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GLOBALISATION AND FOOD SOVEREIGNTY: IMPACT OF FOREIGN DIRECT INVESTMENTS AND GOVERNMENT EXPENDITURE IN GHANA IN 2001–2010

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Abstract

The article looks at the globalisation effects on food availability in Ghana. The aim of the article is to analyse which of the selected macroeconomic indicators have a statistically significant impact on the increase of food availability in the country. Impacts of foreign direct investments on agriculture and government expenditures in agriculture have been tested. Correlation analyses and multiple regression analyses have been used to analyse the test results.

Findings suggest that change in both foreign direct investments in agriculture and government expenditures in agriculture cause significant change in food availability in Ghana. At the same time, the impact of government expenditures on the amount of available food is in the case of Ghana more than two-times higher than the impact of agricultural foreign direct investments, while the increase in government expenditures in agriculture does not cause a decrease in foreign direct investments in agriculture.

Keywords: globalisation, food sovereignty, food availability, Ghana, foreign direct investments in agriculture, government expenditures, regression analyses

INTRODUCTION

There are several reasons why we should focus on food issues like food security, food availability or food sovereignty in current times. As there are limits in the ability to increase the quantity of land reserved for agriculture production or to increase agricultural productivity of developed countries, most of the future potential to fight increasing world food demand lies in developing countries and emerging economies (Franz and Müller, 2015). Historical experiences and also recent experiences from Africa and the rest of the developing world show that sufficient food supply is the primary prerequisite to achieving of peace, social justice, health, prosperity and development. Countries

periodically suffering from hunger witness gradual social and economic decay, internal instability, increasing emigration, revolts and uprisings.

Concerning the overall volume of financial inflows to agriculture of most of the African countries, foreign direct investments and government agriculture expenditures are two main financial sources. Current inflow trends into African agricultural sector show, there is a constant increase in amount of money invested into agriculture from both private investors and central governments (CNBC Africa, 2015; Hallam, 2009). Together with these strengthening inflows a discussion about their collateral impacts occurs.

The objective of the article is to research the impact of Foreign Direct Investments invested into agriculture (FDIA) and government expenditures on agriculture (GEA) on Ghana's national food availability. Food availability is expressed as a number of kilocalories available per capita per day in Ghana.

The article aims at testing three hypotheses with regards to mainstream policies of the IMF and the World Bank, which generally push developing countries to stop subsidising the food sector, while opening up towards world market and inflow of foreign direct investments. First hypothesis supposes that both selected macroeconomic indicators FDIA and GEA cause the positive change in food availability in Ghana, expressed as a number of kilocalories available per capita per day. Second hypothesis supposes that the change caused by FDIA to food availability is higher than the change caused by GEA to food availability. Third hypothesis foresees that the increase of GEA causes a decrease of FDIA.

Given hypotheses have been chosen in order to assess the impact of private and public investments in food availability and to assess their relation in the specific and measurable manner they can contribute to the discussion about a suitable model of agricultural policies and an eligible model of capitalization of the agriculture in the developing countries, such as Ghana. In addition, an assessment of IMF and WB agriculture policy towards Ghana will be provided from the perspective of food availability.

Literature overview

Since the 1980s many developing countries under pressure from the International Monetary Fund (IMF) and the World Bank have stopped subsidising the food sector through supported prices, input subsidies and government credits for farmers (Swinnen and Maertens, 2007 as cited in: Franz and Müller, 2015). These measures were part of broader economic reforms implemented by a number of developing countries with support of IMF and WB to respond to economic crises experienced in 1980s and 1990.

Countries interested in having access to loans and recovery plan of the World Bank and IMF had to commit to fulfilling a series of obligations and economic policy reforms (Stein, 1992, as cited in: Franz and Müller, 2015). Those policy reforms affecting the agricultural sector included: Liberalization of agricultural sector by deregulation of agricultural product market through the: abolishment of price controls, abolishment of reduced interest rates to agricultural credit and abolishment of delivery and subsidy programs for agricultural technologies like agro-chemicals fertilisers and mechanical services by public sector. These changes, together with lowering of import tariffs, non-tariff barriers and nominal exchange rate depreciation (Fosu and Heerink, 2009; Stein, 1992 cited in: Franz and Müller, 2015) were meant to work towards an opening up of the country to the world market, towards an increase of its competitiveness and attractiveness for the inflow of foreign investments, if applied correctly.

Such policy of the World Bank and IMF (as cited in Franz and Müller, 2015) comes from the conviction that the private sector is crucial to the increase in production, value chain inclusion and thus overall food availability. Such a position is supported also by the FAO, the World Food Programme (WFP) and the International Fund for Agricultural Development (IFAD), which mentioned in 2012 that agricultural investment plays an important role in promoting agricultural growth, poverty and hunger reduction. Also some academics like Dries and Swinnen (2004) support the argument of WB and IMF when interpreting FDI as beneficial factor that can be an important source of much needed capital, technology, knowledge etc. for poorer countries. Kareem *et al.* (2013) and Tülüce and Doğan (2014) support that by finding out that the FDI is in a positive relationship to overall agricultural output and agricultural productivity.

On the other hand, other researchers point out dangers of multinational companies crowding out local companies as well as introducing imperfect competition or often frivolous or controversial outcomes of FDI projects when considering impacts to food availability, food access and food security.

Academics like Ramakumar (2012) insist that it is public investments that have a significant poverty and hunger-reducing effect. Also Fosu and Heerink (2009) admit that such changes as proposed by IMF and WB might have severe impacts on food security, job availability, national income, and human development index or poverty rate within the country (Fosu and Heerink, 2009). Varghese and Hansen-Kuhn (2013 as cited in Franz and Müller, 2015) push forward ideas of small-scale peasant agriculture with agro-ecological and organic principles.

Considering FDIs, the legal environment of the given country appears as the most significant factor, deciding about the final effect of FDI. On the one hand, it is as a instrument for promotion of the food security, but on the other hand, it is a instrument which can be harmful to food security when applied in legally undeveloped countries (Hallam, 2011).

FDI can increase productivity in companies with foreign equity, but at the same time it can negatively affect productivity of wholly domestically owned firms in the same industry (Aitken and Harrison, 1999). It can support and cooperate with local farmers and boost their production or take their land and use it to grow food that will be exported back to the investing country, which is for example the case of some of the largest transactions coming from Gulf States to Africa (Hallam, 2011).

Considering government expenditures, it depends on efficiency of the country administration to allocate and use its subsidies, quality of their agricultural programs and overall coordination.

The agriculture sector of Ghana is considered strategic for the country. It is, for a significant share, participating on domestic GDP (around 30 % in 2010), employment, pre-emption of food security and poverty reduction. It represents about 35 % of Ghana's foreign trade (OEC, 2016; Asante, 2004) and as there is a high percentage of self-subsistence farmers in Ghana, about 50.6 % of the active population is employed in agriculture (Asante, 2004).Yet in Global Nutrition Report 2014, Ghana was ranked as the 33rd most undernourished country in the world and with domestic food in deficit, covering domestic consumption of 63 % in cereals, 60 % in fish and 50 % in meat (Hjelm and Dasori, 2012). To precede future issues with food insecurity, careful agriculture politics are essential. Identifying the two most important sources of agricultural financing and their impact on overall domestic food availability is an important part of this process.

MATERIALS AND METHODS

Data in agriculture capital stock, government expenditure, research and development and especially data of agricultural FDI are weak, as they are very limited, inconsistent and incomprehensive (Lowder and Carisma, 2011; cited in: Franz and Müller, 2015). Data about Foreign Direct investments in the agriculture sector in Ghana are obtained from Ghana FDI quarterly reports from 2001 to 2010 published by Ghana Investment Promotion Centre (GIPC). Data for each individual year have been calculated as the summarization of investments during all four annual quartiles. Data about Ghana's government expenditures in the agriculture sector from 2001 to 2010 are obtained from Final Report Basic Agricultural Public Expenditure Diagnostic Review published by Ghana's Ministry of Food and Agriculture. All data about the overall Ghana's food availability from 2001 to 2010 have been obtained from FAOSTAT Food Balance Sheets.

Considering sample size, due to limitations of available data, it was not possible to make the sampling more frequent or to a greater extent. All the data in this paper have been sampled with an annual frequency between years 2001 and 2010. Generally such a sample size can be considered as low when using multiple-linear regression (Hair *et al.*, 2010) as it may have an impact on the generalizability and the statistical power of the model (Hair *et al.*, 2010). Considering statistical significances sample sizes that are small do not have to represent the regression appropriately, as only strong relationships can be detected with certainty, so there is a risk that a small sample model can be evaluated as statistically insignificant (Hair *et al.*, 2010). Statistical method of Multiple-linear Regression Analyses was used to test the hypothesis. The time lags were not considered in the model due to non-availability of data and due to the risk of arbitrary bias. We expected that the FDI are long term process and productivity effects of previous years would encourage future FDI.

RESULTS AND DISCUSSION

There were three hypothesis tested by a method of multiple regression analyses in this paper.

First hypothesis predicts that both selected macroeconomic indicators FDIA and GEA cause positive change in food availability of Ghana, expressed as a number of kilocalories available per capita per day.

On the basis of multiple linear regression results, two coefficients were calculated. Firstly, correlation coefficient (R), measuring the strength of the association between the set of independent variables and the dependent variable (Hair *et al.*, 2010). Secondly, The coefficient of determination (R^2), measuring proportion of the variance of the dependent variable that is explained by the set of independent variables (Hair *et al.*, 2010).

Application of multiple-linear regression analysis proved that the relationship between FDIA and GSA on the one side and ESPC on the other are not accidental correlations, but that both FDIA and GEA significantly influence the overall amount of available kilocalories per capita per day in Ghana. Correlation coefficient (R) reached very high and positive values, as high as 98,5 %. That indicates that independent variable set as a whole (e.g. FDIA and GSA together) have a strong association to ESPC variable. Coefficient of determination (R2) also displays very high values, reaching 97,04 %. This means that more than 97 % of variance of ESPC variable has been explained by the set of independent variables formed by FDIA and GSA.

The results obtained indicate that the hypothesis number one has been confirmed. Both independent variables FDIA and GSA are statistically significantly influencing amount of available food in Ghana, expressed as the number of kilocalories per capita per day and denoted as ESPC variable.

In order to test the second hypothesis, which foresees that the change caused by FDIA to food availability will be higher, than the change caused by GEA to food availability, standardized regression coefficient marked as (b*), explaining the change of dependent variable when given independent variable change by 1 and when all other variables within the model are standardized, were calculated for dependent variable of ESPC.

According standardized regression coefficient (b*) measuring the change of dependent variable when independent variable change by 1 in standardized units, values of GEA were higher than values of FDIA in relation to ESPC as FDIA reached value of 0.371084 while GSA reached value of 0.667384 as can be seen on Tab. I below.

Based on obtained result, the impact of GEA to food availability performs as almost twice as high as the impact of FDIA, when calculated in standardized units, which disapproves the second hypothesis.

Regarding the third hypothesis, claiming that an increase of GEA will cause a decrease of FDIA have been tested by correlation analysis between GEA and FDIA. Results shows that while there is positive relationship between FDIA and ESPC and GEA and ESPC which is necessary pre-requisite for application of regression analysis, no such correlation has been found between FDIA and GEA indicating no positive neither negative correlations between these two variables which

I: *Regression results for ESPC variable*

N = 10	**Regression Summary for Dependent Variable: ESPC**					
	R = 0.98509214 R2 = 0.97040652 Adjusted R2 = 0.96195124					
	F(2.7) = 114.77 p < 0.00000 Std. Error of estimate: 30.030					
	b*	**Std. Err. Of b***	**b**	**Std. Err. Of b**	**t (7)**	**p-value**
Intercept			2509.755	20.49091	122.4814	0.000000
FDIA	0.371084	0.104306	1.451	0.40772	3.5576	0.009249
GEA	0.667384	0.104306	1.112	0.17373	6.3983	0.000368

Where:
b* – stands for standardized regression coefficient
b – stands for unstandardized regression coefficient
Intercept – indicates the value of dependent variable if both independent variables would be zero

II: *Correlation analysis results among FDIA, GEA and ESPC variables*

Variable	**Marked correlations are significant at p < .05000, N = 10**		
	FDIA	**GEA**	**ESPC**
FDIA	1,000000	0,605032	0,738397
GEA	0,605032	1,000000	0,957548
ESPC	0,738397	0,957548	1,000000

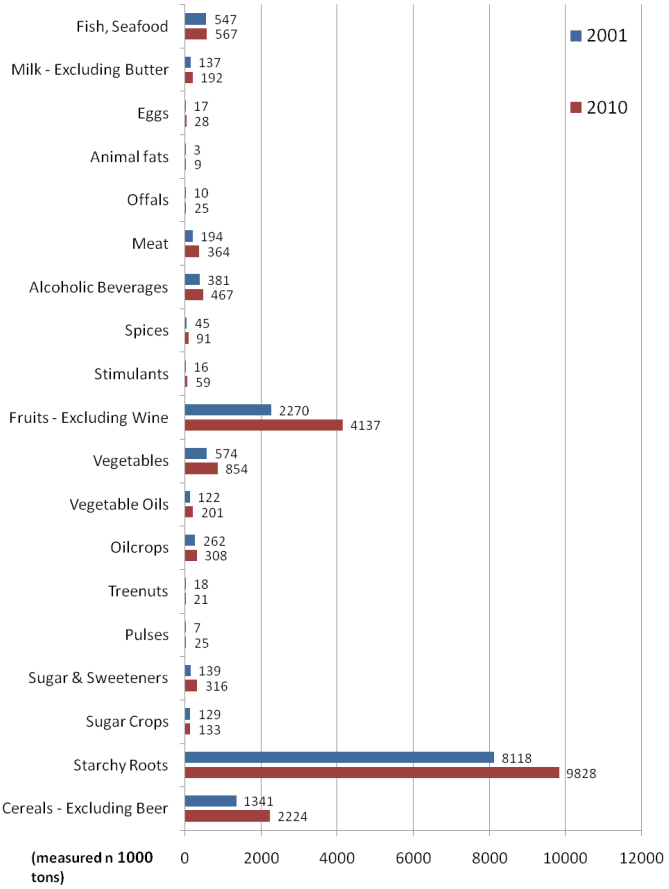
would be statistically significant. Based on obtained results, hypothesis number three has been disapproved as any relationship between GEA and FDIA which would be statistically significant wasn't found. GEA does not cause decrease nor increase of FDIA (Tab. II).

Results suggest that, among the factors determining food supply as defined by Adom (2014) or Fosu and Heerink (2009) capital invested into agriculture plays an important role. Direct influence of FDIA and GEA to overall country food supply has been identified. FDIA and GEA at the national level represent two biggest sources of investments in the country's agriculture. Next to overall volume of investments, also source of these investments is relevant as different institutions utilize their investments with different efficiency as can be seen on example of FDIA and GEA.

FDIA has been identified as statistically significantly influencing food availability. In that manner our findings confirm those of the World Bank (2012 as cited in Franz and Müller, 2015) claiming that private sector is crucial to increase food availability and to decrease hunger. Considering impacts of FDIA to increased agriculture output and overall food availability, positive impact of FDIA to food security can be stated in compliance with Kareem *et al.* (2013), Tülüce and Doğan (2014), Franz and Muller (2015), or Asante (2004). To the contrary, our results are in opposition to findings of Djokoto (2011) who claims that FDI does not cause agricultural output growth.

In addition, GEA has also been identified as statistically significantly in influencing food availability. GEA impact on food availability expressed as ESPC was almost twice as significant as the impact of the FDIA. Such findings are consistent for example with Ramakumar (2012) talking about impacts of public sector expenditures in agriculture in the context of India or Fosu and Heerink (2009) identifying financial capital and products subsidized by GEA as important factors influencing food availability in Ghana.

Nevertheless, the findings of this article are in contrast to arguments of the IMF and the WB claiming that subsidized agriculture tends to discourage investors to invest. (Kherallah *et al.*, 2002; Stein, 1992; Swinnen and Maertens, 2007



1: *Food availability composition in 2001 and 2011*

cited in:Franz and Müller, 2015) Since 2001 and until 2010 both overall amounts of state subsidies increased, as well the amount of foreign direct investments. Thus, no negative correlation has been found between these two variables. So, when looking for factors decreasing FDIA inflow to a country we should look more to other factors like legal environment, tax regulations, custom barriers, economic progress of the country, country's security, or costs of doing business, rather than volume of subsidies.

National food supply in Ghana is deeply dependent on both sources of financing. As can be seen from the statistical results, FDIA and GEA, both significantly influence the overall volume of available food. Even though, not all preconditions for formulating proper statistical model have been fully fulfilled, as there has been limited sample size used in the model. The results seem logical and comply with findings of other researchers. But still, limited sample size remains the weakness of this research. Another calculation including a wider timeframe should be done in the future.

In the framework of future agriculture and food security policy, overall volume of both FDIA and GEA should grow or at least remain on the same levels in comparison to previous years in order to keep the country's ability to feed its rapidly increasing population. There are more than 500 000 additional people in Ghana every year. When we have a look at food availability development in Ghana since 2001 to 2010 in absolute numbers, we realize that Ghana made quite significant progress, as can be seen on Fig. 1 below.

Since 2001 to 2010 the volume of available meat as well as volume of available fruit in Ghana almost doubled. Also the available amount of cereals, starchy roots, vegetables, milk or sugar manifested significant growth. Since 2001 to 2010 average cumulative growth of available food in absolute numbers reached about 38 percent. Cumulative growth of kilocalories per capita per day for the same period reached just about 18 percent. Such a discrepancy is caused just by rapid population growth as most of the annual food surplus, is consumed by the newly born. Population growth in 2010 was so high that there was even a large increase in overall amount of produced food, when calculated per capita; there was less available food than in preceding year. Stable and predictable funding of agriculture sector and increasing inflow of FDIA is thus crucial in order to keep a constant growth of Ghana's' agriculture output for its growing population.

CONCLUSIONS

The paper studied the issue of food availability in Ghana. The aim of the paper was to analyse impact of Foreign Direct Investments invested into agriculture (FDIA) and government expenditures on agriculture (GEA) on Ghana's national food availability expressed as number of kilocalories available per capita per day. Three hypotheses have been tested and resulted in the following findings.

Based on obtained results, the first hypothesis has been confirmed. Both main financial sources of Ghana's agriculture play a statistically significant role in the countries' ability to secure adequate amount of food for its population.

The second hypothesis has been disproved. Even though FDIA have a significant effect on Ghana's food availability, GEA even appear to be far more important as their impact to food availability is almost twice as significant than the impact of FDIA.

The third hypothesis has been also disproven, as correlation analysis between FDIA and GEA did not find any negative correlation. Increase of GEA doesn't cause a decrease of FDIA and vice versa.

In terms of policy recommendations and based on obtained results, both sources of finance should be supported by central government. Cuts in any source of finance might have significant effect to country's food security due to rapidly rising population consuming most of the annual increase in production.

Constant growth of the countries' agriculture GDP, together with increase of overall food availability in Ghana can be achieved by careful domestic policy towards both, agricultural foreign direct investments and especially government subsidies programs, which are essential for sustaining food security in the country.

The results might be understood as an alternative perspective to the issue of food availability and possible source of inspiration for policy makers acting in this field. It might be interesting to further examining the relationship between food availability and food prices or by analyses of the impacts of FDIA and GEA to food accessibility.

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