The Effect of the Presidental Cassava Initiative on Cassava Productivity: Implication for Food Security in Nigeria

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Introduction

- Agriculture still plays an important role in economic growth and development of most West African countries, although its performance has been declining (te Velde *et al*., 2015).
- The major factor contributing to the low performance of the agriculture sector is low investment (World Bank, 2013). Most West African countries including Nigeria allocate less than 10% of the national budget towards agricultural development (World Bank, 2013). Consequently, there is prevalence of poverty, unemployment, food insecurity and low productivity.
- These problems have drawn the attention of policy makers and donor agencies to implement agricultural interventions to help transform rural economies in West Africa particularly, Nigeria. One of these interventions include the **Presidential Initiative on Cassava (PCI)** which was launched in cassava producing countries in West Africa in 2002. There are some claims that the PCI has promoted food security, reduced poverty and increased rural food production (Anyanwu *et al*., 2011; Onwumere and Ichie, 2013). However, there are limited empirical quantitative evidences to support those claims.
- **This study determines the effect of the PCI on cassava production and its implication on national food production and food security in Nigeria.**

Methods

The study used a three-stage multivariate linear regression to model the effect of PCI on cassava productivity and food security using a time series data from 1961-2013.

First, cassava production was regressed on a vector of explanatory variables - PCI (measured as a dummy for the period of its implementation), fertiliser, land and machinery. The **second** step involved the estimation of the impacts of PCI and cassava production on national food production using food production index as a proxy. **Third**, PCI and national food production were regressed on food adequacy index (a proxy for national food security). The models are specified as follows:

$$\ln Cass_t = \delta_0 + \delta_1 T_t + \delta_2 Land_t + \delta_3 \ln Fert_t + \delta_4 \ln AgricMac_t + \delta_5 PIC_t + \varepsilon_t \quad t = 1,2,...,T \quad (1)$$

$$\ln FoodP_t = \gamma_0 + \gamma_1 T_t + \gamma_2 \ln Cass_t + \gamma_3 RsidC_t + \gamma_4 \ln Fert_t + \gamma_5 \ln AgricMac_t + \gamma_5 PIC_t + \zeta_t \quad t = 1,2,...,T \quad (2)$$

$$\ln FoodAdeq_t = \omega_0 + \omega_1 Time_t + \omega_2 FoodP_t + \omega_3 PIC_t + \omega_4 \mathrm{Re}\, sidFP_t + e_t \quad t = 1,2,...,T \quad (3)$$

Cassava=Quantity of cassava produced (tonnes), Land=Harvested land area of cassava (Ha), Fertiliser=Quantity of fertiliser applied (kg), AgricMac=Number of agricultural machinery, PIC=1 for the period during implementation of PCI and 0 otherwise, FoodP=Production index, Foodadeq=Food adequacy index, a proxy for national food security, ln = natural logarithm

Results and Conclusion

The implementation of PCI has resulted in 6.4% increase in cassava production, 8.7% in national food production and 1.9% in food adequacy.

The empirical results show that 1% increase in fertiliser and land area increased the cassava output by 1.3% and 88.7%, respectively.

National food production was increased by 67.90% with a 1% increase in cassava production while 1% increase in agricultural machinery increased national food production by 5.7%.

The main conclusion is that government programmes that promote agricultural development are critical to enhance national food production and food security as well as developing rural economy.

Table 1. Multivariate regression estimates

Variable	Cassava Production Model	Food Production Model	Food Adequacy Model
Constant	3.775*** (0.912)	-7.227*** (1.568)	3.729*** (0.146)
Time	0.008** (0.003)	0.008 (0.005)	0.007*** (0.002)
lnFoodP			0.312*** (0.050)
ResidFP			0.011 (0.064)
lnCass		0.679*** (0.095)	
ResidC		-0.068 (0.214)	
lnLand	0.887*** (0.065)		
lnFert	0.013*** (0.003)	0.004 (0.005)	
lnAgricMa	0.002 (0.014)	0.057** (0.027)	
PCI	0.064** (0.027)	0.087* (0.043)	0.019*** (0.006)
Diagnostic Statistic			
F statistic (5, 46)	1270.43***	342.14***	62.51***
R-squared	0.9903	0.9785	0.9294
Durbin-Watson d-statistic (6, 52)	1.072	1.066	0.827
N	53	53	24

*****, ** and * denote 1%, 5% and 10% significant levels.**

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