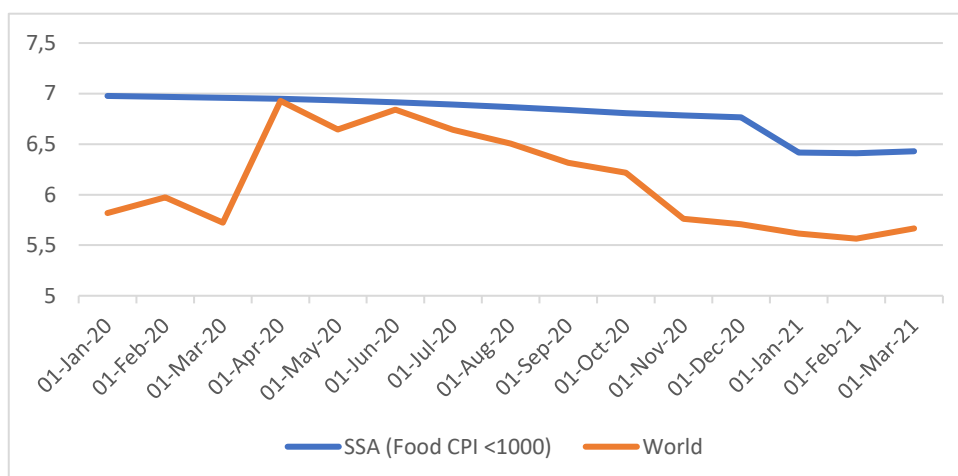


During my internship at the Germany Institute for Global and Area Studies (June-August 2021) I wrote this draft for a policy paper out of personal interest. It was internally presented in front of researchers of the institute, but not officially published. It is based on a literature review.

Why were African food prices not as heavily affected by Covid 19 as other world regions?

1. Introduction

Figure 1: Comparison of average food inflation (in percent) in Sub-Saharan Africa (with a food consumer price index <1000) and the world (source: own visualization, data: FAOSTAT 2021)



The COVID-19 pandemic has been an unprecedented and abrupt shock, which has affected all economies around the world. Food prices are not an exemption: When the pandemic spread, the global average food inflation rates reached its spike (see figure 1). The International Monetary Fund (IMF) writes about “soaring consumer food prices” (Bogmans et al. 2021) and Forbes Magazine asks “Are we about to enter a commodity supercycle?” (Brown 2021). However, despite these concerns regarding increasing global prices, average Sub-Saharan African (SSA) inflation rates¹ have shown an astonishingly low volatility in consumer food inflation so far (see figure 1). This phenomenon raises the question: Why were African food prices not as heavily affected by COVID-19 as other world regions? Are SSA economies not prone to the external shock brought about by the virus?

In order to approach answers, I will unravel the current price development and trace back COVID-19-related and -unrelated factors that determine prices on the global level. Afterwards, characteristics that are unique to SSA and that either influence the pass through of global prices or that determine local price formation dynamics are assessed. Finally, this policy paper proposes policy measures that might ensure food price stability and ultimately food security in the future.

2. General Global Price Developments

In April 2020, when the COVID-19 pandemic had spread around the world, global food price inflation spiked at 6.9 percent, but subsequently decreased and reached its pre-COVID-19 level in November 2020 (see figure 1). Since 2021, food inflation rates follow an upward trend once again. Hence, in the past months global consumer prices have fluctuated and thus, have not pointed towards a clear direction, whereas food producer prices have been increasing since the beginning of the pandemic

¹ excluding three countries with an exceptionally high food consumer price index (CPI) above 1000 (2015 = 100), namely South Sudan, Sudan and Zimbabwe

(Bogmans et al. 2021). In the following, the factors that have favored this development on the global level are assessed.

2.1. Demand

In the long-term, agricultural output is determined by demand. For most commodities except for dairy products the growth in per capita demand for most types of foodstuff (i.e. normal goods in microeconomic terms like staple) is constrained. Therefore, population growth is the major driver of agricultural demand (OECD/FAO 2021). In the last decade, global demand for agricultural commodities grew by 2.2 percent per year. Until 2030, future demand in SSA is expected to increase by 60 percent compared to 2015 (World Bank 2015).

Concerning the current health crisis, theory suggests that demand for staples remains relatively stable even if income growth is negative: The income elasticity of demand for many agricultural commodities normally is low (FAO 2016). Therefore, we expect limited demand-induced effects of Covid-19; except for luxury food products that people might substitute. Indeed, the demand for commodities like coffee, cocoa and sugar have been negatively affected by the pandemic (Mera and Rawlings 2021). Depending on previous consumption patterns and infrastructure, people around the world could substitute or change their source of nutrition or change their behavior, e.g. do more cooking and consume less food from restaurants (EIT 2020). Moreover, due to COVID-19 an increasing share of people stockpiled products with a long shelf life (Aday and Aday 2020). However, given the inelasticity of overall food consumption, drivers of inflation cannot primarily root in these demand side dynamics. Therefore, the shortage of supply side factors and a subsequent easing on the world market must have caused the most part of the food price volatility that was observed on global markets in 2020.

2.2. Intermediate Inputs

Since producers of foodstuff are heavily dependent on the costs of inputs, there is a positive correlation between input factors and producer food prices. The most important intermediate input for agricultural commodities is energy. The oil price determines food prices via the channel of processing, fertilizer production and transportation (Greb 2017; Pal and Mitra 2018). Wang et al. (2014) find that between 20 percent and 40 percent of changes in prices of agricultural commodities derive from oil shocks. Accordingly, when energy prices doubled in 2020, agricultural commodity prices increased by 50 percent (World Bank 2021a; Kuhanatan 2021). However, it is questionable whether this development can be exclusively traced back to a pass through effect of oil prices on agricultural commodities. Correlations between oil and food prices have been discussed controversially and might manifest differently from case to case (see e.g. Roman et al. 2020). Roman et al. find that in the short-term, there is a slight general positive correlation (Roman et al. 2021), which supports the assumption that the volatility of oil prices during the COVID-19 pandemic favored global food price volatility. However, in the long-term, crude oil prices are likely to not have a significant impact on foodstuff like dairy, cereal, oil and sugar. Only meat prices increase by more than 6 percent when crude oil prices increase by 1 percent (Roman et al. 2021).

Demand for energy can also be satisfied by oil substitutes such as biofuels. There is an inverse correlation between both alternatives: The demand for biofuels is likely to increase if oil prices rise (Brümmer et al. 2014; Mizik et al. 2020; OECD/FAO 2021). Moreover, demand for biofuel is supported by national support policies to cut greenhouse emissions. On the other side, biofuels and food compete for arable land which potentially pushes agricultural prices (OECD/FAO 2021). However, given that the energy market structure evolves rather slowly, biofuels can be neglected when explaining the COVID-19 induced short-term price shock.

Furthermore, fertilizers and machinery have pushed prices up. The costs especially for the fertilizer diammonium phosphate, but also for urea have increased since June 2020 due to strong demand and higher input costs (Baffes and Koh 2021). And even though, strictly speaking, machinery is no intermediate input, its increase in cost during the COVID-19 pandemic puts pressure on producer prices (FAO 2020a).

2.3. Trade

Before the COVID-19 pandemic, trade was primarily distorted by tariffs and non-tariff measures: Despite convergence trends, European countries tend to subsidize their agriculture sector whereas African countries impose additional barriers (see e.g. Anderson and Nelgen 2013). Moreover, non-tariff barriers have increased decisively between 2007 and 2017 (Heinemann 2018).

Due to the health crisis, restrictions and border closures to combat the pandemic additionally hampered global trade and disrupted supply chains. Trade policy barriers and regulatory differences usually amount to more than 10 percent of trade costs in all sectors. The pandemic caused a surge in temporarily market distorting measures that facilitated imports or restricted exports (WTO 2020): 190 countries have temporarily implemented external border restrictions (Dietrich et al. 2020). About 5 percent of globally traded calories have been affected by food export restrictions that were established by 22 countries (Clapp and Moseley 2020).

Another major driver of trade costs have been transport and travel costs which make up between 15 and 31 percent of overall trade costs (goods and services). Global air cargo capacity shrank by 24.6 percent in March 2020 (WTO 2020) and costs for containers have more than doubled between February 2020 and February 2021 (Mera and Rawlings 2021). The same applies to the Baltic Dry Index, a shipping and trade index embracing various raw materials: It has surged constantly since the outbreak of the pandemic (January 2021) (Bogmans et al. 2021). The year over year change of June 2021 is +155.7 percent. Against the background of these market distortions and transport-related cost drivers, consumer prices have been affected – especially in the beginning of the pandemic when the majority of mobility restrictions were in place and supply chains were disrupted (Bogmans et al. 2021).

2.4. Stocks

Prices are mainly determined by current supply. However, stocks, hence the storage of excess surplus, can stabilize prices even in times of short-term supply disruptions (Kornher 2015). Stocks have been high enough to meet an elevated demand for food in times of crisis and insecurity. The positive status of stocks is reflected by the stock-to-use ratio which measures the level of stocks as a percentage of the total use. Currently (2020/2021), all current global ratios for corn, oilseed/soybeans, rice/milled and wheat are higher than in the last severe global crisis in 2008/2009, with wheat having the highest and above-average ratio (38.1 percent) and oilseed/soybean having the lowest ratio (23.4 percent) (IFPRI 2021). Therefore, on the global level stocks are unlikely to have contributed to the surge of food prices in the beginning of the pandemic.

2.5. Exchange Rates

Many commodities are denominated in US dollar wherefore the value of the US dollar is important for commodity price dynamics. In the past, there has been a general inverse relationship between the value of the US dollar and commodity prices. This means that prices of commodities have increased when the US dollar value has decreased against other major currencies, since one dollar has bought a smaller amount of commodities and traders have demanded a higher price to compensate for exchange loss (Gustafson et al. 2021; The Economist 2021). In the beginning of the pandemic, the value of the US dollar against most other currencies increased, but it quickly commenced a downwards trend when the US American Federal Reserve provided liquidity (The

Economist 2021). Since then, the US dollar depreciated by 9 percent. At the same time, the World Bank Food Price Index increased by nearly 32 percent (Baffes and Wu 2021). The extent of commodity price inflation, however, differs depending on the respective commodity and on trade patterns (Mera and Rawlings 2021).

2.6. Speculation

In the past years, agricultural markets have experienced a financialization, which influences prices, too (Gross 2017). Future trading can be supportive of commercial traders like farmers that can hedge against price volatility and risks. However, speculation – primarily of non-commercial traders – that targets profit from price changes is controversial. Briefly, advocates of the efficient market hypothesis highlight the alleged positive function of speculation of providing liquidity, whereas advocates of the speculative bubble hypothesis fear disruptions stemming from a decoupling from the physical market (von Braun and Tedasse 2012). It remains unclear which theory is more likely to apply. Therefore, it is up to further research to clarify the price transmission mechanisms of future prices on the spot market during the COVID-19 pandemic. Currently, however, at least the Rabobank does not detect any investor herding nor financial speculation on individual commodities, even though the commodity index S&P GS Ag Index has soared to the highest levels since 2014 (Kuhanathan 2021; Mera and Rawlings 2021). Given that this finding must be verified by further in-depth research, the potential importance of speculation must be kept in mind when talking about price formation. Nonetheless, it is not further discussed in this paper.

3. Food Prices in SSA

Chapter 2 has explained the combination of factors that facilitate the rise and volatility in average world food inflation. However, overall food prices in SSA seem to follow other or additional mechanisms that result in high, but stable inflation rates, even during the COVID-19 pandemic. Even though world food prices might be transmitted primarily via imports, domestic and regional agricultural markets and supply chains seem to be decisive, too. In the following, the factors assessed in the previous chapter are linked to the current situation in SSA countries.

3.1. Demand

Substitution dynamics might be of even less relevance to SSA consumers than to more developed regions of the world, since typically consumed basic diets cannot be replaced easily by a substitute. At the most, diet patterns might change from protein consumption to cereal consumption. Even though the manifestation of inelasticity differs depending on the respective level of income and the degree of urbanization (Melo et al. 2015; IMF 2021), trade figures support the assumption of the overall inelasticity of demand patterns to some extent: Even though the average SSA GNI per capita has decreased (World Bank 2021b), imports of food were stable compared to 2019 (Schmidhuber and Qiao 2020). According to Engel's Law, the proportion of food expenditure by a household increases as the income level decreases (FAO 2016). In 2020, SSA's average GNI per capita measured in current US dollar decreased by 5.2 percent year-on-year (World Bank 2021b). This suggests that the share of food in an average consumer basket increased above the level of 2016. At that time, it already accounted for between 25 and 70 percent of the average consumer basket in SSA countries with a per capita GDP below 5.000 US dollar. To compare: An average German spent 15.5 percent of his consumer spending on food in 2019 (Ahrens 2021). In low-income countries it has already become apparent that food prices have contributed more to overall inflation in 2020 than in 2019 (Gustafson et al. 2021). The concentration of consumption spending does not have a direct impact prices, but is essential when considering the impact of food inflation on household welfare.

3.2. Intermediate Inputs

Apart from general pass through effects of energy prices, the import dependency of oil determines the exposure of food prices to global price dynamics (Aasim et al 2015; Gershon et al. 2019). In this regard, SSA countries differ strongly. Many producers depend on oil imports which raises production costs and is possibly reflected in higher food prices in the short-term. However, also countries that import final agricultural products are indirectly affected by oil prices, too. Export countries of oil are not that prone to international oil price fluctuation and hence their agricultural markets are less affected by oil price changes. However, in times of a declining demand (e.g. observed in the beginning of the pandemic), the export-dependency of oil might cut government revenues, which threatens overall economic stability (see e.g. FAO/WFP 2021a). Considering that most SSA countries are not independent from oil and agricultural imports at the same time (FAO 2020a), the oil price affects the majority of SSA countries either through the direct or indirect channel (or both) (FAO 2020a; Meyimdjui 2020).

Generally, medium- or long-term supply chain disruptions might result in the replacement of machinery by labor which *ceteris paribus* would decrease the profitability. However, the fixed capital available per agricultural employee normally does not exceed 1 000 USD per year in countries with a GDP level below 10 000 USD per person. Therefore, the effect is likely to be smaller in developing SSA countries (FAO 2020a). Nevertheless, the impact of input shortage should not be completely neglected in SSA, since also the lack of basic and small amounts of input factors like fertilizers has a decisive impact on productivity and supply (Bisson and Hambleton 2020).

3.3. Trade

The more economically integrated a region is into global trade patterns, the stronger it follows global price movements (e.g. IMF 2011). In accordance, the stability of food inflation rates in SSA suggest that global trade integration is not as advanced as in other regions of the world. Even though being in a transition, SSA is still characterized by rather short supply chains: Only one fifth of supply chains can be considered as “complex”, which comprises trading along long, rural-urban and international supply chains. The main enterprise type of this category are supermarkets and large processors which make more and more use of contracts, private standards and of capital-intensive technologies. The majority of supply chains are in a transitional phase: 70 percent of the food economy rely on long and rural-urban supply chains and are organized as SMEs. Standards are public and hence rather standardized. The remaining 10 percent are “simple” supply chains, meaning that they are short and local and dominated by home microenterprise, no contracts or standards and labor-intensive work. (Swinnen and McDermott 2020). Overall, despite the transition, most SSA countries still rely on local and regional supply chains and, hence, solely a minority of producers are directly dependent on global producer price determinants. Even though local supply chain are less prone to international trade disruptions, COVID-19 had a huge impact on domestic structures, too. Closures of markets have hampered the flow of good and hence have been a major problem both for farmers and consumers as currently observed in West Africa. Farmers that usually sell their products in large urban settings have been most affected (Bisson and Hambleton 2020). Furthermore, many SSA countries show a comparatively small vulnerability to shortage of labour due to a large share of family labour (Swinnen and McDermott 2020). Nonetheless, having a relatively high share of the labour force employed in agriculture, the disruptions had an adverse impact on farmers that rely on labour force that does not belong to the family, e.g. seasonal and migrant workers (FAO 2020a). All of these local disruptions can contribute to domestically concentrated price volatility.

Despite the concentration of local market structures, most SSA regions are dependent on external food supply which might transmit prices – only Southern Africa is close to parity. Many Eastern African countries have turned from net export to net importer in the recent years and Central and

Western Africa are net importers. This demand is unlikely to be met by neighboring countries: Trade within regional economic communities (REC) does not exceed one third of total agricultural imports (FAO 2021a) and intra-African food and agricultural trade between RECs amounted to 22.5 percent in 2016 (UNCTAD 2019). Therefore, the import dependency is likely to be linked to global markets.

Hence, on the hand, supply chains are rather local, but on the other hand imports originate by large parts from international markets. Altogether, the relatively small impact of global supply disruption on SSA food prices is reflected in calculations of the IMF: According to the fund, a ‘typical’ average global food production shock has a similar impact on food inflation as a domestic food supply shock, namely resulting in an average food price increase of 0.3 percentage points. Regional food production shocks, however, increase food inflation by around 0.7 percentage points (IMF 2021). Apart from local supply chains, one explanation for the low pass through effect and the comparatively small overall impact of global supply shocks might be the tradability of domestically consumed goods: Perishable food is traded little due to storage capacities or transportation constraints (Alper et al. 2016). Moreover, subsistence farming is still prevalent in SSA, e.g. the share of production consumed in-house is high in Malawi (around 79 percent in 2011), Uganda (around 70 percent in 2012) and Ghana (around 54 percent in 2013) (FAO 2020b). In West Africa, subsistence farmers and pastoralists make up more than 80 percent of rural population (Bisson and Hambleton 2020). Therefore, a large part of food consumption is reflected in the CPI, but not in trade statistics.

3.4. Stocks

Even though stocks were plentiful on the global average, several African countries could not mitigate price fluctuations well by means of stocks. Most landlocked countries showed a single-digit ratio in 2019 and 2020. However, Botswana, Congo, Gabon, Sierra Leone, Niger, Central African Republic, South Sudan and Somalia were most affected: They showed a stock-to-use ratio of zero, meaning that they are vulnerable to shortages and price spikes (IFPRI 2021).

3.5. Implications

Based on this chapter’s findings, a pass through of world prices on domestic prices far below 100 percent is reasonable. Kalkuhl (2016) examines the transmission of the FAO Food Price Index to the domestic food prices and takes into account the importance of the respective commodities for the population. He finds that transmission elasticities regarding the domestic grain price index vary substantially throughout SSA, however in most countries that were assessed (seven SSA countries were not included) the elasticity does not exceed 50 percent. Another study gives a more comprehensive insight into price transmission: In 2016, the IMF assessed pass through effects of world food inflation on SSA food inflation. The study includes 20 SSA countries from 2000 to 2016. It considers country-specific food weights and inflation rates that base on nine food categories (meat, fish, fruit, vegetables, milk, bakery, sugar, coffee, oils) that represent about 87 percent of the food basket on average. The estimates for the pass throughs of world food inflation, exchange rates and world fuel inflation to domestic food inflation were 19, 14 and 3 percent, respectively (Alper et al. 2016). These figures lie even below the average of 26 percent calculated for middle- and low-income countries in April 2021 (IMF 2021). This study confirms my finding of the enhanced importance of exchange rates and locally or non-traded food, which seems to have greater impact on domestic prices than world food prices. This suggests that both major contrasting findings of this chapter, namely self-sustaining supply chains (which lower the potential pass through of world market prices) on the one hand and import dependency (which increases the potential pass through) on the other hand, are mentionable. However, the first component is predominant.

4. Conclusion, Outlook and Policy Recommendations

In this policy paper, I have singled out several drivers that form prices on the global level: Demand patterns and supply factors like intermediate inputs, trade stocks, exchange rates and possibly speculation determine food prices. However, global demand and supply alone cannot explain the deviation of SSA food prices from global price developments. The local manifestation of these factors, i.e. in particular the high importance of domestic and regional supply chains and subsistence agriculture, but also the dependence on oil appear to cause higher, but more stable food inflation rates in SSA (before and) during the COVID-19 pandemic.

However, these price-related mechanisms fail to comprise all possible sources of food inflation. First, food inflation might also be induced by macroeconomic indicators: Public and private sector stability, the financial standing and second round effects might mitigate adverse price signals. The ability of governments to counteract an overall economic crisis or slump by means of credit, foreign currencies, government revenues and savings could stabilize not only the overall economy, but also the agricultural sector. Second, the prevalence of exceptionally high food inflation rates in countries dominated by conflict or headline hyperinflation implies that consumer food prices are strongly dependent on the security situation in terms of food availability, access to food and plannability (see e.g. FAO/WFP 2021b). This is why inflation figures of countries with a food CPI above 1000 (in January 2021), namely Sudan, South Sudan and Zimbabwe, were not considered in this policy paper. Accordingly, the doubling of undernourished people that are threatened by starvation since the beginning of 2020 (WFP 2020) is unlikely to root primarily in food price formation determinants. It can rather be traced back to humanitarian crises which constrain food access and trigger income contraction. The latter is a greater driver of food insecurity than food inflation (IMF 2021; FAO 2021b). This threat is enhanced by the relevance of food in an average SSA consumer basket: In 2016, SSA countries with a per capita GDP below 5.000 US dollar accumulated a share of food between 25 and above 70 percent in their CPI (Alper et al. 2016). To compare: An average German spent 15.5 percent of his consumer spending on food in 2019 (Ahrens 2021).

Predicting future price developments is challenging: It is uncertain whether on average SSA will continue to experience low volatility, but persisting high food inflation rates. Positive forecasts like a slight decrease of real food prices on global level over the next nine years (OECD/FAO 2021) cannot be transferred to African prices. Depending on the future level of interregional and international trade integration and macroeconomic and financial stability, African food prices might align more with global food prices. In the short-term, sufficient supply and stable supply chains must be sustained in order to inhibit rising prices and lacking food access. This gains in importance against the background of common price pass through effects from producer prices to consumer prices: Typically, it takes at least six to twelve months before producer price changes are reflected in consumer prices. Since (global) producer prices exceeded consumer prices in the beginning of 2021 (Bogmans et al. 2021), this threat might manifest in rising food inflation in the near future.

On the basis of this paper's findings, two policy recommendations are proposed:

1. In the long-term, policy makers and agri-business players must decide whether to steer towards greater trade integration (which is already enforced inter alia by the Economic Partnership Agreements and the African Continental Free Trade Area) or whether to keep agricultural supply chains regional and local. The first option holds the risk of higher price pass through effects and dependencies, especially if only little value is added in the respective African countries. However, diversified supply chains might mitigate risks of sudden price peaks. The second option implies that the respective region is prone to regional symmetric supply and price shocks. This imposes a threat especially to the large SSA

agricultural sector considering its high inelasticities of supply and demand. The great dependence on local supply and labour might have been beneficial during a global shock like it is the COVID-19 pandemic. However, if in the future shocks prevail domestically or in large parts of SSA (e.g. extreme weather), current market structures might inhibit a mitigation of food price shocks. Possibly, resilient agricultural markets show characteristics of both options. Risks should be well diversified on local and international markets. This way, SSA countries could gain from benefits of trade integration, but maintain a certain degree of self-sufficiency.

2. In order to establish scope to mitigate crises of local or global kind in the future, stabilizing and enhancing income growth is key – especially in order to contain food insecurity resulting from food inflation. Higher incomes typically bring about a lower share of food in the consumption basket and – assuming a higher quality of food consumption – a greater chance to change and substitute consumption patterns in times of crisis. In order to guarantee this resilience, improvements in productivity and value addition are essential (ZEF 2020).

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