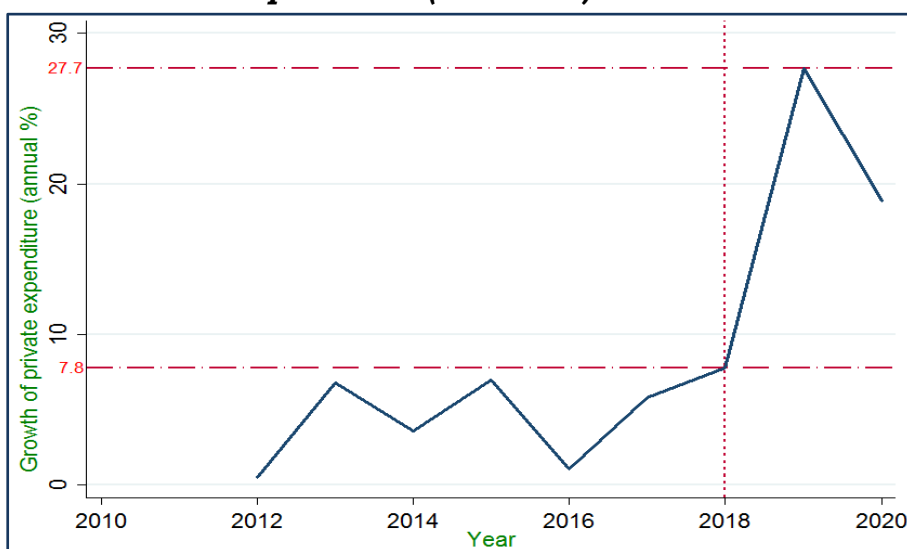
In a market economy demand disturbances may originate from a number of sources, including private demand shocks, such as shifts in private consumption or investment spending, and changes in both government spending and net exports.

4.5.1. Private consumption

Increase in consumption (or rise in expenditure) increases aggregate demand and causes price levels to rise in the product market. Both private and government expenditure are examined for their likely trends during the inflationary period in Ethiopia.

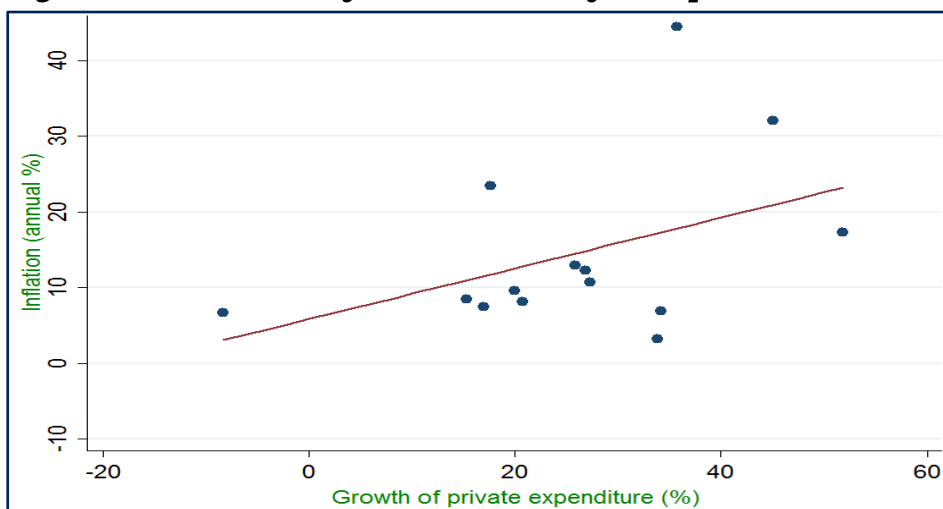
The growth pattern of final real consumption expenditure by households and nonprofit institutions serving households (NPISHs) particularly shows high absolute growth after 2018 (Figure 4.18). This growth of household expenditure is expected to increase income, and hence aggregate demand, where prices are inflated.

Figure 4.18: Growth pattern of private real consumption expenditure (annual %)



Source: Computed from data in the World Bank (2021).

The empirical link between inflation and private consumption expenditure clearly verifies their strong positive relationship (Figure 4.19). The economic growth in Ethiopia has resulted in the growth of private income and expenditure where aggregate demand has been growing, prices are pulled up and demand-pull inflation is partly prevailed.

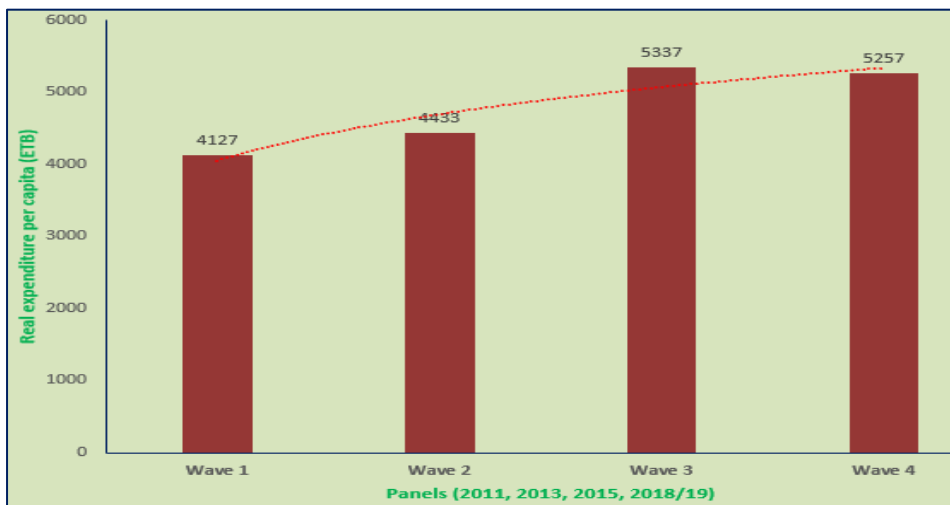
Figure 4.19: Growth of real income inflates prices

Source: Computed from data in the World Bank (2021).

The living standards measurement survey (LSMS) datasets of the World Bank for all the four waves (2011, 2013, 2016, 2018/2019) were utilized to investigate changes in consumption patterns of households over the years when inflation prevailed. To investigate households' real consumption expenditure per capita (ETB), as a proxy for income, was utilized. About 3969 in 2011, 5262 in 2013, 4954 in 2015/2016, and 6770 households in 2018/2019 are utilized and their real income growth investigated.

Patterns of real consumption expenditure per capita clearly demonstrate that household income was growing in the last decade (Figure 4.20). The average real expenditure per capita in 2011 (ETB 4127) was increased by about 27.4 percent in 2019 (ETB 5257). This real growth in real household expenditure is expected to aggravate inflation.

Figure 4.20: Trends of household real consumption expenditure per capita (ETB)

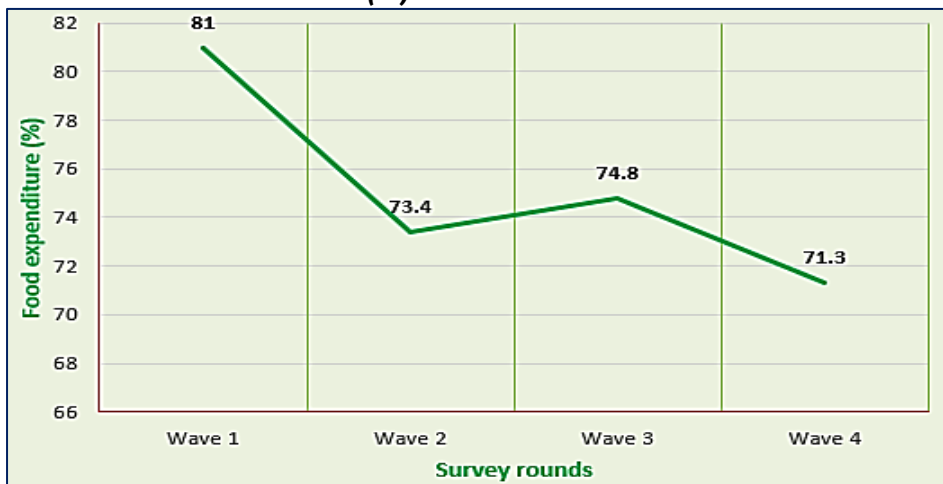


Note: Real consumption expenditure for 2018/2019 is obtained by deflating the nominal consumption by CPI (2000=1.00).

Source: Computed from LSMS data of the World Bank (2011, 2013, 2016, 2019).

Shifts in consumption patterns are also expected to affect inflation. If consumers shift their consumption from one to the other bundle of goods and services, prices of goods and services in the new consumption bundle may rise. The dichotomy of consumption bundles between food and nonfood items is the common practice to investigate these shifts. The proportion of real expenditure per capita of households on food has shown decline from 81 percent in 2011 to 71.3 percent in 2019, indicating a net decline of about 10 percentage points within a decade (Figure 4.21). This level of percentage rise in real expenditure of households on nonfood items is not expected to significantly affect their prices. Regardless of the consumption shift to nonfood items, prices of food items are rather rising.

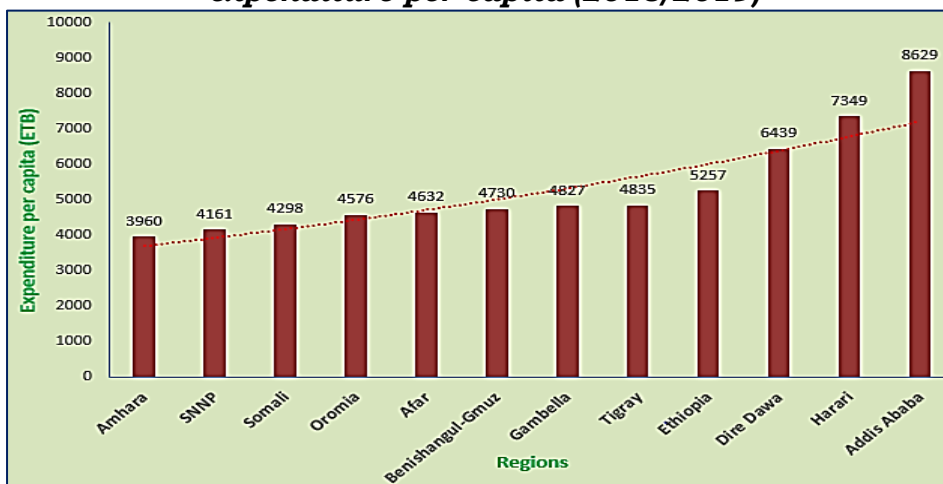
Figure 4.21: Share of household food expenditure per capita over time (%)



Source: Computed from LSMS data (World Bank: 2011, 2013, 2016, 2019).

Real expenditure per capita significantly varies across regional states of the country (Figure 4.22). It varies from ETB 3960 in Amhara to ETB 8629 in Addis Ababa. Urban centers (Addis Ababa, Dire Dawa and Harari) are better off in their real income compared to regional states with real expenditure per capita below the national average (ETB 5257). This indicates differential effects of inflation on consumers across regions.

Figure 4.22: Regional patterns of household real consumption expenditure per capita (2018/2019)



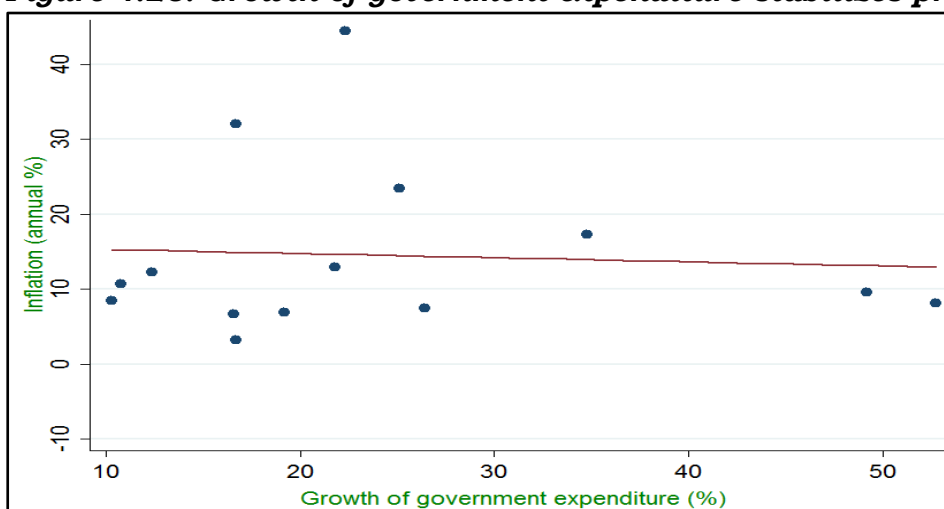
Source: Computed from LSMS data of the World Bank (2011, 2013, 2016, 2019).

4.5.2. Government expenditure

Depending on the nature of fiscal policy pursued (inflationary vs. contractionary), the effect of government spending on inflation may differ. In an expansionary fiscal policy, government spending is postulated to enhance economic growth and to cause inflation. It has a positive effect on economic growth. The more a government spends, the higher the economic growth resulting from expansionary fiscal policy. Increased government spending raises aggregate demand in recession periods and increases consumption, which leads to increased production and faster recovery from recessions. Government spending can also have negative effects on the economy. Government spending in expansionary periods often makes things more expensive; causes serious inefficiencies; and leads to more debt and disruptive financial bubbles.

The growth pattern of government final real consumption expenditure in Ethiopia shows negative but weak relationship with annual inflation (Figure 4.23). The pattern shows that growth in government real expenditure has something to do with rising inflation. The government's investment and expansionary policy might have led to such positive impacts on economic growth through price stabilization roles.

Figure 4.23: Growth of government expenditure stabilizes prices



Source: Computed from data in the World Bank (2021).

The total final real consumption expenditure was decomposed to its constituent parts (Table 4.5). Government final real consumption expenditure covers about 87 percent of the total final real expenditure, and the remaining 13 percent is attributable to household expenditure. The results indicate that private expenditure has a pivotal role in terms of affecting demand and prices in the Ethiopian economy.

Table 4.5: Sources of final consumption expenditure (million ETB) (2011-2020)

| Source | Share | Relative contribution | % Change (2011-2020) |
|------------|-------|-----------------------|----------------------|
| Households | 0.872 | 0.888 | 0.015 |
| Government | 0.127 | 0.114 | -0.014 |
| Constant | 0.001 | -0.001 | |

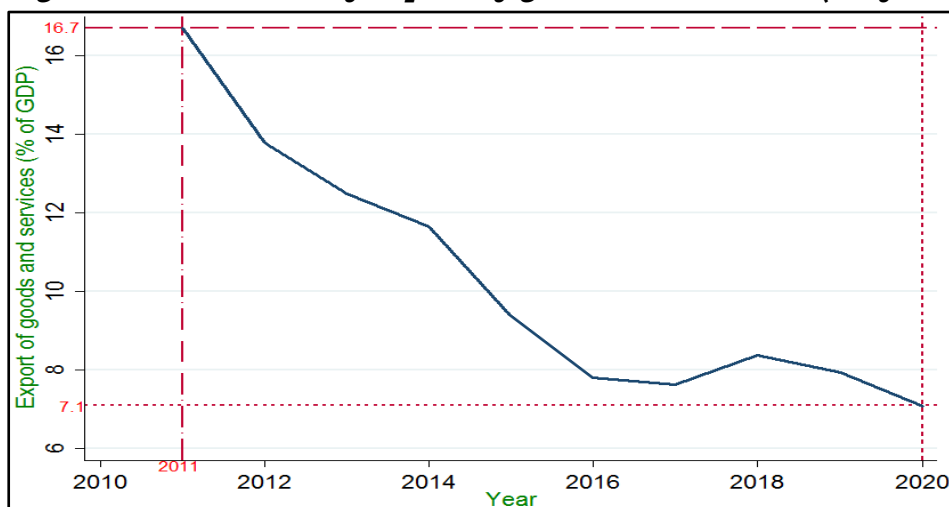
Source: Computed from data in the World Bank (2021).

4.6. Exports

4.6.1. Export patterns

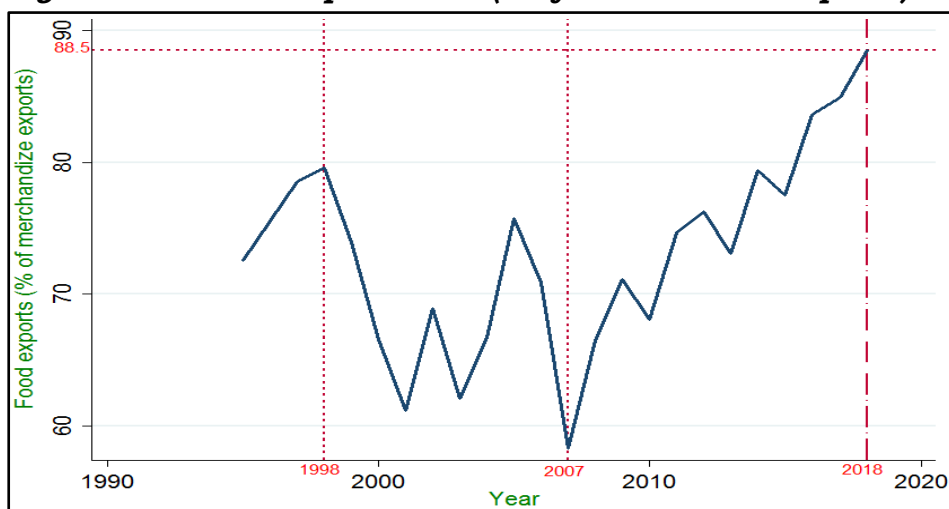
Export serves as a vent for surplus production and domestic supply. Investigation of the effect of exports on the patterns of domestic aggregate supply is vital to identify the role of the export sector in aggravating supply scarcity or surplus and price rise in domestic markets.

The export of goods and services (% of GDP) in Ethiopia was contracting by about 135% within 10 years (16.7% in 2011 to 7.1% in 2020) (Figure 4.24). This drastic decline in foreign earnings might have been related to the contracting production of export goods and devaluation of local currency in making exports cheaper.

Figure 4.24: Pattern of export of goods and services (% of GDP)

Source: Computed from data in the World Bank (2021).

The export portfolio of Ethiopia is dominated by agricultural raw materials or food items. Proportion of food exports (% of merchandise exports) between 1998 and 2007 was also declining with significant fluctuations (Figure 4.25). After 2007, the share of food exports was increasing at a decreasing rate and reached 88.5% of total merchandise exports in 2018.

Figure 4.25: Food export trend (% of merchandise exports)

Source: Computed from data in World Bank (2021).

Increased food exports coupled with declining production significantly and adversely affected domestic aggregate supply, leading to inflated prices of food items. Inflating consumer prices could be the result of declining production and reduced aggregate supply affected by exports.

The annual growth of net exports was essentially negative and fluctuating for most of the years and reached its maximum (39.6%) in 1994 and turned down and fluctuated around zero after 2010 (Figure 4.26). Contraction in the export sector might have been caused by the contraction of agricultural production which aggravates the shortage of forex reserve to import goods and services demanded by the country.

Figure 4.26: Patterns of net export growth (annual %)



Source: Computed from data in the World Bank (2021).

Unproportionate rise in imports (121%) and the declining share of exports (-32%) over the period remains as the primary sources of instability of trade balance in Ethiopia (Table 4.6). Though the country is significantly constrained by shortage of forex reserve to import, the share of imports was relatively increasing.

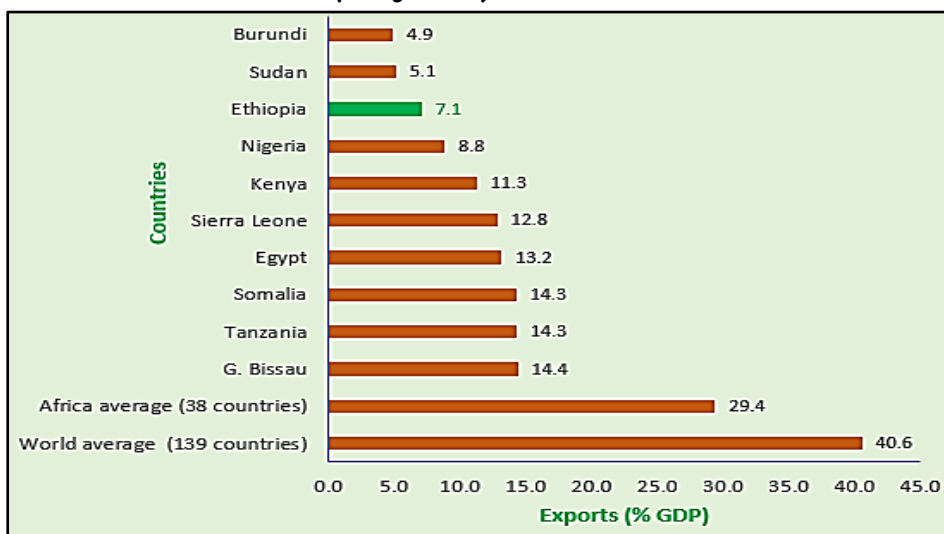
Table 4.6: Sources of instability of trade balance between 2011 and 2020

| Source of instability of trade balance | Share | Relative contribution |
|--|-------|-----------------------|
| Export | -0.32 | -0.04 |
| Import | 1.21 | 1.15 |
| Constant | 0.11 | -0.13 |
| Residual | 0.00 | 0.02 |

Source: Computed from data in the World Bank (2021).

Compared to its counterparts, Ethiopia is one of the bottom 10 African countries with very low exports (Figure 4.27). Its export was about 7.1 percent of the GDP, which is markedly lower compared to the African (29.4%) and the world (40.6%) averages. To ensure stable and positive trade balance, the country need to register notably high exports and fill the gaps between the supply of and the demand for foreign currency reserve.

Figure 4.27: Bottom 10 African countries with very low exports in 2020 (% of GDP)



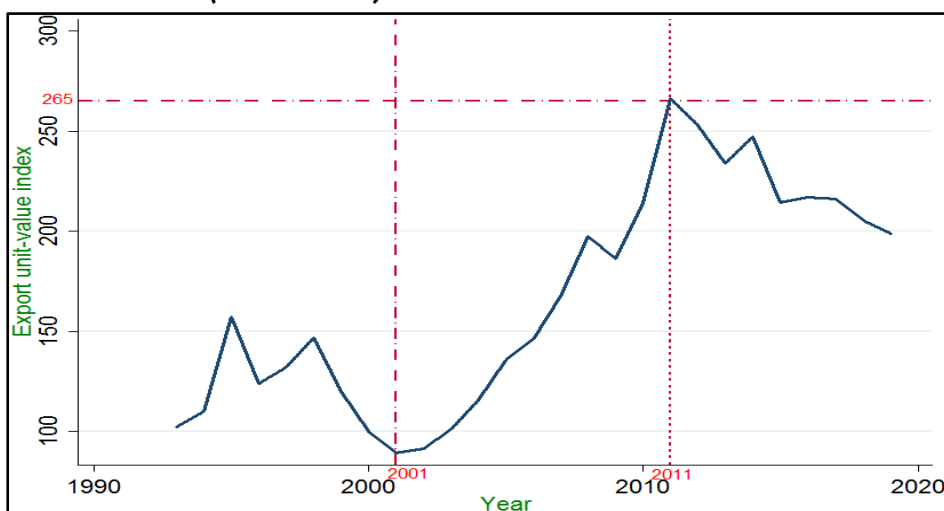
Source: Computed from data in the World Bank (2021).

4.6.2. Export price and quantity

The export unit value index characterizes changes in the price level of exported goods and services within the reporting period against the base period. It is a price index which measures the change in the average value of exported units that are not homogeneous, and which may be affected by changes in the mix of items (or quantities), as well as by changes in their prices.

The export unit value for Ethiopia clearly shows consistent and increasing trend between 2001 and 2011, tenfold growth within a decade (Figure 4.28). After 2011, however, export prices were declining at a decreasing rate. This drastic decline may be attributable to both value and quantity of exports.

Figure 4.28: Pattern of export prices (unit values) in Ethiopia (2000=100)



Source: Computed from data in the World Bank (2021).

Export quantity index, on the other hand, is the ratio of the export value index to the corresponding unit value index. Though export quantity was increasing with decreasing rate until 2013 (from 100 in 2000 to 275 in 2013), it has stayed nearly with the same pattern until 2020 (Figure 4.29).

Figure 4.29: Pattern of export quantity in Ethiopia (2000=100)

Source: Computed from data in World Bank (2021).

4.6.3. Instability of export values

To estimate the level of contributions of price and quality to the rise of values, export value indices were decomposed to their unit value and quantity indices (Table 4.7). Export prices and quantities have shares of 86% and 94%, respectively, to the rise in export values. About 80% of the decline in export value was attributable to other factors. The relative contributions of export prices and quantities were, respectively, 20% and 35%. The highest contribution (45%) to the decline of export value was attributable to other exogenous factors.

Table 4.7: Sources of export value instability (value index) in Ethiopia

| Source of instability of export values | Share | Relative contribution |
|--|-------|-----------------------|
| Unit value | 0.86 | 0.20 |
| Quantity | 0.94 | 0.35 |
| Constant | -0.80 | 0.45 |
| Residual | 0.00 | -0.01 |

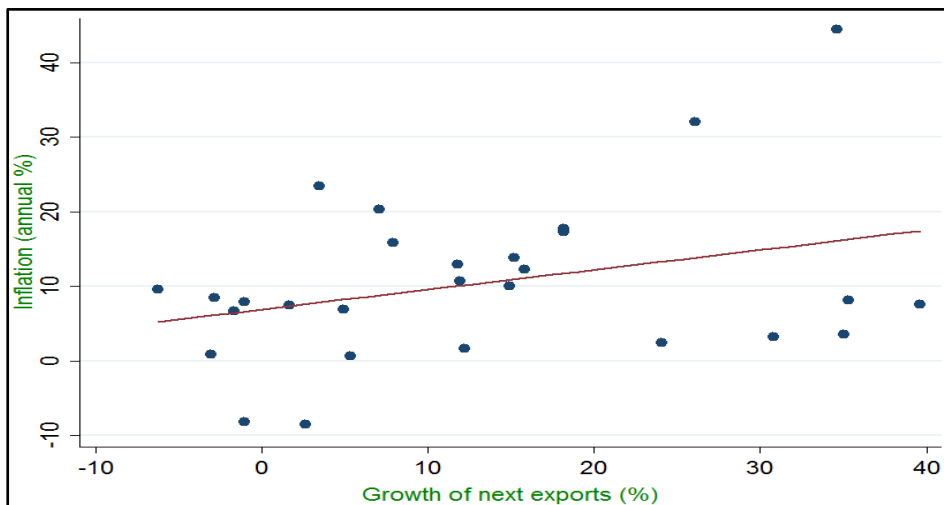
Source: Computed from data in the World Bank (2021).

4.6.4. Export growth and inflation

Theoretically, export and inflation have inverse relationship. Inflation leads to more expensive export of goods and services and thus, reduced exports due to expensive prices of exports in international markets.

The effect of growth of net exports on inflation in Ethiopia is clearly positive, suggesting that the rise in net exports was driving inflation of domestic prices (Figure 4.30). Export growth in Ethiopia is mainly realized with the export of goods characterized by shortfalls in domestic markets and other factors related to exchange rate devaluation and scarcity of forex reserve. In other words, the growth in net exports is achieved with the expense of domestic supply, and hence, aggravates inflation by creating scarcity. Growth in exports significantly depletes domestic supply and pulls prices up because they are exported in the presence of huge supply shortfalls in domestic markets. This is evidenced by export of most food products including oilcrops, pulses, meat, fruits, and vegetables. Export of products characterized by shortfalls in domestic markets have considerably aggravated inflation of food items. Moreover, prices of exports are cheaper and less competitive in international markets. Exports are growing not because they are competitive but because scarcity of forex reserve is serious and the urgent needs to generate it by any means.

Figure 4.30: Growth of net exports inflates prices in domestic markets

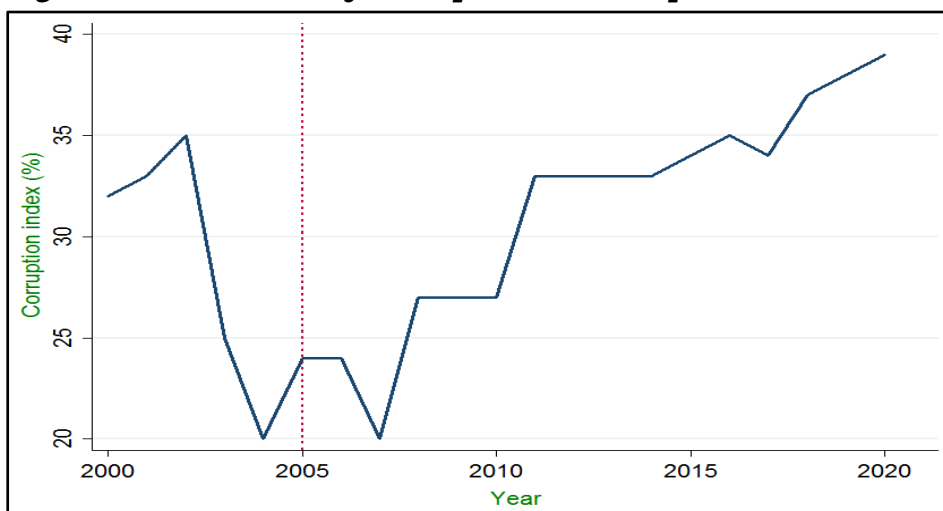


Source: Computed from data in the World Bank (2021).

4.7. Corruption

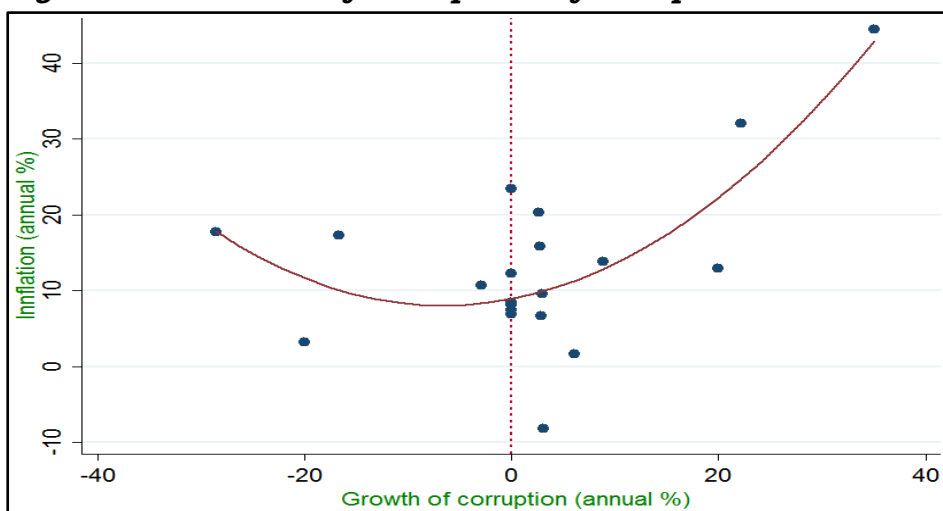
There is a theoretical link between inflation and corruption. Corruption increases inequality, decreases accountability and political responsiveness, thereby produces rising frustration and adversity among citizens. Then citizens will more likely accept or demand illegal and illiberal tactics in the economy. Because corruption has a negative impact on growth and investment, there is an indirect cost of inflation induced by corruption.

The growth of corruption perception in Ethiopia is clearly perceived over the last 15 years (Figure 4.31). Since 2007, corruption was increasing and contributing more to the inflationary trend in Ethiopia.

Figure 4.31: Pattern of corruption in Ethiopia

Source: Computed from data in Transparency International (2022).

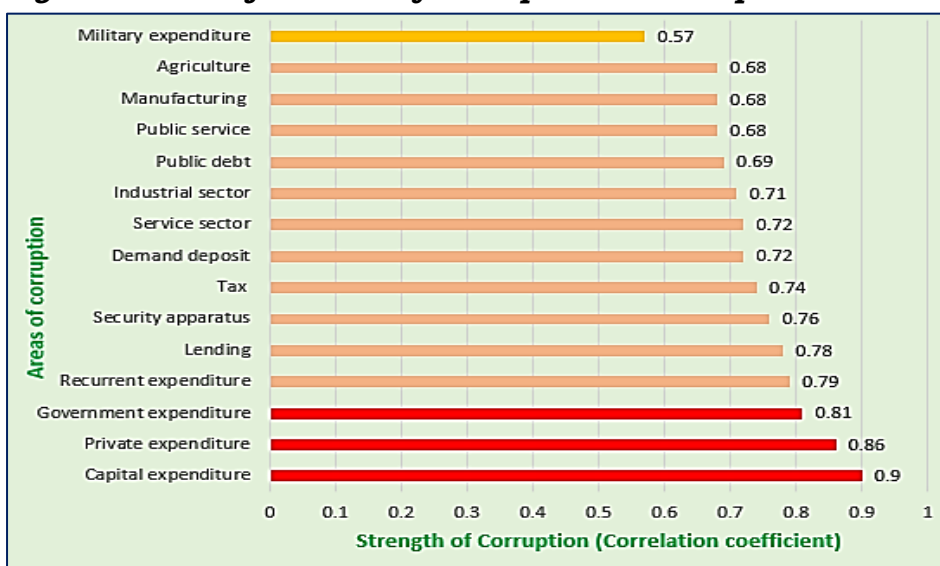
Corruption can contribute to inflationary trends due to corrupt practices related to tax evasion, costly tax collections with capital flights, budget deficits, saving and lending practices, public service, and private and public purchases/expenditures. The empirical link between inflation and corruption suggests that annual positive growth of corruption strongly drives inflation in Ethiopia (Figure 4.32).

Figure 4.32: Growth of corruption inflates prices

Source: Computed from data in the World Bank and Transparency International (2022).

The prevalence of corruption in different sectors was measured by their correlation coefficients. Around 15 areas or sectors/subsectors were identified to be the most important where corruption is significantly prevailed over the period (Figure 4.33). The top 10 areas of corruption expected to drive the inflationary challenges include (in order of importance) capital expenditure, private expenditure, government expenditure, recurrent expenditure, lending, security apparatus, tax, demand deposits, service and industrial sectors.

Figure 4.33: Major areas of corruption in Ethiopia



Source: Computed from data Transparency International (2022).

4.8. Public Debt

Economic theory states that inflation causes the value of a currency to decline over time. Cash now is worth more than cash in the future. Accordingly, inflation lets debtors pay lenders back with money that is worth less than it was. Higher inflation reduces the real value of the government's outstanding debt while increasing the tax burden on capital investment usually due to lack of inflation indexing. However, empirical evidence on the relationship between public debt and inflation is mixed, depending on the nature of the

economy. Interaction of public debt and inflation purely depend on government financing sources, because government spending on consumption and investment and on the public debt service is financed with taxes, increased public debt, or the printing of money, which could directly cause inflation.

External debt in Ethiopia has been exponentially growing, particularly since 2006 (Figure 4.34). The external debt burden increased from \$2.2 billion in 2006 to \$30.4 billion in 2020. Over the period, external debt was growing by 1282 percent, which is 85.5 percent per year. This debt burden is expected to be the primary source of fiscal instability in Ethiopia.

Figure 4.34: Pattern of Ethiopia's total external debt stock (billion USD)



Source: Computed from data in the World Bank (2021).

Total public debt was also considerably increasing since 2009 (Figure 4.35). National debt (budget deficit) was increased with increasing rate from \$8.6 billion in 2009 to \$52.6 billion in 2021. On average, the budget deficit was growing by about 39 per annum. Fiscal policy measures have caused fiscal instability in Ethiopia.

Figure 4.35: Rising trend of total debt service in Ethiopia (million USD)



Source: Computed from data in the World Bank (2021).

National debt in Ethiopia was decreasing until 2008, but increased thereafter (Figure 4.36). The size of national debt burden shows a clear picture of the debt burden if it is adjusted with the size of the economy, measured by GDP. National debt was growing from 30 percent in 2009 to 55 percent of the GDP in 2020. Compared to its counterparts in SSA and the global experiences, the debt-to-GDP ratio for Ethiopia is significantly lower.

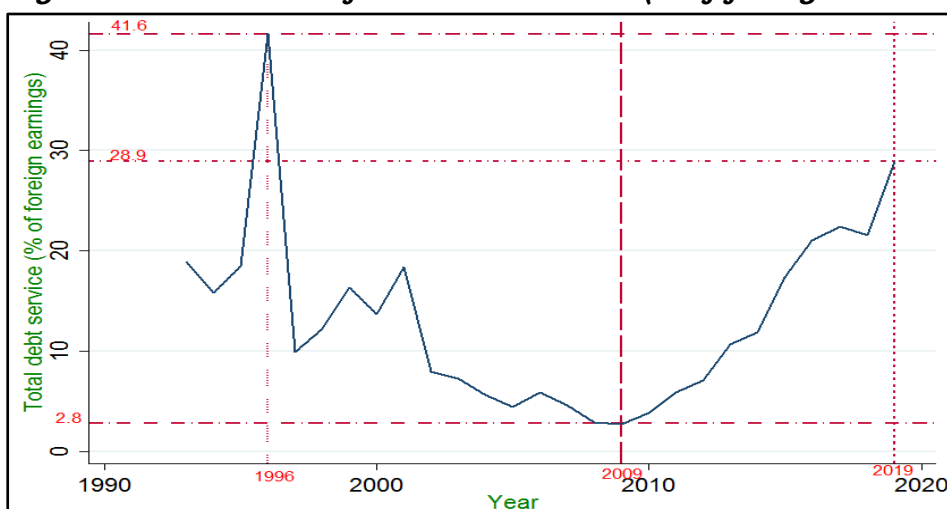
Figure 4.36: Pattern of national debt in Ethiopia (% GDP)



Source: Computed from data in the World Bank (2021).

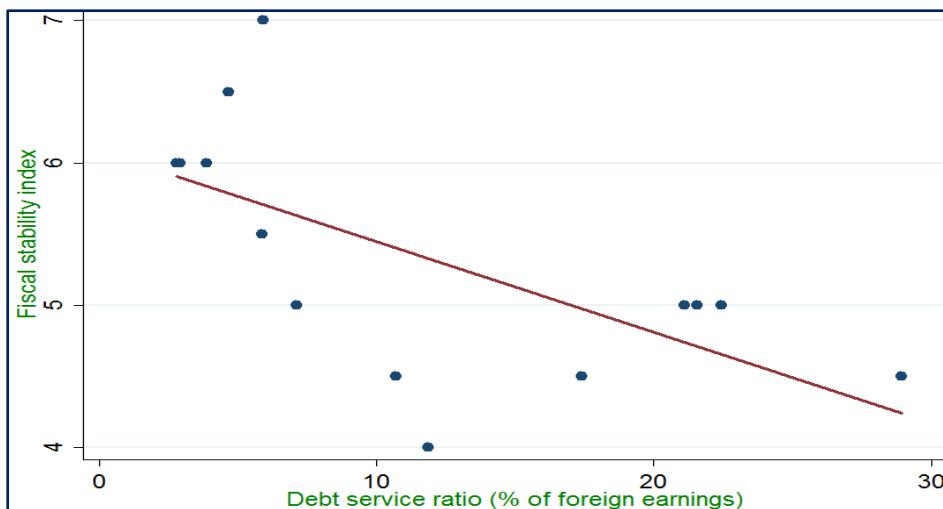
Due to the rise in public debt with declining foreign earnings, total debt service of the country (as a percentage of its foreign earnings) was decreasing until 2020 and rising thereafter (Figure 4.37). The maximum value of 40.6 percent was recorded in 1996 before it reached its minimum value in 2009. The share of debt services to foreign earnings is 28.9 percent in 2019. The tendency to increase public debt and spending in the last decade coupled with declining foreign earnings of the country created huge debt burden.

Figure 4.37: Pattern of total debt service (% of foreign earnings)



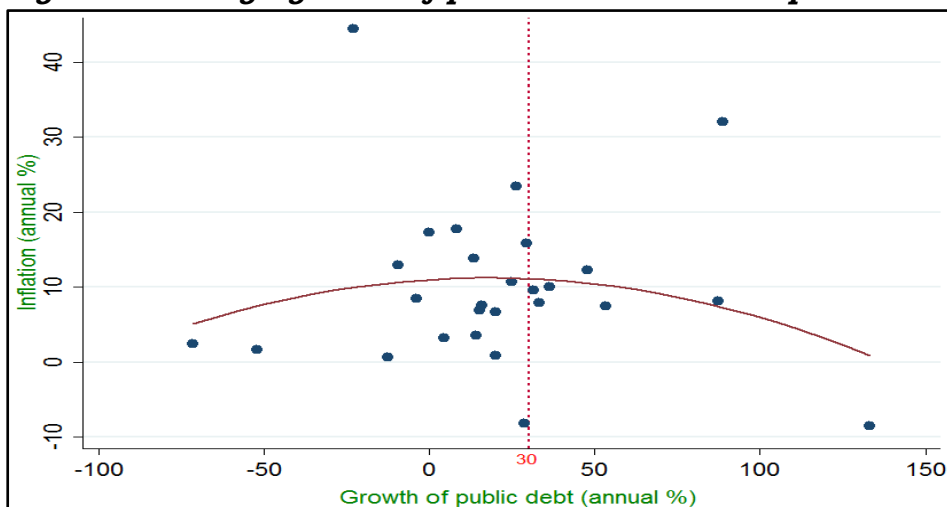
Source: Computed from data in the World Bank (2021).

The debt obligations Ethiopia is overcoming has strongly caused fiscal instability (Figure 4.38). Debt repayments have worsened the forex reserve constraint and aggravated fiscal instability. Negotiations of debt cancellations and additional concessional loans may help in realizing fiscal stability.

Figure 4.38: External debt burden causes fiscal instability

Source: Computed from data in the World Bank (2021).

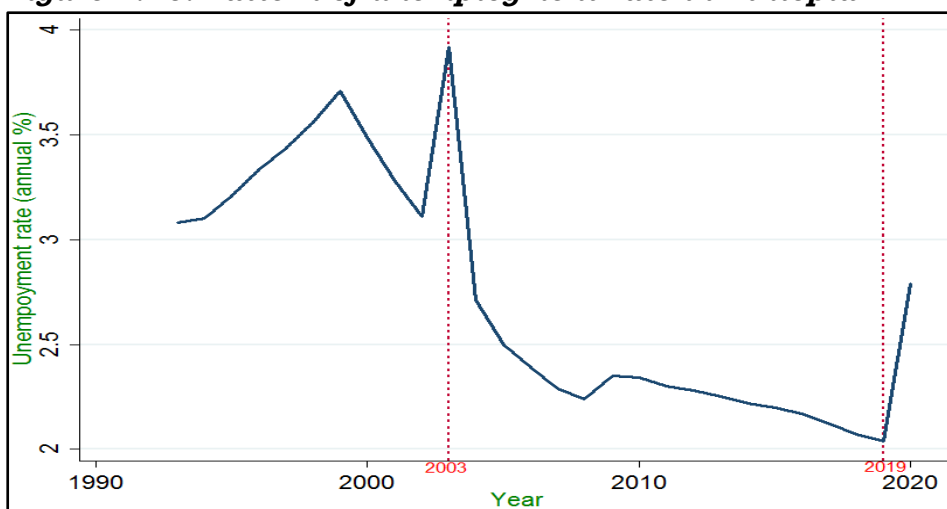
Public debt management of the government do have direct and/or indirect interaction with the practices of managing inflation. Price stability is a precondition for faster sustainable growth. Stability should contribute to creating an environment conducive to long-term financing of the public debt. The debt burden of the country is increasing over the period, indicating a mixed or nonlinear relationship with inflation (Figure 4.39). Higher growth of public debt (30% or more) somehow enables to stabilize prices in domestic markets. High growth in public debt may lead to more investment for more production of goods and services to increase aggregate domestic supply, leading to stable prices. However, lower growth of foreign debt (below 30%) rather aggravates inflation by creating scarcity of forex reserve required to import goods and services.

Figure 4.39: High growth of public debt stabilizes prices

Source: Computed from data in the World Bank (2021).

4.9. Unemployment

The rate of unemployment in Ethiopia was decreasing between 2003 and 2019 (Figure 4.40). However, this decreasing trend was rapidly reversed mainly due to the contraction in investment and recession arising from shocks the country has faced, including domestic violence, conflicts, and Covid-19 pandemic.

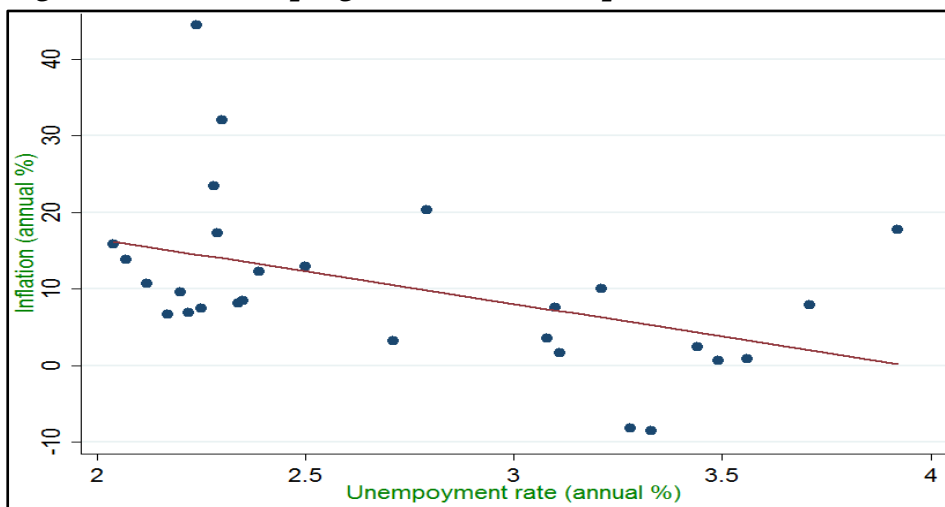
Figure 4.40: Pattern of unemployment rate in Ethiopia

Source: Computed from data in Macrotrends (2022).

Theoretically, inflation and unemployment have inverse relationship. Though this relationship breaks in many cases, employment (or unemployment) is one of the most important macroeconomic indicators closely monitored by governments for its likely effects on the overall economy.

The unemployment rate in Ethiopia is strongly and negative correlated with inflation (Figure 4.41). In order to stabilize prices and control inflation, determination of different unemployment rates in the production and service sectors may be appropriate for balancing aggregate supply and demand arising from investments and employment opportunities in the economy.

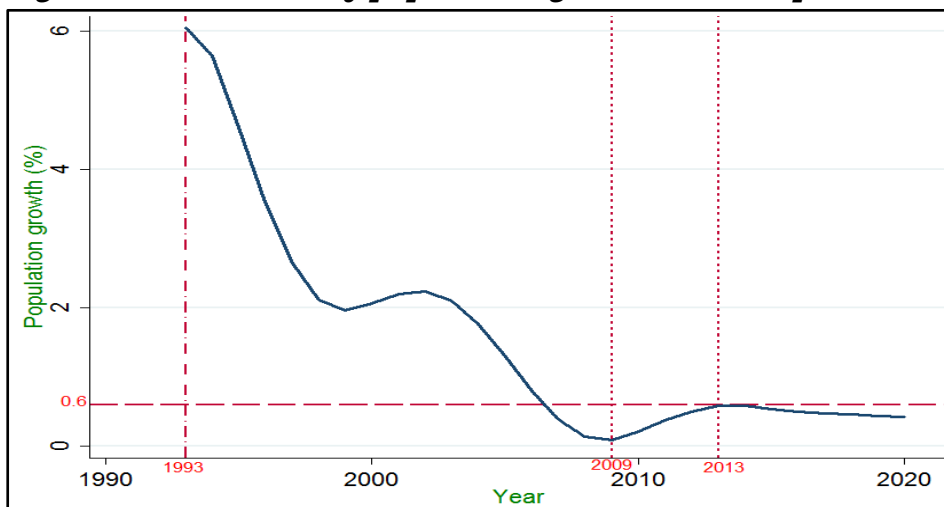
Figure 4.41: Unemployment stabilizes prices



Source: Computed from data in Macrotrends (2022) and The World Bank (2021).

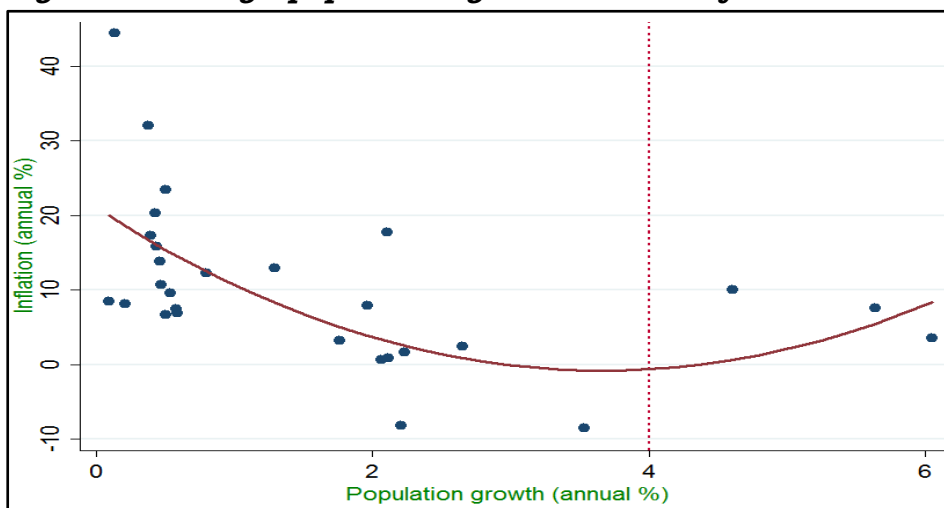
4.10. Population Growth

The relationship between population growth and inflation is nonlinear in many occasions. Population growth in Ethiopia has shown considerable decline over the last three decades, from six percent in 1993 to below 0.6 percent after 2013 (Figure 4.42). Control of population growth registered in the last three decades has substantial contribution to control aggregate demand and to stabilize prices.

Figure 4.42: Pattern of population growth in Ethiopia

Source: Computed from data in the World Bank (2021).

As expected, there is a systematic nonlinear relationship between inflation and annual growth of population in Ethiopia (Figure 4.43). For lower annual growth rates of population, inflation was significantly falling. For higher rates of annual population growth (4% or higher), however, inflation was rather aggravated or at least unrelated with population growth.

Figure 4.43: High population growth drives inflation

Source: Computed from data in the World Bank (2021).

5. DYNAMICS AND DETERMINANTS OF INFLATION

Based on the dynamics and its prevalence in a country, inflation is generally categorized into two types: walking and galloping. If the rate of annual price increase lies between 3 and 4 percent, it is considered as walking or moderate inflation. It is also common to call one-digit inflation as moderate. Moderate inflation is predictable and keeps confidence of citizens on the monetary system of the country. The confidence of people considerably falls if inflation gets out of control or the economy will be caught with galloping inflation or even hyperinflation.

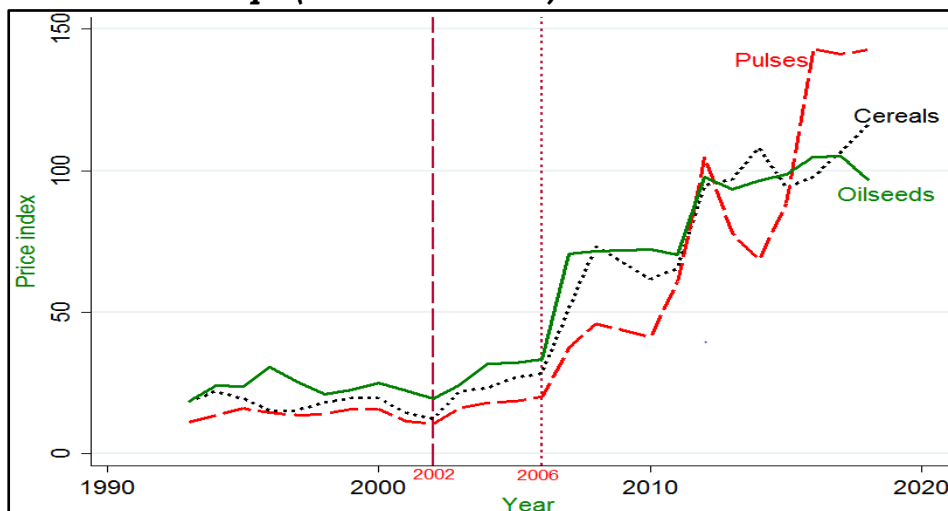
Walking inflation may be converted into running inflation, which is more dangerous. If it is not controlled, it may ultimately be converted to galloping or hyperinflation. Hyperinflation is an extreme form of inflation when an economy gets in inflationary trends with double or triple digits (15, 50, 150, etc.).

5.1. Inflation of Producer Prices

5.1.1. Price developments

Producer prices of major grain crops were increasing since 2002 and rapidly rising since 2006 which might have been aggravated by the global food price inflation prevailed since 2004/2005 (Figure 5.1). Prices of most of the grain crops follow nearly the same pattern with some fluctuations.

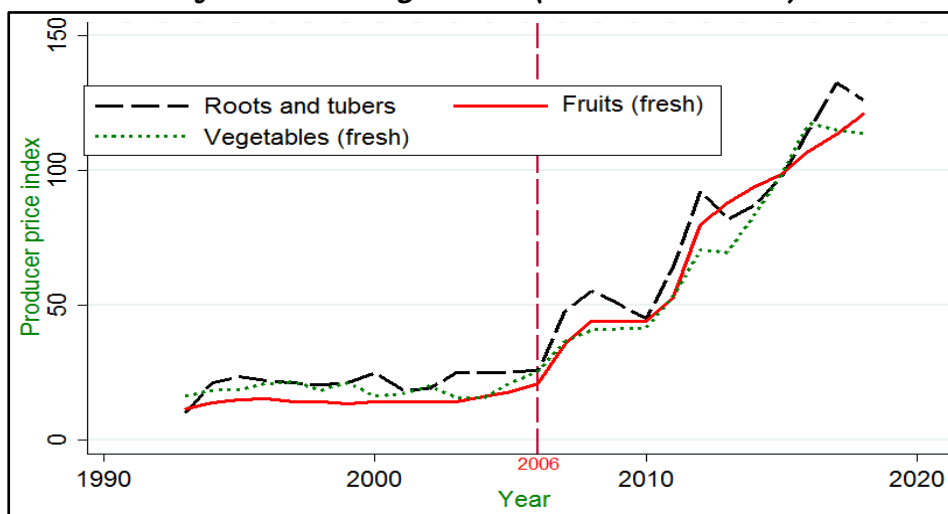
Figure 5.1: Trends of producer price indices of major grain crops (2014-2016=100)



Source: Computed from data in FAOSTAT (2021).

Producer prices of roots, fruits and vegetables have shown significant developments since 2006 (Figure 5.2). All of them follow nearly similar patterns with prices of grain crops.

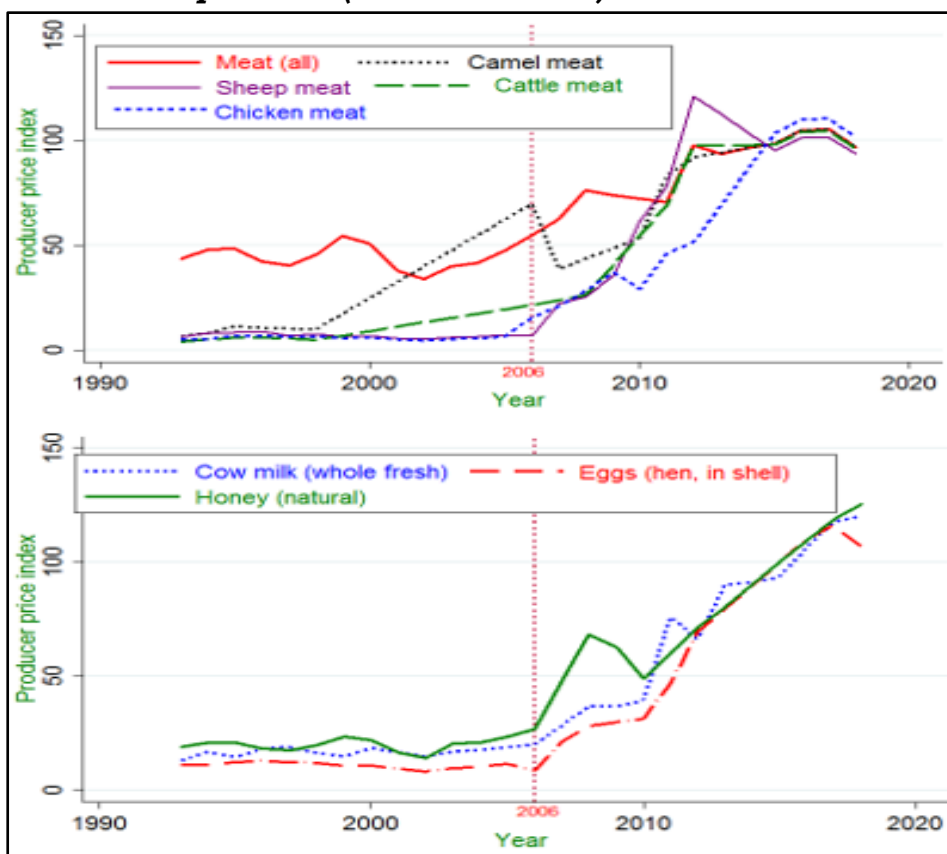
Figure 5.2: Trends of producer price indices of major roots, fruits and vegetables (2014-2016=100)



Source: Computed from data in FAOSTAT (2021).

Producer prices of livestock products (meat, milk, egg, and honey) were also rising since 2006 (Figure 5.3). The year 2006 was the period when inflationary process in the economy was visible. The price differences among livestock products were converging, leaving consumers without substitutes to change their consumption patterns.

Figure 5.3: Trends of producer price indices of major livestock products (2014-2016=100)



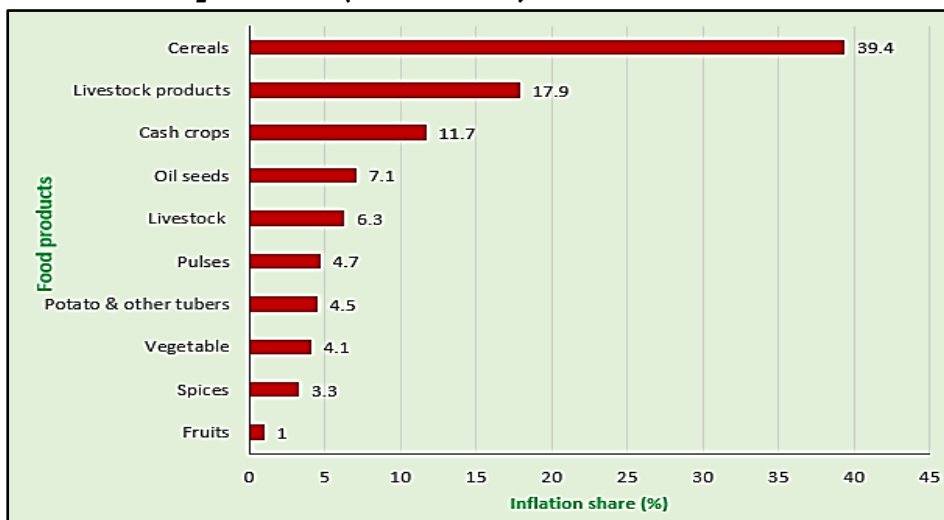
Source: Computed from data in FAOSTAT (2021).

5.1.2. Sources of inflation of producer prices

Decomposition of producer prices into their major components of agricultural products identifies the major sources and their relative importance in the inflation of agricultural products. Cereals and

livestock products alone caused 57 percent of producer price inflation of agricultural products (Figure 5.4). The top five sources of producer price inflation are cereals (39.4%), livestock products (17.9%), cash crops (11.7%), oilseeds (7.1%), and livestock (6.3%).

Figure 5.4: Sources of producer price inflation of agricultural products (2007-2016)

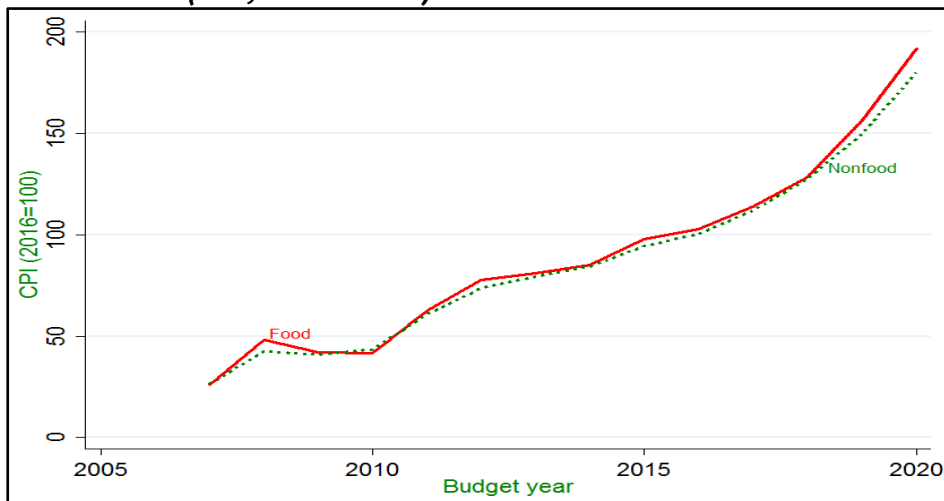


Source: Computed from data in CSA and NBE (2021).

5.2. Inflation Dynamics

Consumer prices in Ethiopia have shown considerable development since 2010 (Figure 5.5). Until 2010, inflation of food items was growing at a relatively lower rate than nonfood items. In the last decade, food prices were increasing at a faster rate than prices of nonfood items, indicating the relative higher burden of inflation on consumers.

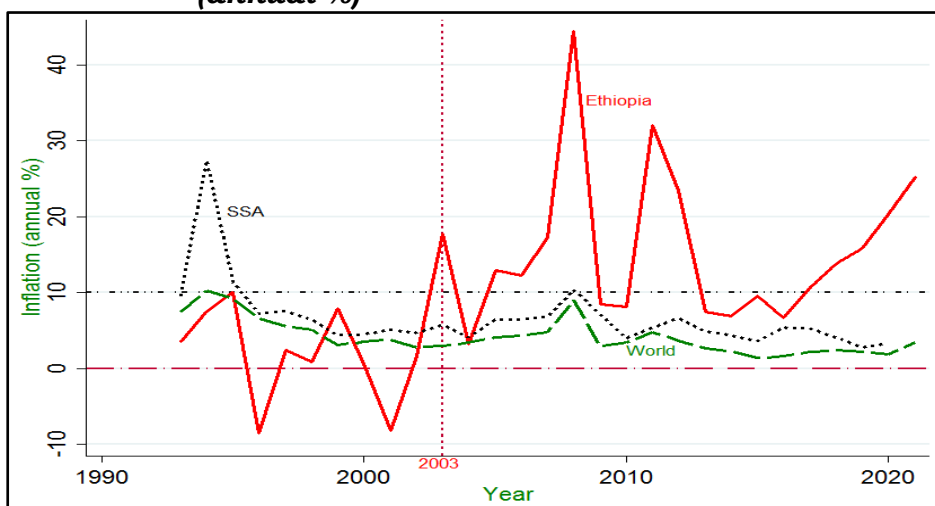
Figure 5.5: Differential patterns of food and nonfood inflation (CPI, 2016=100)



Source: Computed from data in NBE and CSA (2020).

The annual rate of inflation of consumer prices in Ethiopia is exceptionally higher compared to the SSA and world average inflation rates (Figure 5.6). After the 2004 (2003 budget year) global food crisis, prices in Ethiopia skyrocketed and remained two-digit thereafter. Ethiopia is not able to stabilize prices while the inflation rate in the rest of the world is single-digit over the last three decades.

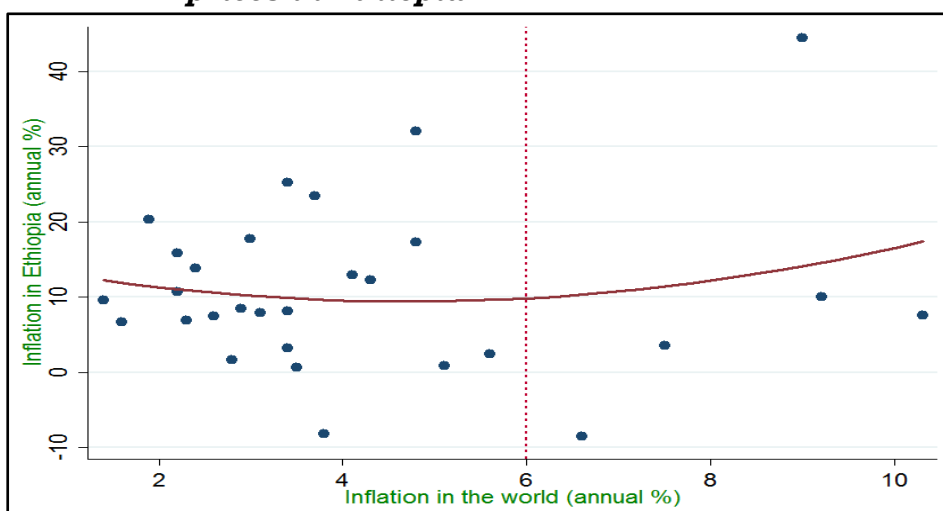
Figure 5.6: Patterns of inflation in Ethiopia and the world (annual %)



Source: Computed from data in the World Bank (2022).

Inflation in Ethiopia is commonly asserted to be imported from abroad. The empirical link between inflation in Ethiopia and the entire world shows nonlinear relationship (Figure 5.7). Consumer prices in Ethiopia tend to rise or adjust if the global inflation is over six percent. Because world prices are relatively and significantly lower over the last three decades, inflation in Ethiopia is mainly driven by domestic and other exogenous factors.

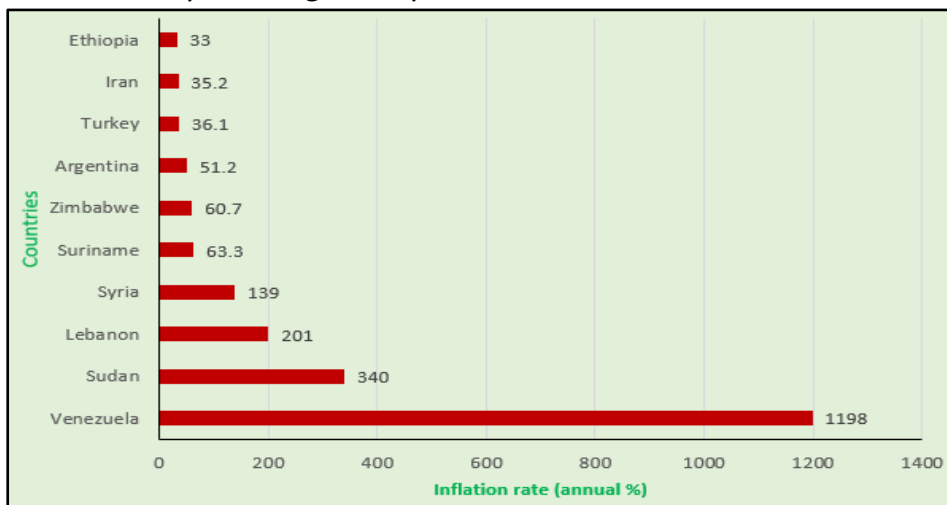
Figure 5.7: Inflation in the world does not significantly affect prices in Ethiopia



Source: Computed from data in the World Bank (2022).

Ethiopia has become one of the top 10 inflationary countries of the world in January 2022 (Figure 5.8). With 33 percent monthly inflation, Ethiopia falls under a group of countries adversely affected by economic sanctions (Iran & Zimbabwe), domestic conflicts (Syria & Sudan), contracting economies (Venezuela & Suriname) and inflationary but growing economies (Turkey and Argentina).

Figure 5.8: Top 10 inflationary countries of the world (January 2022)



Source: Computed from data in Trading Economics (2021).

5.3. Decomposition of Inflation

About 57 percent of the general inflation in Ethiopia is attributable to prices of food and non-alcoholic beverages, while the remaining 43 percent arises from inflation of nonfood items (Table 5.1). Because the share of food expenditure is higher for consumers in the lower income quintiles, it is generally expected that inflation in Ethiopia has created relatively more burden on the poor.

Table 5.1: Contribution of food and non-food components to general inflation (2008-2021)

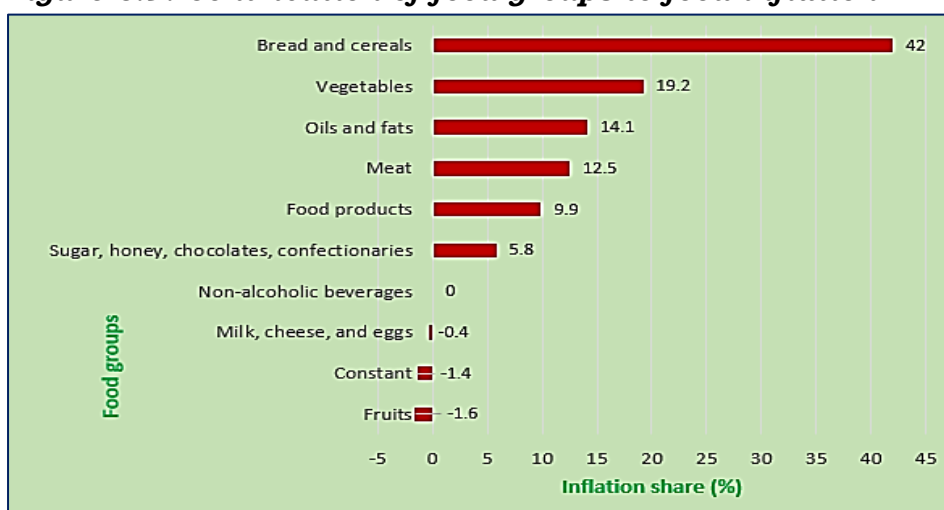
| Sources of general inflation | Inflation shares (%) | Relative contribution (%) |
|----------------------------------|----------------------|---------------------------|
| Food and non-alcoholic beverages | 56.7 | 57.6 |
| Non-food components | 43.3 | 42.4 |
| Constant | 0 | 0 |
| Residual | 0 | 0 |

Note: Regression-based decomposition is used to estimate the relative contribution of predicted components.

Source: Computed from data in NBE and CSA (2020).

Decomposition of inflation of food prices into its nine major food groups estimates the relative importance of each food group in causing inflation (Figure 5.9). The top five food items contributing more to the food price inflation are bread and cereals (42%), vegetables (19.2%), oils and fats (14.1%), meat (12.5%), and food products (9.9%). On the other hand, three food groups (fruits, milk, cheese and eggs, and non-alcoholic beverages) have rather stabilization effects on consumer prices of food.

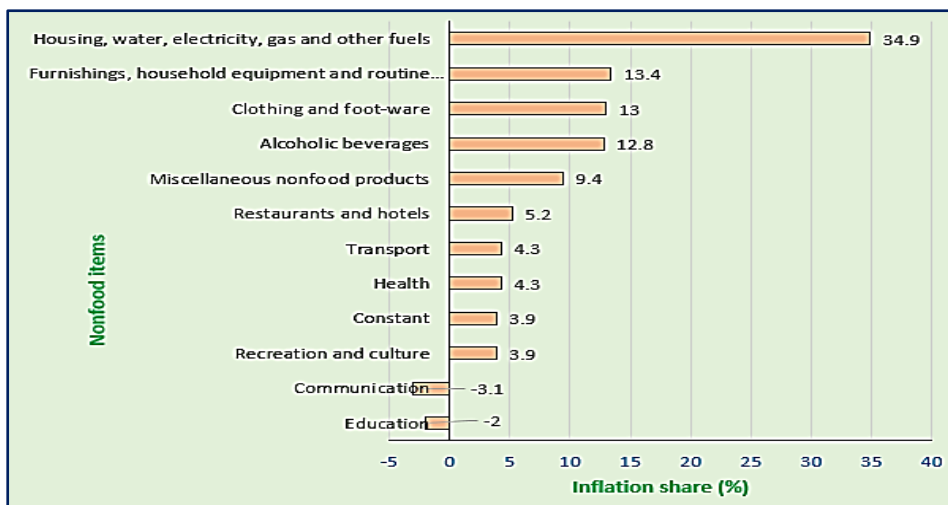
Figure 5.9: Contribution of food groups to food inflation



Source: Computed from data in NBE and CSA (2020).

Similarly, decomposition of nonfood inflation into 11 groups indicates the top three sources of nonfood inflation to be housing, water, electricity, gas and other fuels (34.9%); furnishings, household equipment and routine maintenance of house (13.4%); and clothing and foot-ware (13%) (Figure 5.10). The results show the huge burden of inflation on the welfare of people related to housing and housing facilities. Prices of education and communication have price stabilization roles in the economy.

Figure 5.10: Contribution of non-food components to non-food inflation



Note: Due to lack of data, fish price inflation is not considered in the analysis.
Source: Computed from data in NBE and CSA (2020).

5.4. Determinants of Inflation

Based on the investigation of potential causes of inflation using differential diagnosis and decomposition methods, the econometric model of inflation was fitted by stepwise regression (Table 5.2). The generalized least squares (GLS) methods of Prais-Winsten and Cochrane-Orcutt regression model was tested for six assumptions of the residuals with and without Cochrane-Orcutt transformation: (a) Single-lag OLS of residuals; (b) Single-lead OLS of residuals; (c) Autocorrelation of residuals; (d) Durbin-Watson; (e) Adjusted autocorrelation; and (f) Adjusted Durbin-Watson. Based on the test results, single-lead OLS of residuals was identified to be the relevant assumption to estimate the model. In terms of their contributions to the inflation dynamics, top six potential causes⁴ of inflation were selected for parametric analysis.

⁴ If data are available, other potential longrun determinants of inflation dynamics might include expenditure, taxes and subsidies, input prices, investment, productive capacity, productivity, exports, credit and debit, forex reserve, governance, to mention a few. The link between inflation and such variables with data gaps are analyzed by nonparametric methods as indicated in previous sections of the document.

Table 5.2: GLS estimation and decomposition results of inflation dynamics

| Explanatory variables (%) | Coefficients | Inflation share (%) |
|----------------------------|--------------|---------------------|
| Growth of agricultural GDP | -0.465** | -21.8 |
| Growth of industrial GDP | 0.169 | 18.7 |
| Growth of service GDP | 0.915** | 72.9 |
| Growth of money supply | 0.962*** | 189.9 |
| Saving rate | 2.286 | 141.5 |
| Lending rate | -3.745*** | -450.8 |
| Constant | 10.950 | 149.5 |
| Adjusted R ² | 0.651 | - |
| D-statistic (transformed) | 2.210 | - |

Notes: ***, **, and *, respectively, denote 1%, 5% and 10% significance levels.

Source: Computed from data in the World Bank (2021).

The model has passed all other important tests of serial autocorrelation. The D-statistic used to test serial correlation is about 2.21, verifying that there is no autocorrelation problem adversely interfering with the model fitness. This inflation model of six variables explains about 65 percent of the dynamics of annual inflation in Ethiopia. Growth of industrial output and saving rate were found to be statistically insignificant to explain the inflation dynamics. The shares of longrun determinants estimated by regression-based decomposition method shows that agriculture and lending rate are the only variables stabilizing prices.

Growth of agricultural GDP: Annual growth of real agricultural GDP, as expected, significantly and negatively affects inflation. As agricultural output increases, aggregate domestic supply increases and stabilizes consumer prices. A unit percentage increase in annual growth of agricultural output leads to 0.47 percent decline in inflation. One of the primary supply-side causes of inflation in Ethiopia is identified to be slow growth of agriculture. The contribution of agricultural growth on price stabilization was below 22 percent. Boosting agricultural output is expected to fill the supply shortfall and stabilize consumer prices.

Growth of service GDP: Growth of service GDP and annual inflation are positively and strongly related. The faster growth in aggregate demand was primarily caused by the growth in the service sector where consumers were able to spend more in a consumer market continuously constrained by supply shortfalls. A unit percentage growth in the service GDP leads to 0.92 percent rise in consumer prices. The service sector was highly inflationary contributing about 73 percent of inflation dynamics in Ethiopia. This structural problem arising from the disequilibrium in supply and demand (or the mismatch between aggregate supply and demand) requires both short- and long-term policy measures to tackle the inflationary trend in Ethiopia.

Growth of money supply: Growth of money supply and annual inflation are positively related. A unit percentage growth in money supply causes consumer prices to rise by 0.96 percent. About 190 percent of inflation of consume prices was attributable to the annual growth of money. The demand for and supply of money determines the cost of capital and thereby the price of goods and services. The government should optimize the supply of money and use monetary instruments for controlling prices.

Lending rate: Lending interest rate and annual inflation have inverse and significant relationship. A unit percentage increase in lending rate causes consumer prices to fall by 3.75 percent. Its price stabilization effect was very high, about 451 percent, which shows that very high lending rates were constraining investment and aggravating unemployment, thereby reducing disposable income of citizens and stabilizing consumer prices⁵.

⁵ The net effect on inflation due to adjustment in saving and lending rates (lending rate minus saving rate) an important indicator to measure the net effect of interest rates on inflation. It is advisable to identify the optimal level of saving and lending rates which may enable to stabilize prices and control inflation in Ethiopia.

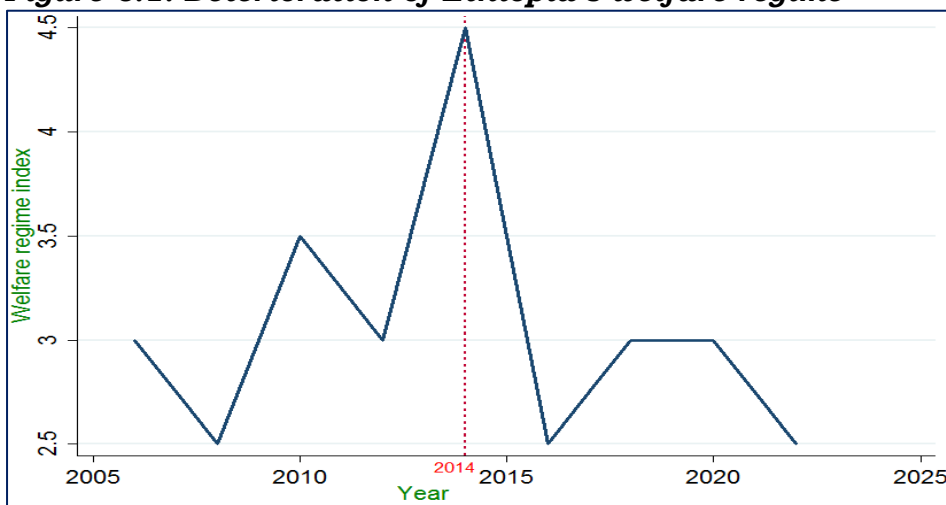
6. EFFECTS OF INFLATION

One of the major expected effects of inflation is income and wealth redistribution. This income and wealth redistribution is expected to differently affect households in different socioeconomic settings.

6.1. Welfare Regime

Inflation adversely affects welfare at different levels. The welfare regime index produced by the BTI for Ethiopia shows the highest value at 4.5 (out of 10) in 2014 (Figure 6.1). Since the start of pronounced inflationary period in Ethiopia, welfare regime of the country was falling until it reaches the minimum value at 2.5, which is interpreted as flawed welfare regime.

Figure 6.1: Deterioration of Ethiopia's welfare regime

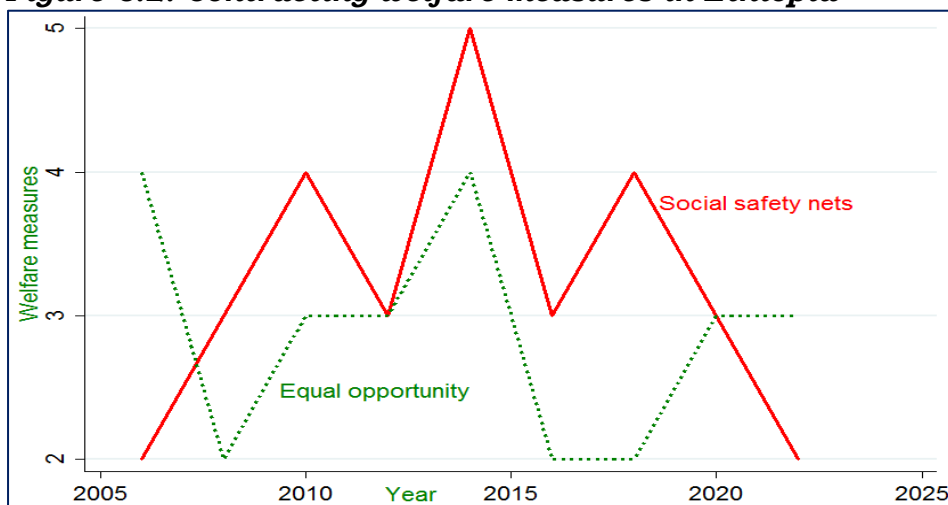


Source: Computed from BTI data in Bertelsmann Stiftung (2022).

Welfare interventions undertaken by a country can be in the form of social safety nets and equal opportunities available to citizens. The pattern of these two welfare measures in Ethiopia indicates the same declining tendency with the welfare regime presented above (Figure 6.2). The index for social safety nets in 2022 is two (2 out of 10), suggesting that social safety nets were rudimentary covering only few

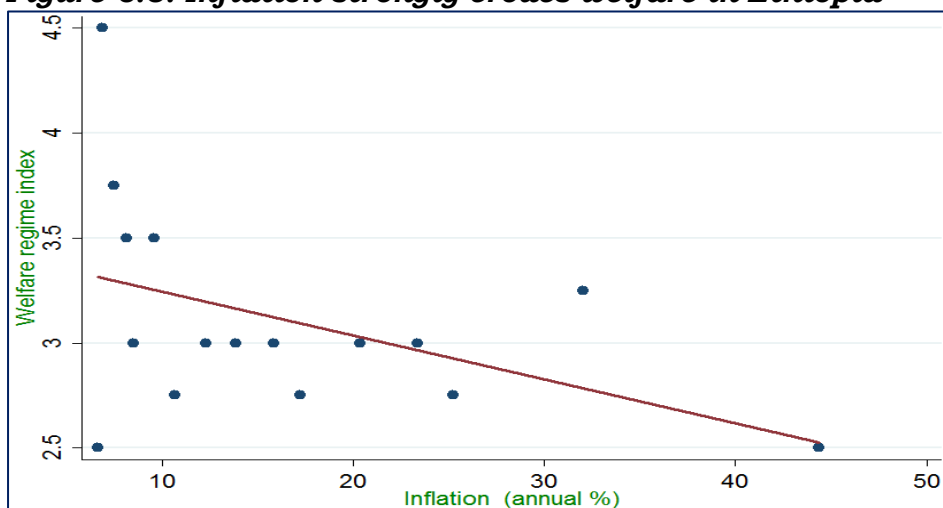
risks for a limited number of beneficiaries but majority of the population at risk of poverty. The index for equal opportunities is also three in 2022, which shows that ‘equality of opportunity is not achieved and implementation of legal provisions against discrimination is highly deficient’.

Figure 6.2: Contracting welfare measures in Ethiopia



Source: Computed from BTI data in Bertelsmann Stiftung (2022).

As expected, the empirical link between welfare regime and inflation is strongly negative (Figure 6.3). Inflation in Ethiopia strongly erodes the welfare citizens. To lessen the adverse effects of inflation., the government and other stakeholders need to give due focus on the identification of the most disadvantaged population subgroups and initiate relevant welfare measures.

Figure 6.3: Inflation strongly erodes welfare in Ethiopia

Source: Computed from BTI data in Bertelsmann Stiftung and World Bank.

6.2. Consumption Effects

6.2.1. Effects across regions

Inflation has differentiated effects on real income and consumption expenditure of households across regions (Table 6.1). With the exception of Benishangul-Gumuz and Gambella regions and urban centers (Addis Ababa, Dire Dawa, Harari), households in other regional states have experienced significant decline in real consumption. The top five regions with high welfare loss are SNNP (-20.3), Oromia (-20%), Tigray (-19.9%), Amhara (-19.6%), and Afar (-15.7%).

Table 6.1: Changes in real consumption expenditure per capita across regions (between 2015 and 2018/2019)

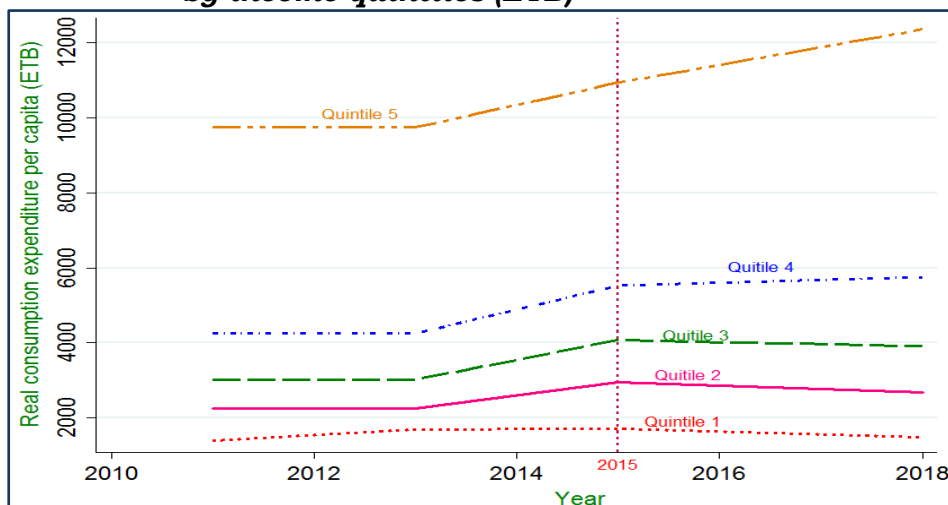
| Region | Real expenditure per capita (ETB) | | % Change |
|-------------------|--------------------------------------|------|----------|
| | 2015 | 2018 | |
| Addis Ababa | 6222 | 8629 | 38.7 |
| Benishangul-Gumuz | 3548 | 4730 | 33.3 |
| Harari | 5514 | 7349 | 33.3 |
| Dire Dawa | 5591 | 6439 | 15.2 |
| Gambella | 4562 | 4827 | 5.8 |
| Somali | 4563 | 4298 | -5.8 |
| Afar | 5496 | 4632 | -15.7 |
| Amhara | 4928 | 3960 | -19.6 |
| Tigray | 6037 | 4835 | -19.9 |
| Oromia | 5722 | 4576 | -20.0 |
| SNNP | 5223 | 4161 | -20.3 |
| National | 5337 | 5257 | -1.5 |

Source: Computed from data in the World Bank (2015, 2019).

6.2.2. Effects by income quintiles

Inflation has differential effects on households with different income levels. Households with lower income are disproportionately affected by inflation in Ethiopia. Households in the higher quintiles have rather enjoyed increasing real expenditure due to inflation, witnessing its redistribution effects (Figure 6.4).

Figure 6.4: Patterns of real consumption expenditure per capita by income quintiles (ETB)



Source: Computed from data in the World Bank (2011, 2013, 2015, 2019).

The visible changes in real consumption expenditure per capita between 2015 and 2018/2019 show that households in the first three quintiles have experienced significant decline in their real expenditure and faced significant welfare loss (Table 6.2). Real expenditure of households in the lowest income quintile was reduced by about 13.4 percent. On the other hand, households in the highest income quintiles benefited from the inflationary trend in the country. Real expenditure of households in the highest income quintiles was increased by 13.0 percentage points over the period.

Table 6.2: Changes in real consumption expenditure per capita by income quintiles (between 2015 and 2018/2019)

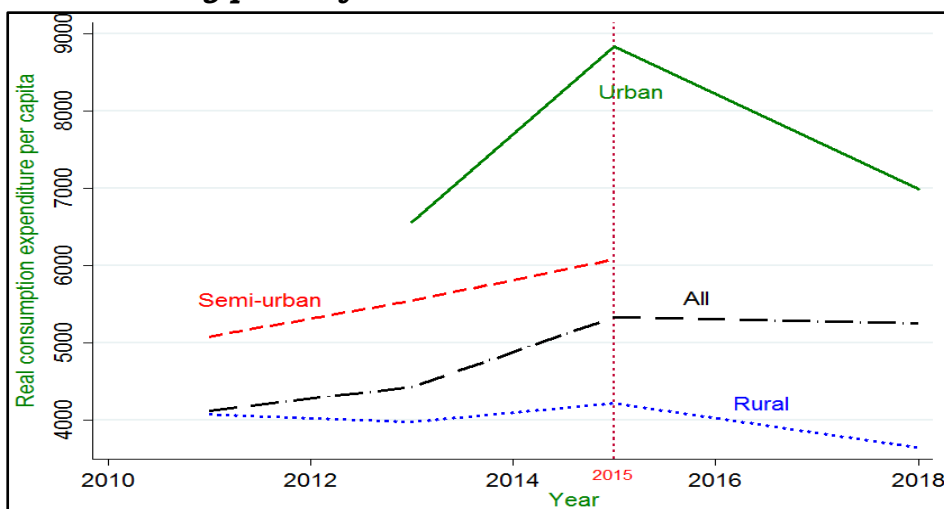
| Income quintiles | Expenditure (ETB) | | % Change |
|------------------|-------------------|-------|----------|
| | 2015 | 2018 | |
| Quintile 1 | 1706 | 1477 | -13.4 |
| Quintile 2 | 2955 | 2681 | -9.2 |
| Quintile 3 | 4068 | 3907 | -4.0 |
| Quintile 4 | 5526 | 5751 | 4.1 |
| Quintile 5 | 10942 | 12364 | 13.0 |
| All | 5337 | 5257 | -1.5 |

Source: Computed from LSMS data in the World Bank (2015, 2019).

6.2.3. Effects by area of residence

The inflationary trend in Ethiopia has disproportionately affected households in rural and urban areas (Figure 6.5). Urban households have relatively experienced rapid decline of real consumption expenditure compared to their rural counterparts.

Figure 6.5: Patterns of household real expenditure per capita by place of residence



Source: Computed from LSMS data of the World Bank (2011, 2013, 2015, 2019).

6.3. Poverty Effects

During inflationary periods, people generally experience rise in incomes. However, some people experience net gain during inflation at the expense of others. Some individuals gain because their money incomes rise more rapidly than the market prices and some lose because prices rise more rapidly than their incomes. Thus, inflation redistributes income and wealth among households in different income groups.

6.3.1. Poverty rates

The last decade (since 2011) in Ethiopia can be termed as the period of inflation. The poverty estimates during this period show considerable rise in poverty among rural households from 27.4 percent in 2011 to 47.1 percent in 2018/2019 (Table 6.3). On the other hand, urban households have experienced a rise of poverty rate from 19.1 percent in 2013 to 22.5 percent in 2018/2019. Overall, the country has faced a rise of household relative poverty rate from 27.2 percent in 2011 to 35.2 percent in 2018/2019. The results show that inflation in Ethiopia has clear effects on income redistribution between households in rural and urban areas.

Table 6.3: Trends of relative poverty by place of residence

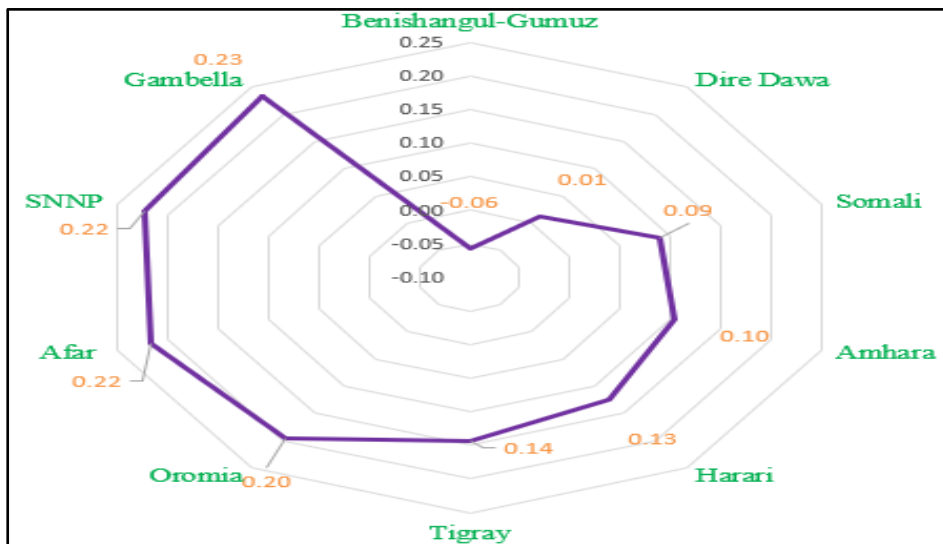
| Place of residence | Survey year and poverty index | | | |
|--------------------|-------------------------------|-------|-------|-------|
| | 2011 | 2013 | 2015 | 2018 |
| Rural | 0.274 | 0.225 | 0.236 | 0.471 |
| Semi-urban | 0.231 | 0.170 | 0.191 | - |
| Urban | - | 0.191 | 0.152 | 0.225 |
| National | 0.272 | 0.217 | 0.220 | 0.352 |

Note: 50% of the population mean expenditure is used as a relative poverty line.

Source: Computed from LSMS data of the World Bank (2011, 2103, 2016, and 2019).

Regional states in Ethiopia have also experienced the redistribution effects of inflation during the period (Figure 6.6). The top five regions with high relative poverty changes due to income losses between 2011 and 2019 are Gambella (23%), SNNP and Afar (22%), Oromia (20%), and Tigray (14%).

Figure 6.6: Changes in relative poverty rates across regions (between 2011 & 2019)



Source: Computed from LSMS data in the World Bank (2011, 2103, 2016, 2019).

6.3.2. Elasticity of poverty

The responsiveness of poverty with respect to growth was declining from two percent in 2011 to 1.2 percent in 2018/2019 (Table 6.4). Elasticity of poverty with respect to inequality was higher in 2011 and 2013 but declined to 0.3 percent in 2018/2019. The economic growth in Ethiopia has certainly reduced poverty but aggravated by the growing inequality, though the marginal effect is decreasing over time. The main source of poverty in Ethiopia is expected to be the income growth arising from economic growth. During the inflation period, poverty has become less elastic to economic growth.

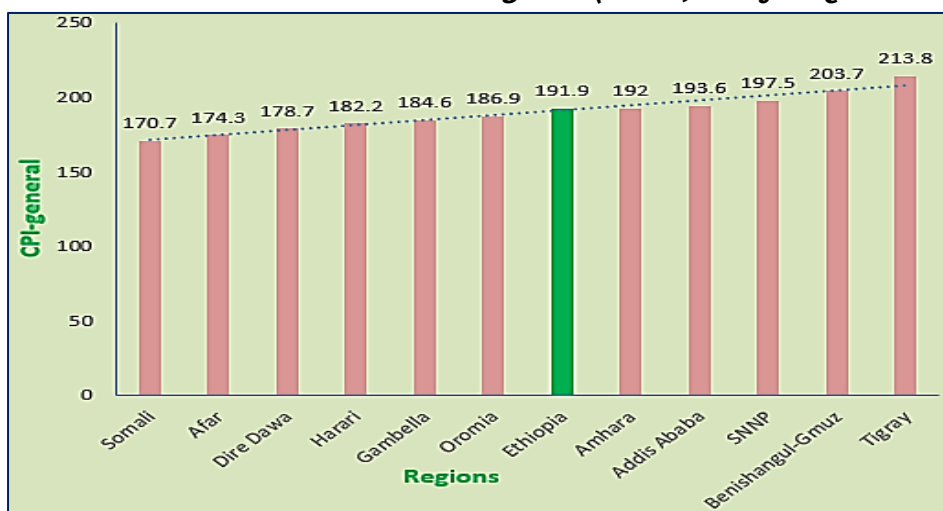
Table 6.4: Elasticity of poverty with respect to growth and inequality

| Survey year | Poverty elasticity with respect to (%) | |
|-------------|--|------------|
| | Growth | Inequality |
| 2011 | -1.988 | 4.104 |
| 2013 | -2.639 | 4.856 |
| 2015 | -1.965 | 1.796 |
| 2018/19 | -1.167 | 0.327 |

Source: Computed from data in the World Bank (2011, 2103, 2016, and 2019).

6.4. Regional Effects

The regional distribution of inflation shows its differential effect on consumers across regions (Figure 6.7). In the third quarter of 2021, the top five regions with very high inflation were Tigray (213.8), Benishangul-Gumuz (203.7), SNNP (197.5), Addis Ababa (193.6), and Amhara (192). The CPI for these regions was higher than the national average (191.9). Regions in eastern Ethiopia (Somali, Afar, Dire Dawa and Harari) were rather relatively better off in coping up with the effects of inflation. The results suggest the need for differentiated policy measures suitable to regional contexts.

Figure 6.7: Differential effects of general inflation on consumers across regions (2021, CPI for Quarter 3)

Source: Computed from data in NBE (2020).

7. CONCLUSION AND RECOMMENDATIONS

Under this section, the major findings of this study and their policy implications are summarized.

7.1. Conclusion

This study critically investigates the structural problems of the Ethiopian economy to identify the binding constraints driving inflation and the associated effects. About 43 macroeconomic variables hypothesized to affect the Ethiopian economy are assessed in six dimensions including, supply, demand, goods market, financial market, governance, and the socioeconomic environment. To conduct the diagnostics, the study utilized timeseries data covering the last 30 years (1993-2022). National and global official sources of secondary data are widely utilized to investigate the dynamics of these variables over the period. Due focus is given to ensure quality, reliability, consistency, and relevance of data used in the assessment.

Several methods of data analysis are employed depending on the nature of data obtained. Nonparametric methods including tabulation, graphics, differential diagnostics (such as shadow prices and benchmarking or comparative analysis), food balance sheet, distributive analysis of poverty and inequality, and Gini decomposition are widely employed. Macroeconomic variables with adequate sample size are analyzed by parametric methods such as generalized least squares (GLS) and regression-based decomposition of aggregates variables.

The diagnostic results show that the major constraints driving inflation in the supply-side are contracting agricultural and industrial production and supply, low productive capacity and absence of economic transformation, limited rights and access to land, lack of innovation inputs and outputs in production, low and contracting imports, shortage of forex reserve and excessive and untariffed devaluation of local currency, high taxes and import tariffs on international trade, and increasing domestic violence and conflicts. These variables have adversely affected production, domestic aggregate supply, or distribution of available supply and

caused inflation of producer and consumer prices. Monetary and fiscal instability, excessive money supply, low saving and high lending interest rates, contracting investment (local and FDI), growth of private income and expenditure, contracting export sector, and corruption are also identified as the major drivers of inflation in Ethiopia.

The diagnostics of both supply- and demand-side constraints has also enabled identification of the binding constraints and entry points for possible reform measures. Accordingly, eight binding constraints and drivers of inflation are identified: (1) Low productive capacity; (2) Limited access and rights to land; (3) Negative real interest rates; (4) High import tariffs; (5) Domestic violence and conflicts; (6) High growth of money supply; (7) Corruption; and (8) Low innovation. Relaxation of these binding constraints is expected to boost production and supply, stabilize prices, and address associated growth and development challenges in Ethiopia.

Inflation of both producer and consumer prices are observed in Ethiopia. Greater proportion of inflation of agricultural producer prices are mainly attributable to cereals, livestock products, and cash crops. On the other hand, inflation of food and nonfood items, respectively, contribute 57 percent and 43 percent to general inflation. The top five sources of food price inflation are identified to be bread and cereals, vegetables, oils and fats, meat and food products. Housing and basic utilities, furnishing and household equipment, clothing and foot-ware, and alcoholic beverages are the top sources of inflation of nonfood items.

Inflation in Ethiopia has multiple and differentiated effects across population subgroups, regional states, and areas of residence. The inflationary trend has considerably and adversely affected the major regional states. Real consumption expenditure was substantially reduced due to inflation in SNNP, Oromia, Tigray, Amhara, and Afar. Households in the lowest three income quintiles were differently and adversely affected by inflation. They have experienced a welfare loss ranging from -13.4 to -4.0 percent. On the other hand, those households in the highest two income quintiles have rather enjoyed 4.0 to 13 percent welfare gains.

Because inflation redistributes income and wealth, it causes changes in relative poverty situation of citizens. Relative poverty rate increased in both rural and urban areas. Changes in relative poverty rates were estimated to be higher in Gambella, SNNP, Afar, Oromia, and Tigray. Elasticity of poverty to income growth was negative, which verifies adverse effects of inflation on the effectiveness of poverty intervention measures. Thus, measures designed to control inflation are required take into count the prevalence and distribution of poverty across regions.

7.2. Recommendations

Inflation in Ethiopia is proven to be structural and multidimensional primarily caused by the imbalance between aggregate supply and aggregate demand. The Ethiopian economy is supply-constrained wherein economic contraction in many sectors and subsectors is observed with inflationary trends. Economic contraction or recession with inflation is a clear indication of economic stagnation arising from inappropriate economic policies. There are seven binding constraints identified for policy intervention and reform options: low productive capacity; limited access and rights to land; negative real interest rates; high import tariffs; domestic violence and conflicts; corruption; and low innovation. Both short-term and long-term interventions are suggested to address the inflationary challenge in Ethiopia. The following measures require policy interventions and reforms at different time horizons:

7.4.1. Immediate measures

To manage the adverse effects of inflation and to control the complications arising from disintegrated reform measures taken so far, the following measures may be taken in the very short-run.

Supply and Price Stabilization Board (SPSB)

Supply and Price Stabilization Board (SPSB) should be established to formulate supply management of strategic goods and services, design and implement price stabilization schemes, and prepare anti-

inflation guidelines and directives of fighting inflation. The Board may particularly play roles of inflation targeting; formulation and validation of welfare measures to be undertaken; measurement of reform effects; and coordination of reform activities undertaken by different institutions. The Board might have 3-5 years of operation.

Franco valuta

The government should allow franco valuta for importing strategic commodities such as pharmaceuticals, construction materials, food staples (with shortfalls in domestic supply), agricultural and industrial inputs, and technological products. This measure is expected to increase imports of consumer and capital goods for boosting production and supply within a short period, consequently leading to stable prices. It also allows the government to save its limited forex reserve to allocate for selected strategic imports.

Saving and lending rates

For the financial market to play its role in addressing the inflationary challenge, bank interest rates need to be revised. To realize growth in the context of expansionary economic policy and to relax the supply-side constraints through investment, revision of bank interest rates plays vital roles. Raising saving rates and reducing lending rates will ensure positive real interest rates for enhancing investment and boosting production and supply, leading to stable prices.

Import tariffs

Import tariff is the most important factor of domestic price determination of imported goods. Optimal tariffs will ensure reasonable prices of imports in domestic markets. If import tariffs are excessively high, production costs and consumer prices will inflate, making outputs and consumer goods more inflationary, which will aggravate stagnation of firms using imported inputs. Reducing import tariffs will ensure increased imports, fill supply shortfalls in domestic markets, and reduce input prices, leading to stable prices.

Domestic violence and conflicts

Increased incidence of domestic violence and conflicts adversely and strongly affect production and distribution of outputs. It also affects investment where production and supply are increasingly constrained. Controlling domestic violence and conflicts will boost production and supply for ensuring smooth distribution of goods and services and increasing FDI, aid, and development assistance, thereby relaxing the forex reserve constraint the country is strongly challenged.

7.4.2. Medium- and long-term measures

The following reform measures may be taken in the short-run but their effects may be realized in the medium- and long-term time horizons.

Productive capacity

The Ethiopian economy is identified to be supply-constrained mainly caused by low and contracting productive capacity. The annual growth of productive capacity of the country was contracting which is the result of inappropriate economic policies and other shocks. Contracting productive capacity is found to cause inflationary trends. Natural capital, institutions, energy, and the private sector are contracting and affecting productive capacity of the country. The negligible role of the private sector in the production process also requires due policy focus without which economic growth and transformation is less likely. Elasticity of natural capital, energy, institutions, and the private sector over the last two decades are negative. Improving multidimensional productive capacity is required to increase production and supply. There is an urgent need to improve policies related to land resource management and availability, increase access and use of energy, the way institutions are organized and operating, and to widely engage the private sector in the production process and other economic activities.

Rights and access to land

Land is a vital livelihood asset and indispensable resource for the enjoyment of human rights. Land is the primary factor of production in all economic sectors and subsectors including agriculture, manufacturing, and construction. Equitable access and rights to land gives long-term incentives to invest and save, improves access to important public services, allows for more productive use of time and money, facilitates use of land for collateral, and contributes to social stability and good local governance. Addressing the existing binding constraints related to rights and access to land in Ethiopia will ensure productive use of land and boost production in all sectors for increasing domestic supply of goods and services.

Innovation

Knowhow and technology are the primary binding constraints for production and economic transformation in Ethiopia. However, the country is one of the bottom 10 countries of the world in innovation. It is ranked the bottom third and 107th in input and outputs innovations, respectively. The pattern of innovation is also continuously declining, which is an indication of increasingly constrained economic growth and transformation. Ethiopia is required to use innovation inputs and produce innovation outputs and ensure growth and sustainability of productivity, competitiveness of exports, and structural and economic transformation.

Corruption

Corruption contributes to inflationary trends arising from corrupt practices. It is rapidly increasing and driving the inflationary trend in Ethiopia. Inflation and growth of corruption are found to be strongly linked. In order to reduce inequality, improve accountability and political responsiveness, avoid frustration and adversity among citizens, control illegal and immoral tactics, and to ultimately minimize the adverse effects on growth and investment, Ethiopia is highly required to formulate implementable policy for fighting against corruption.

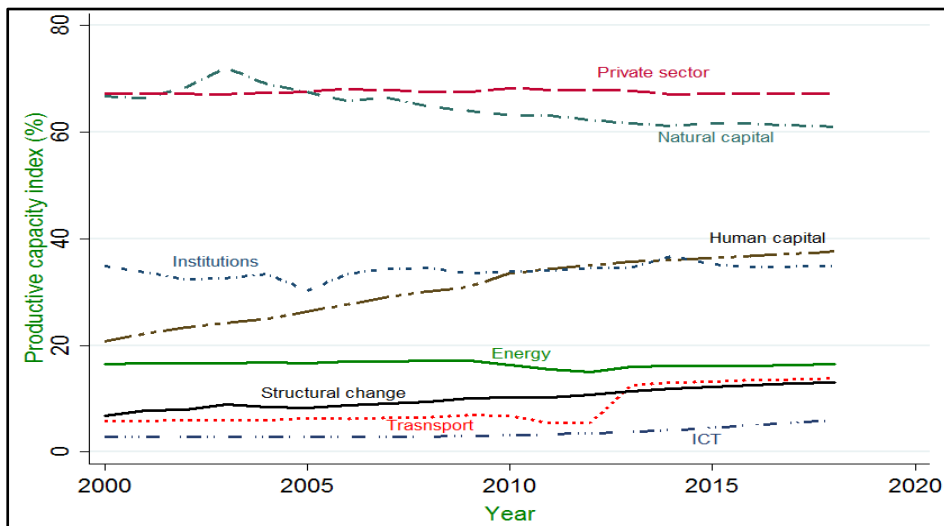
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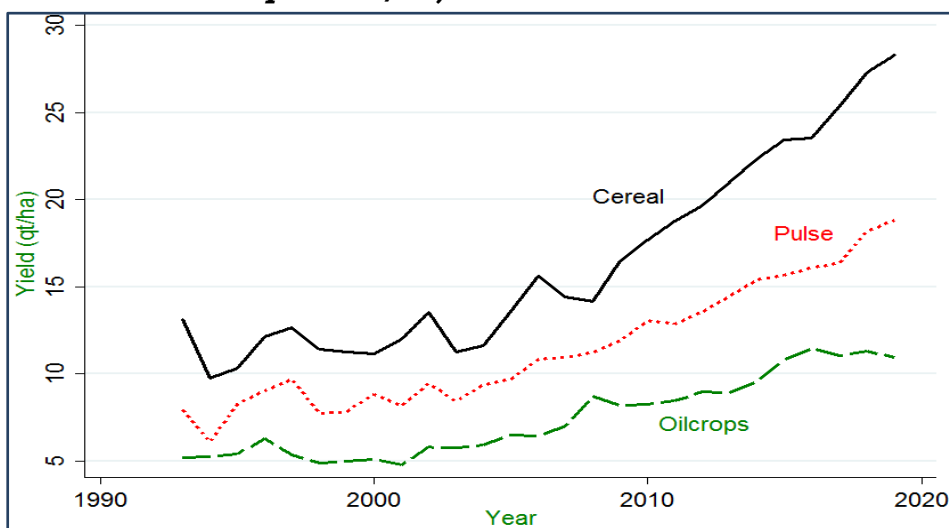
Annex Figures

Annex Figure 1: Relative dynamics of productive capacities of Ethiopia



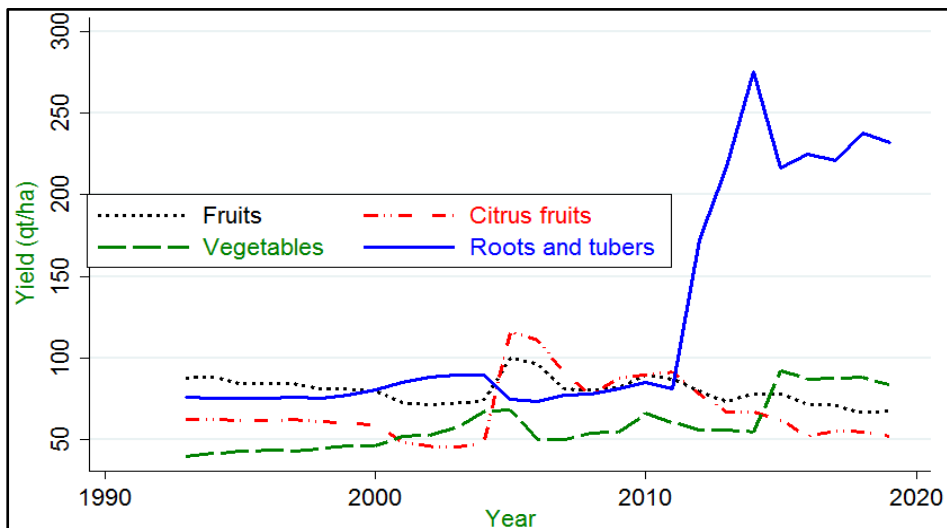
Source: Computed from data in UNCTAD (2022).

Annex Figure 2: Productivity trends of grain crops (yield, quintals/ha)



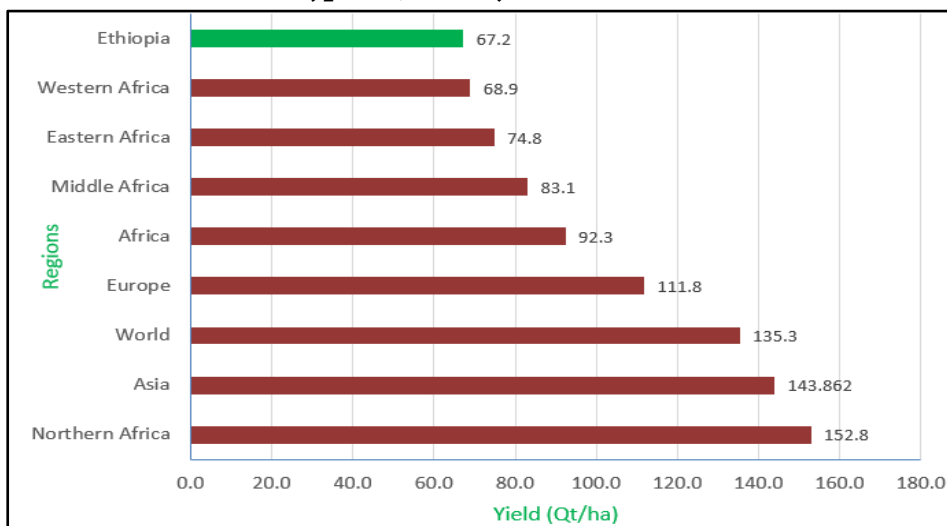
Source: Computed from data in FAOSTAT (2021).

Annex Figure 3: Productivity trends of major roots, fruits and vegetables (quintals/ha)



Source: Computed from data in FAOSTAT (2021).

Annex Figure 4: Relative status of fruit productivity in Ethiopia (qt/ha, 2019)



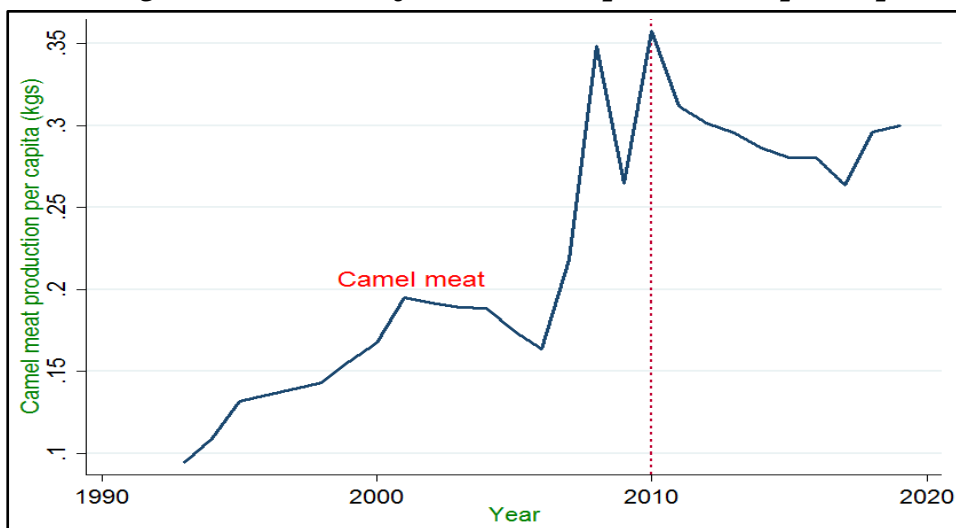
Source: Adapted form data in the Global Economy (2021).

Annex Figure 5: Pattern of shoat meat production per capita (kg)



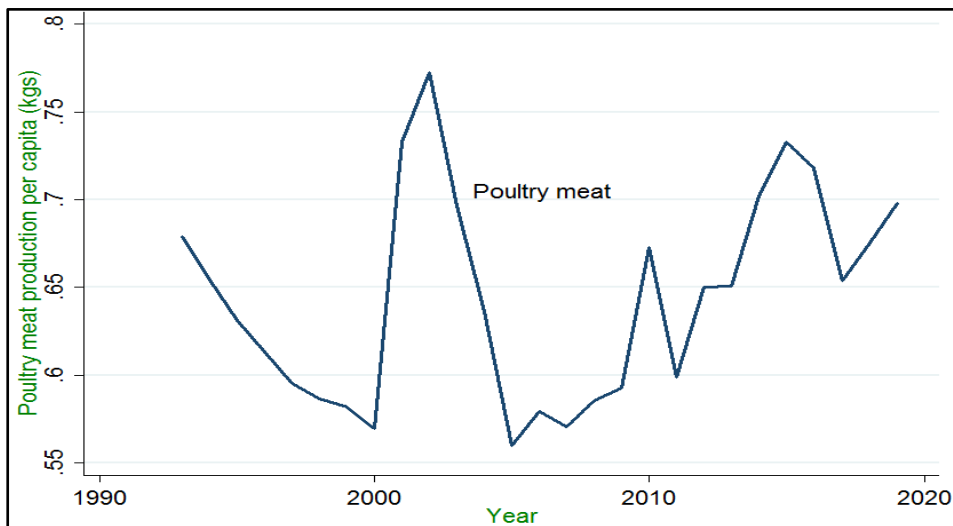
Source: Computed from data in FAOSTAT (2021).

Annex Figure 6: Pattern of camel meat production per capita (kg)



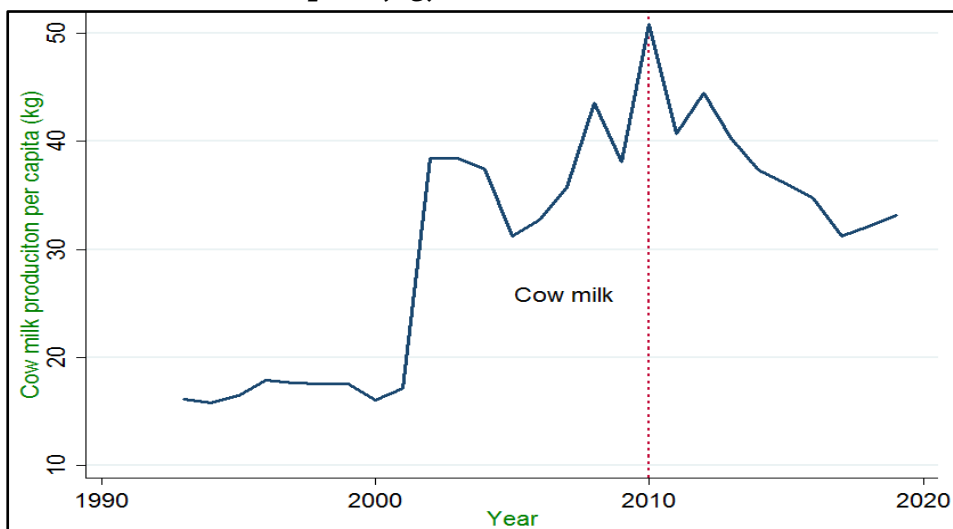
Source: Computed from data in FAOSTAT (2021).

Annex Figure 7: Cyclic fluctuations of poultry meat production per capita (kg)



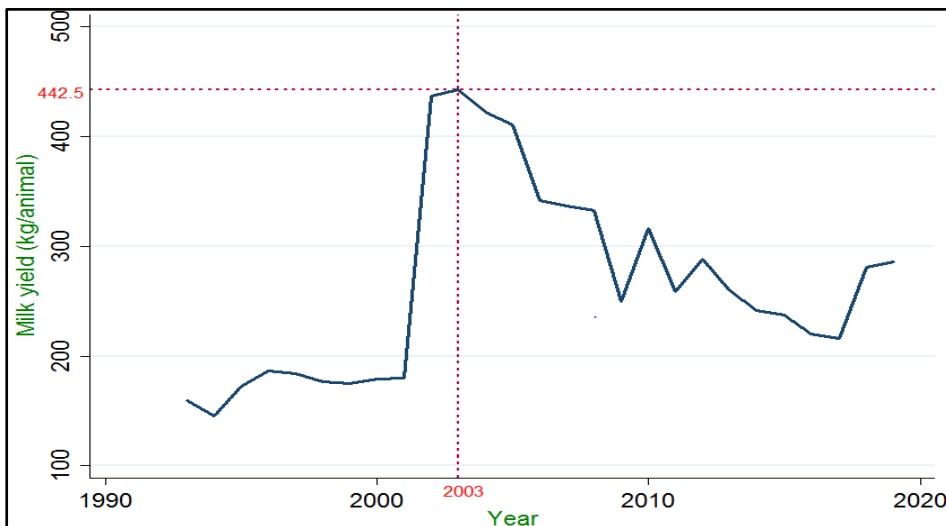
Source: Computed from data in FAOSTAT (2021).

Annex Figure 8: Decreasing trend of cow milk production per capita (kg)



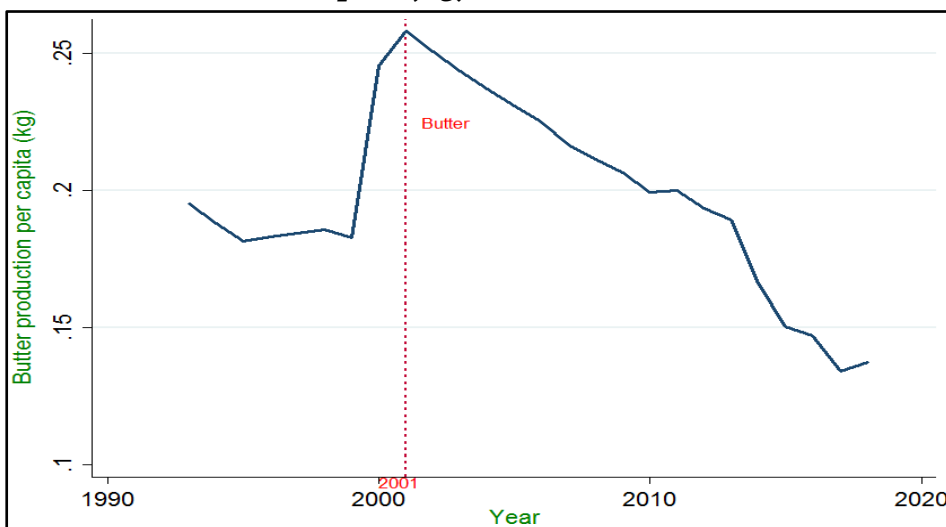
Source: Computed from data in FAOSTAT (2021).

Annex Figure 9: Decreasing cow milk productivity trend (kg/animal)



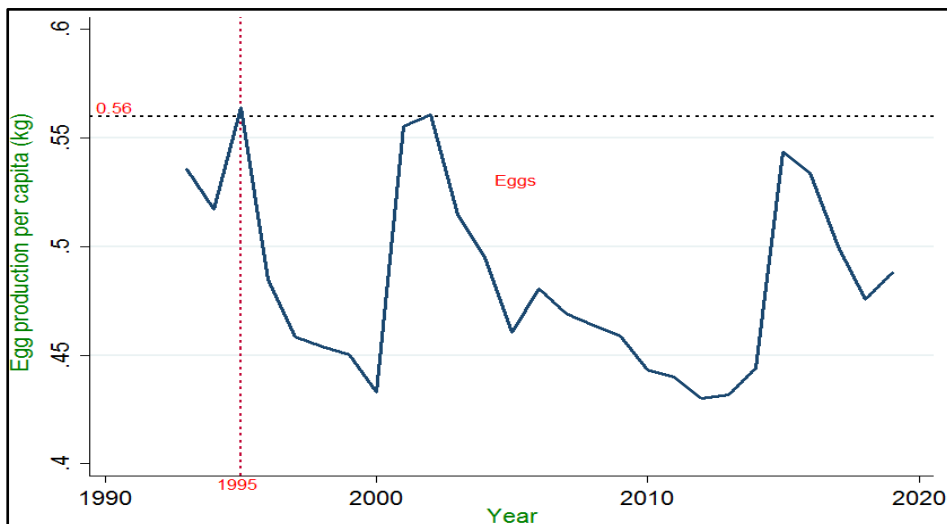
Source: Computed from data in FAOSTAT (2021).

Annex Figure 10: Decreasing trend of butter production per capita (kg)



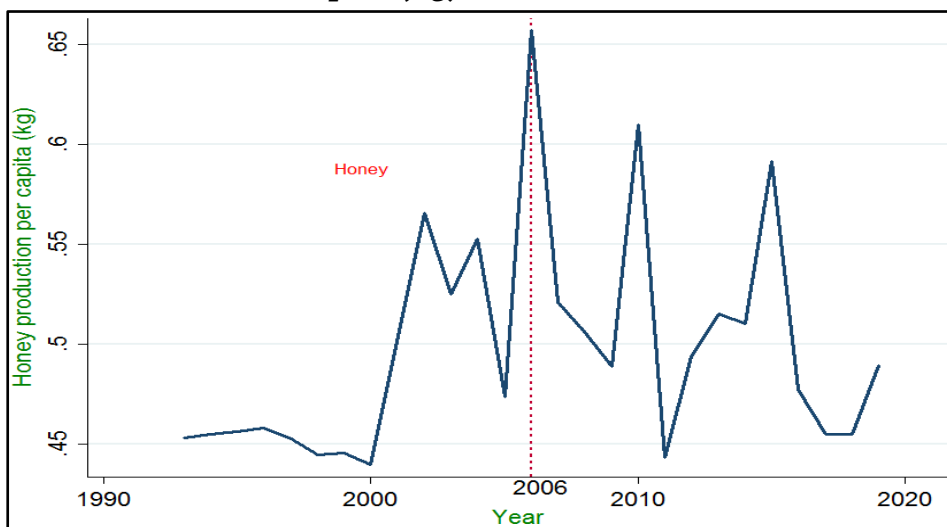
Source: Computed from data in FAOSTAT (2021).

Annex Figure 11: Decreasing and fluctuating trend of egg production per capita (kg)



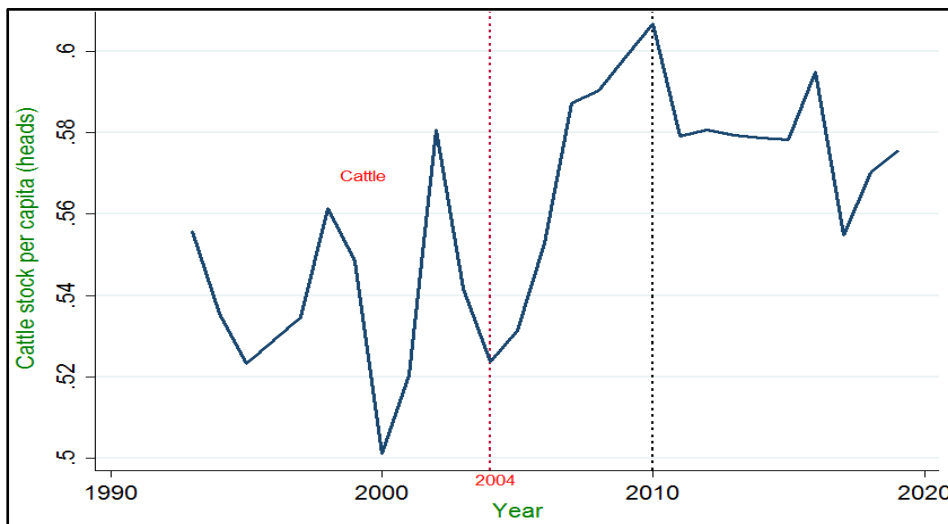
Source: Computed from data in FAOSTAT (2021).

Annex Figure 12: Cyclic fluctuations of honey production per capita (kg)



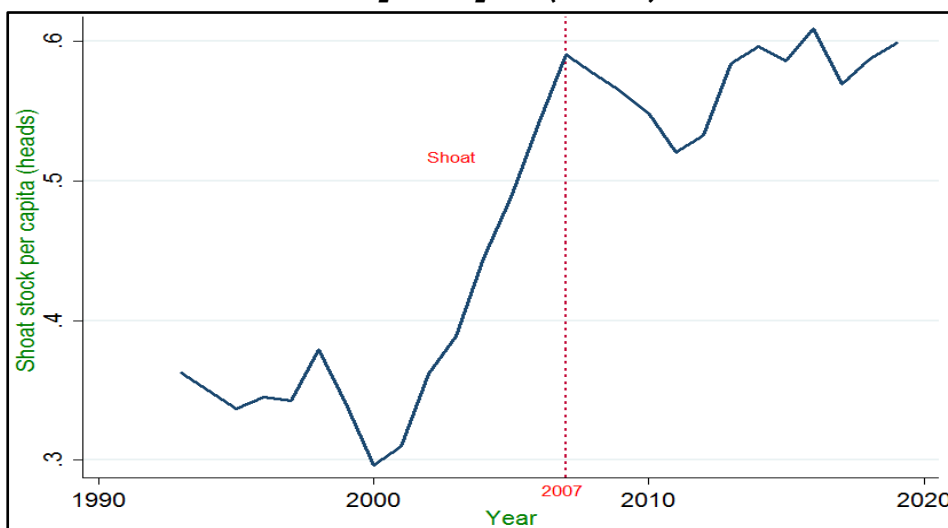
Source: Computed from data in FAOSTAT (2021).

Annex Figure 13: Increasing and fluctuating patterns of cattle stock per capita (heads)



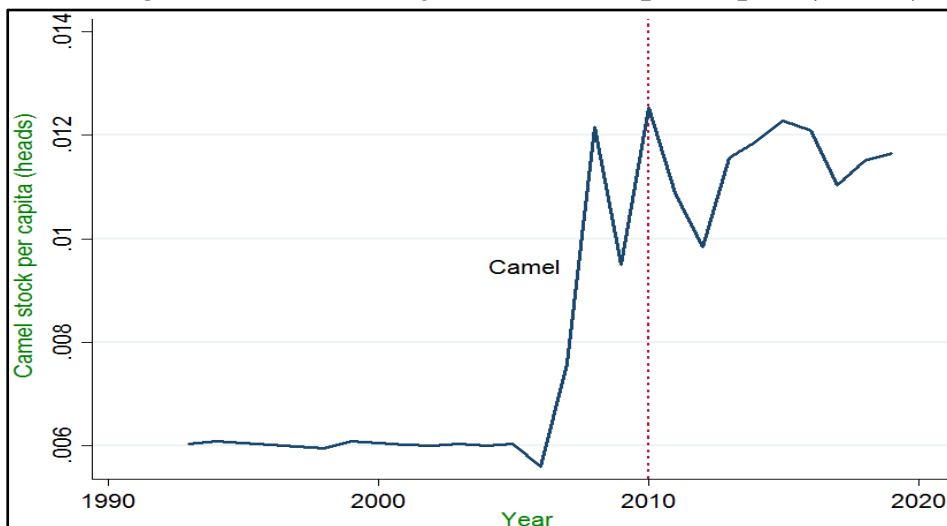
Source: Computed from data in FAOSTAT (2021).

Annex Figure 14: Increasing and fluctuating patterns of shoat stock per capita (heads)



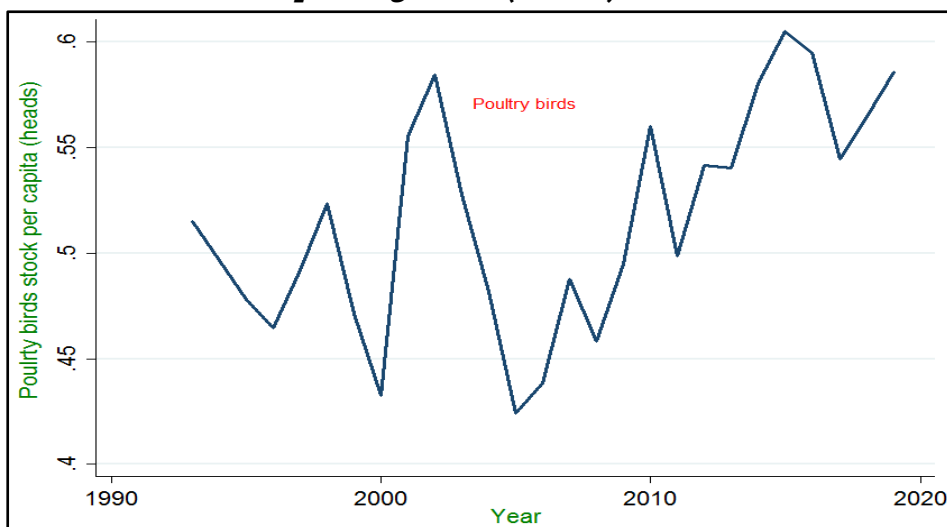
Source: Computed from data in FAOSTAT (2021).

Annex Figure 15: Pattern of camel stock per capita (heads)



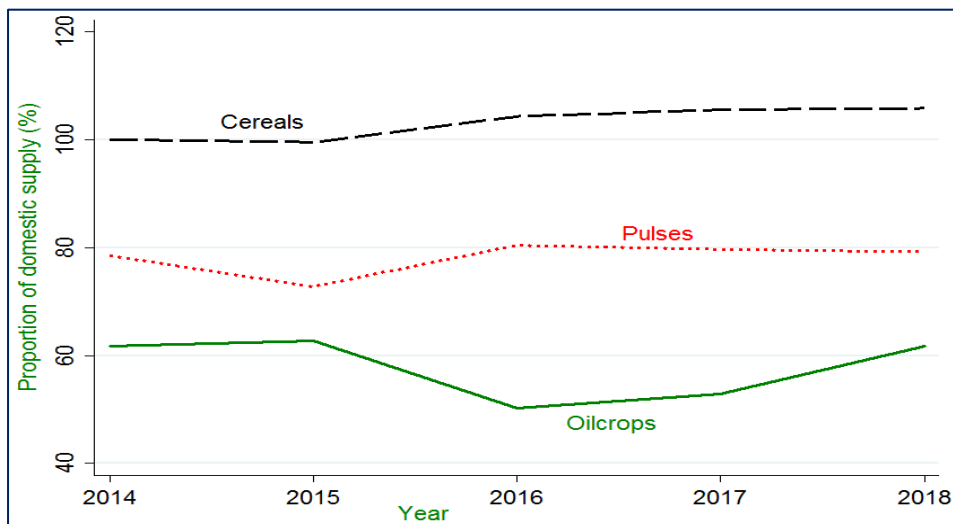
Source: Computed from data in FAOSTAT (2021).

Annex Figure 16: Fluctuating patterns of stock per capita of poultry birds (heads)



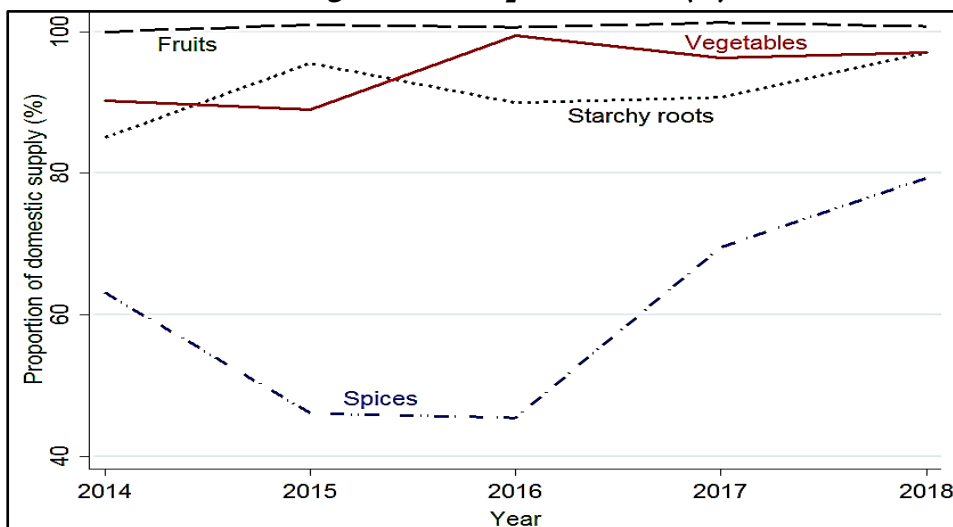
Source: Computed from data in FAOSTAT (2021).

Annex Figure 17: Proportion of domestic grain supply to production (%)



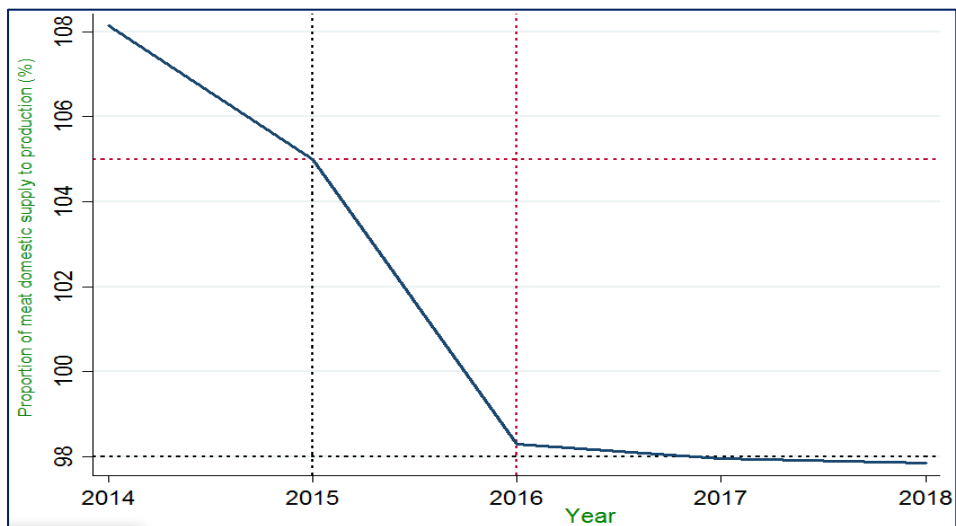
Source: Computed from data in FAOSTAT (2021).

Annex Figure 18: Proportion of domestic supply of roots and vegetables to production (%)



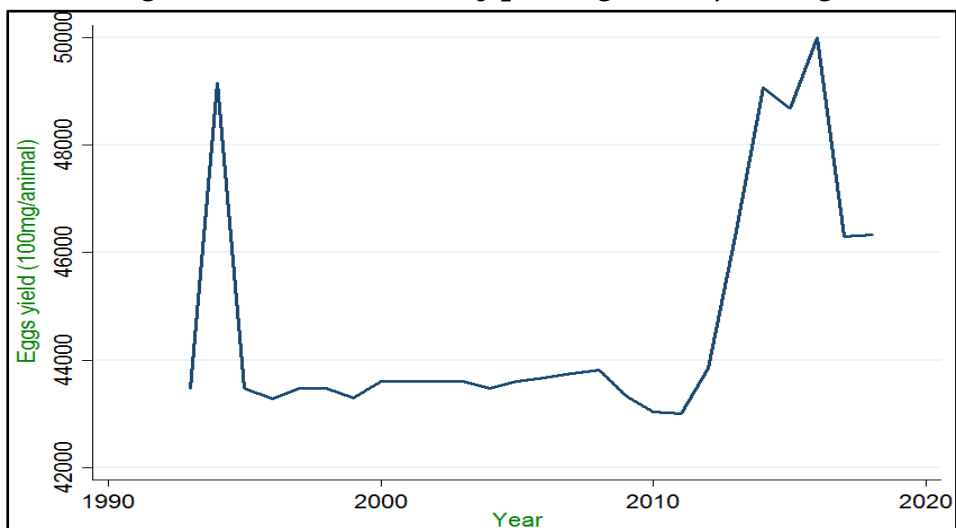
Source: Computed from data in FAOSTAT (2021).

Annex Figure 19: Proportion of domestic supply of meat to production (%)



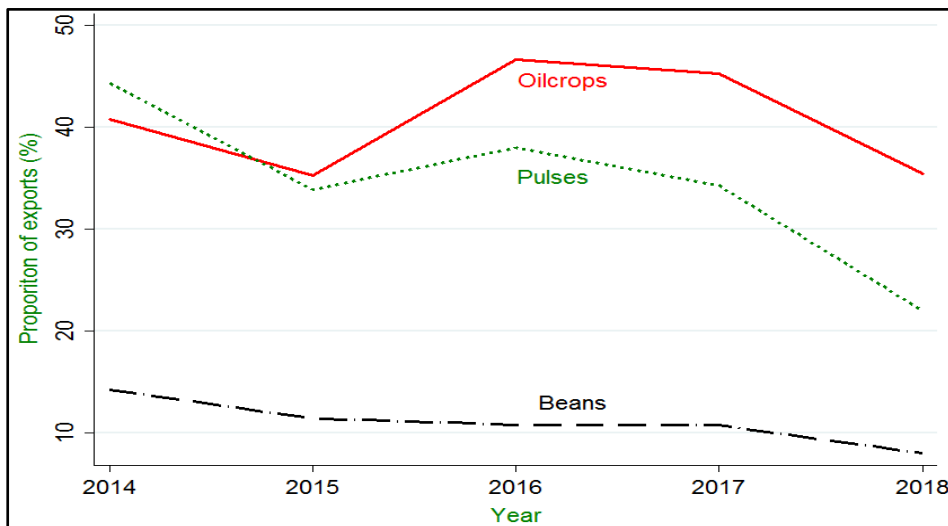
Source: Computed from data in FAOSTAT (2021).

Annex Figure 20: Yield trend of poultry meat (100 mg/animal)



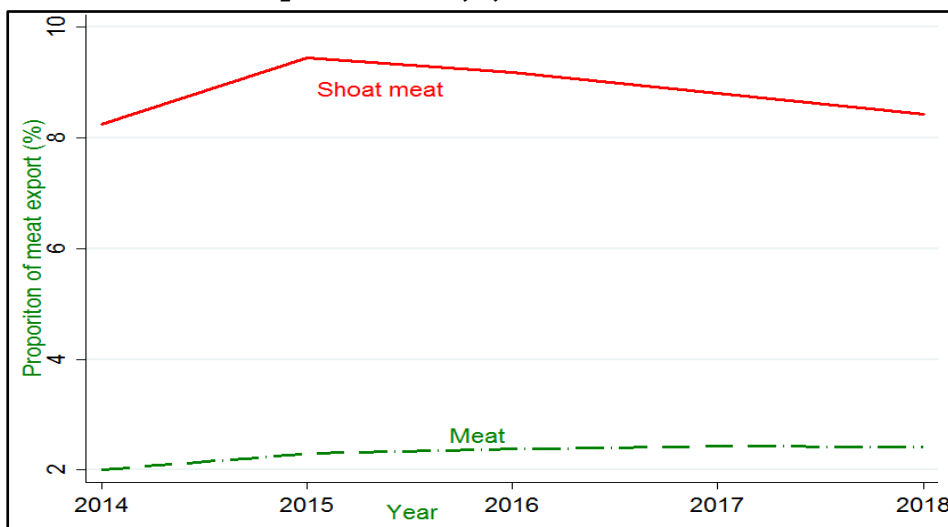
Source: Computed from data in FAOSTAT (2021).

Annex Figure 21: Proportion of export quantity of major grain crops produced (%)



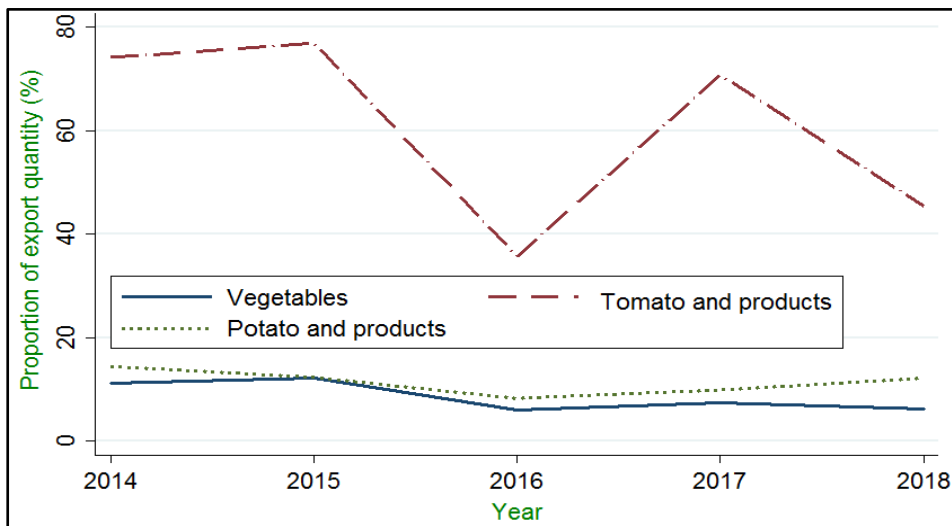
Source: Computed from data in FAOSTAT (2021).

Annex Figure 22: Proportion of meat export quantity to production (%)



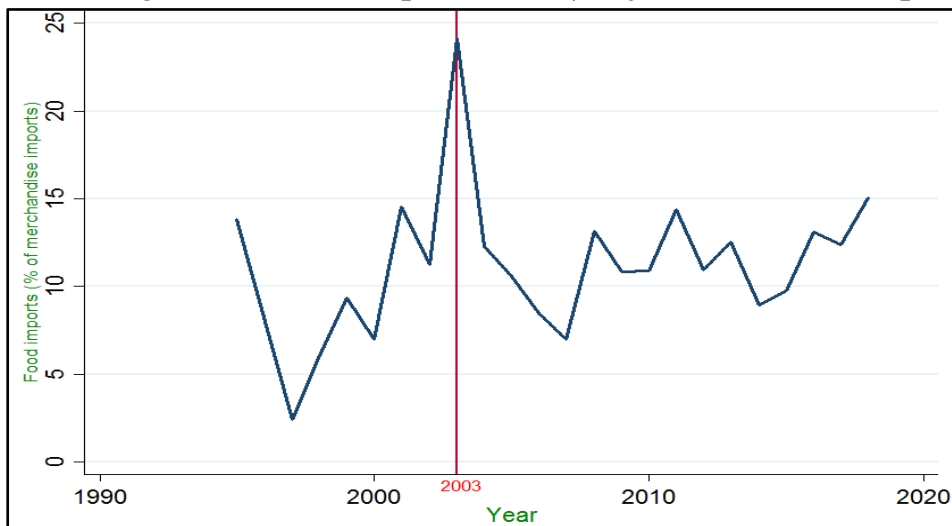
Source: Computed from data in FAOSTAT (2021).

Annex Figure 23: Proportion of export quantity of roots and vegetables (%)



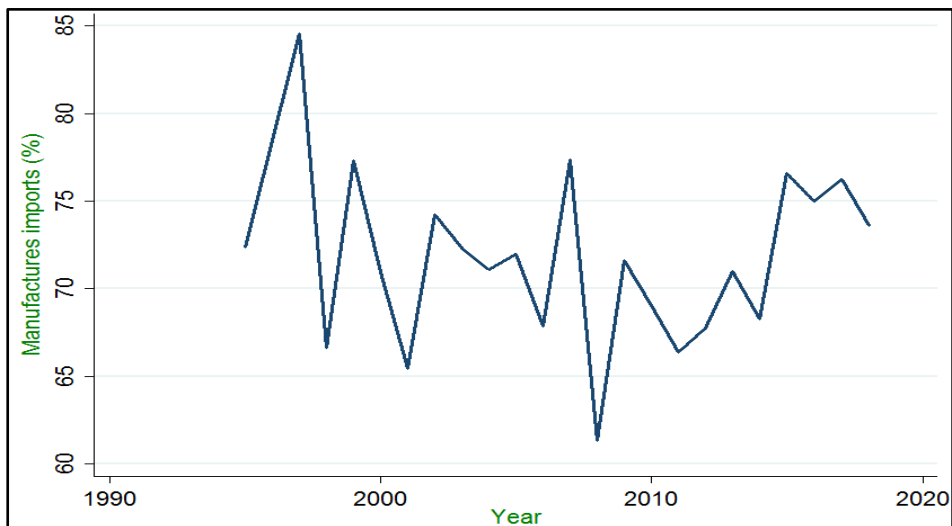
Source: Computed from data in FAOSTAT (2021).

Annex Figure 24: Food import trend (% of merchandize imports)



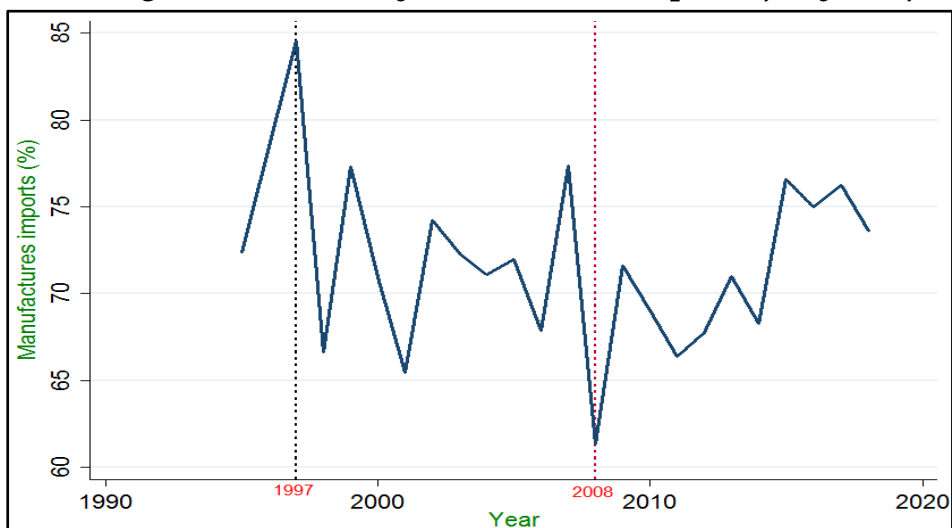
Source: Computed from data in FAOSTAT (2021).

Annex Figure 25: Trend of manufactures imports (% of merchandise imports)



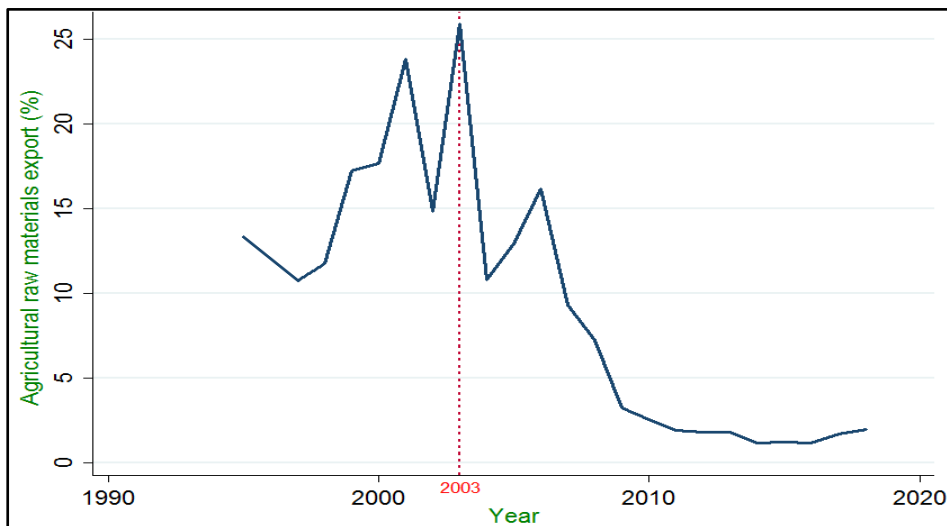
Source: Computed from data in the World Bank (2021).

Annex Figure 26: Trend of merchandize imports (% of GDP)



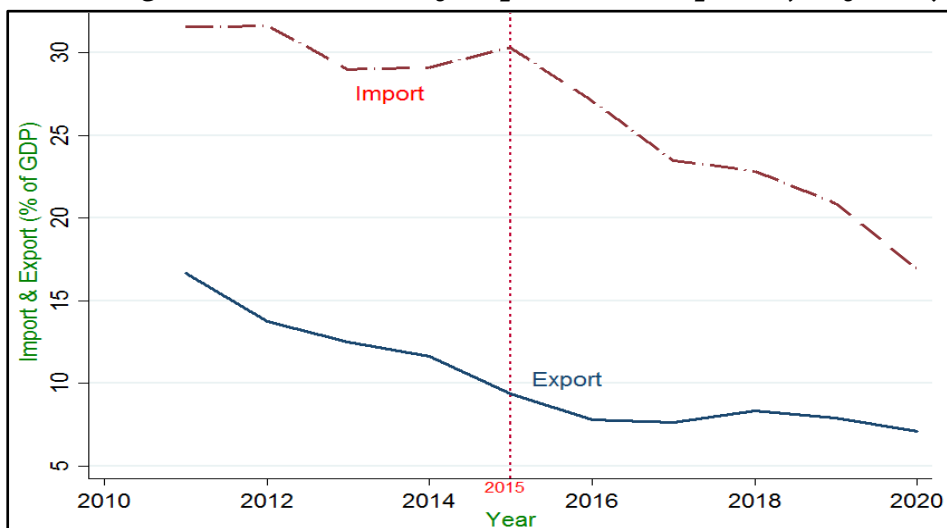
Source: Computed from data in the World Bank (2021).

Annex Figure 27: Agricultural raw material export trend (% of merchandize exports)



Source: Computed from data in the World Bank (2021).

Annex Figure 28: Patterns of imports and exports (% of GDP)



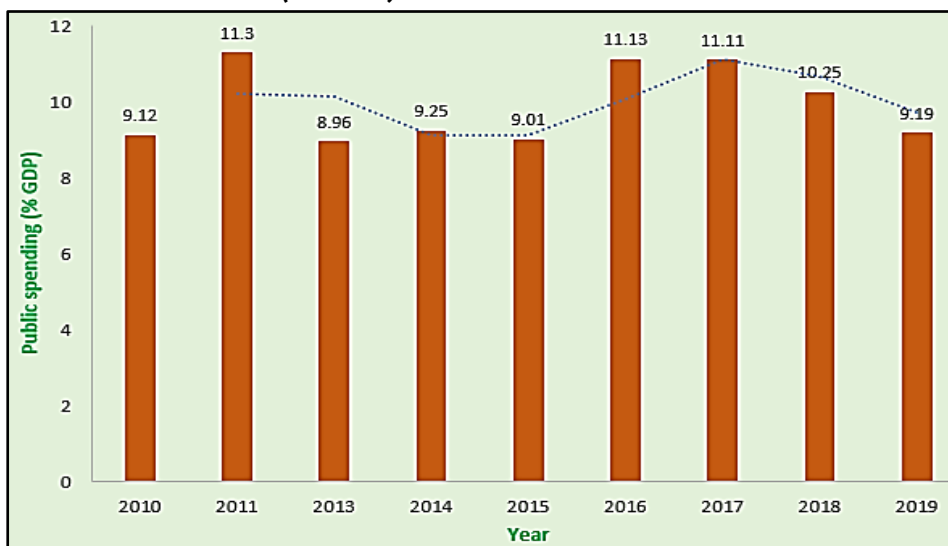
Source: Computed from data in the World Bank (2021).

Annex Figure 29: Bottom 20 African countries with high trade deficits in 2020 (% of GDP)



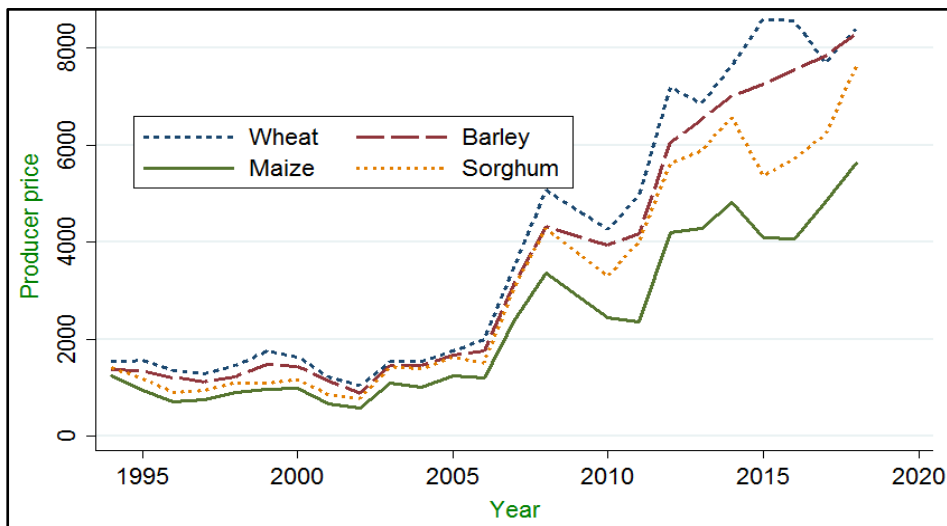
Source: Computed from data in World Bank (2021).

Annex Figure 30: Moving average patterns of public spending (% GDP)



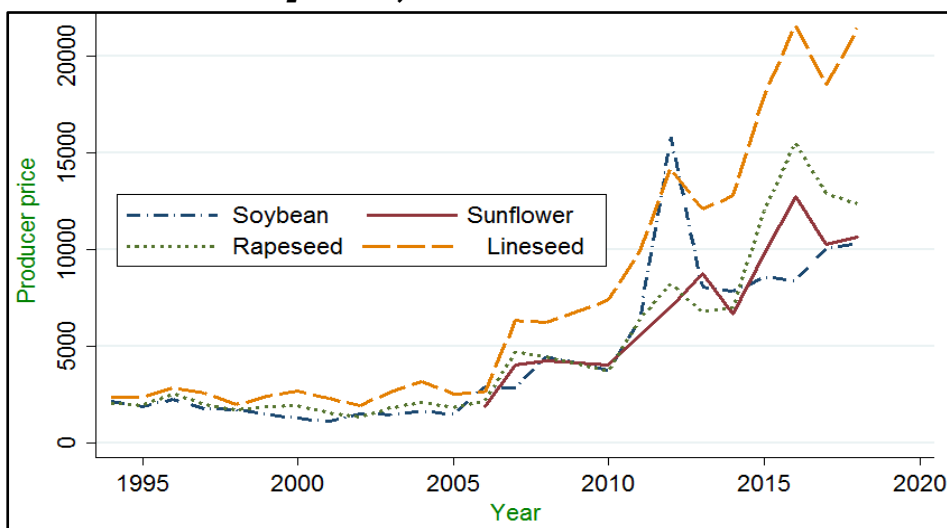
Source: Computed from data in the World Bank (2021).

Annex Figure 31: Producer price trends of major cereal crops (ETB per ton)



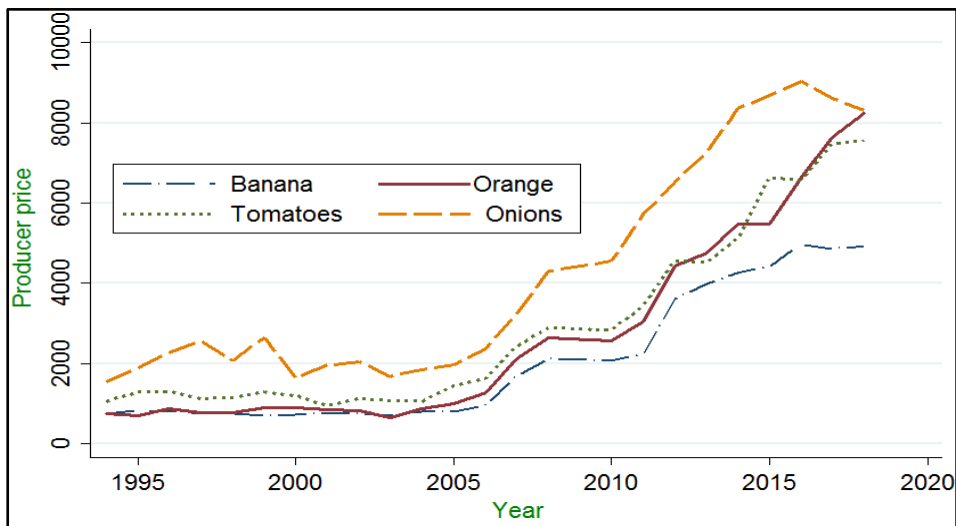
Source: Computed from data in FAOSTAT (2021).

Annex Figure 32: Producer price trends of major oilseeds (ETB per ton)



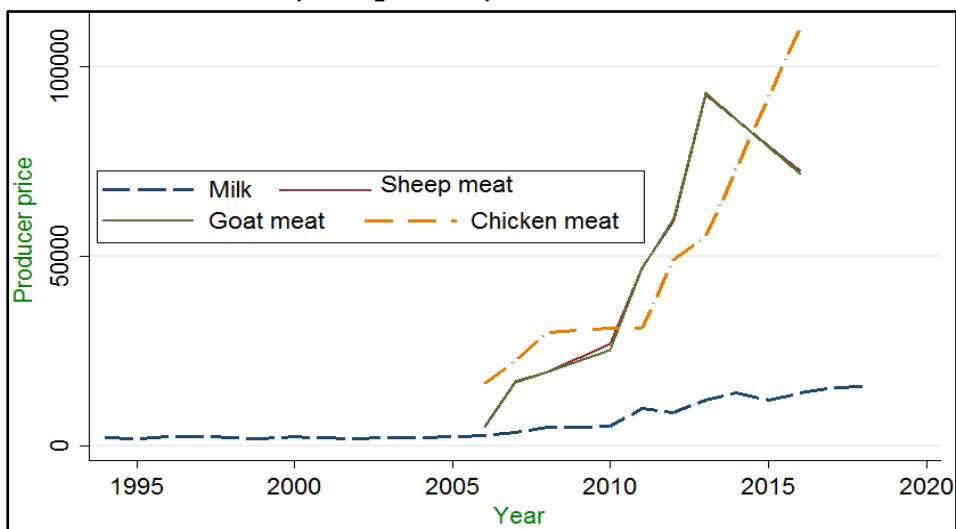
Source: Computed from data in FAOSTAT (2021).

Annex Figure 33: Producer price trends of major fruits and vegetables (ETB per ton)



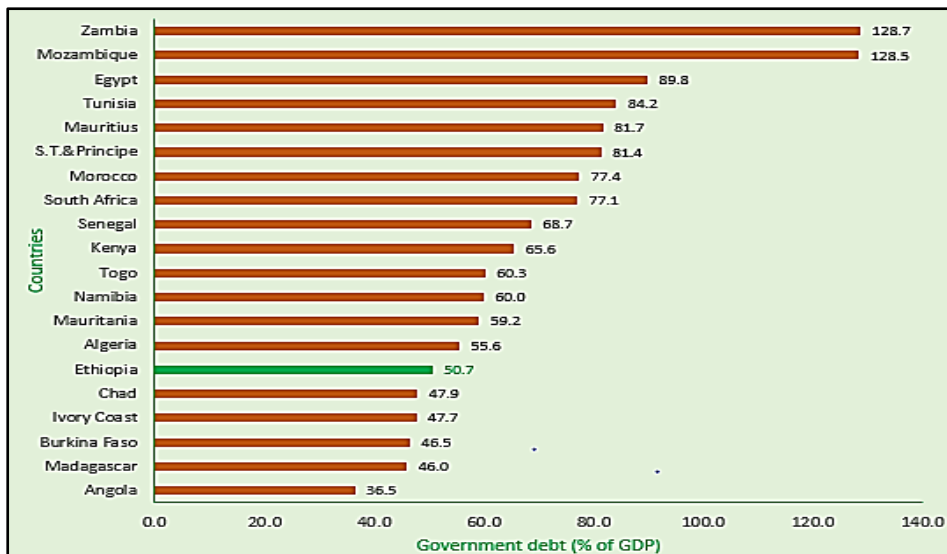
Source: Computed from data in FAOSTAT (2021).

Annex Figure 34: Producer price trends of livestock products (ETB per ton)



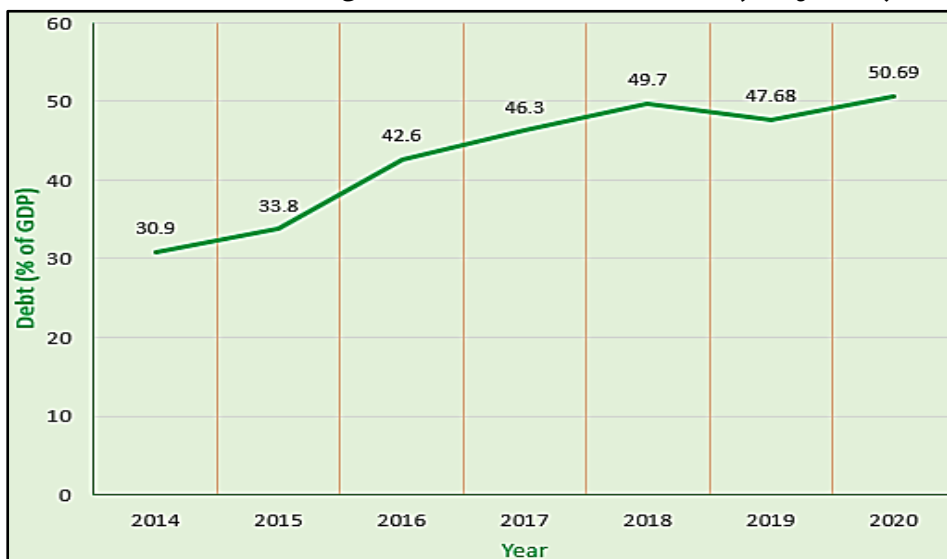
Source: Computed from data in FAOSTAT (2021).

Annex Figure 35: Rising government debt in Ethiopia (% of GDP)



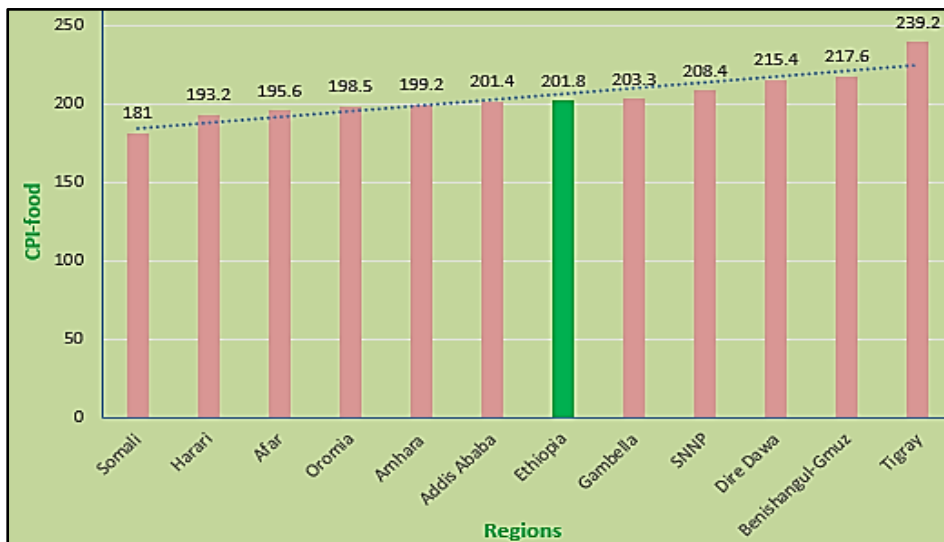
Source: Computed from data in the World Bank (2021).

Annex Figure 36: Top 20 African countries with high government debt in 2019 (% of GDP)



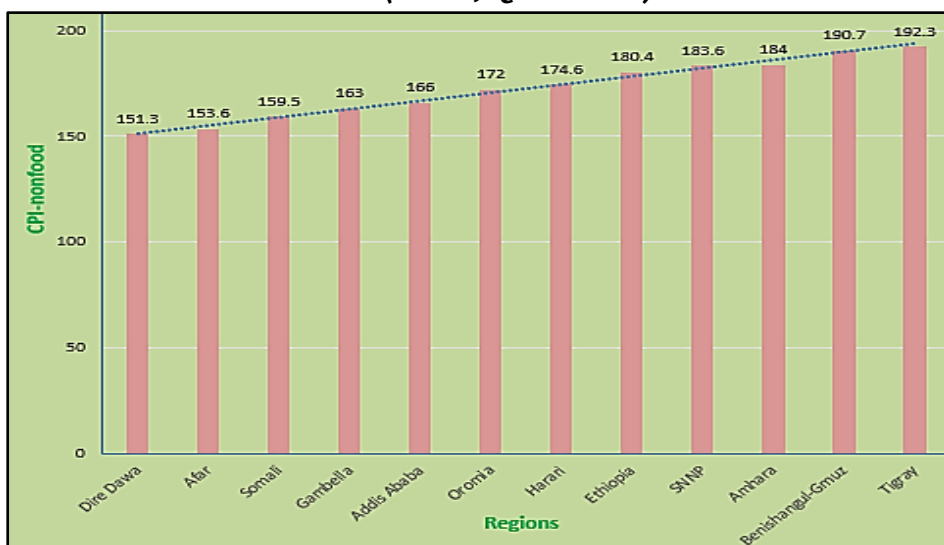
Source: Computed from data in the Global Economy (2021).

Annex Figure 37: Differential effects of food inflation on regional states (2021, Quarter 3)



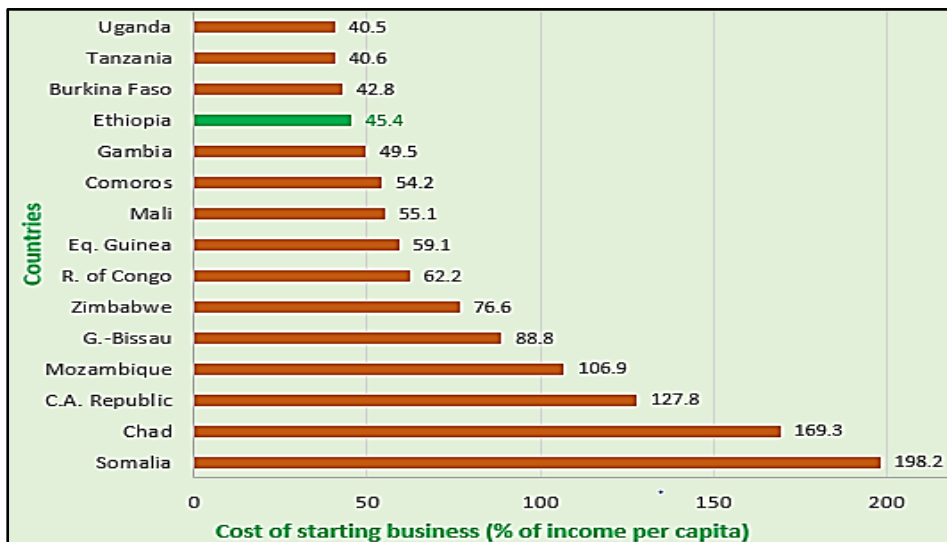
Source: Computed from data in the World Bank (2011, 2013, 2016, 2019).

Annex Figure 38: Effects of nonfood inflation on regional states (2021, Quarter 3)



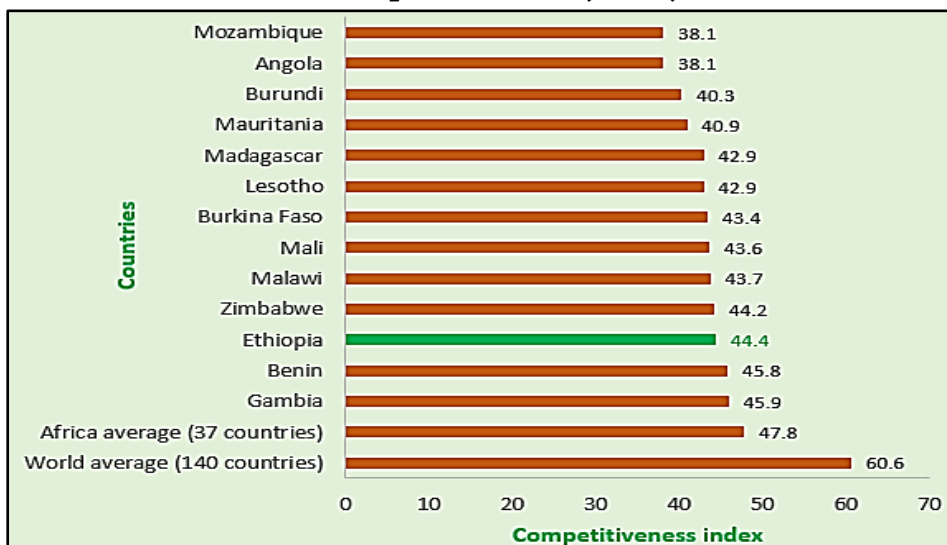
Source: Computed from data in the World Bank (2011, 2013, 2016, 2019).

Annex Figure 39: Top 15 African countries with high cost of starting business (% of income per capita, 2019)



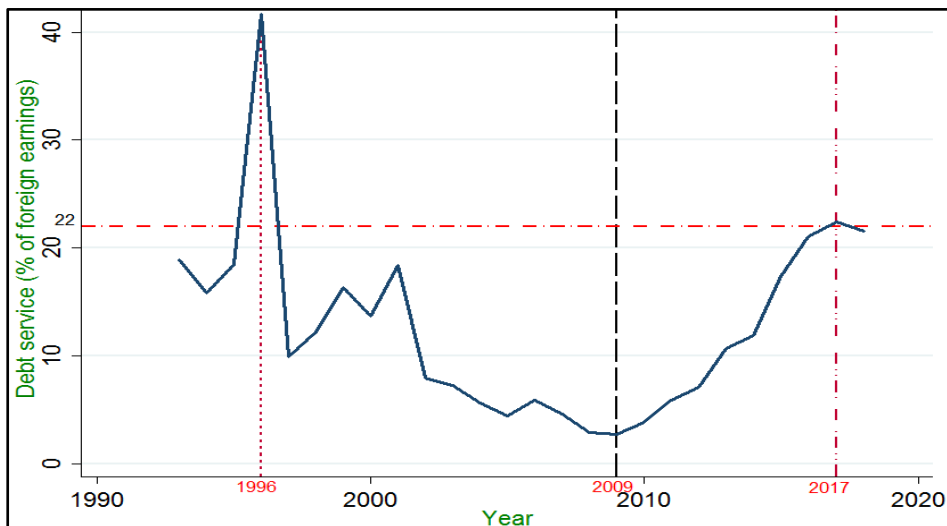
Source: Computed from data in the Global Economy (2021).

Annex Figure 40: Bottom 15 African countries with low competitiveness (2019)



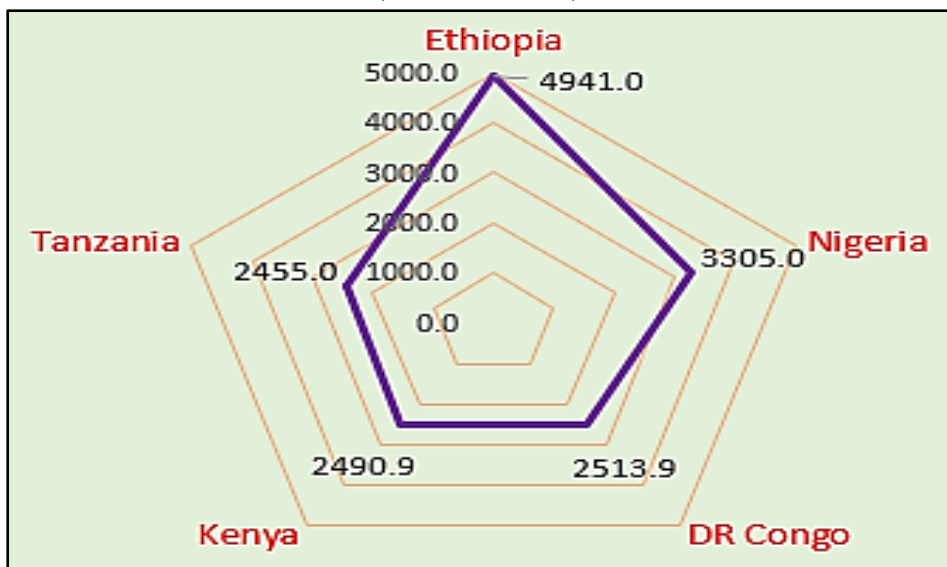
Source: Computed from data in the Global Economy (2021).

Annex Figure 41: Patterns of total debt service (% of total foreign earnings)



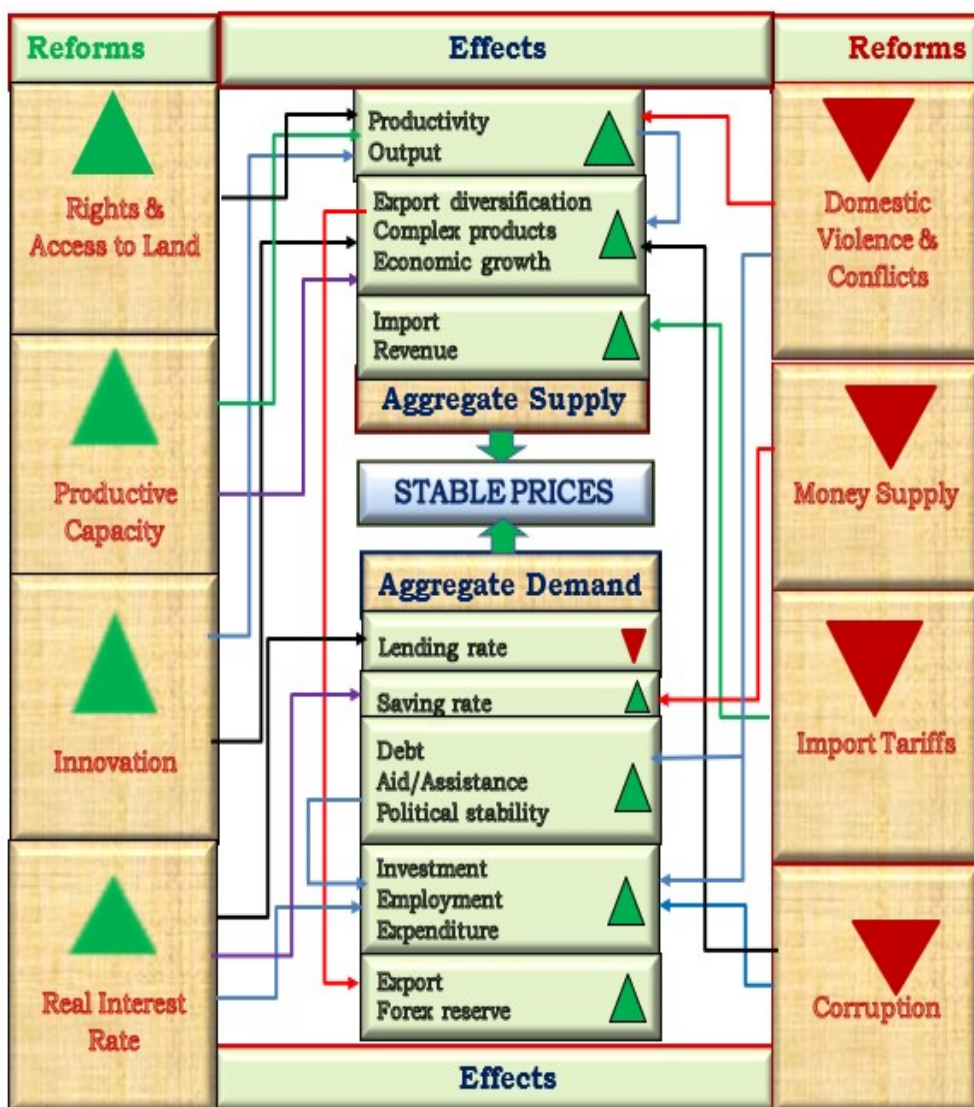
Source: Computed from data in the World Bank (2021).

Annex Figure 42: Top five African countries with high foreign aid and official development assistance in 2019 (million USD)



Source: Computed from data in the Global Economy (2021).

Annex Figure 43: Expected direct effects of relaxation of binding constraints



Source: Authors' sketch based on diagnostics of constraints (2022).

Annex Tables

Annex Table 1: Sources of domestic aggregate supply of wheat and products

| Components of aggregate supply of wheat and products | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 73.6 | -0.57 |
| Import | 23.6 | 0.07 |
| Export | 0.1 | -0.07 |
| Losses | 2.9 | -0.03 |
| Food | 62.2 | -0.02 |
| Animal feed | 1.8 | 0.03 |
| Seed | 2.6 | -0.03 |
| Other uses (nonfood) | 30.6 | 0.05 |
| Stock variation | -2.9 | -0.50 |
| Residuals | 0 | 0.3 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 2: Sources of domestic aggregate supply of barley and products

| Components of aggregate supply of barley and products | Supply share (%) | % Change (Elasticity) (2014-2018) |
|--|-------------------------|--|
| Production | 101.5 | -0.65 |
| Import | 6.8 | 0.11 |
| Processing | 12.6 | 0.539 |
| Losses | 3.3 | -0.02 |
| Food | 77.7 | -0.525 |
| Animal feed | 1.9 | 0.04 |
| Seed | 4.5 | -0.03 |
| Stock variation | 8.3 | -0.54 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 3: Sources of domestic aggregate supply of maize and products

| Components of aggregate supply of maize & products | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 101.1 | -0.01 |
| Import | 0.1 | 0.00 |
| Export | 0.1 | 0.01 |
| Losses | 3.3 | -0.03 |
| Food | 60.0 | 0.04 |
| Animal feed | 10.5 | 0.02 |
| Seed | 0.8 | -0.01 |
| Other uses (nonfood) | 25.5 | -0.04 |
| Stock variation | 1.1 | -0.02 |
| Residuals | -0.1 | 0.01 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 4: Domestic aggregate supply of sorghum and products

| Components of aggregate supply of sorghum & products | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 100.0 | 0.0 |
| Import | 3.9 | 0.13 |
| Export | 0.1 | -0.03 |
| Losses | 3.2 | -0.01 |
| Food | 60.7 | -0.05 |
| Animal feed | 2.0 | 0.08 |
| Seed | 1.2 | -0.01 |
| Other uses (nonfood) | 32.9 | -0.01 |
| Stock variation | 10.2 | -0.03 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 5: Sources of domestic aggregate supply of pulses

| Components of aggregate supply of pulses | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 128.1 | -0.33 |
| Import | 2.5 | -0.02 |
| Export | 14.0 | -0.43 |
| Processing | 0.0 | 0.00 |
| Losses | 9.7 | -0.10 |
| Food | 84.6 | 0.06 |
| Seed | 3.5 | -0.01 |
| Stock variation | 16.6 | 0.07 |
| Residuals | 0.0 | 0.00 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 6: Sources of domestic aggregate supply of oilcrops

| Components of aggregate supply of oilcrops | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 173.6 | -1.07 |
| Import | 0.8 | 0.04 |
| Export | 66.5 | -0.02 |
| Processing | 8.5 | -0.01 |
| Losses | 23.8 | -0.18 |
| Food | 23.8 | -0.18 |
| Animal feed | 3.2 | -0.12 |
| Seed | 2.4 | -0.02 |
| Stock variation | 3.5 | 0.18 |
| Residuals | -4.2 | 0.35 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 7: Sources of domestic aggregate supply of fruits

| Components of aggregate supply of fruits | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 99.3 | -0.08 |
| Import | 2.9 | 0.31 |
| Export | 1.9 | 0.01 |
| Losses | 9.0 | -0.01 |
| Food | 90.9 | 0.00 |
| Stock variation | 0.2 | 0.22 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 8: Sources of domestic aggregate supply of vegetables

| Components of aggregate supply of vegetables | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 105.9 | -0.68 |
| Import | 3.2 | 0.17 |
| Export | 9.0 | -0.49 |
| Processing | 0.4 | 0.00 |
| Losses | 9.1 | -0.07 |
| Food | 90.5 | 0.07 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 9: Sources of domestic aggregate supply of major edible oils

| Components of aggregate supply of edible oils | Supply share (%) | % Change (Elasticity) (2014-2018) |
|--|-------------------------|--|
| <i>Palm oil</i> | | |
| Import | 100.2 | 0.01 |
| Food | 51.1 | -0.45 |
| Other uses (nonfood) | 48.9 | 0.45 |
| <i>Oilcrops oil</i> | | |
| Production | 79.6 | -0.74 |
| Import | 19.2 | 0.20 |
| Export | 0.2 | -0.00 |
| Food | 55.0 | 0.22 |
| Other uses | 45.0 | -0.24 |
| Stock variation | -1.7 | -0.55 |
| <i>Soyabean oil</i> | | |
| Import | 108.0 | -1.51 |
| Food | 100.0 | 0.00 |
| Stock variation | 16.0 | -2.02 |
| <i>Vegetable oil</i> | | |
| Production | 18.4 | -0.14 |
| Import | 82.6 | 0.21 |
| Export | 0.0 | 0.00 |
| Food | 54.7 | -0.46 |
| Other uses | 45.3 | 0.46 |
| Stock variation | 0.9 | 0.08 |

Source: Computed from FAOSTAT (2021).

Annex Table 10: Sources of domestic aggregate supply of mutton and goat meat

| Components of aggregate supply of mutton & goat meat | Supply share (%) | % Change (Elasticity) (2014-2018) |
|---|-------------------------|--|
| Production | 106.0 | -1.03 |
| Export | 9.4 | -0.04 |
| Food | 100.0 | 0.00 |
| Stock variation | -3.3 | -1.00 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 11: Sources of domestic aggregate supply of eggs and cow milk

| | Supply share (%) | % Change (Elasticity) (2014-2018) |
|------------------------------------|-------------------------|--|
| Eggs | | |
| Production | 100.0 | 0.00 |
| Losses | 9.2 | 0.01 |
| Food | 81.7 | 0.03 |
| Seed | 12.2 | 0.04 |
| Residuals | -3.1 | 0.14 |
| Cow milk (excluding butter) | | |
| Production | 100.0 | -0.00 |
| Import | 0.1 | -0.00 |
| Processing | 8.6 | 0.03 |
| Losses | 2.8 | 0.00 |
| Food | 86.9 | -0.06 |
| Animal feed | 1.7 | 0.02 |

Source: Computed from data in FAOSTAT (2021).

Annex Table 12: Decomposition results of broad money supply by sources (1993-2019)

| Measure | Narrow money | Quasi money |
|-----------------------|--------------|-------------|
| Share | 0.422 | 0.579 |
| Relative contribution | 0.384 | 0.616 |
| Electivity (% change) | -0.038 | 0.038 |

Source: Computed from data in the World Bank (2021).

Annex Table 13: Bottom 10 African countries with low tax rates on income, profits and capital gains in 2019 (% of total revenue)

| Rank | Countries | Tax rate on income, profits and capital gains |
|-------------------------------|--------------|---|
| 1. | Rwanda | 24.7 |
| 2. | Lesotho | 24.6 |
| 3. | Burkina Faso | 23.5 |
| 4. | Mauritius | 23.2 |
| 5. | Ethiopia | 22.6 |
| 6. | Madagascar | 19.1 |
| 7. | G. Bissau | 18.5 |
| 8. | Togo | 16.0 |
| 9. | Ivory Coast | 11.8 |
| 10. | Somalia | 3.4 |
| Africa average (24 countries) | | 29.1 |
| World average (114 countries) | | 24.7 |

Source: Computed from data in The Global Economy (2021).

Annex Table 14: Bottom 10 African countries with low public spending in 2020 (% of GDP)

| Country | Government spending (% of GDP) |
|-------------------------------|--------------------------------|
| Sierra Leone | 10.8 |
| Uganda | 9.5 |
| C.A. Republic | 9.3 |
| Ethiopia | 9.1 |
| Nigeria | 8.7 |
| Angola | 8.7 |
| Tanzania | 8.2 |
| Egypt | 8.0 |
| DR Congo | 7.0 |
| Chad | 5.0 |
| Africa average (37 countries) | 15.4 |
| World average (130 countries) | 17.1 |

Source: Computed from data in The Global Economy (2021).

Annex Table 15: Patterns of relative poverty (income redistribution) across regions

| Regions | Poverty indices | | | |
|-------------------|-----------------|-------|-------|---------|
| | 2011 | 2013 | 2015 | 2018/19 |
| Benishangul-Gumuz | 0.458 | 0.339 | 0.403 | 0.402 |
| Amhara | 0.449 | 0.303 | 0.322 | 0.553 |
| SNNP | 0.298 | 0.263 | 0.256 | 0.521 |
| Tigray | 0.291 | 0.166 | 0.215 | 0.434 |
| Dire Dawa | 0.206 | 0.190 | 0.201 | 0.218 |
| Gambella | 0.183 | 0.258 | 0.131 | 0.417 |
| Somali | 0.169 | 0.239 | 0.163 | 0.259 |
| Afar | 0.159 | 0.126 | 0.062 | 0.377 |
| Oromia | 0.137 | 0.143 | 0.152 | 0.334 |
| Harari | 0.094 | 0.147 | 0.166 | 0.219 |
| Addis Ababa | - | 0.223 | 0.147 | 0.138 |
| National | 0.272 | 0.217 | 0.220 | 0.352 |

Note: The poverty line is 50% of the mean income of population.

Source: Computed from LSMS data of the World Bank (2011, 2013, 2016, 2019).

Annex Table 16: Patterns of absolute poverty (between 2011 & 2018)

| Poverty and place of residence | Survey year and poverty index (FGT) | | | |
|--------------------------------|-------------------------------------|-------|-------|-------|
| | 2011 | 2013 | 2015 | 2018 |
| Rural | 0.123 | 0.093 | 0.259 | 0.642 |
| Semi-urban | 0.094 | 0.077 | 0.200 | - |
| Urban | - | 0.078 | 0.169 | 0.350 |
| National | 0.122 | 0.090 | 0.241 | 0.502 |

Note: The international poverty line for Ethiopia is estimated to be ETB 7743 ($1.25 \times 365 \times 16.97$) in 2011, ETB 8536 ($1.25 \times 365 \times 18.71$) in 2013, ETB 14348 ($1.90 \times 365 \times 20.69$) in 2015, and ETB 19189 ($1.9 \times 365 \times 27.67$) in 2018.

Source: Computed from data in the World Bank (2011, 2013, 2016, 2019).

Annex Table 17: Trends of inequality by place of residence during inflation period

| Survey year | Inequality index (Gini) | | | |
|-------------|-------------------------|------------|-------|----------|
| | Rural | Semi-urban | Urban | National |
| 2011 | 0.418 | 0.378 | - | 0.416 |
| 2013 | 0.344 | 0.353 | 0.377 | 0.352 |
| 2015 | 0.337 | 0.334 | 0.375 | 0.353 |
| 2018/19 | 0.372 | - | 0.363 | 0.386 |

Source: Computed from LSMS data in the World Bank (2011, 2013, 2016, 2019).