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Measuring the Competitiveness of Sugar

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Abstract

Competitiveness is important for Jamaica's agriculture and specifically sugar, as the instruments of protection are gradually being removed. Sugar producers and sugar interests in Jamaica are concerned that one day they may not benefit from the present preferential agreements for sugar sales to the European community and the United States. A new agreement reached in the year 2000 with the European Union extends Jamaica's preferential treatment to 2008.

The study used two indicators namely: "Relative Quasi-tents" and Nominal Rate of Protection" to measure competitiveness. Results of this study suggests that 92% of the farms with 3.3 hectares or less of sugar realized modest quasi-rents that were only about 1.6 times the opportunity cost of owner-operator labour. The comparable figure for producers of 16 hectares of sugarcane was 7.3 times the opportunity cost of owner operator labour.

Nominal rates of protection estimated here for the 1990-2000 period indicate that domestic producers have been receiving prices for sugarcane that are about two times the equivalent free market world prices. This is a result of the country's preferential marketing agreement with the European community and the United States.

The study points out that Jamaica's sugarcane yields are low, the sugar content of the cane is low, production costs are high and cane ills are currently inefficient.

INTRODUCTION

This paper examines the competitiveness of sugar produced in Jamaica and forms part of a wider study which examines the competitiveness of 19 agricultural commodities in Jamaica. These studies were conducted during a workshop in Kingston, Jamaica in October 2000, and published June 2001. The Inter-American Development Bank (IADB) financed the publication of the collection of studies¹ for use by the

¹Hertford, Reed. 2001. Measuring The Competitiveness of Jamaica's Agricultural Commodities. San Jose, IDB/BID. Government of Jamaica.

The sugar industry is very important to the economy of Jamaica as it contributes significantly to the economic and social wellbeing of the country. In 1999, sugar, sugarcane and related products (rum, molasses) contributed 1.0% to the nation's gross domestic product (GDP)². Apart from the government, the sugar industry is the single largest employer of labour, directly employing approximately 33,000 workers

²Planning Institute of Jamaica 2000. Economic and Social Survey of Jamaica. Kingston, Jamaica, WI.

during the cropping season and an estimated 20,000 during the rest of the year. It is also estimated that approximately 150,000 persons derive their livelihood directly and indirectly from the industry, with spanning cultivation, manuactivities transportation, shipping facturing. and engineering, among others. Over 80% of the sugar produced in Jamaica annually is exported to satisfy quotas in the European Union (EU) and the United States. In 1998 and 1999, foreign exchange earnings averaged just over US\$95 million per annum.

Nonetheless. production sugar in Jamaica has declined in the past twenty (20) years, attributable to high cost of production, resulting from poor management, inefficiencies at both the field and factory level and frequent labour disputes. To arrest the decline and improve the industry's viability, the Government of Jamaica (GOJ) embarked on a process of privatization to remedy management problems as well as attract capital investment in the industry to improve efficiencies. Partial privatization was achieved in 1994. The Sugar Company of Jamaica (SCJ) was controlled by private sector interests which acquired 51% of the shares, with GOJ retaining 24% and cane farmers and employees the remaining 25%³.

The divestment was short-lived, and after four years, the privately-owned shares were transferred, in 1998, to the GOJ along with debt, totalling J\$2.9 billion. The industry did not receive the expected capital input after divestment and therefore did not prove to be profitable. During the 4 years of partial privatization, the performance of the industry was mixed, with sugar production reaching a 16-year high in the 1995/96 crop year. However, there was a dramatic downturn in production with production reaching a low of 186,134 tonnes in the 1997/98 crop year.

MEASURING COMPETITIVENESS – CONCEPTUAL FRAMEWORK

The competitiveness of a product has several dimensions. On the one hand, the term competitiveness is often used to refer to the ability of a domestically-produced good to maintain or increase its share of domestic, and/or global, demand for that product. We may think of this as "intraindustry" competitive-ness, whereby different producers within a particular industry compete among themselves. On the other hand, the term competitiveness is also used to refer to the ability of a product to maintain a constant or increasing share of demand at the expense of another product, or group of products, that satisfies the same wants. We may think of this as "inter-industry competitiveness, whereby producers in a particular industry compete with producers of another industry producing a related or substitute product.

According to the United Nations (2000, p.3)⁴, we may also distinguish between static and dynamic competitiveness. Under static competitiveness, firms or industries compete on the basis of received endowments such

³Government of Jamaica. 2001.Report of the Task Force on the Sugar Industry in Jamaica. Kingston, Jamaica, W.I.

⁴United Nations. 2000. The Competitive Challenge: Transnational Corporations and Industrial Restructuring in Developing Countries. New York.

as low cost labour or natural resources. These may be starting points for export growth, but they are expected to lose their edge as technologies change or incomes rise. In contrast, under dynamic competitiveness, the productive sector retains its edge in international markets as wages grow and new technologies and demand patterns emerge.

Competitiveness - whether static or dynamic, inter- or intra-industry - may be described as a function of price and nonprice factors. Non-price factors, refer to the quality attributes of the product (such as packaging and reliability of supply) or to the effects of changing consumer tastes and production technology, This paper essentially focuses on the price dimension of competitiveness (quasi- rent and the nominal rate of protection).

The competitiveness indicators used in this study include the following set of variables:

- trends in yields (output per unit of land);
- comparisons of Jamaica's yields with those of its neighbours and trading partners;
- trends in commodity production;
- quasi-rents (or short-run profits of the enterprise) over the urban industrial wage rate multiplied by the all-island rate of employment; and
- the nominal rate of production.

In the collection of studies "Measuring the Competitiveness of Jamaica's Agricultural Commodities" (2001, p.13), these variables were described as follows:

"Increases in indicator number 1 are taken to signal a commodity production transformation process involving the increased

use of non-traditional purchased inputs and some technological change. Other things being equal, commodities experiencing these changes should be more competitive in domestic and world markets. Indicator number 2 shows how Jamaica's yields stack up against those of similarly positioned countries. Although this measure says nothing about costs or unitary prices of inputs, comparatively, high yields are indicative of a competitive advantage. Indicator number 3 would be expected to arow rapidly for very competitive commodities, and to be stagnant or declining for non-competitive commodities since new enterprises and additional capital would be expected to be drawn into the production of highly competitive and profitable commodities, while enterprises would be expected to be closed down and capital withdrawn if commodity returns are not competitive.

Profitability (quasi-rents – or the value of production less total variable costs) is measured in this instance relative to the "expected" wage of the enterprises owneroperated in the urban-industrial sector. If commodity returns do not at least equal that wage, the enterprise may not be generating the producer's opportunity costs, leading to exits from production of the commodity or exits from agriculture.

The nominal rate or protection (NRP) is -1.0 plus the ratio of the domestic price received by producers for commodity to the world price received by producers, after adjusting the latter for the costs of getting the commodity from the world market to the producer's farm gate. When the ratio is greater than zero, the domestic price is high relative to the world price and producers are being benefited while consumers are effectively being taxed. When the ratio is less than zero, producers are effectively being

taxed and consumers are being subsidized".

MARKETS AND MARKETING

The International Market⁵

World sugar⁶ production in 2000 amounted to 130.6 million tonnes, compared with 134.9 million tonnes in 1999, while consumption stood at 128.0 million tonnes as against 125.7 million tonnes in the previous year. Sugar from beet accounted for approximately 28% of world sugar production⁷. The combination of oversupply and weak demand for this commodity continued to drive up ending stocks8, and kept free market⁹ prices languishing at (or near) a 13 year low. The world market price per pound of raw sugar fluctuated between US\$0.04 and US\$0.11 cents during 1999/2000. In 2000, 21.7% of total world production was sold on the world free market.

⁷F.O. Licht. World Sugar Statistic 2002. Germany<u></u> ⁸Stocks: The sum total of all stocks of sugar held by country or territory in sugar factories, refineries and port facilities, and where this can be ascertained, in warehouses.

⁹Free market refers to the total of net imports of the world market, except those resulting from the operation of the special arrangements as defined in chapter IX of the 1977 international sugar agreement.

Markets for Jamaican Sugar

Like a number of other African, Caribbean and Pacific (ACP) states, Jamaica has been a beneficiary of the Sugar Protocol with the European Union (EU), under which the EU has purchased and imported specific quantities of cane sugar at quaranteed prices. The majority of sugar produced by Jamaica is sold under such preferential marketing arrangements, at prices about double the world (free) market price. Jamaica's present market share in the EU is slightly less than 10% of EU imports of 1.305 million tonnes. As is the case with a number of preferential marketing arrangements. bananas being a clear example, there have been mounting pressures for reductions in both prices and volumes of sugar traded under the Sugar Protocol. A gradual trend towards freer markets will exert downward pressure on sugar prices and make it harder for ACP countries to enjoy privileged access to EU markets.

Discussions have been taking place with respect to possible changes in these arrangements. One result was the June 2000 "Cotonou Agreement", which replaces the Lome' Agreement and extends the existing arrangement for Protocol sugar until 2008. However, the 'Everything But Arms' (EBA) initiative which came into existence during 2000, is expected to affect the EU Special Preferential Sugar, the agreement under which Jamaica exports a portion of its sugar (24,000 tonnes) to the EU. Because the Jamaican sugar industry has not prepared for the loss of these preferential marketing arrangements, it is imperative that it become more efficient in order to be able to compete successfully with other sugar-

⁵Data on the international sugar market is compiled from International Sugar Organization Statistical Bulletin Vol.60, No.10, London, 2001.

⁶For the purposes of the International Sugar Organization, sugar means: sugar in any of its recognized commercial form derived from sugarcane or beet, including edible and fancy molasses, syrups and other forms of liquid sugar used for human consumption, but does not include final molasses or low grade types of non-centrifugal sugar produced by primitive methods or sugar destined for uses other than human consumption as food.

producing countries.

Jamaica has a preferential export market for some 160,000 tonnes of brown sugar. In addition, there is local demand for 75,000 tonnes of brown sugar and 50,000 tonnes of refined sugar, some of which is being imported under the deregulation programme. Under the Special Preferential Sugar (SPS) arrangement, the volume of sugar exported increased from 126.083 tonnes in 1994 to 177.522 tonnes in 1999. At the same time, foreign exchange earnings from sugar increased from US\$75.6 million in 1994 to US\$95.8 million in 1999. Although there was a general increase in the volume and value of exports during the 1994-99 period, earnings per tonne continued to decline after 1995. This downward movement in earnings per tonne could be linked to the depreciation of the Euro currency against the US dollar. Earnings per tonne of sugar exported to the UK declined from US\$591.10 in 1997/98 to US\$567.52 in 1998/99.

Structure of the Jamaican Sugar Industry

The sugar industry is at present structured around eight estates, with factories that process the sugar cane into raw sugar and molasses. Four of the estates also distill rum. Only approximately 60% of the milling capacity of the factories was used to process the 1999/2000 crop, attributable primarily to low crop output, fluctuations in the delivery of cane supplies, and factory down-time due to mechanical and other technical problems. Sugar recovery (as measured by the ratio of tonnes of cane received to tonnes of sugar produced) has shown mixed results over the past several years. There are an estimated 40,000 hectares of lands under sugar cane cultivation in Jamaica. currently split between farms estate (46%) and independent farms (54%). It is estimated that approximately 12,500 independent farmers are delivering cane to factories. About 92% cultivate on farms between 3.3 and 16 hectares¹⁰. Sugar estates and large cane farms account for only 2.0% of all sugar enterprises, but produce more than half of the total sugar cane.

PRODUCTION PERFORMANCE

Table 1 gives the production figures for sugarcane and sugar for the 1975-2000 period.

A review of the production data for the industry over the past 11 years reveals that the quantity of sugar cane milled has varied from a high of approximately 2.7 million tonnes in 1991 to a low of 2.0 million tonnes in 2000. The quantity of raw sugar produced has ranged between a high of 237,943 tonnes in 1996 and a low of 186,133 tonnes in 1998. In 2000, 216,357 tonnes of sugar were produced.

With respect to efficiencies, the data for the past 11 years show fluctuations in a number of the indicators that measure yields and the conversion of sugar cane to sugar. For example, the yield of cane per hectare has ranged between a high of 68 tonnes in 1996 and 56 tonnes in 1990. The key conversion ratio - the tonnes of cane/tonne of sugar ratio, or TC/TS - has also shown some variation. In the 2000 crop, the TC/TS

¹⁰Farmers with 3.3 hectares are regarded as small scale and 16 hectares as medium scale.

was 9.36, while the worst ratio was in 1998 with a value 12.14.

A very important conversion factor is the tonnes of sugar per hectare, which measures the sugar received from a hectare of sugarcane. During the period under review, the best recovery was 6.15 tonnes achieved in 1996 and the worst was 5.19 in 1998.

Price data and other relevant statistics are shown in Table 4.

The sugar industry has demonstrated its capacity over the years to satisfy its quotas under the two preferential marketing arrangements. However, like most agricultural activities, the sugar industry is subject to poor management and the vagaries of nature, for example, floods one year and then extended drought another, both of which adversely affect production and profitability.

The industry must be brought up to higher levels of efficiency in order to become viable and to be able to withstand adverse changes in the international markets.

COMPARISON WITH OTHER SUGAR-PRODUCING COUNTRIES

Yields

The Jamaican sugar industry in 2000 yielded 52 tonnes of cane per hectare. This is below the level targeted by the Sugar Industry Authority (SIA). Seventy five tonnes of cane per hectare is considered competitive by the SIA. A combination of improved cultivation and harvesting practices, coupled with investment in the industry's irrigation systems, would result in the required increase in yields. The scope for raising sucrose content, however, is considered limited, although improvements in harvest management, a reduction in the crushing season, and the use of artificial ripeners for early ripening of cane could bring about gains in cane quality as well.

PROCESSING

An important measurement of factory technical efficiency relates to capacity utilization. Capacity utilization in the Jamaican sugar industry is low at 10 tonnes of sugar produced per tonne of crushing capacity, when compared with Brazil's 20.5 and Mexico's 14.8. In addition, for the 1997/1998 crop year, the average factory recovery in the local sugar industry, or the amount of sugar extracted based on the efficiency of the factory process, was 80.0%, compared with 89.5% in Brazil and 83.8% in the United States.

The target for recovery (86%), achieved by the local industry in prior years would require further investment in the mills and an improvement in the quality of cane delivered. Increased capacity utilization, that is, the greater use of processing capacity during the milling season, would require a combination of increased cane supply and a shortened crushing period.

Production Costs

Jamaica may be classified as a high cost producer of sugar. It produces sugar at a cost that is significantly higher than the average cost of the African, Caribbean and Pacific Countries. The following table gives a breakdown of the total cost of producing a

pound of sugar.

Sugar Industry Five-Year Plan

The Sugar Industry Authority, the statutory body authorized by the government of Jamaica to regulate and develop the sugar industry, has formulated (and is implementing) a five-year plan for the 1999/2000-2003/04 period to help improve the competitiveness of the industry by increasing efficiency and productivity.

The plan recognizes the following main problems of the industry:

- high costs of production
- inefficient factory operations, low cane production and yields
- poor cane quality
- low employee morale
- poor factory management and supervision
- declining price of sugar and sugar cane
- the increasing debt burden
- high interest rates, and
- ill-timed financing of field and factory operations.

The objectives of the plan are to:

- preserve current local and preferential export markets
- produce 311,000 tonnes of sugar by 2004
- implement an acceleration and sustainable replanting program
- · reduce the harvest period by one third
- increase factory operating efficiency by 20%
- reduce the costs of production by half
- improve labour productivity and provide financing on a timely basis.

To meet these objectives, the factories need to be upgraded and retooled.

Accordingly, the government is seeking approximately US\$100 million in funding to bring the factories up to the required levels of throughput.

Cane yields of 75 tonnes per hectare are targeted, to be achieved in part through research on high-yielding varieties. A replanting programme is underway to replace unproductive ratoons with plant canes, and nurseries are being established to ensure that supplies of recommended seed cane varieties are available.

Other areas being targeted are improved harvesting management and a possible change in the cane payment formula to reward farmers for supplying higher quality cane to the factory. The technical capacity of industry personnel is to be strengthened through training programmes and improved extension services.

THE COMMODITY CHAIN

The above chart (Chart 1) shows the process of cultivating sugar cane through to the export of sugar.

COMPETITIVENESS

A measure of competitiveness, "relative quasi-rents" was calculated to assess the profitability of sugar. If a commodity is not profitable for producers for a number of years, it cannot be competitive in domestic or foreign markets. Profitability is measured relative to the "expected" wage of the enterprise's owner-operator in the urbanindustrial sector. If commodity returns do not at least equal that wage, the enterprise may not be generating the producers "opportunity cost". This measure uses gross returns

minus total variable costs, divided by a measure of the opportunity cost of owner-operator:

$$QR = \frac{PR(1-S)T}{W}$$

where, P = price received by farmers per unit of output

- R = Yield, or output, per unit of land
- S = Average variable cost/total revenue

T = Size of the enterprise

W = annual urban wage multiplied by the urban employment rate.

Farmers are paid according to the amount of sugar produced from the cane delivered to the factory. Therefore, the relevant price is the value of a tonne of sugar. Yields have also been calculated as tonnes of sugar per hectare. On average, the variable cost for producing a tonne of sugar is 60% of the revenue. The size of the small farm used is 3.3 hectares and the size of the medium farm is 16 hectares. Quasirents were calculated for both small and medium-sized farms for the 1990-99 period, as shown below.

The quasi-rents for the small farmers show that sugar cane was a minimally profitable exercise, however, after 1996, profitability declined because of the levelingoff of the effects of the depreciation of the Jamaican dollar and the Euro against the US dollar. The world market price for sugar has also decreased due to oversupply, which effectively "capped" the price received by local producers at around J\$11,000 per tonne.

Medium-sized farms showed higher

profitability due to larger acreage and economies of scale. The estates and large farms would also benefit from economies of scale, but may show less profitability per hectare than medium-sized farms because of economy of scale.

Protection of the Sugar Industry

To determine whether the price being paid to farmers has effectively been protected, and the extent of the protection, the Nominal Rate of Protection (NRP) was used. The NRP is -1.0 plus the ratio of the domestic price received by producers for the commodity to the world price received by producers, after adjusting the latter for the costs of getting the commodity from the world market to the producers farm gate. Using the formula:

NRP = $Pd/Pb^*e - 1.0$

where: Pd is the domestic price per tonne of sugar and Pb is the border equivalent world price of sugar, adjusted for shipping and distribution costs, and multiplied by the prevailing exchange rate ("e"). The NRP for the years 1990-2000 is shown above (Table 6).

When the NRP is greater than zero, the domestic price is high relative to the world price, and producers are being benefitted, while consumers are effectively being taxed. When the NRP is less than zero, producers are effectively being taxed, and consumers are being subsidized.

These calculations show that there was significant protection for the 1990-1993 period. However, the rate of protection has been falling since 1994, except in 1999

when protection rose dramatically. The main reason for the rise is that the world market price for sugar fell to levels that were below the costs of production, even below the costs of most low-cost countries In the year 2000, there was an improvement in the world market price for sugar.

CONCLUSION

Any study of the competitiveness of agricultural commodities in Jamaica must examine the case of sugar because of its importance to the economy, agricultural policy and the investment programme of government.

Sugar producers and sugar interests in Jamaica are concerned that one day they may not benefit from the present preferential agreements for sugar sales to the European Community and the United States. A new agreement, reached in the year 2000 with the EU extends Jamaica's preferential treatment only to 2008.

Results of this study suggest that those 92% of farms with 3.3 hectares, or less, of sugar realized modest quasi-rents over the 1990-99 period - quasi-rents that were only about 1.6 times the opportunity cost of owner-operator labour. The comparable figure for producers of 16 hectares of sugar cane was 7.3 times the opportunity cost of owner-operated labour.

Nominal rates of protection estimated here for the 1990-2000 period indicate that domestic producers have been receiving prices for sugar cane that are about two times the equivalent free market world prices. In other words, producers have been significantly protected as a result of the country's preferential marketing agreements with the European Community and the United States.

Were these marketing agreements eliminated, the levels of quasi-rents would be roughly halved, producing a noncompetitive situation for most producers, namely, those with 3.3 hectares or less of sugar cane production. Producers with 16 hectares of sugar cane production would see their net returns fall to much more modest levels, making it likely that their sugar cane production would not compete with opportunities offered by other commodities.

However, the decision on whether it would make sense to exit sugar cane production at that point would depend on the costs and benefits of improving the competitiveness of sugar. This study points out that Jamaica's cane vields are low, the sugar content of the cane is low, production costs are high, and cane mills are currently inefficient. These deficiencies certainly suggest that the investments required to make sugar competitive on a free world market might be much higher than those required for switching to other agricultural commodities. One way or another, the short time horizon and tenuous nature of Jamaica's marketing arrangements for sugar should motivate Industry interests to examine carefully this possibility and begin to formulate policy that could include alternative commodities, especially for smallscale sugar producers.

This is not to say that the sugar industry does not still have a place in the Jamaican landscape. This study was limited to only the analysis of the production of raw sugar. It did not assess the value of related industries of

rum distilling or the manufacture and sale of molasses. It is obvious also that the larger acreages and estates enjoy economies of scale that are not achievable by small producers. In addition to the traditional export markets, local production can be increasingly used to supply the local market and Jamaica can also look at producing for other Caribbean countries whose sugar industries are in trouble and whose costs of production are even higher than Jamaica's. Other areas of possible investment which could be expanded or developed are the further processing of raw sugar into refined sugar and the production for organically grown sugar.

If Jamaica can modernize its sugar industry to achieve a higher level of efficiency, it will be able to compete with many sugar-producing countries. It must be stressed that sugar is a manufactured product, not a primary product, and there are varying levels of quality produced for the international market. If Jamaica can produce clean, high-quality sugar it may be able to obtain a premium price and above the world market price even if European market preferences are modified or removed.

Year	Cane Milled	96º Sugar Produced	Tonnes Cane/Tonne Sugar	Area Harvested	Tonnes Sugar Per Hectare
	('000 Tonnes)	('000 Tonnes)	(TC/TS)	('000 Hectares)	
1975	3580	366.5	9.77	53.1	6.65
1976	3631	365.5	9.93	53.9	6.71
1977	3227	295.8	10.91	51.8	5.96
1978	3571	305.7	11.68	51.8	5.85
1979	2965	270.2	10.97	45.3	5.87
1980	2768	250.7	11.04	46.1	5.44
1981	2453	204.9	11.97	42.3	4.52
1982	2521	202.2	12.47	42.4	4.80
1983	2323	200.1	11.61	41.1	5.05
1984	2422	195.9	12.36	39.6	4.92
1985	2270	210.0	10.81	38.1	5.47
1986	2220	203.5	10.91	37.7	5.43
1987	1994	191.0	10.44	35.6	5.36
1988	2565	224.3	11.43	37.2	5.81
1989	2293	192.4	11.92	39.3	4.57
1990	2572	219.1	11.74	40.0	5.43
1991	2732	237.3	11.51	42.1	5.64
1992	2525	223.5	11.29	39.9	5.60
1993	2661	224.0	11.88	40.1	5.59
1994	2473	220.4	11.12	38.5	5.63
1995	2322	211.5	10.85	39.7	5.34
1996	2624	237.9	11.03	38.7	6.15
1997	2413	236.5	10.20	39.6	5.93
1998	2260	186.1	12.14	35.4	5.19
1999	2312	204.2	11.32	37.6	5.42
2000	2025	216.4	9.36	39.4	5.49

Table	1:	Cane	and	Sugar	Production	in i	Jamaica ((1975-2000)
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Year	Price/ Tonne Sugar	Growers' Share Price/ Tonne	Manufacturer's Share Price/ Tonne	TC/ TS	Tonnes Cane/ Hectare	World Market Price/ Tonne	Tonnes Sugar/ Hectare	Exchange Rate
	(J\$)	Sugar (J\$)	Sugar (J\$)			(US\$)		(US\$:J\$)
1990	3248	2014	1234	11.74	56.3	276	5.47	7.18
1991	4675	2747	1805	11.51	65.7	199	5.64	12.85
1992	10544	6537	4007	11.30	64.1	242	5.59	23.01
1993	11403	7070	4333	11.88	67.1	221	5.59	25.68
1994	14825	9192	5633	11.82	64.5	267	5.63	33.35
1995	18120	11234	6886	10.85	58.8	296	5.34	35.54
1996	20456	12679	7773	11.03	68.3	270	6.15	37.02
1997	17170	10645	6525	10.20	62.9	266	5.93	35.58
1998	16670	10335	6335	12.14	63.5	213	5.19	36.69
1999	19098	11841	7257	11.32	60.8	144	5.42	39.33
2000	19107	11904	7296	9.36	52.2	188	5.49	43.32

Table 2: Selected Jamaican Sugar Statistics (1990-2000)

Source: Sugar Industry Authority.

Table 3: Production and Productivity for Selected Sugar-Producing Countries (1997)

	Jamaica	Guyana	Trinidad	Belize	Fiji	[•] Mauritius
Normal Production (tones)	237,000	280,000	123,000	122,000	450,000	650,000
Hectares Cultivated	40,000	42,000	24,000	24,000	74,000	78,000
No. of Factories	8	8	2	1	4	17
No. of Employees	33,000	31,500	30,000	10,000	105,000	57,000
Tonnes sugar/hectare	5.9	6.7	5.1	5.1	6.1	8.3
Tonnes sugar/factory	29,625	35,000	61,500	22,000	12,500	38,235
Tonnes sugar/employee	7.2	8.9	4.1	12.2	4.3	11.4

Source: Aide Memoire on ACP Sugar, Jamaica 1998.

Table 4: Sugar Production Cost – Average 1993/94 to 1997/98 (US Cents/Pound Raw Sugar, Ex-factory)

	Jamaica	Africa	Caribbean	Pacific	ACP
Field Cost	17	9	14	8	10
Factory Cost	9	4	8	3	5
Administration Cost	4	2	3	1	2
Total Cost	30	15	25	12	17

Source: Derived from Table 8, LMC International Ltd., 2000.

Year	Yields (tonnes of raw sugar/hectare)	Price Received (J\$/tonne)	Urban Annual Wage (J\$)	Urban Annual Employment Rate	Relative Quasi-rents (3.3 ha)	Relative Quasi-rent (16 ha)
1990	5.43	2,014.00	10,448.96	0.820	1.67	8.13
1991	5.64	5,747.00	13,440.00	0.846	1.80	8.72
1992	5.60	6,537.00	20,258.20	0.843	2.83	13.72
1993	5.59	7,070.00	31,238.40	0.837	1.99	9.67
1994	5.63	9,192.00	43,464.59	0.846	1.85	9.01
1995	5.34	11,234.00	48,982.56	0.838	1.93	9.35
1996	6.15	12,679.00	71,119.20	0.840	1.72	8.35
1997	5.93	10,645.00	104,936.52	0.835	0.95	4.61
1998	5.19	10,335.00	111,713.52	0.845	0.75	3.64
1999	5.42	11,841.00	114,761.76	0.843	0.87	4.25

Table 5: Quasi-Rent Statistics for Jamaica Sugar Production 1990-99





CAES: 24th West Indies Agricultural Economics Conference, Grenada, July 2002.

Year	Farmer's	International	Shipping	Storage	Adjusted	Exchange	NRP
	[Price/Tonne	Price/Tonne	Costs/Tonne	Distribution	Border	Rate (e)	
	Sugar (Pd)(J\$)	Sugar* (J\$)	J\$	Costs (J\$)	Price (J\$)	J\$:1US\$	
1990	3,248	1,881	122	194	1,565	7.18	1.07
1991	4,675	2,853	218	373	2,265	12.85	1.07
1992	10,544	5,545	437	713	4,395	23.01	1.40
1993	11,403	6,600	514	796	5,290	25.68	1.15
1994	14,825	9,405	700	1,067	7,639	33.35	0.94
1995	18,120	13,861	782	1,244	11,655	35.54	0.55
1996	20,456	13,438	888	1,370	11,180	37.02	0.83
1997	20,453	11,919	854	1,423	9,642	35.58	0.78
1998	16,670	10,934	954	1,578	8,402	36.69	0.98
1999	19,090	8,888	1,062	1,770	6,056	39.33	2.15
2000	19,200	114,425	1,300	1,993	11,132	43.32	0.72

 Table 6: Nominal Rate of Protection Statistics (1990-2000)

*International price is the average price at which Jamaica purchases raw sugar from the international markets for the local market.

Chart 1.



CAES: 24th West Indies Agricultural Economics Conference, Grenada, July 2002.