

## An Update on the Consequences of EU Sugar Reform

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### ABSTRACT

Since its formation the European Union (EU) has employed a rather complicated policy to ensure high prices to domestic sugar growers and trade preferences to certain sugar exporting countries, e.g. the African Caribbean and Pacific (ACP) group. One result of this policy is that the EU has been both the second largest importer and second largest exporter in the world market. Under pressure from the World Trade Organization (WTO), the EU agreed to reform its policies toward sugar in 2001, with the full effect of the reforms being fully implemented in 2006. In this paper, the impact of the sugar reform on EU production, consumption, imports, and exports is examined especially with regard to how it all affects the ACP countries who receive preferential treatment regarding access to EU sugar markets. Preliminary analysis indicates that lowering domestic EU prices, while quotas requirements for ACP countries remain intact might have negative revenue implications for poor sugar producers.

*Keywords: Impact of EU sugar policy, ACP countries, Sugar trade*

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### 1 Introduction

In the past four decades sugar trade in the EU has been regulated by the Common Market Organization (CMO) which was established in 1968 and whose main goal was ensuring self sufficiency in the EU market (Abbot, 1990). What has evolved over time though is a costly supply management scheme for the EU domestic sugar market which insulates domestic producers from international competition by means of a system of price supports and prohibitive import tariffs (South Center, 2007). There is evidence from sugar price data (World Bank, 2011) that the policies that were followed by the EU over time have resulted in domestic prices three times higher than world free market prices as well as production surpluses that have been exported to the world markets using expensive market distorting subsidies. Part of the supply management scheme involved granting duty free access for certain amounts of sugar from the African, Caribbean and Pacific countries (ACP), a block made up of mostly former British and French colonies. Many economists (Marks and Muskus, 1993; Borrell and Pearce, 1999) believe that the sugar protocol which allows 18 ACP countries preferential access to the EU has allowed high cost producers to stay in business despite lack of competitiveness.

Australia, Brazil and Thailand, all countries which did not have access to the protected EU market, filed a complaint, in September 2002, against the EU claiming that the volume of the EU's subsidized exports of sugar exceeded the levels the EU had committed itself under the Uruguay Round Agreements (Milner et al, 2004). One of the main issues of the complaint was about the 1.6 million tons of sugar that originates from the ACP and India that the EU re-exported to the world markets at subsidized rates. A World Trade Organization (WTO) panel and the Appellate body ruled in favor of the three complainants, finding that the EU exceeded its subsidy commitments. The EU was then obliged to bring its domestic market regulation into conformity with its WTO obligations (South Center, 2007). The increasing costs of the Common Agricultural Policy (CAP) have also contributed to internal pressure to reform, while the expansion of the EU has made it necessary to revisit some of these agreements including the Sugar Protocol.

To be compliant with WTO regulations, in 2005 the European Agricultural Council agreed to a set of reforms to the EU sugar sector that were to result in an eventual 36% price cut, with beet growers compensated with direct income payments. In addition, they agreed on a quota buy back scheme, funded by those processors staying in the sugar sector, to compensate processors leaving the sector. The envisaged net result of the reform was that by 2011, EU sugar production would be reduced by between 25% and 33% from roughly 20 million metric tons white sugar in 2005 to a figure between 13 and 15 million metric tons. The reforms were expected to leave the EU sugar price at roughly double the world market prices compared to 2005 prices when it was three times world prices (Gain Report E35225, 2005). Other features essential to the proposed reform include phasing out of sugar intervention; eliminating over-quota sugar exports; elimination of re-exports of sugar imported under preferential terms.

The price reductions however contradict the interests of the ACP beneficiaries of the Sugar Protocol, since the guaranteed price under the protocol has traditionally resembled the EU domestic price. South Center (2007), reports that the EU sugar market reform yielded even more consequences for the signatories of the Sugar Protocol, providing for the termination of preferences by October 2009. In September 2007, the EU denounced the sugar protocol, for two reasons, providing for the termination of preferences by October 2009. Firstly EU policy makers wanted to take pressure off the over-supplied domestic market which had proven to be relatively resistant to initial reforms. The elimination of guaranteed imports hence would complement efforts to reduce domestic over supply. Secondly, there was increasing doubt whether the sugar protocol, if upheld for indefinite duration would withstand legal challenges under WTO law, mostly because the Sugar Protocol preferences generally violate non-discrimination obligations contained in the GATT 1994 (South Center, 2007). The EU had received a waiver which, expired in 2007, which allowed it to grant trade preferences under the Cotonou Agreement, of which the Sugar Protocol is an integral part. By 2008, the preferences were highly vulnerable to legal challenge from other WTO members. By denouncing the protocol, the EU was eliminating the possibility of further WTO complaints that could have been laid against it as early as 2008, the year after the waiver expired.

The purpose of this paper is to understand better the predicament the ACP countries find themselves in because both the EU reform and the denunciation of the Sugar Protocol have severe effects on ACP beneficiaries. Reduced rents to EU dependent exporters may have serious macroeconomic implications in terms of incomes, employment, the balance of payments and tax revenues. The paper aims to review literature on the impact of sugar reform and how that could inform policy makers. Descriptive analysis is done on trade data to understand the movements in data series since the inception of the policies in 2006. The paper also proposes a mathematical programming model, which is part of ongoing research that could be used to understand the trading positions of different countries after the policy changes.

## **2 The Conceptual Framework and Model**

To fully understand the impact of the change in EU policies, there is a need to look at the whole world in aggregate, the idea is to develop a world sugar trade model to determine the direction of flows of sugar from production to consumption regions, and also determine the equilibrium prices. Consider a two country trade model where the EU is one country and the ACP another. Also we apply the small country assumption to the ACP, implying that it has no market power in terms of determining sugar prices.

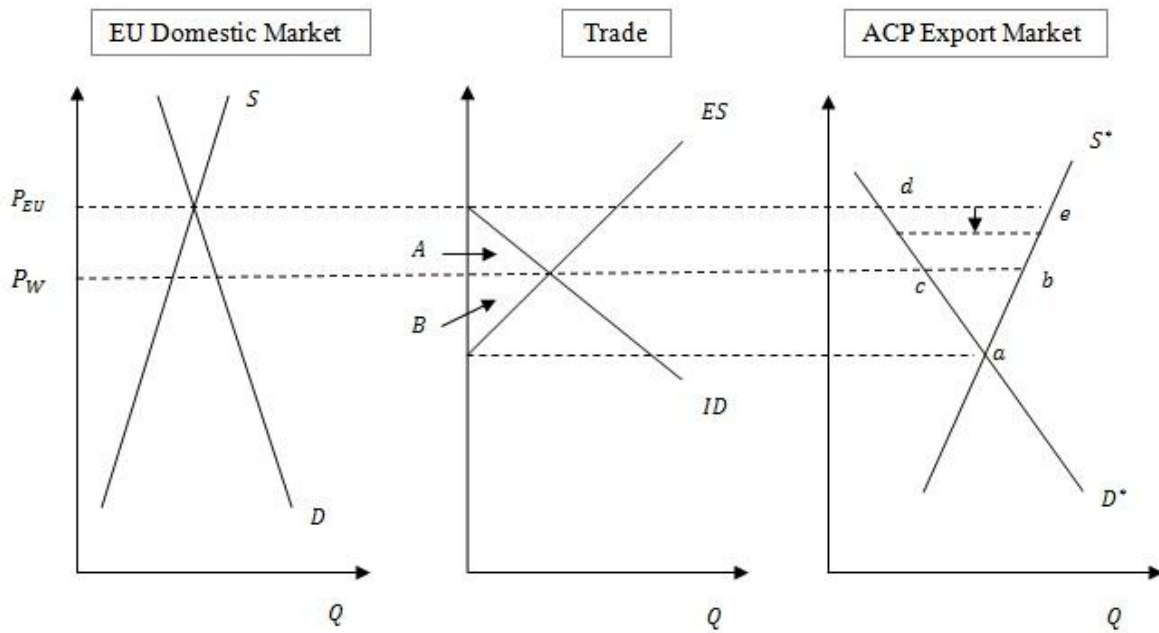


Figure 1. A two country trade model for the EU and ACP countries

$P_{EU}$  is the price that prevails in the EU before the implementation of the sugar policy reform. It is assumed that since the EU is an exporter and importer of sugar, the market clearing price in the domestic EU market takes into consideration sugar inflows and outflows. The gains from trade are shown in the middle diagram where area  $A$  are the gains accruing to the EU, while area  $B$  are the gains that accrue to the ACP, assuming trade is at the world price ( $P_W$ ). Since the ACP countries receive preferential treatment and are paid a price  $P_{EU}$  for their produce, their gains to trade are even larger by area  $bcde$ . Given the scenario presented by the EU whose goal is to lower the price  $P_{EU}$  by up to 36% and this new price call it  $P'_{EU}$  which is higher than  $P_W$ , the impact on the ACP countries will be a decline in the surplus area  $bcde$ . The size of the surplus changes will be determined by among other things, the import and export demand elasticities. The EU/ACP Sugar Protocol assigns production quotas to participating countries. So while the prices will go down in the EU as a result of the reform, ACP countries could face a revenue effect as a result of lower prices and unchanged output, if quotas remain fulfilled.

Takayama and Judge (1971) developed a spatial price equilibrium model, where prices, consumption and geographical flows for a single commodity are determined, when linear functions are acceptable approximations to the regional demand and supply functions. Even though sugar is produced from sugar beets and cane, the final product is assumed to be homogeneous, so what needs to be determined is (a) the net price in each region or country, (b) the quantity of exports and imports for each region or country (c) which regions export, import or do neither (d) the volume and direction of trade between each possible pair of countries.

Let us assume that for each country, demand and supply quantities are given by the following inverse demand and supply functions respectively  $P_i = \lambda_i - w_i y_i$  and  $P^i = v_i + \eta_i x_i$  where we assume  $\lambda_i > 0$ ,  $w_i > 0$ ,  $\eta_i > 0$  for all  $i$ . For each country assume that the quantity actually consumed,  $y_i$  is less than or equal to the quantity shipped into the region from all supply regions. Thus,  $y_i \leq \sum_{j=1}^n x_{ij}$  where  $x_{ij} \geq 0$  for all  $i$  and  $j$  and is the quantity shipped from the  $j^{th}$  region to the  $i^{th}$  region. The actual supply quantity  $x_i$  is assumed to be greater than or equal to effective supply from region  $i$  to all regions. Note that the supply and demand functions referred to here are the excess supply (ES) and import demand (ID) schedules referred to in the figure 1 above.

Thus  $x_i \geq \sum_{j=1}^n x_{ij}$  where  $x_{ij} \geq 0$  for all  $i$  and  $j$ . Given this framework, the objective is to develop a mathematical programming model which will yield a competitive spatial equilibrium price and allocation solution. Consider the following quasi-welfare function,  $W_i(y_i, x_i) \equiv \int_{\hat{y}_i}^{y_i} (\lambda_i - w_i y_i) dy_i - \int_{\hat{x}_i}^{x_i} (v_i + \eta_i x_i) dx_i - \sum_i \sum_j t_{ij} x_{ij}$  where  $\hat{y}_i$  and  $\hat{x}_i$  are the pre-trade equilibrium quantities. The solution to this model yields the prices and quantities at equilibrium which allows an analyst to determine the equilibrium prices and quantities prevailing in each country and hence the direction of trade flows prevailing as a result of changes in EU policies. There are transportation costs involved, since the countries are separated physically, let these unit costs be  $t_{ij} \geq 0$  for all  $i$  and  $j$ .

### 3 Review of impact studies

A plethora of studies have been carried out to evaluate the impact of sugar policy reform at a number of levels varying from single country level to a global level focusing on world markets. There seems to be widespread agreement that the EU-ACP Sugar Protocol has had the effect of keeping world prices lower than prices prevailing in the domestic EU market (Borrell and Pearce, 1999; Milner et al, 2004). The fundamental question then becomes, by how much could the liberalization of the EU market result in world prices going up, and among ACP countries who will be the gainers and losers? According to McDonald (1996), deriving estimates of the proposed reforms on the ACP countries is complicated by the large number of unknowns, foremost among these being the precise details of how the EU reforms and the GATT-induced reforms would be implemented.

Borrell and Hubbard (2000) quantified the cost of EU protection and suggest that to quantify the effects of the Common Agricultural Policy (CAP) on the EU and the rest of the world requires imagining how the economies of many nations would change if the CAP on sugar were to be abolished, replacing it with free trade. To measure the aggregate effects of the CAP they adopted and modified the Global Trade Analysis Project (GTAP) database and standard model developed by Hertel (1997). To simulate what would happen if the CAP were abolished, EU barriers to trade and direct subsidies were eliminated from the model. This serves to remove all the CAP support to EU farmers and lowers the prices they receive and EU consumers pay. The model then simulates how EU producers and consumers would respond to such changes. Borrell and Hubbard (2000) found that the effects of the CAP were that, firstly, it was the largest source of distorting subsidies. Specifically producers of over 40% of world production receive prices that are 50% to nearly 400% higher than the world price. But on a value basis, it is the subsidies in the EU that are largest. Quota restricted access to the EU market provided export subsidies of \$560 million a year to over 20 countries, with Mauritius being the biggest recipient with nearly \$200 million in subsidies a year. Secondly, world prices would rise up to 38% with trade liberalization. Their model predicted a fall in prices in Japan, 40% in Western Europe, and 25% in the United States, Mexico, Indonesia and Eastern Europe. Lower prices in these countries would induce increases in consumption and decrease in production of sugar, which would raise import demand and increase world prices by 30% to 38%. In response, efficient low-cost producers would increase production.

Koo (2002) considered alternative scenarios developed on the basis of changes in policy in the United States and in the EU. One of the three scenarios considered was what would happen if the EU eliminated its import restrictions and subsidies for sugar for 2001 to 2004, while other countries maintained their subsidies and import restricting programs. Koo (2002) concludes that this scenario would lead to a 21.6% increase in the Caribbean raw price of sugar, usually considered the world market price.

Elobeid and Beghin (2006) analyzed a sequence of incremental policy reforms, the removal of trade distortions, followed by the removal trade distortions and domestic production support, and finally the removal of pure consumption distortions in addition to the previous removals. The removal of trade distortions alone induces a 27% price increase, while the removal of trade and production distortions induces a 48% increase in 2011/2012 relative to the baseline. They also conclude that with the removal of both trade and production distortions production patterns would shift away from the OECD countries towards competitive countries. They found consumption distortions to have marginal impacts on world markets and the location of production.

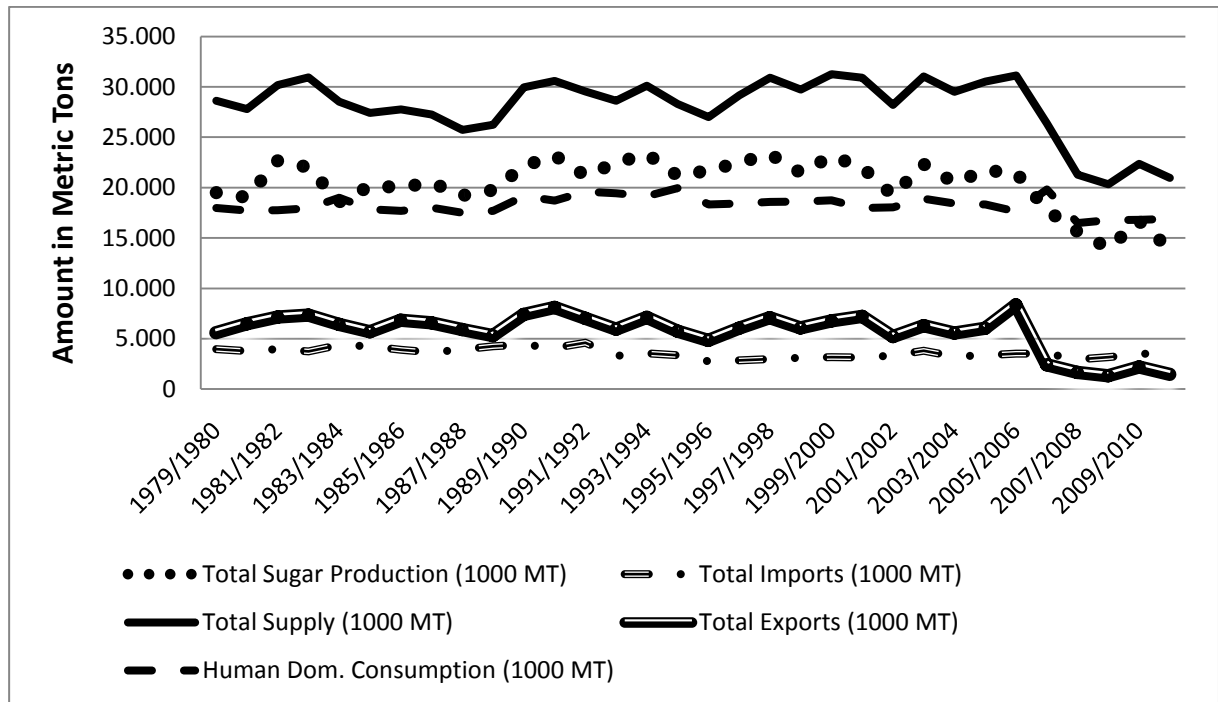
Poonyth et al (2000) makes the point that the world market impacts of reductions in subsidized EU sugar exports depend on the manner in which those reductions are achieved. Relying on quota reductions alone results in smaller reductions in total EU exports than if the intervention prices are reduced. Lower intervention prices result in adjustments in both EU production and consumption, while quota changes only affect production.

A review of literature on the impact of the EU Sugar Policy Reforms on the world sugar market yields mixed results. Most studies appear to show that liberalization would in general lead to the EU becoming a net sugar importer, and with a probable shifting of production to countries with lower production costs. What is not consistent is the extent of the impact on welfare and prices.

#### 4 Results

The conceptual framework presented suggests that if the EU were to lower its domestic prices, ACP countries revenues will be impacted negatively, because there is pressure to meet unchanging quota requirements, or else lose them. A descriptive analysis of import data, which is mostly sugar from the ACP and India, shows a drop in 2005/2006, the period which coincides with the implementation of new policies. This appears to be a validation of the conceptual framework, since decreased EU imports imply less revenue for the ACP countries.

Figure 2 presents the trends in sugar production and use in the EU between 1980 and 2010. Five series of data are reported in 1000 MT, and they are “Total Supply”, “Total Sugar Production”, “Total Imports”, “Total Exports” and “Domestic Consumption”.



Source: Production, Supply and Distribution Online Tables of the Foreign Agricultural Service, USDA

**Figure 2.** Sugar Production and Use Trends in the EU

The proposed 36 percent support price cut over four years beginning in 2006/07 was to ensure a sustainable market balance was to be implemented with a 20 percent decrease in year one, 25 percent in year two, 30 percent in year three and 36 percent in year four. Based on Figure 2, it appears that that some of these proposals appear to have had an immediate effect, resulting in a significant drop in supply starting with 2005/2006 marketing year. Production metrics also indicate a large drop in 2005/2006, while exports also plummeted. Total sugar imports appear to have remained almost unchanged. There appears to have been a jump in domestic sugar consumption in the year the policy was implemented, although the levels have returned to their pre 2005/2006 levels.

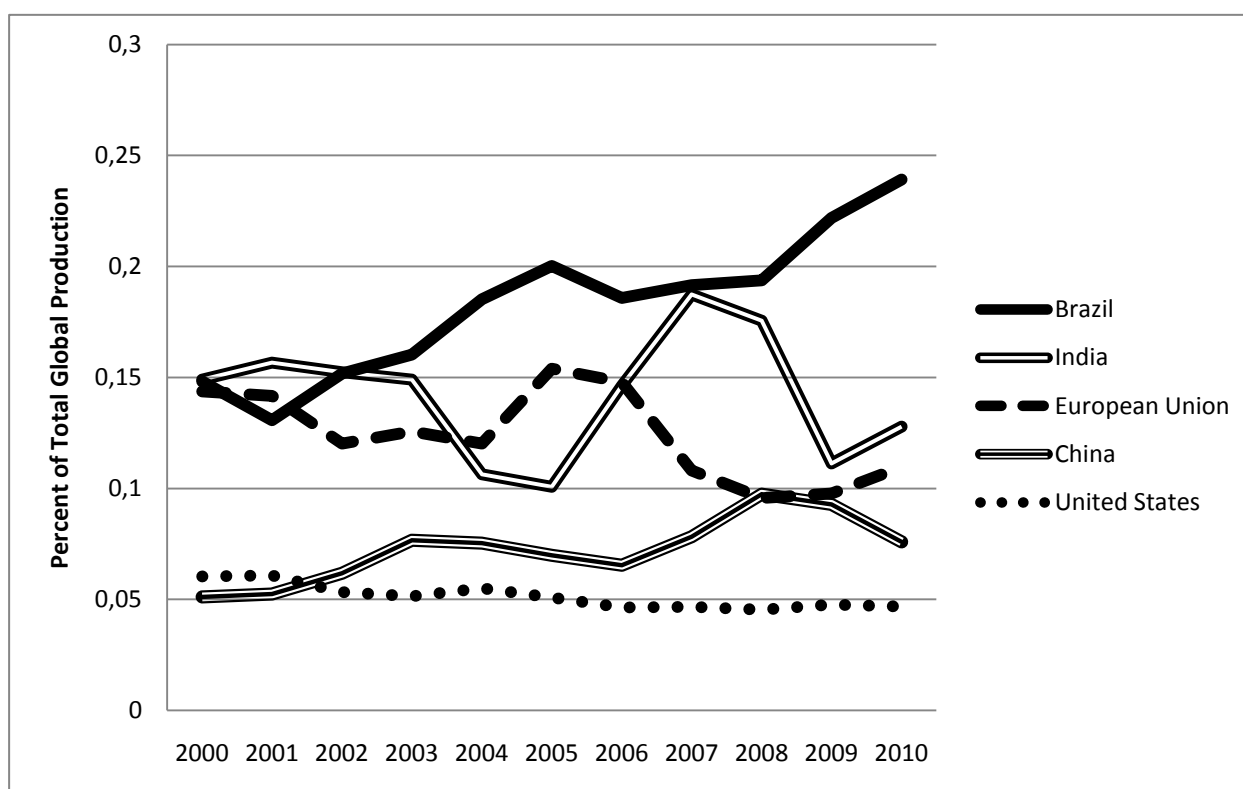
Total sugar production in the European Union decreased annually by 3.82% between 2000/2001 and 2010/2011 agricultural marketing years. Total supply declined by 3.16% annually, exports declined by 5.09% annually and domestic consumption went down by under a percentage point (0.36%) in the same period while imports showed a 1.88% growth. The impact of new policies are better seen when pre and post reforms percentage changes are compared to the 1999/2000 baseline. Sugar production was declining at about 0.78% per year before reform, and by about 7.4 % per annum after reforms were introduced. Total sugar imports grew at 2.17% per annum pre-reform and were down to 1.53% post reform.

**Table 1.**  
Annual Growth in Production, Imports, Exports and Consumption

	Average % change	Pre-Reform	Post-Reform
Total Sugar Production	-3.82	-0.78	-7.47
Total Imports	1.88	2.17	1.53
Total Supply	-3.16	0.10	-7.06
Total Exports	-5.09	5.82	-18.19
Human Dom. Consumption	-0.69	-0.97	-0.36

Source: Based on ERS/USDA data

To make a comparison of how the EU is performing relative to other major sugar trading nations, we consider metrics on production shares, export shares, import shares and consumption shares. The top five sugar producing nations led by Brazil accounted for 55% of world production in year 2000 and were four percentage points higher in 2010. In that ten year period, the EU had a production share of 14% up to 2006, and then its share plummeted to 10.8% in 2007 and has remained at that level ever since.

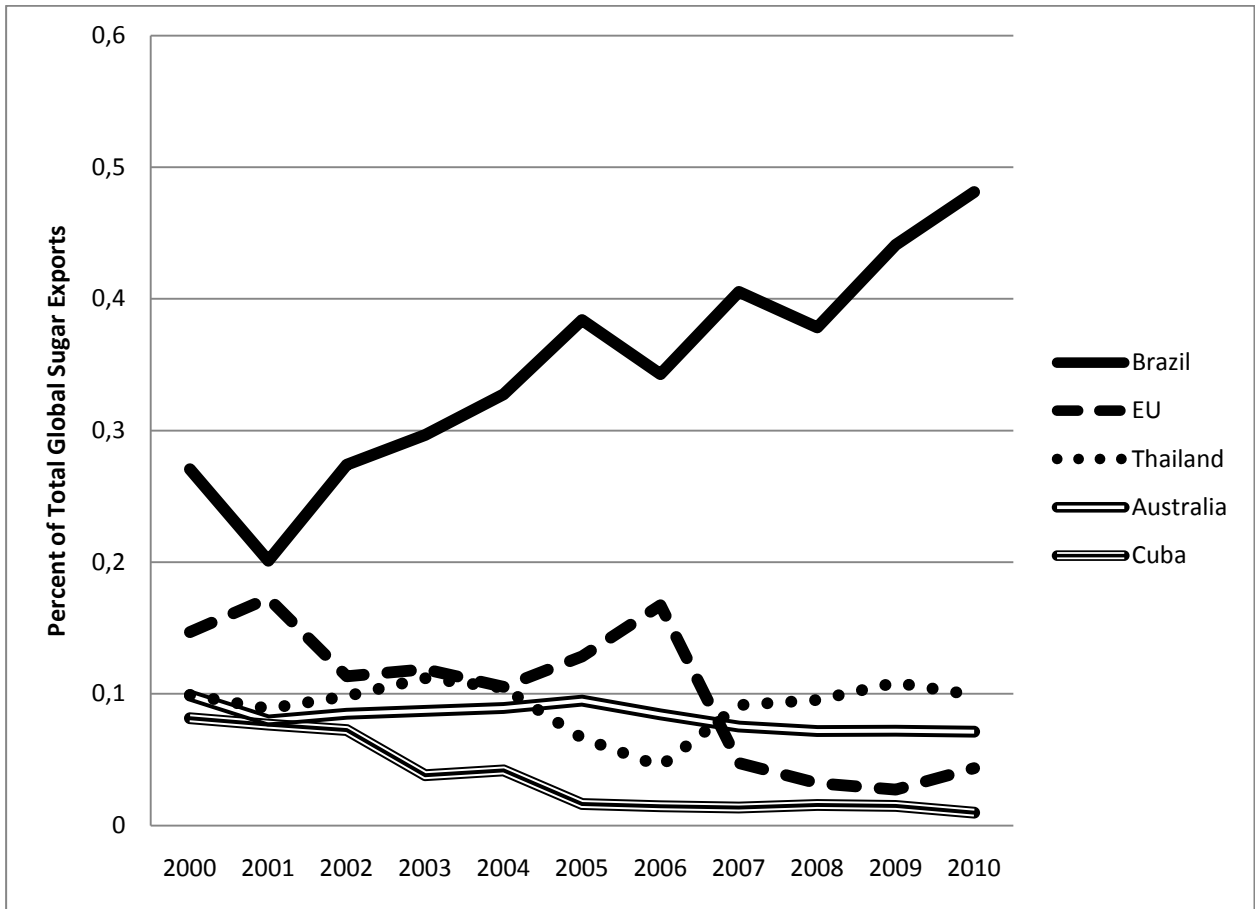


Source: Production, Supply and Distribution Online Tables of the Foreign Agricultural Service, USDA

**Figure 3.** Production Shares of Top Five Producing Nations

Competing producers like Brazil and China appear to have increased their world production shares at about the same time when the EU appears to have lost ground.

The top five exporting nations account for about 70% of world exports, a figure that has remained steady over the 2000 to 2010 period. The EU accounted for 14.6% of world sugar exports in 2000, and that figure grew to about 16.7% in 2006 before collapsing to a 4.7% world export share in 2007, and has never recovered. On the other hand Brazil's exports grew substantially in the same period to account for 48% of global sugar exports, up from 27% in 2000.

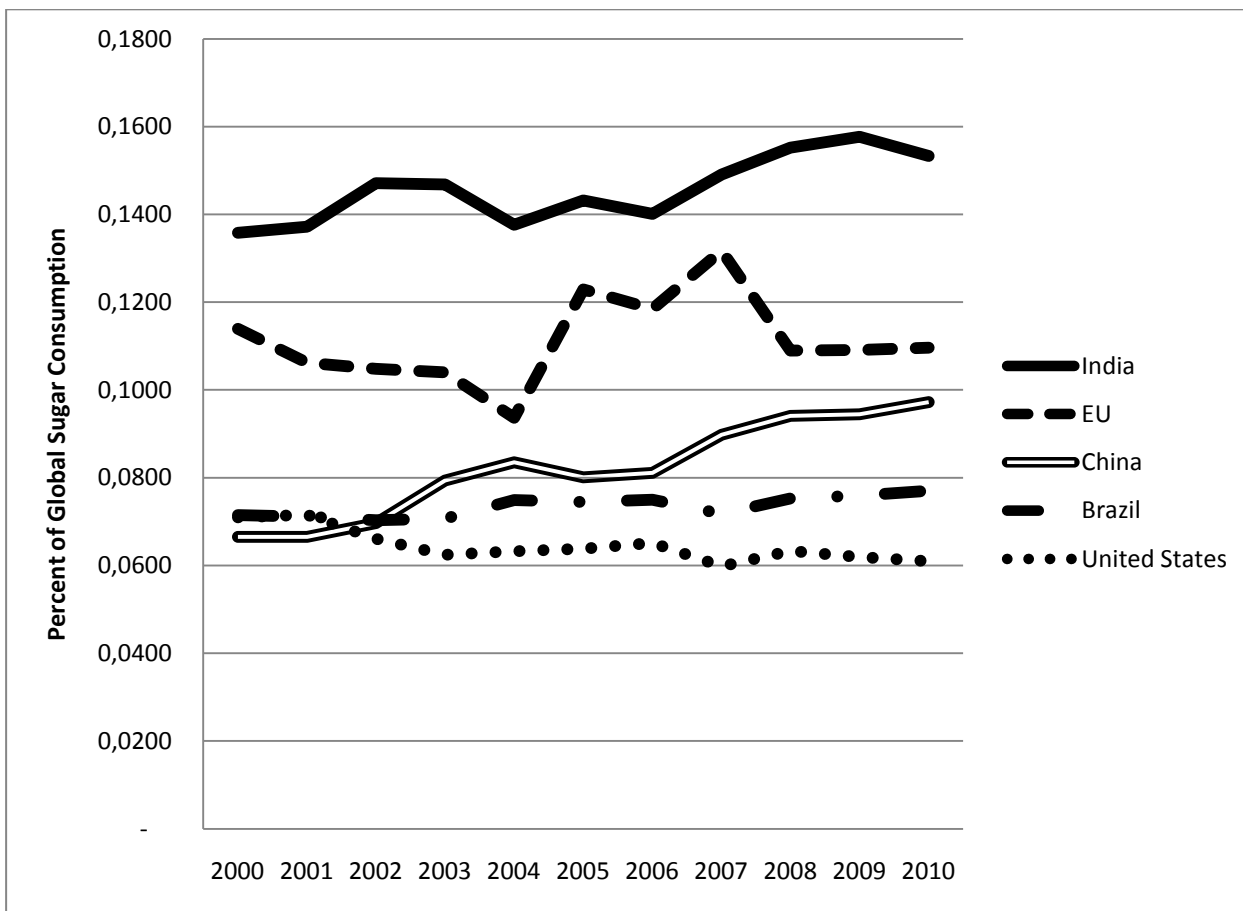


Source: Production, Supply and Distribution Online Tables of the Foreign Agricultural Service, USDA

**Figure 4.** Export Shares of Top Five Sugar Exporting Nations

Because more countries consume sugar than produce it, there is less domination by sugar importing countries, therefore there is wide ranging demand for the product across the globe. Nonetheless the top five sugar importers accounted for 32% of total sugar exports in 2000 and 23.5% in 2010, led by Russia, in the earlier part of the decade, and by the EU until present. The EU accounted for 5.9% of world imports in the years 2006 and that figure went up to 8% in 2007 and appears to have stabilized at 6.6% in the three years that followed. One paradoxical thing about the EU is that despite being a major exporter, unlike Brazil, it still imports sugar, mostly due to some preferential trade agreements it has with ACP countries and India.

Sugar consumption has been dominated by India, with the Asian nation accounting for 13.6% of all sugar consumed worldwide in 2000. The EU has been ranked second in consumption for the past decade, and appears to have experienced a surge in consumption in the years 2004 to 2007 before consumption stabilized in 2008. It is plausible that reforms might have triggered a drop in prices in the EU temporarily and by a margin big enough to induce more consumption.

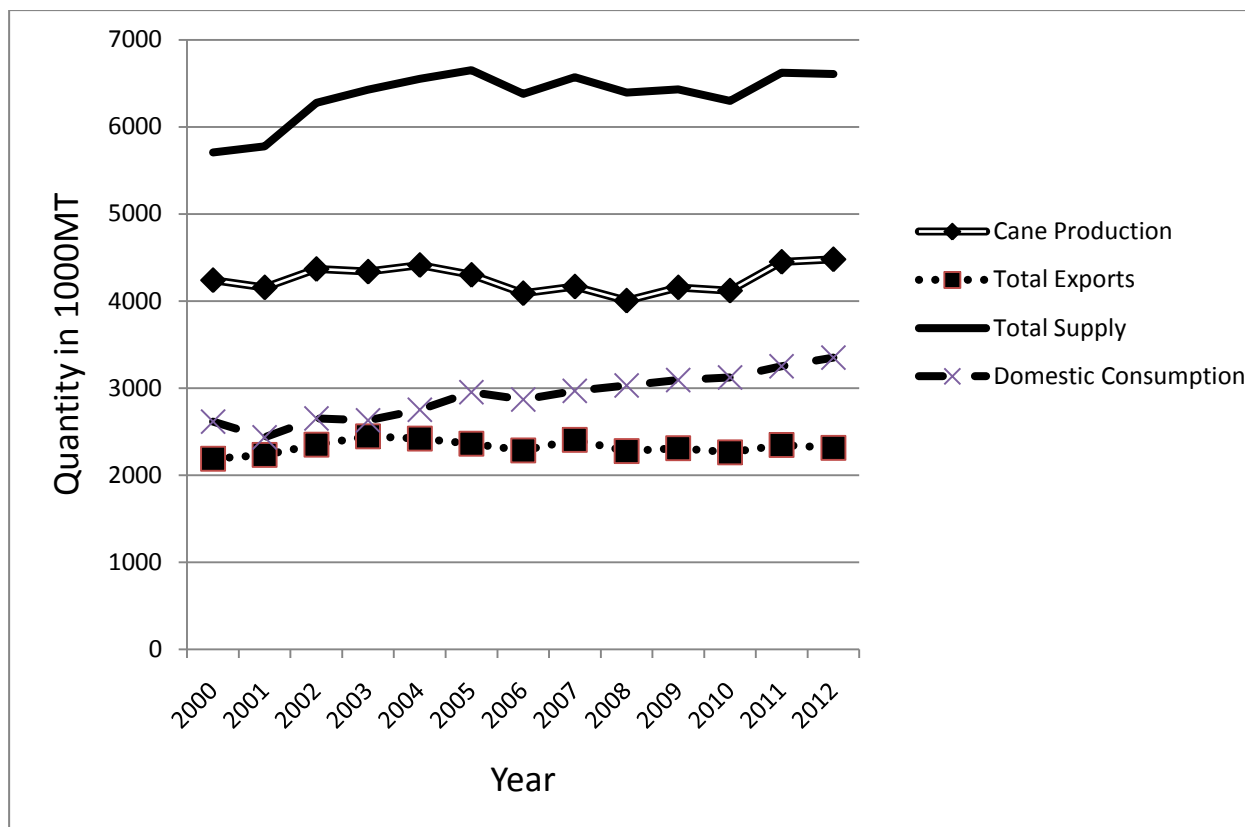


Source: Production, Supply and Distribution Online Tables of the Foreign Agricultural Service, USDA

Figure 5. Consumption Shares of Top Five Sugar Consuming Nations

The same analysis was applied to production, consumption and export statistics for all the ACP countries combined, and when look at it from that level, the impact on the ACP does not appear diagrammatically. Summing together ACP data does not seem to indicate any drastic changes in response to the EU changing its sugar policies. This is a probably justification to build a strong mathematical model that could take into consideration the differences of the each of the tiny ACP countries.





Source: Production, Supply and Distribution Online Tables of the Foreign Agricultural Service, USDA

**Figure 6.** Sugar Trends for ACP Countries, 2000 to 2012

Even though the metrics mentioned above have been descriptive, they are nonetheless informative. They are telling a story that there have been quantifiable changes in the world sugar market since 2006, the year the new policies were adopted, that need to be understood better, especially their implications for the EU and its trading partners in respect to impact on future production trends, price movements and welfare impacts.

## 5 Conclusion

EU sugar policy has taken decades to evolve dating back to 1960's and in its present state it has far reaching effects on the welfare of ACP countries. It also has significant effects on how major sugar exporters like Brazil and Thailand behave or how developed countries like the United States, set their sugar policies. There is therefore an urgent need to understand the economic effects of EU reforms, while they are still in their early stages of implementation, in order to better advise policy making in the European Union, ACP countries and the rest of the sugar producing and trading nations.

Attempting to evaluate the effects of policy changes that have global effects can be challenging. By its very nature, the Sugar Protocol provides an alternative marketing channel for sugar exporting ACP countries. For an average ACP country, 40% of domestic production and 62% of its sugar exports are covered by the sugar quota, i.e. how much they are allowed to export into the EU, and the quota can be sold on the EU market at guaranteed EU prices. This basic point leads to a revenue raising impact in typical years, and in medium run to revenue stabilizing effect (Roland and Dietmar, 1995). It is thus unclear at this point how an EU policy change would affect production in ACP countries and what are the implications for the rest of the world.

Over the life of the CAP and specifically the Sugar CMO, a number of studies have been undertaken on the impact of the EU on Sugar, but of late the market has changed drastically. Sugar is not only being used for energy (ethanol), but it also now faces serious competition from High Fructose Corn Syrup (HFCS). Literature review has not revealed any studies that incorporate the impacts of diverting some sugar to ethanol production for example and how that affects global prices and actions of ACP countries. There is therefore a need for new analysis given the ushering of a new set of competing uses and substitutes. The

size of the EU as both a consumer and producer, and the impact of the its actions on the rest of the world, makes it necessary to look at this problem from a global standpoint and build a world sugar model to consider alternative ways for quantifying the effects of the EU Sugar policy on the rest of the world. We therefore propose to further this work by developing a world sugar model to understand what the effects of EU sugar policy reform on world production, taking into consideration the non-competitive nature of the world sugar market and the presence of competing products. Specifically how reforms would affect sugar production in the ACP countries and the rest of the world and further on understand what the effect on world sugar prices will be and what the welfare benefits, if any on ACP countries and the rest of the world.

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