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The Impact of Trade Liberalization on Poverty in Ghana

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Abstract

Studies have shown that free trade is better than no trade and therefore trade liberalization will significantly improve export earnings and enhance economic growth. Many countries especially those of South-East Asia have attained significant growth rates which are partly attributed to their trade policies. Evidence from countries such as India and China also show that economic growth has led to significant declines in poverty levels. Many African countries including Ghana have liberalized their trade regimes by reducing trade barriers and encouraged export processing companies. Although trade liberalization has benefited some countries, the same cannot be said of many African countries, including Ghana; a situation attributed to the fact that trade reform tends to generate both winners and losers. Hence, the impact of trade-led growth on poverty reduction may not necessarily be unambiguous. The lack of general consensus on the influence of growth on poverty level in Ghana has prompted the following question: To what extent has trade liberalization affected economic growth in Ghana? Using CGE modelling technique, the study investigates the trade-growth nexus and its implications for poverty reduction in Ghana.

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1. INTRODUCTION

Poverty reduction is an increasingly important consideration in the deliberations over multilateral trade liberalization (Hertel, Preckel and Cranfield, 2001). The first of the Millennium Development Goals (MDGs) calls for halving the proportion of people living in extreme poverty - and those suffering from hunger – between 1990 and 2015 (World Development Report, 2004). Studies have shown that free trade is better than no trade and therefore trade liberalization will significantly improve export earnings and enhance economic growth. Many countries especially those of South-East Asia have attained significant growth rates which are partly attributed to their trade policies. Evidence from countries such as India and China also show that economic growth has led to significant declines in poverty levels. Many African countries including Ghana have liberalized their trade regimes by reducing trade barriers and encouraged export processing companies. Although trade liberalization has benefited some countries, the same cannot be said of many African countries, including Ghana; a situation attributed to the fact that trade reform tends to generate both winners and losers. Hence, the impact of trade on growth and poverty reduction may not necessarily be unambiguous. The lack of general consensus on the influence of growth on poverty level in Ghana has prompted the following question: To what extent has trade liberalization affected economic growth in Ghana?

Ghana is one of the countries that have implemented trade policy reforms to open-up their economies. Beginning from 1984, when Ghana began to open up its economy to participate in international trade as part of the Economic Recovery Programme (ERP), the trade intensity index (defined as the ratio of exports plus imports to gross domestic product, which indicates the openness or otherwise of an economy) began to rise again, followed by a rise in per capita income (ISSER, 2002). But the Ghanaian economy appears to be trapped in low-level equilibrium. Extreme poverty level though declined significantly in urban and rural forest belts have worsened in rural savannah belts between 1993 and 1999 (GLSS 3 & 4). The Ghanaian authorities have formulated a poverty reduction strategy in line with the MDGs to grow the economy and reduce

poverty. To achieve the objectives of the Ghana Poverty Reduction Strategy, there is the need to identify the sources of growth and transmission mechanisms that translate growth into poverty reduction. Of specific importance is the need to ascertain how trade liberalization can improve export earnings, stimulate growth and accelerate poverty reduction. This forms the focus of the study. The paper is organized as follows: section two traces the link between trade liberalization, economic growth and poverty reduction. The next section discusses the study methodology and this is followed by a section analyzing and discussing the results. The final section provides the concluding remarks.

2. TRADE LIBERALIZATION, ECONOMIC GROWTH AND POVERTY

Trade Openness refers to the degree to which nationals and foreigners can transact trade without artificial (that is, governmentally imposed) costs (including delays and uncertainty). Trade openness is desirable because relative international prices reflect the international marginal rate of transformation in a competitive international economy is equated with domestic prices for an efficient allocation of resources.

There are various trade and growth theories that expose the connection between trade and economic growth. According to the traditional trade theory, free trade via reduction of import and export impediments are the best strategies for growth due to specialization gain (increased efficiency due to production according to comparative advantage). Usually the gains from this type of trade are static and exist only in the short term under a perfect competition. Also, according to the dynamic trade theory which is based on neoclassical assumptions, gains from trade are due to an increase in growth rate and the volume of additional resources made available to or employed by the trading country (Kreinin, 1988).

Dynamic trade also draws attention to the indirect gains from trade and consequently increased growth rates in the medium and long term whilst the new trade theory relaxes all the restrictive assumptions of the existence of a perfect competition and concludes that, under conditions of an imperfect competition and existence of externalities

(spillovers), trade might be welfare-improving. The existence of spillovers in production is able to lead to an increase in the long-run of growth and therefore permanent growth becomes possible. According to the neoclassical models trade policy has only a level effect on per capita income. Liberalization does increase the long –run level of per capita income but not its long-run rate of growth.

Many developing countries have, since the early 1980's, been implementing, in varying degrees, fairly comprehensive packages of policy reforms under the general umbrella of Structural Adjustment Programs (SAPs) that were initiated, in most cases, and actively supported and funded by the Breton Woods Institutions as a means for reducing poverty. One of the prominent components of these packages is Trade liberalization policies. According Rodrik (1988), trade reforms "carried great weight in many of the reform packages proposed to (and increasingly implemented by) African governments." This could be as a result of exposure to developments in the world markets. Yet, the main conviction for recommending trade liberalization to such economies is based on the fact that the original diagnostic study (World Bank 1981), which prepared the way for the SAP initiative attributed much of the fault for Africa's poor economic performance in the 1970s to misguided trade policies. Even though many studies have confirmed the fact that trade liberalization is growth enhancing in developing countries and thus reduces poverty, others also believe that trade liberalization could be poverty ridding as well.

As the arguments stand, the link between trade liberalization and poverty becomes very important for the assessment of the impact of trade liberalization on poverty. Khan (2005) postulates that, there are at least two aspects of any poverty impact analysis for a particular policy. These are: i) the impact on economic growth; and ii) the impact on income and asset distribution. First of all, Dollar and Kraay (2000) is only one of the several cross-country studies that provide evident conclusion that economic growth is a necessary but not always sufficient condition for significant and sustained reduction in poverty. This means that the link between trade liberalization and poverty will be expected to be an indirect one through the mediation of higher growth.

Weiss (2000) demonstrates that poverty may respond to reforms, such as trade liberalization in three ways. First is through employment creation. If economic activities respond favourably to the reform the poor will find their wage employment increasing. Siting the East Asians as a model, he argues that this poverty mechanism has led to the focus on labour-intensive growth in discussions of poverty reduction. Also, the significance of macroeconomic stability is important to the reform-growth-poverty link. If inflation is stabilized through fiscal and monetary policies, then the rising price effect of trade liberalization could be avoided and whiles the full benefits of trade are enjoyed. This has been confirmed in Bhasin and Annim (2005). The most complex of the three mechanisms, however, is through the relative price shifts that are entailed in such reforms. Generally, there are price shifts from traded to non-traded goods and from privately supplied goods to publicly supplied goods. However, where the poor are net producers of traded goods, they should benefit from the relative price shifts, although there could be exceptional cases since price shifts may not be that uniform. Again, where the poor are net consumers of non-traded goods, they should benefit as well. However, these relative price shifts may occur at a time when real incomes are also changing and hence the full impact on the poor will be determined by the net effect, allowing for both income and price changes as they all affect the poor.

One of the most interesting empirical evidence of the link between trade growth and poverty is to be found in the detailed country studies pioneered by the OECD project directed by Ian Little, Maurice Scott and Tibor Scitovsky, and the NBER project directed by Bhagwati and Krueger. The recent reliance on cross-country regressions, by contrast, produces mixed evidence in both directions: for example Sachs and Warner (1995), as well as Frenkel and Romer (1999) found a positive relationship between growth and poverty while Harrison (1996) and Rodriguez and Rodrik (1999) were skeptical, the latter even leaning to being opposed. But then, as has been argued in Srinivasan and Bhagwati (2001), the cross-country regressions are a poor way to approach this question. Nonetheless, it is interesting that practically no country that has been close to autarky has managed to sustain a high growth performance over a sustained period. David and Kraay

(2001) also presented evidence of trade liberalization leading to faster growth in average incomes, which increases the income of the poor "proportionately."

The above considerations underscore the complexity regarding the measurement and the assessment of poverty impact of trade liberalization policies. Those who believe that the indirect effects of trade liberalization on poverty reduction are mainly through generating rapid growth (Berg and Krueger 2003, Srinivasan 2001, Quibria 2002) have recognized growth-poverty elasticity as the crucial parameter. Such studies have used cross-country linear regressions to provide empirical relation between growth and poverty (Ravallion and Chen, 1997; De Janvry and Sadoulet 1998; Agenor, 2002). However, Weiss (2000) criticizes this approach on the grounds that it is exclusively ex-post. Secondly, it is rarely able to distinguish precisely between different policies, so that what one can pick up is only the effect of the existence of a reform programme. Hence, this approach fails to provide a direct assessment of the poverty consequences of reform.

In establishing the link between trade liberalization and poverty reduction requires more than just a description or projection of trade patterns. Baker (2000) recommends to practitioners of poverty impact assessment of policies that a counterfactual "no-change" scenario must be compared with an estimated scenario after liberalization. The most comprehensive ways of overcoming these challenges involves using either a Social Accounting Matrix (SAM) or in a more dynamic form a Computable General Equilibrium (CGE) macro model. According to Weiss (2000), the most desirable advantage for using these models is that they can be designed to incorporate features of individual economies and can be run for different policy simulations. Thus, they are conceptually, the only rigorous means of assessing the counterfactual –what would have taken place in an economy without a particular policy reform, as recommended by Baker.

Several studies have used CGE model to assess the impact of trade liberalization on poverty reduction and have had interesting results. Cockburn (2005) has shown that it is straightforward to adapt a standard CGE model to explicitly integrate a large number of households (over 3000 in this case). Using data on household income sources and

consumption patterns collected in most standard household surveys, he is able to model the impacts of trade liberalisation on individual households and how these impacts feed back into the general equilibrium of the economy in a standard CGE model. By removing all kinds of tariffs, the simulation results for Nepal show that, generally speaking, the impacts of trade liberalisation on income distribution appear to be small, however some interesting results emerge. Urban poverty falls and rural poverty increases, particularly among the moderately poor as opposed to the very poorest. The absolute impact of trade liberalisation, whether it is positive (in the urban areas) or negative (in the rural areas), generally increases with the level of income. Indeed, there appear to be very strong, mostly positive, impacts on the very richest individuals. This explains the increased income inequality found in the urban and Hills/mountains regions of Nepal.

Thorbecke (1991) examines the impacts of stabilization and structural adjustment programs on income distribution in a CGE model for Indonesia. He observed that adjustment programs restore equilibrium and improve income distribution. To investigate the impacts of import liberalization on poverty in Philippines, Bautista and Thomas (1997) employ the SAM for the period 1979. Five households were considered in this model – three were rural and the remaining two were urban. Experiments carried out in the study include import rationing, uniform surcharge on imports, tariff liberalization, tariff reduction and 50% reduction in current account deficits. They conclude that, there is a favorable effects of import liberalization on income and poverty in the Philippines.

Similarly, applying a CGE model for Cote d'Ivoire, Lambert, Schneider and Suwa (1991) trace the effects of public expenditures, export taxes and devaluation on poverty and income distribution. Their simulation results demonstrate that reduction of public expenditures by cutting wages of public employees reduces inequality but were unable to efficiently reduce poverty. Devaluation reduces inequality and poverty in Cote d'Ivoire.

Sahn, Dorosh and Younger (1997), and Dorosh and Sahn, (2000) use the SAM's for the period 1989 – 93 to investigate the poverty and income distribution impact of trade and exchange rate liberalization in Cameroon, Gambia, Madagascar and Niger. The

households were disaggregated into the urban non-poor, urban poor, rural non-poor and the rural poor. Four simulations were carried. The first consists of setting implicit tariff on imports high enough to keep real exchange rate fixed. The second simulation involved real exchange rate depreciation. The third was exchange rate depreciation and a reduction in government spending. The final simulation involved maintaining government revenue through increased taxes. Generally, the outcome of the study shows that trade and exchange rate liberalization benefits the poor households in both urban and rural areas.

Finally, Bhasin and Obeng (2004) and Bhasin and Annim (2005) have applied the CGE Model on Ghana. Of particular interest, Bhasin and Annim (2005) examine the impact of alternative fiscal reforms; in which lost tariff revenue is compensated by a lump-sum tax, on the poverty and income distributions of households. The outcome of the two simulations in the study show that, the elimination of trade related import taxes accompanied by an increase in VAT by 100% could be used to reduce the incidence, depth, and severity of poverty, and improve the income distributions of households in low-income countries. On the other hand, the elimination of export taxes accompanied by an increase in VAT by 100% shock increases the incidence, depth, and severity of poverty, and worsens the income distributions of households in low-income countries.

3. RESEARCH METHODOLOGY

The study will test the relationships between trade liberalization and poverty reduction. Although it is possible to describe the pathways through which various aspect of liberalization might affect poverty, the range of potential linkages between trade liberalization and poverty is wide. Irrespective of the mechanism, however, and as with any other project, Baker (2000) argues that the policy changes under trade liberalization projects must be (a) compared with relevant counterfactuals that would respond to the same macroeconomic constraints, and (b) analyzed in the context of the local economic structure and based on empirical information from household surveys. This, however, is very difficult for three reasons. First, policy changes may have economy-wide impact, making it impossible to find comparison groups that are unaffected. Second, because of exogenous factors, lags, feedbacks, and substitutions, any changes in the well-being of

the poor must be interpreted with extreme caution. And third, it is difficult to predict what would have happened if adjustment had not taken place—what alternative policies a government might have pursued and what the resulting impact would have been on the poor.

In the literature, several approaches have been used to curb the above methodological challenges in the assessment of the impact of policies on poverty, each with its own shortcomings. The most comprehensive methodologies of evaluating the impact of economic policies on the incidence of poverty and income distribution is using Social Accounting Matrices (SAM) and Computable General Equilibruim (CGE) models. The SAM is a comprehensive, disaggregated, consistent and complete data system that captures the interdependence that exists within a socio-economic system. The CGE model, on the other hand, is used to simulate the impact of socio-economic policies on the incidence of poverty and income distribution. In other words, CGE Models attempt to contrast outcomes in treatment and comparison groups through simulations. These models seek to trace the operations of the real economy and are generally based on detailed social accounting matrices collected from data on national accounts, household expenditure surveys, and other survey data. CGE models do produce outcomes for the counterfactual, though the strength of the model is entirely dependent on the validity of the assumptions.

In line with the above considerations, the study adopts a CGE model belonging to the "third generation of CGE models" where poverty impact has been modeled explicitly (Khan, 2005). It is based on the works of Decaluwe et al (1999); Siddiqui and Kamel (2002b); Aka (2003); Bhasin and Obeng (2004) and Bhasin and Annim (2005). The superiority of this type of CGE model in analyzing the impact of trade policies on poverty lies in the fact that, in addition to helping to evaluate the evolution of both between and within group inequalities, it also allows for micro-simulation. Its underlining principles makes it possible to include as many agents as there are in the survey in order to keep all information about the heterogeneity with regards to endowment and consumption (Decaluwe et al, 1999).

The structure of the CGE model used in this study involves a representation of a small open economy which has no influence on international markets. It consists of three production sectors (agriculture, industry, and service) with two factors of production (labor and capital) and five categories of households (agricultural farmers, public sector employees, private sector employees, non-farm self-employees and non-working). In all, the system is made up of five blocks, namely: production and trade; income; savings and investment; taxes and; equilibrium conditions with a government closure.

In the production block, output is estimated in a 2-step nested structure based on Cobb-Douglas technology at the top level and a Leontief technology with intermediate input at the second level. Profit maximization is constrained by technology. Again, Armington's assumption will be used to distinguish between imported and domestically produced goods and between goods for export and for domestic consumption. Finally, the production possibility frontier for the economy will be defined by Constant Elasticity of Transformation (CET) between domestic supply and export, leading to the generation of the export supply function. A detailed description of the income and expenditure flows in the various sectors, the price determination mechanisms and the assumptions in the income, taxes, savings and investment blocks and the equilibrium conditions are provided in Bhasin and Obeng (2004) and Bhasin and Annim (2005). Finally, in order to overcome the inherent problem of over-determination and its associated difficulties in estimation that characterize CGE models, the model chooses a neo-classical macroeconomic closure rule, where aggregate savings is assumed to determine aggregate investment, to render the model computable. The implication of this choice is that the economy is savings driven.

The system of equations in the CGE model has 10 basic equations for the Production and Trade; 16 for Income, Taxes, savings and Investment block; 8 for Demand for commodities block; 9 for Prices; and 5 for the equilibrium conditions and the macroeconomic closures. Considering the fact that there are three categories of production activities (agricultural, industry and services) and five categories of

households extends the 48 basic equations to 140 equations. Since the total number of equations in the system is just equal to the number of exogenous variables in the model, the model is exactly identified and thus computable. Finally, the incidence, depth and intensity of poverty is measured by the Foster, Greer and Thorbecke (FGT) poverty measure. The definition of poverty lines is based on the relative deprivation assumption of poverty as set out in the GLSS4.

Structure and Data of SAM

The macro SAM used in the study was obtained from Bhasin and Obeng (2004) and Bhasin and Annim (2005). It is based on the SAM of Ghana for 1993 by the Ghana Statistical Services. They make an assumption of stable parameters for the 1993-1999 period, updates the SAM of Ghana from 1993 to 1999 using the fixed proportion method. However, since the period from 1993 to the date of this study was so long, the above assumption would have been unacceptable; hence the choice of the study to use the updated SAM in the two above sited studies. Nevertheless, data for other variables that cannot be tracked from the SAM were obtained from other sources including International Financial services, The State of the Ghanaian Economy Reports, Annual Budgets and World Development indicators.

The analysis of the microeconomic impact of trade liberalization requires the assessment of this impact on the various categories of households in an economy. In order to incorporate the behavior of different categories of household, the Ghana living Standard Survey 4 (GLSS 4) data set is integrated with the SAM for 1999. The contribution of each category of household in the total income and expenditure were obtained from the GLSS 4.

The factorial sources of income for the various category of household are presented in Table 1. The data shows that the agricultural farmers' category has the largest number of households (49.2%) in comparison with the other household categories. Concerning the sources of income, all categories of households receive the bulk of their income from providing labor. It constitutes about 93% of total factorial income to the households in

the private sector. The 87.9% share of labour income to the agricultural farmers is the least. The second ranking source of income to all categories is income from transfers. The importance of this source is most profound to the agricultural farmers than all other categories. It forms about 10% of their total income. The least important source of income to all categories is capital income.

Table 1: Factorial Source of Household Income (%)

Household Group	Number of Households	Labor Income	Income from Transfers	Capital Income	Total
Agricultural Farmers	49.2	87.9	10.5	1.6	100
Public Sector Employees	9.4	92	6	2	100
Private Sector Employees	7.9	93.3	5.1	1.7	100
Non-farm Self Employed	25.6	92	6	2	100
Non-Working	7.9	90	8	2	100

Source: Bhasin and Obeng, 2004

Again, Table 2 presents the income and demographic characteristics of households. As mentioned earlier, the largest number of households is found in the agricultural farmers' category. As shown in Table 2, they constitute about 49.20% of the total population in the survey. The category with the least share of the total population belongs to the non-working category. The national mean annual household income stood at ¢2,267,000. Apart from the employees in the private sector, all household categories received average income above the national average. Even though the agricultural farmers received the highest mean income, the range is the widest with highest maximum income of ¢44,000,000 and the least minimum income of ¢7,665. With respect to the maximum mean income, non-working, non-farm and the private sector categories follow the agricultural farmers in that order. The last row of Table 2 shows that, with a poverty line of ¢665,300 (based on the GLSS4), the incidence of poverty is highest among non-farm self employed. About 21% of those in that category live below the poverty line. This is followed by non-working, public sector employees, agricultural farmers and the private sector employees, respectively.

One interesting outcome from this analysis is that, even though the households in the private sector are among those with the least maximum income, the proportion of their number below the poverty line is the least; that is, the least poor category. On the other hand, even though the households in the agricultural farmers category have the highest maximum income, about 17.3% of them live below the poverty line. Also, even the 17.3% is the second highest in the row and it corresponds to the highest share of the total population of about 49.2%. This means that in absolute terms, the agricultural farmers category has the largest share of the population living below the poverty line.

Table 2: Demographic and Income Characteristics of Households

	Agricultural Farmers	Public Sector Employees	Private Sector Employees	Non-farm Self Employed	Non-Working
Population (¢)	49.20%	9.40%	7.90%	25.60%	7.85%
Mean income (¢)	2,765,729	2,534,159	2,206,560	2,360,109	2,398,446
Maximum income (¢)	44,000,000	39,000,000	24,000,000	24,000,000	27,000,000
Minimum Income (¢)	7,665	13,808	12,000	23,865	13,738
% Below the poverty line (¢665,300)	17.30%	19.30%	7.90%	21%	20%

Source: Bhasin and Obeng, 2004

Finally, the importance of the agricultural farmers contribution to the national income is seen in Table 3. Table 3 shows that, this category contributes about 16.28 of the nations GDP. Of this, 15.76% is in the form of labour income whiles the remainder 0.52% comes from their income on capital. This is followed by the public sector, non-farm self employed, non-working, and the private sector respectively. The largest contribution to GDP in the form of capital comes from the non-working category.

Table 3: Share of Components of Household Income in GDP (%)

Household Group	Share of Labor Income in GDP	Share of Capital Income in GDP	Share of Household Income in GDP
Agricultural Farmers	15.76	0.52	16.28
Public Sector Employees	15.13	0.51	15.64
Private Sector Employees	13.34	0.43	13.77
Non-farm Self Employed	14.08	0.48	14.56
Non-Working	13.93	0.58	14.51
Total Households	72.24	2.52	74.76

Source: Bhasin and Obeng, 2004

The Estimation Approach

The study uses a general equilibrium model to examine the impact of trade liberalization on poverty and income distributions of households in Ghana, using the calibrated 1993 SAM for Ghana. As suggested in Baker (2002), in analyzing the effects of trade liberalization on poverty, counterfactual "no-change" scenario must be compared with an estimated scenario after liberalization. Thus the study first obtains the counterfactuals through the estimation of the benchmark equilibrium to obtain pre-shock values for the variables and the baseline estimates for the incidence, depth and the severity of poverty. A simulation of trade liberalization policy is conducted to obtain the post shock values of the variables. The post shock effects of these simulations are then used to find the effects of trade liberalization on poverty lines and the incomes of households. The consistency of the data with the equilibrium conditions and simulations are made using the GAMS software package. The DAD software is used to evaluate the poverty measures. The pre-shock and post-shock poverty levels are obtained using Foster, Greer and Thorbecke (FGT) poverty measures

$$POVk,h = \int_{0}^{Z} [(z - yh)/z]k\, f(yh)\, dyh,\ k= 0,1,2$$

where *yh* is the income of household h , k is a poverty-aversion parameter, *z* is the endogenously determined poverty line. The incidence of poverty is indicated by *k= 0.* The depth of poverty is indicated by *k= 1*, and the severity of poverty is indicated by *k=2.*

4. DATA ANALYSIS

The paper investigates the impact of trade liberalization on poverty reduction in Ghana. A CGE modeling approach was used and the simulation process is as follows: Since trade liberalization leads to tariff reduction, in the first simulation, we reduced import tariff on all imports to 20%. In the second simulation, we reduced the export tariff on all exports to 20%. The tariff rate used here is in line with the proposed ECOWAS common external tariff. Table A1 in the appendix indicates the effects of these simulations on macro economic variables. The first simulation leads to a reduction in the prices of imported goods and services. As a result, imports become cheaper and consumers substitute imported goods for the domestic goods. Depending on the elasticity of substitution and imports' share in total consumption, demand for all imports increase.

The reduction in domestic costs caused by the import tariff cut increase the profitability of the export sector. This leads to the increase in investment, output and exports in the industrial sector. However, the increased inflow of imports is by no means enough to eliminate the import competing sectors, investment, output and exports decline in agricultural and services sectors. Factors of production move from inefficient sectors towards sectors that are more productive. As a result, both returns to labor and capital increase. The incomes of all types of households increase because of increase in factor prices and reallocation of resources. The cut in import tariffs reduces the prices of composite goods in agricultural and industrial sectors considerably. The fall in the prices of composite goods reduces the poverty line by 11.05%. The income of the government decreases by 40.67%, which reduces the investment, output and exports of the industrial sector.

The second simulation makes exports more competitive and as a result exports of agricultural goods and services increase. The output and investment in these sectors increase. Since the industrial sector is not very competitive on the internal market, the output, employment and investment in this sector decline. Since the relative prices of imports have increased, there is a resultant decrease in the imports of goods and services. As there is a movement of labor and capital from inefficient industrial sector to efficient

export oriented agricultural and services sectors, the factor prices fall. This causes the incomes of all categories of households to fall. In this simulation, the prices of composite goods decline in all sectors. This fall in prices reduces the poverty line by 15.07%. The income of the government decreases by 72.41%, which hampers the investment in the agricultural and services sectors considerably.

Table 4: Poverty Measures for the Base Year and Simulations

		Agricultural Farmers	Public Sector Employees	Private Sector Employees	Non-farm Self-Employed	Non-Working
alpha=0	base	17.29%	19.28%	25.36%	21.04%	20.00%
	Simulation 1	14.48% (-2.81%)	17.86% (-1.42%)	21.35% (-4.01%)	17.65% (-3.39%)	17.02% (-2.98%)
	Simulation 2	13.53% (-3.76%)	17.14% (.-2.14%)	19.03% (-6.33%)	16.55% (-4.49%)	16.60% (-3.40%)
alpha=1	base	7.15%	9.02%	9.85%	8.56%	7.99%
	Simulation 1	6.05% (-1.10%)	7.85% (-1.17%)	8.16% (-1.69%)	7.23% (-1.33%)	6.70% (-1.29%)
	Simulation 2	5.70% (-1.45%)	7.38% (-1.64%)	7.60% (-2.25%)	6.76% (-1.80%)	6.18% (-1.81%)
alpha=2	base	4.16%	5.30%	5.41%	4.96%	4.30%
	Simulation 1	3.52% (-0.64%)	4.53% (-0.77%)	4.50% (-0.9%)	4.20% (-0.76%)	3.51% (-0.79%)
	Simulation 2	3.30% (-0.86%)	4.23% (-1.07%)	4.13% (-1.28%)	3.92% (-1.04%)	3.22% (-1.08%)
Poverty Line	base	665,300	665,300	665,300	665,300	665,300
	Simulation 1	591,784 (-11.05%)	591,784 (-11.05%)	591,784 (-11.05%)	591,784 (-11.05%)	591,784 (-11.05%)
	Simulation 2	565,039 (-15.07%)	565,039 (-15.07%)	565,039 (-15.07%)	565,039 (-15.07%)	565,039 (-15.07%)

Table 4 presents information on the incidence (alpha=0), depth (alpha=1), and severity (alpha=2) of poverty for the base year and variations in these measures after the shocks. In the base year, the incidence, depth, and severity of poverty is highest among the

private sector employees. The least incidence, depth, and severity of poverty is prevalent among the agricultural farmers. In the first simulation, reduction in consumer prices reduces the poverty line and incomes of all households increase. This causes the incidence, depth, and severity of poverty for all categories of households to be reduced. The maximum reduction in the incidence, depth and severity of poverty is noticed for the private sector employees. The least reduction in the incidence of poverty is noticed for public sector employees, whereas the least reduction in the depth and severity of poverty is noticed for the agricultural farmers.

This shows that elimination of trade related import taxes could reduce the incidence, depth, and severity of poverty in low-income countries. In the second simulation, reduction in consumer prices reduces the poverty line to a larger extent and incomes of all households decrease. These changes cause the incidence, depth, and severity of poverty for all categories of households to decrease. The maximum decrease in the incidence, depth and severity of poverty is noticed for the private sector employees. The least decrease in the incidence of poverty is observed for public sector employees, whereas the least decrease in the depth and severity of poverty is noticed for the agricultural farmers. The study shows that elimination of export taxes could also be used as a tool to reduce poverty in low-income countries.

5. CONCLUSIONS AND POLICY IMPLICATIONS

The study principally investigates the effect of trade liberalization on poverty in Ghana using the Ghana living Standards Survey Data and other complementary datasets. It finds that elimination of trade related import and export taxes could reduce the incidence, depth, and severity of poverty in low-income countries. The paper suggests that although trade liberalization can lead to poverty reduction, over-liberalization can be harmful to local producers since already established foreign products out-compete local manufacturers. Secondly, liberalization should ensure that no dumping of products occur; the situation where developed countries subsidize products, particularly agricultural products which are sold on developing countries' markets should be discouraged

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APPENDIX

Table A1: Simulation Results

Variables	Base	**Sim 1** Reduction in import tariff to 20%	% Increase or Decrease	**Sim 2** Reduction in export taxes to 20%	% Increase or Decrease
Production of agricultural sector	1725.64	1614.43	-6.44	2047.94	18.68
Production of industrial sector	1817.12	1937.21	6.61	1475.64	-8.79
Prod. Of services sector	849.824	831.25	-2.19	881.9	3.77
Income of government	729.155	432.602	-40.67	201.16	-2.41
Household income of agricultural farmers	338.744	360.84	22.1	252.89	-5.34
Household income of public sector employees	306.877	328.51	7.05	224.74	-6.77
Household income of private sector employees	266.743	285.36	6.98	194.1	-7.23
Household income of non-farm self employed	285.763	305.91	7.05	209.28	-6.76
Household income of non-working	293.401	313.68	6.91	216.74	-6.13
Exports of agricultural sector	645.848	591.5	-8.42	801.51	24.1
Exports of industrial sector	990.075	1073.62	8.44	756.6	-3.58
Exports of services sector	0.481	0.48	-0.21	0.489	1.66
Imports of agricultural sector	192.925	262.38	36	154.29	-0.02
Imports of industrial sector	519.212	628.1	21	422.91	-8.55
Imports of services sector	646.129	689.01	6.64	608.36	-5.85
Labour demand of agricultural sector	3.261	3.06	-6.14	3.85	18.1
Labour demand of industrial. sector	2.726	2.54	-6.96	1.75	-35.9
Labour demand of service sector	1.354	1.34	-0.74	1.35	0
Capital demand of agricultural. sector	3.957	3.48	-12.12	5.7	43.94
Capital demand of industrial sector	83.745	85.88	2.56	76.78	-8.31
Capital demand of services sector	3.181	3	-5.66	3.86	21.38
Composite price of agricultural goods	0.628	0.563	-10.63	0.516	-18.1
Composite price of industrial goods	0.716	0.609	-15.42	0.653	-9.31
Composite price of services	0.851	0.759	-10.71	0.757	-0.94
Average wage rate	187.656	201.43	7.34	134.34	-8.41
Average rental on capital	4.893	5.6	14.52	2.87	-1.31
poverty	270.815	240.883	-11.05	229.99	-5.07