CHAPTER 7

THE SUGAR SUPPLY CHAIN

7.1 Introduction

The aim of this Chapter is to report on trends in the components of the sugar supply chain in South Africa (SA) over the period 1998/99-2002/03. This entails estimating how the farm value (what farmers get for the sugarcane that they sell), the processing and refining spread, and the transport, handling and wholesale spread for sugar changed from year to year. Before analysing these trends, the chapter briefly describes pricing in, and the structure of, the market for refined sugar in SA. Some policy implications of the results are considered in the conclusion.

7.2 Pricing in, and structure of, the market for refined sugar in South Africa

The Sugar Act of 1978 (as amended) and the Sugar Industry Agreement (SIA 2000) provide for three main regulatory provisions within which the pricing of refined sugar in SA takes place: (a) an import tariff that is set relative to a US dollar-based reference price; (b) a single channel export mechanism, and (c) a local market proceeds-sharing agreement whereby proceeds earned by the SA sugar industry are divided amongst growers and millers according to a set formula (about 64% of the proceeds are allocated to growers). The combination of these regulatory provisions allows the SA sugar industry to maintain a domestic refined sugar price that is at or near the import parity price (including the tariff). The Department of Trade and Industry (DTI) and the Board on Tariffs and Trade (BOTT) remain committed to the imposition of an import tariff due to the distorted nature of the world sugar market. Numerous studies estimate that the long-term world price of refined sugar would be 20% higher without market intervention (Board on Tariffs and Trade, 2000).

Refined sugar prices in SA currently reflect price discrimination, whereby the SA sugar industry earns revenue from a domestic market and an export market, which have different prices for sugar. Until 2000, the South African Sugar Association (SASA) had the authority to determine the maximum domestic industrial price of sugar, and, in terms of the single channel mechanism, to determine the quantity of sugar released onto the SA national market and the quantities released for the export market. SASA could, therefore, increase the total revenue for the industry, because:

- The domestic and export markets have different price elasticities of demand for sugar. The demand for sugar in the SA national market is price inelastic, with estimated price elasticities of demand ranging from –0.18 to –0.47 (Cleasby, 1990; Oosthuizen, 1980). The export demand for sugar facing SASA is price elastic, since SASA cannot influence the world sugar price. Cleasby (1990) estimates a price elasticity of export demand of –7.90.

- Via the single channel export mechanism (implemented by SASA) the national SA and export markets were effectively separated. This mechanism controls

supply on the national market and prevents sugar that is sold on the export market from returning onto the national market.

By controlling domestic supply at the maximum industrial price via the single channel mechanism, SASA could earn a higher price on the South African domestic market where there existed a more price inelastic demand. Sugar in excess of domestic needs and storage could then be exported at a lower price on the export market that has a more price elastic demand. Overall, this led to higher total revenue than if all sugar was sold on the domestic market (see Tomek and Robinson, 1981 for the relevant economic principles).

With the introduction of the revised Sugar Industry Agreement in 2000 (SIA 2000), SASA now has no statutory authority to set the industrial sugar price, and the millers' pricing decisions (reflected by the miller net selling price) are now influenced by the import tariff and the structure of the local market for refined sugar. This market is an oligopoly, in which two main players - Tongaat-Hulett Sugar Limited and Illovo Sugar Limited - dominate as they produce about 35% and 48%, respectively, of total sugar output (Board on Tariffs and Trade, 2000). Industry representatives indicate, however, that supplies of sugar from neighbouring countries, particularly Swaziland, in recent years have put downward pressure on the local prices of refined sugar.

Although SASA can no longer set the domestic industrial sugar price, current import tariff protection, the benefits of price discrimination (higher total revenue), and the single channel export mechanism still give millers the incentive to sell less sugar on the domestic market, and to allow the domestic net miller price to rise to import parity. In making their pricing decisions, firms in an oligopoly must take account of the potential reactions of their rivals. SA millers currently have a tacit local market proceeds-sharing agreement (millers that sell more than their allotted local market share compensate millers that sell less than their allotted share). This suggests that local millers are more likely to avoid open price competition.

The status quo enables the domestic miller net selling price of sugar to be raised at least up to import parity. The single channel export mechanism then diverts supply in excess of domestic sugar consumption and storage into the export market. Domestic sugar prices, therefore, can approach import parity, since millers have a local market proceeds-sharing agreement, and they would lose national market share to sugar imports if they tried to raise the net miller price above import parity. The availability of domestic sugar stocks would have a slight dampening effect on domestic sugar prices.

It is not in the millers' interest to aggressively cut the miller net selling price to try and increase their domestic market shares: there may be a threat of retaliation by rivals (price wars), or cutting prices would reduce the total sugar revenue (domestic demand for sugar is price inelastic). Rather they compete for sales by using advertising, special promotions, sales rebates, and discounts, or they informally collude and agree on market share allocations (Tomek and Robinson, 1981). Domestic stocks of sugar would again have a slight dampening effect on domestic sugar prices.

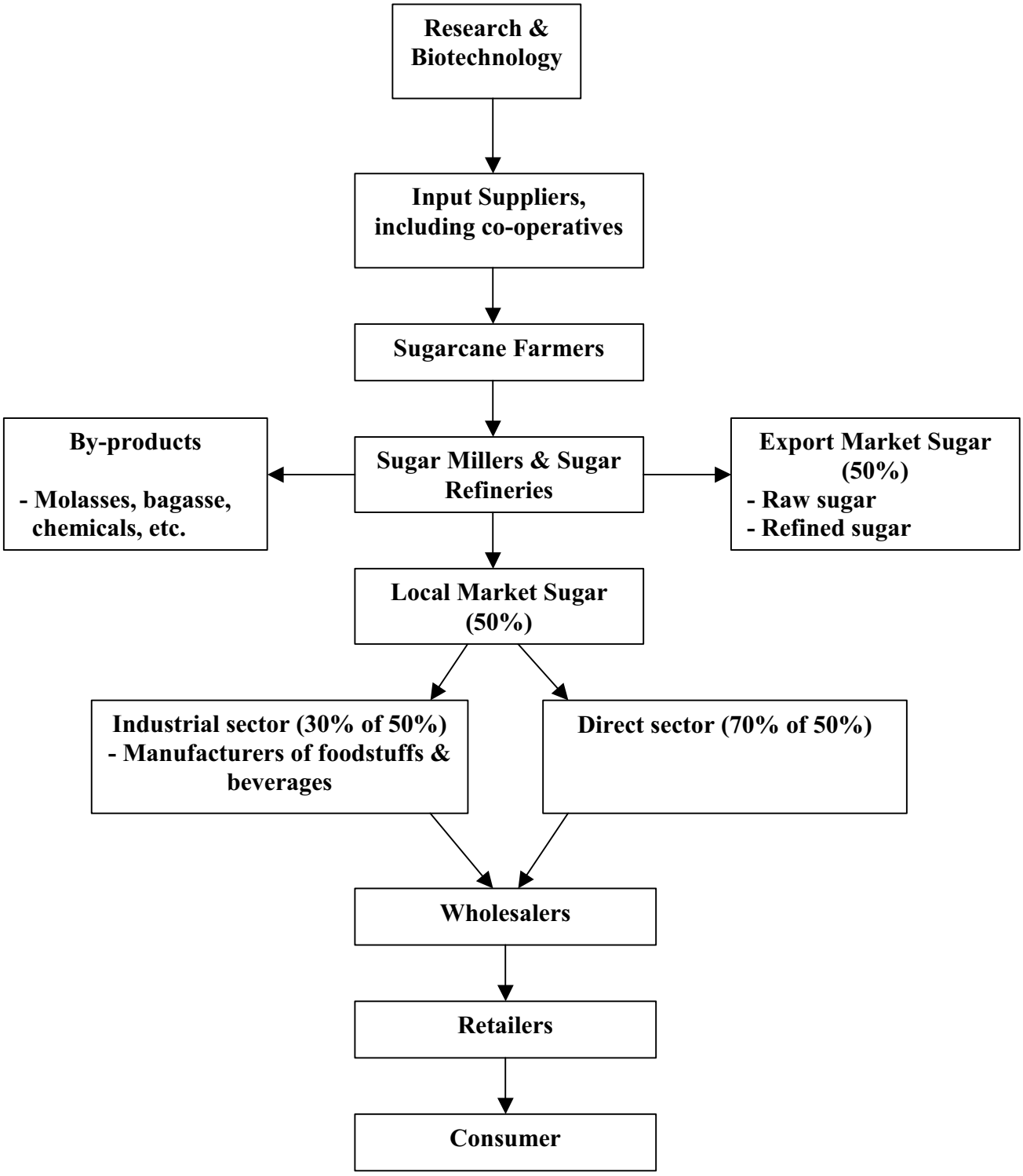

Figure 7.1: The South African sugar industry supply chain

7.3 Trends in farm value and the farm-retail price spread for refined sugar in South Africa, 1998/99-2002/03

The farm-retail price spread for sugar is the difference between what consumers pay for sugar (retail price) and what farmers receive for an equivalent amount of sugarcane at the farm level (farm value). It shows the price of all utility-adding activities and functions performed by middlemen such as sugar millers, transporters, wholesalers and retailers. This price includes the costs of performing marketing functions; it also includes the profits earned by these middlemen (see Kohls and Uhl, 1998). Trends in the nominal values of these components of the SA sugar industry supply chain are presented in Figure 7.2.

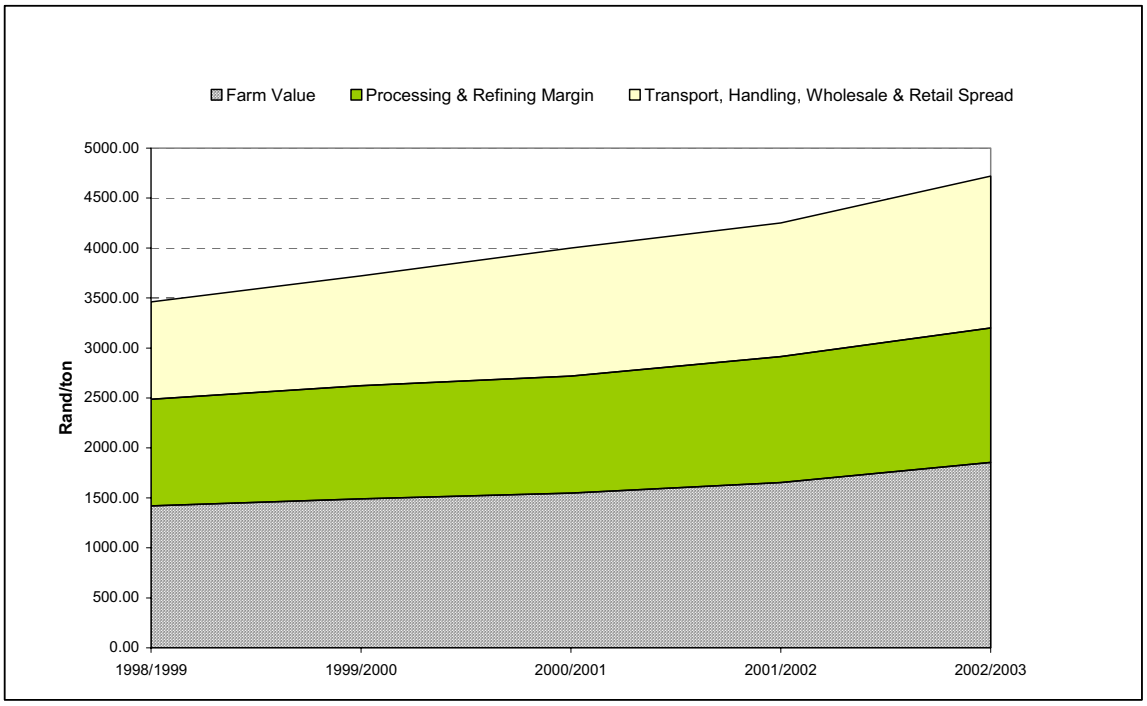

Figure 7.2: Nominal values of marketing costs in the sugar supply chain: 1998 - 2003

Against a background of import tariff protection and proceed sharing between millers, and between millers and growers, Table 7.1 shows that during 1998/99-2002/03, the nominal farm value (cost of material from growers) rose from about R1,421/ton to about R1,856/ton (average annual rate of 6.90%), the nominal processing and refining spread increased from about R1,067/ton to R1346/ton (average annual rate of 5.99%), the nominal transport, handling, wholesale and retail spread rose from about R973/ton to about R1,518/ton (average annual rate of 11.75%), and the nominal retail price of sugar rose from R3,460/ton to R4,720/ton (average annual rate of 8.07%). The estimated average annual rate of increase in all consumer prices (reflected by the Consumer Price Index (CPI) with 2000=100) over this period was about 6.36%.

Table 7.1 Nominal farm-retail price spread for sugar in SA, 1998/99-2002/03

Item	Year				
	1998/99	1999/2000	2000/01	2001/02	2002/03
	R/mt				
Farm value[1]	1420.49	1491.03	1549.19	1654.50	1855.56
Processing & refining spread[2]	1066.65	1130.98	1168.93	1260.08	1346.06
Transport, handling, wholesale & retail spread[3]	972.86	1097.99	1281.88	1335.42	1518.38
Retail price[4]	3460.00	3720.00	4000.00	4250.00	4720.00

Note: [1] *Data supplied by the SA Sugar Millers' Association Limited (2003)*
[2] *Difference between the miller net selling price and the farm value. Data supplied by the SA Sugar Millers' Association Limited (2003).*
[3] *Difference between the retail price and the miller net selling price.*
[4] *Based on data supplied by Statistics South Africa (StatsSA) (2003) and South African Statistics (2002) for the sugar component of the CPI and retail prices of a 2.5 kg bag of sugar collected by StatsSA in 12 principal urban areas.*

The main source of the *increase* in the nominal farm-retail price spread for sugar over this period - except during 2000/01 when farm value and the processing and refining spread rose - seems to be the rising transport, handling, wholesale and retail spread. This represents the costs and profits incurred by middlemen conducting activities from the point of final despatch from the sugar millers through to delivery to the consumer. Increases in nominal transport costs (fuel and equipment) up to 27%, nominal labour costs up to 18%, (South African Reserve Bank, 2003) and imported inputs up to 57% over this period are the likely cost items driving this change. Note: there is no readily accessible source of data to assess whether or not increases in profit margins - if any - for players in this link in the SA sugar supply chain could have contributed to this increase.

Table 7.2 shows the real (inflation-adjusted with 2000=100) farm-retail price spread for sugar in SA during 1998/99 to 2002/03. The real farm value fell from 1998/99 to 2000/01, before rising in 2001/02 and in 2002/03. The real processing and refining spread fluctuated over this period, while the real transport, handling, wholesale and retail spread has consistently risen, except in 2001/02. The net result was a real increase in the retail price of sugar during 1998/99 to 2002/03.

Table 7.2 Real farm-retail price spread for sugar in SA, 1998/99 to 2002/03 (2000=100)

Item	Year				
	1998/99	1999/2000	2000/01	2001/02	2002/03
	R/mt				
Farm value[1]	1574.82	1571.16	1549.19	1565.28	1607.94
Processing & refining spread[2]	1182.54	1191.76	1168.93	1192.13	1166.43
Transport, handling, wholesale & retail spread[3]	1078.56	1157.00	1281.88	1263.41	1315.75
Retail price[4]	3835.92	3919.92	4000.00	4020.81	4090.12

Note: [1] *Data supplied by the SA Sugar Millers' Association Limited (2003).*
[2] *Difference between the miller net selling price and the farm value. Data supplied by the SA Sugar Millers' Association Limited (2003).*
[3] *Difference between the retail price and the miller net selling price.*
[4] *Based on data supplied by Statistics South Africa (StatsSA) (2003) and South African Statistics (2002) for the sugar component of the Consumer Price Index (CPI) and retail prices of a 2.5 kg bag of sugar collected by StatsSA in 12 principal urban areas.*

7.3.1 Trends in margins and spreads

As stated previously, thanks to tariff protection, an oligopolistic market, and an inelastic price elasticity of demand, sugar prices are pushed up close to import parity price so that the industry can maximise profit. The import parity price is greatly effected by the exchange rate, that is, the stronger the local currency the lower the import parity. Needless to say that the opposite also holds. Thus, if the import parity prices increase due to the exchange rate devaluation, and prices are kept just below import parity, local sugar prices should increase when the exchange rate weakens. This, however, does not appear to be entirely true. Figure 7.3 reports the average monthly R/$ exchange rate and the average retail price for 2.5 kg of sugar. The R/$ exchange rate reached its weakest levels in January 2002 while the price of sugar remained close to the 2000-2001 average. From the graph it appears that the sugar price followed a similar increasing trend as the devaluation of the R/$ exchange rate, albeit with a few months time lag. If companies, however, were to make extra profits from higher import parity prices due to a weaker exchange rate, this time lag could not exist. Figure 7.3 also indicates that in comparison with the average price of 2000/01, the retail price of sugar increased by 19.2% in July 2003.

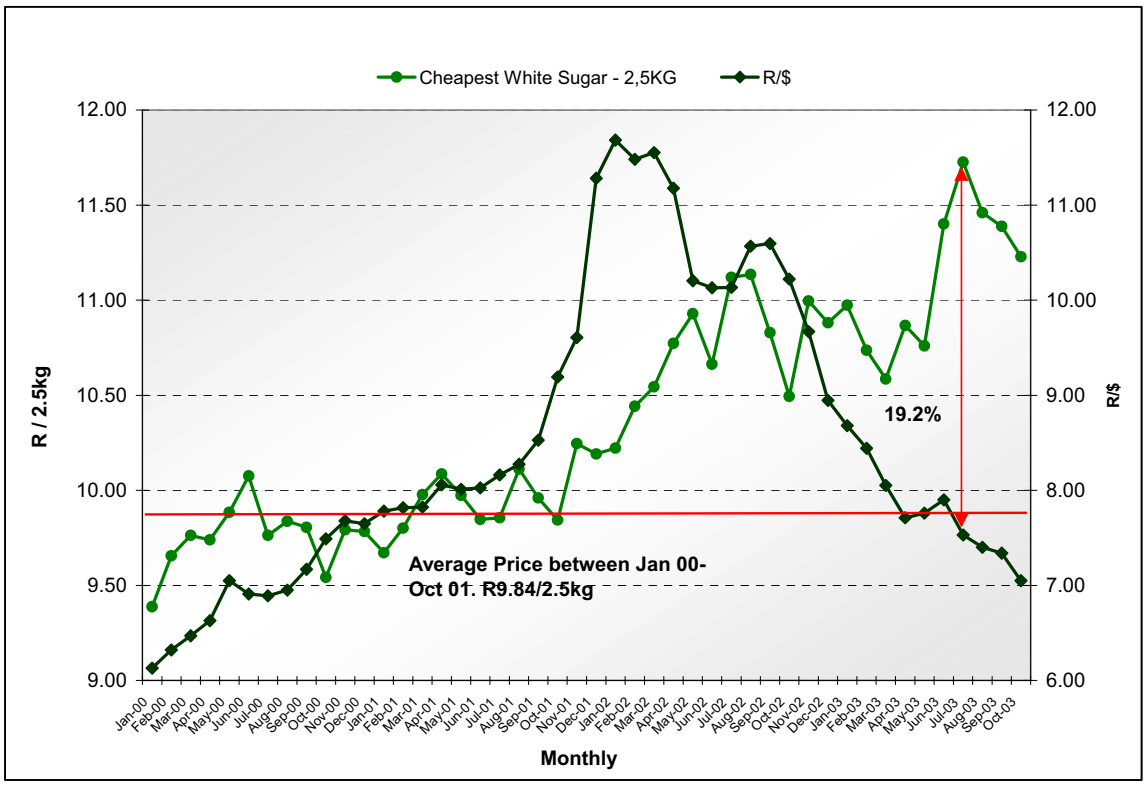

Figure 7.3: Sugar average national retail price and R/$ exchange rate: Jan 2000 to Oct 2003

Prices generally increase for two reasons, that is, increased costs of production and increased margins (assuming that the product is homogeneous and no additional value has been added). Table 7.3 reports the various costs of production for sugar along the supply chain, annually, from 1998/99 to 2002/03. From this supply chain, it is possible to calculate miller and retail profit margins (see points 15 and 17 in the Table). The reader should note, however, that retail costs are not available. From the table it is clear that almost all costs of production have increased over the five year period under investigation.

Sugar miller profit in R/ton decreased in 1999/00 and again in 2001/02 compared to the previous year. Profit in terms of percentage of total cost, however, only decreased in 2001/02 to 5% from an average of 8%. Retailer margin, however, increased throughout the period in question in terms of R/ton, but remained the same in terms of percentage of total cost. Thus, both millers and retailers have not increased their profit margin percentages during the period in question.

Table 7.3: Sugar supply chain components

Year	1998/ 1999	1999/ 2000	2000/ 2001	2001/ 2002	2002/ 2003
	R/mt	R/mt	R/mt	R/mt	R/mt
1. Farm Value	1420.49	1491.03	1549.19	1654.50	1855.56
2. Milling Cost	411.54	428.50	435.34	502.35	504.79
3. Refining Cost	124.84	164.95	158.32	192.63	211.10
4. SASA Levy	81.74	100.25	95.24	133.52	87.38
5. Ex Refinery Bulk Cost (1+2+3+4)	2038.61	2184.73	2238.09	2483.00	2658.83
6. Warehousing/Handling	52.10	49.58	48.23	60.52	72.60
7. Marketing & Distribution	52.20	61.04	73.06	91.76	96.17
8. Packing Cost	64.17	65.93	80.44	79.15	88.90
9. Working Capital Cost	92.94	77.41	60.06	57.37	77.96
10. Packed Cost at Point of Supply (5+6+7+8+9)	2300.02	2438.69	2499.88	2771.80	2994.46
11. Miller Gross Selling Price	2579.71	2746.86	2889.98	3074.92	3421.92
12. Discounts	19.47	24.99	28.42	36.81	52.01
13. Rebates	73.10	99.86	143.44	123.53	168.29
14. Miller Net Selling Price (11-12-13)	2487.14	2622.01	2718.12	2914.58	3201.62
15. Miller Net Profit (14-10)	187.12	183.32	218.24	142.78	207.16
16. Retail Price	3460.00	3720.00	4000.00	4250.00	4720.00
17. Retail Gross Profit	972.86	1097.99	1281.88	1335.42	1518.38

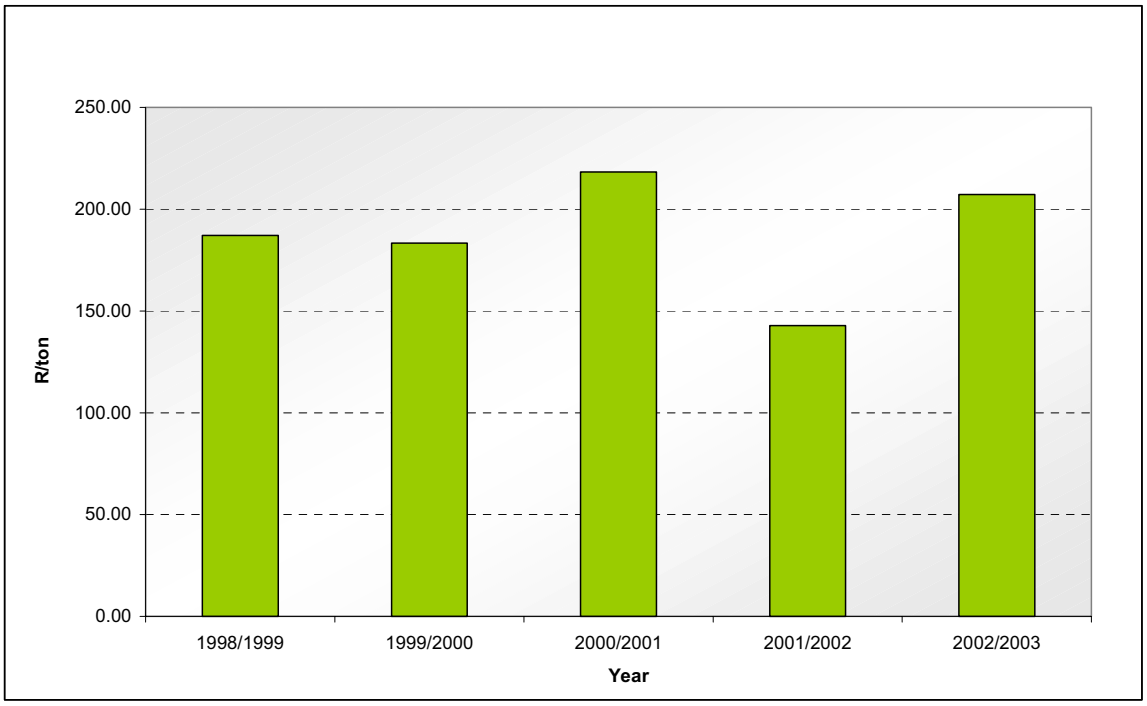

Figure 7.4: Sugar miller net profit: 1998/99-2002/03

7.4 Conclusion

Current regulatory mechanisms mean that the *domestic sugar price in SA can approach import parity*, as SASA can practise price discrimination, and SA sugar millers have import tariff protection, a local market proceeds-sharing agreement. Moreover, they would lose the national market share to sugar imports if they tried to raise the net miller selling sugar price above import parity. The policy implication is that these mechanisms provide stability in terms of local market proceeds for growers and millers, and a regulated 'base' level from which the nominal domestic retail price of sugar in SA is ultimately derived. Depending on world prices, and in the absence of these regulations, sugar processors (e.g. drinks and confectionary manufacturers), wholesalers, retailers and consumers could import sugar at lower prices than determined by this base level, but the DTI and BOTT remain committed to the imposition of an import tariff due to the distorted nature of the world sugar market.

Given these determinants of the base level of the domestic sugar price in South Africa, the retail price of sugar in SA rose in both nominal and real terms during 1998/99 to 2002/03. The main reason for these *increases* – except in 2001/02 - seems to be an increase in both the nominal and the real value of the transport, handling, wholesale and retail spread (the link from the point of final despatch of refined sugar from the millers to the customer). The main cost drivers were rising transport and labour costs. Policy makers need to research further the reasons for increases in nominal transport costs and nominal imported input costs (other than the Rand:Dollar exchange rate), and nominal labour costs, and whether or not there were any increases in the profit margins of the players in this link of the sugar supply chain.

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