Does the WTO Increase Trade? The Case of U.S. Cocoa Imports from WTO-Member Producing Countries

Osei-Agyeman Yeboah, Saleem Shaik, Shawn J. Wozniak and Albert J. Allen

This study analyzes U.S. cocoa bean imports from twenty-one major cocoa-producing and exporting countries during the pre- and post-liberalization period of 1970-2008 using the gravity equation and a linear one-way fixed effects model. The objective was to measure trade creation for a World Trade Organization (WTO) member that has undergone trade liberalization. Cocoa beans can serve as a proxy for any tropical commodity upon which a developing country heavily relies on for export revenue, such as is the case with cocoa for Côte d'Ivoire and Ghana, for example. Our results find participation in free trade agreements (FTAs) and WTO membership do contribute to increased U.S. cocoa bean imports at the one percent and five percent confidence levels, respectively.

U.S. imports of cocoa beans have grown in recent years. This is due to increased cocoa production, lower world prices, greater centralization and efficiency in the supply chain, greater consumer demand for chocolate products due to the introduction of various niche markets, increased consumer per capita income, and trade liberalization, among other causes. Market access to export cocoa beans in many cocoa producing countries has improved greatly due to trade liberalization in the cocoa sector. This has been accomplished through a variety of policy instruments, primarily structural adjustment programs (SAPs).

In reducing or eliminating the role of state-owned and operated marketing and exporting boards, cocoa-producing countries have opened themselves up to foreign-owned corporate agribusiness exporting companies and producers have received a higher share of a lower world price. U.S. and European transnational corporations have become increasingly involved in more aspects of the cocoa bean supply chain, becoming the buyers and exporters of cocoa beans in producing countries with the scaling back or dissolution of commodity marketing boards in those countries. These corporations have also centralized grindings from a number of companies into the control of a few, larger corporations and have increased grindings in the producing countries.

Trade liberalization was also accomplished through free trade agreements (FTAs) in a few countries from which the United States imports fewer cocoa beans than those that underwent SAPs. Free trade agreements are those in which a designated group of countries have agreed to reduce or eliminate tariffs, quotas and trade preferences on many or most goods and services traded between them. This study also discusses the role that the World Trade Organization (WTO) has in agricultural negotiations. The World Trade Organization is an intergovernmental body regulating tariffs and trade. This section presents an overview of trade liberalization in the cocoa industry, changes in the market structure of exporting and marketing companies, and the U.S. market for cocoa beans and products.

Prior to trade liberalization, cocoa trade was inefficient and the share of the f.o.b. price received by farmers was small (Varangis & Schreiber, 2001). Marketing boards were largely responsible for these faults, taking the lion's share of the f.o.b. in taxes while returning only some of it in the form of extension services and seed varieties. Many farmers smuggled cocoa to neighboring countries when those countries' market price was higher than their own, inflating export figures for the higher-priced countries and deflating prices for lower-priced countries

Yeboah is Associate Professor and Interim Director, L. C. Cooper, Jr. International Trade Center, North Carolina A&T State University. Shaik is Assistant Professor, Department of Agribusiness and Applied Economics, North Dakota State University. Wozniak is Agricultural Economist for Economic Research Service, United States Department of Agriculture. Allen is Professor, Department of Agricultural Economics, Mississippi State University.

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(Bulíř, 2003). Cocoa exports were on the decline in many countries, such as Nigeria, where exports in 1985 – after the implementation of SAPs – were still below their 1970 levels, as oil became more vital to that country's economy (Kwanashie, Ajilima & Garba, 1998).

Following historically low prices in the 1970s, many cocoa producing countries underwent trade liberalization under SAPs from the World Bank and International Monetary Fund (IMF). In Nigeria, SAPs were used as the "only alternative" toward improving agricultural output (Kwanashie, Ajilima & Garba, 1998). Marketing boards were restructured, replaced or eliminated and opened up to competition from private marketing and export companies. Beginning in the 1980s, these processes are still underway in Ghana and Côte d'Ivoire, the two highest-volume cocoa-producing countries in the world.

Trade liberalization has had both positive and negative impacts. It has brought a greater share of the f.o.b. price to cocoa bean farmers (Varangis & Schreiber, 2001). This greater share, though, is of a lower world price as production has grown and prices have harmonized across borders (Figure 3, Gilbert & Varangis, 2003). Marketing boards' roles have been reduced or eliminated and transnational corporations have replaced them in buying and exporting cocoa beans (Fold, 2002). Exporting has also undergone centralization, as these transnational firms have exercised comparative advantage against smaller firms (Fold, 2001). But by opening up markets to foreign competition, farmers have become more vulnerable to price fluctuations, great and small, on the world market. World prices have also converged between countries and fallen during the trade liberalization period (Figure 1). For U.S. imports, trade liberalization has signaled lower world prices for firms buying cocoa beans from producing countries and lower prices for U.S. consumers buying the cocoa and chocolate products derived from them.

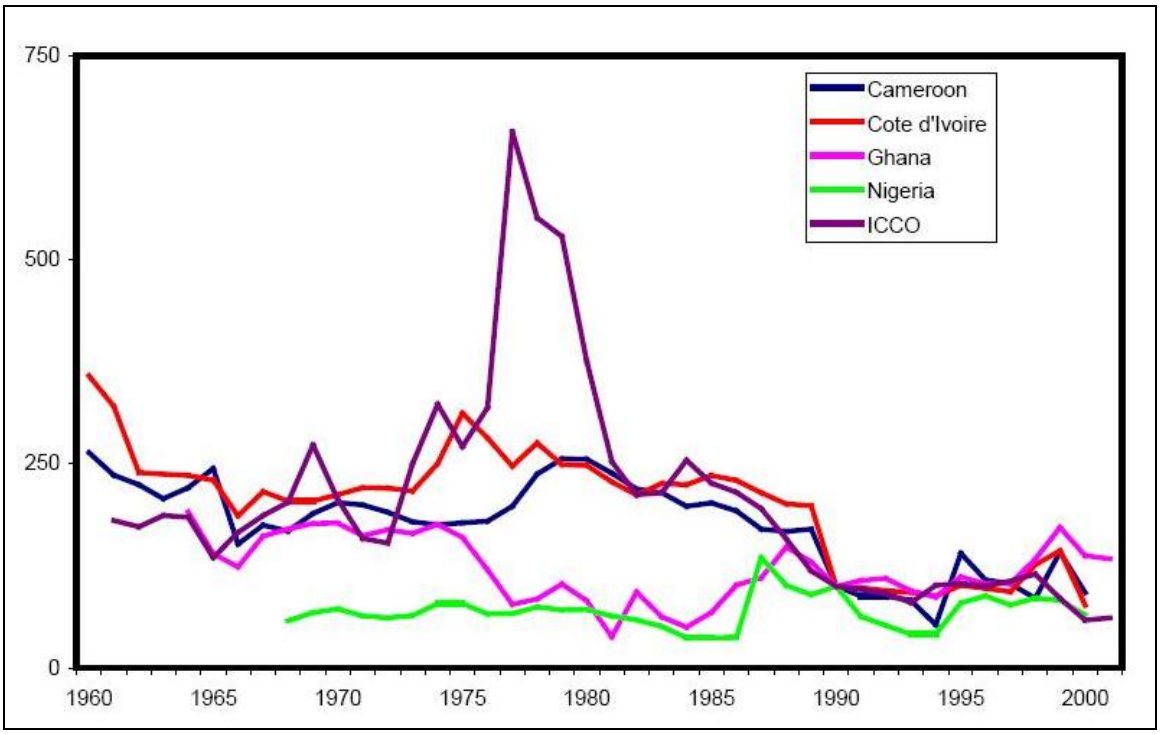

Figure 1. Deflated Cocoa Producer Prices and Deflated ICCO Indicator Price, West African Countries (1985 = 100)

The move under trade liberalization from protectionist agricultural commodity policies toward open market policies for cocoa beans has implications for other commodities, as well, such as coffee, tea, sugar and cotton. These issues are especially relevant during the current Doha Round of WTO negotiations, which are at an impasse as developing countries whose economies are dependent on agriculture square off against industrial countries seeking the developing countries' full market liberalization for agricultural goods.

This study researches the effects of trade liberalization and U.S. cocoa bean imports from twenty-one cocoa-producing and exporting countries for the pre- and post-liberalization period of 1970-2008. These countries are Brazil, Cameroon, Colombia, Costa Rica, Côte d'Ivoire, Dominican Republic, Ecuador, El Salvador, Ghana, Guatemala, Haiti, Honduras, Indonesia, Malaysia, Mexico, Nicaragua, Nigeria, Panama, Papua New Guinea, Trinidad and Tobago and Venezuela. At issue is not the countries' unwillingness to liberalize trade, as their governments have taken, willingly or unwillingly, the first steps through SAPs, FTAs and GATT/WTO membership to liberalize their agricultural markets, but to measure the potential export growth for cocoa bean-exporting countries if trade were further liberalized under WTO negotiations. The United States represents the second-largest export market for cocoa beans, behind the Netherlands, and there has been a growth in exports of cocoa beans to the United States under trade liberalization. Increased trade liberalization could be stalled due to the impasse in WTO negotiations, which could slow development through trade for the developing countries.

As the United States, European Union (E.U.), the WTO, World Bank and IMF promote trade liberalization for developing countries, analysis of its benefits needs to continually be taken into consideration. Improper sequencing of trade liberalization could lead to disruptions for any economy, and for a country like Côte d'Ivoire, which receives 15% of its GDP from cocoa exports, this can be disadvantageous. Also, given trade's potential for lifting millions of people out of poverty, trade liberalization has some potential to be extremely beneficial for farmers. Improved terms of trade for these countries can lead to further development in agriculture, as well as in other sectors. Increasing market access for their cocoa bean exports can help them achieve greater development and lift themselves out of poverty.

This study's objectives are to measure trade creation for WTO member countries that have undergone trade liberalization and to measure the impacts of further trade liberalization of cocoa markets using the gravity model. The specific objectives are to provide descriptive analysis of marketing/distributing channels of U.S. cocoa bean imports from these ten countries, apply gravity models to econometrically determine the effects of trade liberalization and other economic factors on cocoa exports in a panel data setting; and to provide policy recommendations.

Gravity Model

Originally inspired by Newton's gravity equation in physics, the gravity model has become popular in regional science for describing and analyzing spatial flows. Anderson (1979) was the first to draw linkages to economic theory that was pioneered in the analysis of international trade by Tinbergen (1962); Pöyhönen (1963); and Linneman (1966). The generalized framework Anderson developed incorporates the Armington assumption, that goods produced by different countries are inherently imperfect substitutes by virtue of their provenance. Under the assumption of monopolistic competition, each country is assumed to specialize in different products and to have identical homothetic preferences. Zero balance of trade is also assumed to hold in each period. Anderson built on the ordinary variables of dollar flow of a good from one country (or group of countries) to another as the dependent variable, and both parties' incomes (often measured as GDP), populations, and the distance between the two parties and an error term, lognormally distributed with an expected value of 0, as the independent variables.

The basic gravity model is often expressed as follows:

$$(1) \quad tf_{ij,t} = f(G_{i,t}, G_{j,t}, d_{ij,t})$$

where

$tf_{ij,t}$ = value of trade between countries *i* and *j*,
$G_{i,t}$ & $G_{j,t}$ = income of countries *i* and *j* and is positively related to trade,
$d_{ij,t}$ = a negative function capturing the distance between the two trading partners and transaction costs of commercial activity.

The generalized framework Anderson developed assumes Cobb-Douglas expenditure system and incorporates the Armington assumption that goods produced by different countries are inherently imperfect substitutes by virtue of their origin. Each country specializes in different products and has identical homothetic preferences under the assumption of monopolistic competition. Zero balance of trade is also assumed to hold in each period.

Recently, the application of gravity models has enjoyed a big revival. However, this has not so much been driven by its more rigorous theoretical foundation (Anderson, 1979; Bergstrand, 1985, 1989, and 1990; Helpman & Krugman, 1985; and Helpman, 1987) but the opportunity to project bilateral trade relations (Hamilton & Winters, 1992; Baldwin, 1994). According to the traditional concept of the gravity equation, trade can also be explained by GDP and/or GDP per capita figures and both trade impediment (distance) and preference factors (common border, common language, etc.). The economic framework in most cases was cross-section analysis (Wang & Winters, 1991; Hamilton & Winters, 1992; Brulhart & Kelly, 1999; and Nilsson, 2000). Only a few authors made use of (random effects) panel econometric methods (Baldwin, 1994; Gros & Gonciarz, 1996; Mátyás, 1997; and Egger, 2002). Mátyás, (1997 and 1998) provides insights into the question of proper econometric specification without dealing with the issue of trading potentials.

The Econmetric Model

According to the endowment-based new trade model with Dixit & Stiglitz (1977) preferences, bilateral trade is an increasing sum of factor income *G*, relative size *S*, the difference in relative factor endowments *R*, and real bilateral exchange rate denoted by *E*. We use purchasing power parity, denoted by *PPP*, in place of *E*. The presence of a free trade agreement between the producing country and the United States is measured with the dummy variable *FTA*, and the effect of GATT/WTO membership is measured by the dummy variable *GATTWTO*. As this organization enforces trade liberalization and we can be certain of steps toward trade liberalization in agriculture for all countries only for years the Agreement on Agriculture (AoA) is in force, it could have been separated into pre-WTO and pre-AoA years denoted by a dummy variable 0, and post-WTO and post-AoA years denoted by a dummy variable with value 1. However, trade liberalization is not a process where a researcher can observe an import value and assign causation in a regression equation for increased or decreased import values under any liberalization policy. As such, if the country were a member of GATT or WTO, the value for *GATTWTO* is 1, and 0 if a non-member. Applying the typical cross-section gravity equation to study trade effects of liberalization policies, we can specify the model as follows:

$$(2)\quad IMPVAL_{ijt} = \beta_0 + \beta_1 GDP_{it} + \beta_2 GDP_{jt} + \beta_3 PPP_{ijt} + \beta_4 FTA_{ijt} + \beta_5 GATTWTO_{ijt} + \varepsilon_{ijt},$$

where all variables except FTA_{ijt} and $GATTWTO_{ijt}$ are in real figures. The one-way random effects model representation is

$$(3)\quad e_{ijt} = u_{ij} + w_{ijt}$$

and the two-way random effects model representation is

$$(4)\quad e_{ijt} = u_{ij} + v_t + w_{ijt}$$

where *ij* represents the cross-section and *t* represents time, with u_{ij} as the (one-way fixed or random) unobserved bilateral effect, v_t as the (two-way fixed or random) unobserved time effect and w_{ijt} as the remaining residual error. The one-way fixed effects model representation is

$$(5)\quad IMPVALijt = \beta_0 + \beta_1 GDPit + \beta_2 GDPjt + \beta_3 PPP_{ijt} + \beta_4 FTA_{ijt} + \beta_5 GATTWTO_{ijt} + \beta CS_{ij-1}\ CS_{\ dummies} + \varepsilon_{ijt},$$

where *CS*= number of cross sections or countries. The Heckscher-Ohlin (H-O) bilateral trade determinants can be formulated as the GDP of the cocoa bean-producing country GDP_{it} and the U.S. GDP_{jt}.

$IMPVAL_{ijt}$ represents U.S. cocoa bean imports deflated in real 2005 dollars from exporting country *i* to the United States, denoted as *j*. GDP_{it} is the real GDP of the exporting country *i* in the year *t*. GDP_{jt} is the real GDP the importing country *j* in the year *t*. PPP_{ijt} represents the purchasing power parity between country *i* and country *j* in year *t*, expressed as national currency value of GDP divided by the real value of GDP in international dollars. The international currency has the same purchasing power over total U.S. GDP as the U.S. dollar in a given base year (PWT 7.0 is in base year 2005) (Penn World Table 2011). FTA_{ijt} and $GATTWTO_{ijt}$ represent the dummy variables of interest and take the value of 1 if the country is a party to each respective trade liberalization policy and 0 if otherwise.

For the panel econometric projection of potential bilateral trade, many researchers have concentrated on the random effects model (REM), which requires that $u_{ij} \sim (0, \sigma_u^2)$, $v_{tj} \sim (0, \sigma_v^2)$, $w_{ijt} \sim (0, \sigma_w^2)$, and that u_{ij} and v_{tj} are independent of the w_{ijt}. Moreover, the X_{ijt} (i.e. the explanatory variables) have to be independent of u_{ij}, v_{tj} and w_{ijt} for all cross-sections (*ij*) and time periods (*tj*). Whereas the fixed effects model (FEM) is always consistent in the absence of endogeneity or errors in variables, the REM is only consistent if the above-mentioned orthogonality conditions are fulfilled. Then, the REM has the advantage of more efficiency as compared to the FEM. If these conditions do not hold, only the FEM is consistent since it wipes out all the time-invariant effects (u_{ij}) and spatially-invariant effects (v_{tj}). The decision between the FEM and the REM models can be based on the Hausman (1978) test. Heteroskedasticity rarely occurs in time-series and panel data, but this study has corrected the errors through unequal variances resulting from different cross-sections through the FEM which assumes the intercept of each cross-sectional unit is different from the other and it never happened by chance.

The choice between a one-way FEM and a two-way FEM was determined through problems with multicollinearity. GDP_{jt} was found to be collinear with $IMPVAL_{ijt}$ in the two-way fixed effects model and an estimate was not able to be calculated. Dropping GDP_{jt} from the regression equation presents problems for our analysis because importing country GDP is an important theoretical predictor for import demand, measured by $IMPVAL_{ijt}$. Also, a Hausman statistic could not be calculated due to problems with rank between the REM and FEM. Because an estimate for GDP_{jt} could not be determined, a Hausman statistic could not be calculated through the comparison of the REM and FEM estimates. Thus, this study utilizes the one-way fixed effects model as the aforementioned orthogonality conditions were not met.

Data

The gravity model is applied using panel data for the period 1970 to 2008 for U.S. imports of cocoa beans from twenty-one cocoa producing countries (fourteen Latin American, four African, and three Asian). Data on nominal trade values (in $1000) for cocoa imports to the U.S. are from the U.S. Census Bureau publication, "U.S. Imports for Consumption" for the years 1970-1988 and the U.S. International Trade Commission's Interactive Tariff and Trade Data Web from 1989 to 2008, at http://dataweb.usitc.gov/. These were deflated with CPI data obtained from the Federal Reserve Bank of St. Louis' Economic Research Division, at http://research.stlouisfed.org/. PPP data was obtained from Penn World Table 7.0, http://pwt.econ.upenn.edu/, and GDP data (in U.S. $Billion) were obtained from the USDA Economic Research Service International Data Sets, http://www.ers.usda.gov/Data/macroeconomics/. Data for FTA and GATT/WTO were obtained from Rose's (2004) WTO data set at the University of California-Berkeley Haas Business

School at http://faculty.haas.berkeley.edu/arose/. As trade liberalization is not a process whereby a country "flips a switch" and becomes liberalized overnight or from one year to the next, a dummy variable for FTA and GATT/WTO membership simplifies this political procedure greatly. However, as there are few measures of trade liberalization (tariff reduction would be one), using a dummy variable is at least practical. The United States does not have tariffs on cocoa beans, but rather processed cocoa products.

The GATT/WTO dummy variable was constructed with 1 representing full membership for greater than three months' membership for that year, and 0 representing less than three months' membership for that year. Three months were chosen because WTO *could* have some effect on a country's exports of its larger late harvest in autumn. Entry years were obtained from the WTO web site. Trade liberalization was also measured by including a free trade agreement variable, FTA. Of the observed countries, the United States only has FTAs with Mexico, the North American Free Trade Agreement (NAFTA), since 1994, and with the Dominican Republic and Central American countries that are a part of the Dominican Republic – Central American Free Trade Agreement (DR-CAFTA). This free trade agreement between the United States, Dominican Republic, Costa Rica, Honduras, Guatemala, El Salvador, and Nicaragua started at different dates per country after 2006.

Estimation Procedure

Problems with a zero-value dependent variable were present. Taking the natural logs of these would provide undefined values. If a zero import value is present for a given country in a given year, it was left as zero in the analysis. In this analysis, the one-way fixed effect model is used while the two-way FEM, the one-way REM, and two-way REM are used as robustness checks. The dependent variable, observed real value of U.S. cocoa imports $IMPVAL_{ijt}$, was regressed on each exporting country's GDP GDP_{it}, the U.S.' GDP GDP_{jt}, purchasing power parity PPP_{ijt}, and the presence of trade liberalization policies, FTA_{ijt} and WTO_{ijt}. Estimates for the other observable determinants impeding or inducing bilateral trade (distance, common border, and common language) dropped out in the final models together with distance as they are all time-invariant dummy variables. Linear variables were used following goodness of fit tests on the panel dataset. Other specifications of the model were conducted as robustness checks on the linear model.

Results and Discussion

To examine the empirical validity of the gravity model with respect to cocoa bean trade potential between the United States and twenty-one exporting countries from 1970 to 2008 equation (2) is estimated. The descriptive statistics of the variables in the model are reported in Table 1. On average, the value of cocoa imports to the United States from 1970-2008 from a given country is about $38.4 million. This statistic is no surprise as the U.S. chocolate industry uses very little of cocoa as an input – 5 to 10 percent of the value of the bar (Gilbert and Varangis 2003). The mean of GDP for exporting countries was $85.7 billion, with a minimum and maximum of $2.04 billion and $1.1 trillion, respectively. U.S. GDP ranged from $4.3 trillion to $13.2 trillion. PPP ranges from nearly 0 units of currency to 4974 units of currency, with the mean being 113 units of currency. Exporting countries were members of FTAs 3.5 percent of the observations, and GATT/WTO 74 percent of the observations.

Table 2 presents the country effect results for the one-way fixed effect panel (country) estimators, while Table 3 presents the parameter estimation results for this regression. According to the test statistics we cannot ignore the cross-sectional effects as the F-value coefficient for the one-way FEM is significant at ($P < 0.0001$) with R^2 of 0.65. Thus, the probability that there are no effects in the model is 0 and thus the probability of the one-way or two-way REM being a better fit is 0.

Many country effects were also significant, relative to Venezuela. Venezuela is the omitted country variable because it was alphabetically last in our list of countries. For a $1000 increase in Brazil's cocoa bean exports to the United

Table 1. Descriptive Statistics (N=819)

Variable	Mean	Std. Dev.	Minimum	Maximum
$IMPVAL_{ij,t}$ ($1000)	38385.15	78831.12	0	529610.60
$GDP_{i,t}$ ($Billion)	85.68	182.49	2.05	1126.15
$GDP_{j,t}$ ($Billion)	8125.78	2726.61	4262.25	13220.02
$PPP_{i,t}$ *(see Data section for description)*	112.59	420.97	1.62E-12	4973.59
$FTA_{ij,t}$ *(Dummy, 1=FTA, 0 otherwise)*	0.04	0.19	0	1
$GATTWTO_{i,t}$ *(Dummy, 1=FTA, 0 otherwise)*	0.74	0.44	0	1

Table 2. Fixed One Way Country Effect Parameter Estimates

Number of Cross Sections			21
Time Series Length	39		
Fit Statistics			
SSE	1.78E+12	DFE	793
MSE	2.25E+09	Root MSE	47416.9
R-Square	0.65		

F Test for No Fixed Effects

Num DF	Den DF	F-Value	Pr > F
20	793	62.96***	<.0001

Country	DF	Estimate	Std. Err.	Pr > |t|
Brazil	1	207229.2***	25193.0	<0.0001
Cameroon	1	-43295.6***	12026.9	0.0003
Colombia	1	-38980.0***	11797.9	0.0010
Costa Rica	1	-24515.1**	11550.6	0.0341
Cote d'Ivoire	1	205900.1***	12244.2	<0.0001
Dominican Republic	1	51274.7***	11679.6	<0.0001
Ecuador	1	35388.0***	11372.7	0.0019
El Salvador	1	-27614.7**	11565.7	0.0172
Ghana	1	68237.9***	11699.6	<0.0001
Guatemala	1	-23334.6**	11449.1	0.0419
Haiti	1	-29150.4**	11706.5	0.0130
Honduras	1	-27256.7**	11686.5	0.0199
Indonesia	1	-6638.6	16526.9	0.6880
Malaysia	1	-9951.8	11172.4	0.3733
Mexico	1	69576.6***	18520.0	0.0002
Nicaragua	1	-35562.1***	11868.8	0.0028
Nigeria	1	34574.2***	11230.2	0.0022
Panama	1	-22729.3**	11565.6	0.0497
Papua New Guinea	1	2011.1	11624.8	0.8627
Trinidad and Tobago	1	-28418.9**	11682.0	0.0152

* - Significant at 10%
** - Significant at 5%
*** - Significant at 1%

Table 3. Fixed One-Way Parameter Estimates

Variable	DF	Estimate	Standard Error	Pr > |t|
Intercept	1	54543.45	7230.99	<0.0001
GDP_i	1	-202.82***	39.75	<0.0001
GDP_j	1	-4.00***	1.16	0.0001
PPP_i	1	58.68***	9.41	<0.0001
FTA_{ij}	1	32131.11***	7562.86	<0.0001
$GATTWTO_i$	1	12192.38**	4861.22	0.0117

* - Significant at 10%
** - Significant at 5%
*** - Significant at 1%

States, Venezuela's cocoa bean exports will increase $207,229. For a $1000 increase in Côte d'Ivoire's cocoa bean exports, Venezuela's exports to the United States will increase by $205,900, suggesting that the United States will be purchasing more cocoa beans from more countries to satisfy greater consumer demand. Indonesia, Malaysia and Papua New Guinea were the only countries that showed no significant impact on exports from Venezuela to the United States.

The coefficient of the exporting country's GDP (GDP_i) is negative and statistically significant at ($p < 0.0001$). Thus, the larger the per capita GDP for the exporting countries the smaller the trade value of cocoa bean exports. A US$1 billion increase in the GDP of the exporting country will lead to a -$202,820 decrease in the export value of cocoa beans to the United States, possibly because that country is slowly developing and shifting away from the agricultural sector and into manufacturing or services.

The GDP of the importing country, the United States (GDP_j), is also negative and significant at the 1% level. A $1 billion increase in U.S. GDP leads to a $4,000 decrease in U.S. cocoa bean import value. This may be because cocoa is an inelastic good, and cocoa products comprise a small share of the United States' food expenditures and an increase in GDP would not necessarily mean an increase in cocoa bean imports. The reason could also be that consumers with higher incomes are more often more educated about health issues and thus consume fewer cocoa products, due to their high fat and sugar contents. However, during the recent recession, chocolate is a good that Americans still seem to be buying, perhaps more than before the recession began (U.S. News and World Report, 2009).

PPP_i is significant and positive at ($P< 0.0001$). An increase of one unit in PPP will lead to a $58,683 increase in U.S. cocoa bean import value as the terms of trade improve for producers and they are able to purchase more inputs and other goods.

The dummy variables that are the focus of this study on trade liberalization, FTA_{ij} and $GATTWTO_i$, are significant at ($P\leq 0.0001$) and ($P\leq 0.05$) and positive. Trade liberalization appears to increase cocoa exports from producer countries per annum. Participation in FTAs leads to a $3.2 million increase in the amount of cocoa beans imported by the United States. Also, membership in GATT/WTO increases U.S. cocoa bean imports $12.2 million. This could also incorporate gains made under SAPs and other measures, showing that trade liberalization on the whole has been beneficial under GATT/WTO, SAPs, FTAs and other measures to increase U.S. cocoa bean imports. This lends support to Subramanian and Wei (2003) that there is empirical evidence that membership in the GATT/WTO increases trade, though with a 5 percent threshold, this study's results only lend mild support for the cocoa and the WTO tropical products deal.

Conclusion

International trade theory informs us that at the individual country level, border relaxation reduces domestic prices that help local consumers and increases the profit for low-cost exporters

through increased sales in the foreign market. At the global level, trade liberalization causes demand and supply to expand, both of which improve price signals and improves world welfare.

Theory also teaches us that there are many other socio-economic and political-institutional determinants of cross-border trade, including market size, geographical proximity, tastes and preferences, cultural ties, and financial linkages. This paper used a linear one-way fixed effect panel estimation to determine the influence of the various factors driving the value of U.S. imports from major cocoa exporting countries.

One noteworthy finding is that increases in the GDP of exporting and importing countries decreases cocoa bean trade. PPP also matters, as the terms of trade for cocoa-producing countries improve, so does their ability to produce as they choose to invest in cocoa forests and not in timber or products requiring fewer inputs. But as producers' share of world price of cocoa through trade liberalization grows, production increases and the volume of exports rises. Finally, important to this study on the effects of trade liberalization of cocoa bean producer markets on U.S. imports, trade liberalization through membership in the GATT/WTO and FTAs is shown to positively influence U.S. cocoa bean imports from producing countries.

Comparative advantage under trade liberalization has been shown to have a positive effect on U.S. cocoa bean imports, which would lead us to believe this trade would contribute positively to the terms of trade, holding other agricultural goods and industries equal. This would lead to greater development for the cocoa bean producers and give them a means to invest in their development, making increased education for the community, increased infrastructure, health care, or other goods harder for producers to afford. It could also lead to an investment in improving the quantity or quality of cocoa beans they produce or a divestment from growing cocoa altogether as demand from the United States increases.

For the United States, trade liberalization has given consumers more cocoa beans with which to produce cocoa products. Though a small share of consumer income spent, it is still beneficial to consumers to purchase goods at a lower price, so long as producers benefit on the production end for a mutually beneficial relationship between trading partners. Ensuring that current and future agreements have language protecting both the consumers and producers so that the trading relationship continually improves between both partners for the development of the producers and the financial welfare of the consumer is important to the success of trade liberalization. As FTAs were part of the trade liberalization analysis and have a significant and positive effect on cocoa bean exports, there is evidence that future FTA negotiations and legislation, such as those with Colombia and Panama, and with cocoa-producing countries possessing FTAs with the United States, such as Mexico, the DR-CAFTA countries, Chile and Peru, can be structured such that the welfare of producers is improved through these agreements. FTAs can help producers increase their share of the cocoa price to improve the livelihoods of these people and their communities and their local environment. Fair Trade certification under FTAs is one such way to accomplish this.

As trade liberalization under GATT/WTO was shown to have a significant and positive effect on U.S. cocoa bean imports, as the Doha Round of WTO negotiations goes forward, WTO membership should benefit the development of producing countries specializing in tropical export products, like Côte d'Ivoire and Ghana, and benefit U.S. consumers of chocolate and other cocoa products. The current negotiations of a broad deal on the treatment of tropical products, with the new WTO exception for bananas, in the Doha Round should offer producing countries a path toward increased development through increased market access, and not vice versa (ICTSD, 2010). Trade liberalization under SAPs has not proved well for import-substituting industrialization. For example, Ghana's economy is still very much focused on gold, cocoa and timber (Mkandawire & Soludo, 1999). Smallholder dynamism can play a mitigating role in this, as evidenced by the Kuapa Kokoo cooperative in Ghana and its relationship with the Day Chocolate Company and Fair Trade Certification (Tiffen 2002; Doherty and Tranchell 2007).

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