Agency costs, corporate governance and the Fiji Sugar Corporation

Padma Lal

The Fiji Sugar Corporation, the sole miller in Fiji, has experienced declining financial performance for over a decade, despite Fiji enjoying sugar prices two to three times the average world price. The corporation’s poor financial performance has primarily been blamed on the increase in burnt cane. This paper tests the importance of factors controlled by growers and millers in explaining the decline in the profitability. It concludes by reviewing proposed policy reforms and suggests alternative policies to reverse the recent trend.

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Sugar industries throughout the world are facing increasing challenges in the wake of world trade liberalisation and rising competitiveness of sugar-producing countries such as Brazil, Thailand and Australia. For a small sugar producer like Fiji to survive, it must be able to deal with the challenges of expected changes in its preferential sugar trade arrangements with the European Union. But more importantly, it has to reverse its recent poor financial performance in the milling sector.

The sugar industry is the backbone of Fiji’s economy and is the single most important source of earnings. In 2002, it generated 9 per cent of the country’s GDP and employed 25 per cent of the active formal labour force. Sugar exports generated F$235 million, the single largest commodity export earner.

The industry is based on around 3.4 million tonnes of sugarcane produced by 22,000 growers and processed into raw sugar by the Fiji Sugar Corporation (FSC), a publicly listed company. Although the industry as a whole has experienced a steady decline in its performance, the country has been particularly concerned about the decline in the before-tax profit of the FSC in recent years. Most importantly, the FSC has shown
a financial loss for each of the last three years, despite Fiji enjoying sugar prices of two to three times the average world price under the Cotonou Agreement.

FSC and the government have blamed the FSC’s poor financial performance primarily on the increase in the proportion of burnt cane supplied by growers. Losses have also been attributed to the miller’s ‘low’ share of sugar proceeds, which they have argued has prevented them from investing in much-needed capital improvements. To improve its financial performance, the FSC is trying to encourage growers to reduce the proportion of burnt cane supplied to the mills. Other changes proposed include increasing its share of the net industry revenue by fixing growers’ cane-price payments, restructuring the organisation, limiting cane throughput, and replacing old machinery.

The implicit assumption behind the suggested changes is that the FSC’s deteriorating financial performance is primarily due to the declining quality of cane supplied by growers, organisational structure and old machinery. There is no doubt that grower-determined factors, such as cane quality and the volume of cane supplied, affect milling and processing efficiencies and miller’s profits. One can also argue that old machinery is not as efficient as new equipment, and that an increased share of sugar proceeds may help improve a firm’s profitability in the short run. However, in the long run they may not address the underlying causes of poor performance.

The objective of this study was to examine possible causes of recent poor financial performance of the FSC and to determine the importance of farmer dependent factors and factors that are directly under the control of the miller for the financial performance of the FSC. Amongst the factors under the influence of growers is the sugar content of sugar cane and cane quality, both of which are affected by the proportion of burnt cane. Miller-dependent factors tested include cane throughput, milling efficiency in extracting and processing sugar from sugarcane, and the quality of mill management.

The Fiji Sugar Corporation

The Fiji Sugar Corporation is the largest private company listed on the South Pacific Stock Exchange. It has an annual gross turnover of around F$250 million. The company was established in 1974 when the Fiji Government bought out the South Pacific Sugar Mills, a subsidiary of the Australian-owned Colonial Sugar Refining Company (CSR). The company issued 44.4 million fully paid shares at an issue price of F$0.50, which today are owned largely by institutional shareholders. The two largest shareholders are the Fiji Government, holding 68 per cent, and the national superannuation fund, the Fiji National Provident Fund (with 17 per cent). The remainder are owned by other local institutions and private individuals, each with less than one per cent of shares (Figure 1).

The Fiji Sugar Corporation is what Putterman and Kroszner (1996a) define as an organisation that manages and coordinates the activities of its participatory actors. The FSC owns four mills—Lautoka, Rarawai, Labasa and Penang—on Fiji’s two main islands and has its headquarters at Lautoka.

Over the last 15 years or so, the four mills have processed a total of between 2.1 and 4.4 million tonnes of sugar cane annually, yielding between 256,000 tonnes and 520,000 tonnes of raw sugar and a small quantity of molasses. In 2002, for example, 3.4 million tonnes of sugarcane (supplied by 17,773 small growers) were crushed and processed to yield 380,000 tonnes of sugar. Most of the sugar is exported to the European Union under the Cotonou Agreement.
Figure 1  Distribution of Fiji Sugar Corporation shareholders, 2002 (per cent)

Note: Total share value in 2002 was F$44.4 million.

Figure 2  Main destinations for Fiji sugar, 2006 (per cent)

Source: Fiji Sugar Marketing.
Table 1  Average sugar prices received by Fiji, 1992–2002 (F$)

<table>
<thead>
<tr>
<th>Market</th>
<th>Average price (F$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACP/EU Protocol</td>
<td>973</td>
</tr>
<tr>
<td>Special Preferential Sugar Agreement</td>
<td>841</td>
</tr>
<tr>
<td>United States</td>
<td>905</td>
</tr>
<tr>
<td>World market</td>
<td>373</td>
</tr>
<tr>
<td>Local/region</td>
<td>445</td>
</tr>
</tbody>
</table>

Source: Fiji Sugar Marketing.

(previously the Lomé Convention) and the Special Preferential Sugar Agreement; small amounts are consumed locally and exported to countries in the Pacific region (Figure 2). Due to the high prices paid by the European Union, the average price received has been two to three times the world market price (Table 1).

The FSC’s current organisational structure could be seen, a la Coase (1937), to minimise the transaction costs of contract negotiation, price discovery, and negotiation with farmers and other stakeholders such as the government and the landowners. Instead of each mill negotiating with thousands of growers and individual suppliers of other inputs for the milling and processing of sugarcane, for transport, storage and sale of sugar and molasses, transactions costs are minimised through the centralised management of the four mills.

The CEO of the FSC is the Managing Director who has underneath him General Managers of the four mills. The Management Committee comprises the Managing Director, the four General Managers, the General Manager Technical, the General Manager Human Resources, the General Manager Finance, and a Financial Advisor. Operationally, the Managing Director and other members of the Management Committee make the strategic decisions about the financial and human resource allocations across the four mills and within each mill that determine the technical and financial performance of each mill and, overall, the FSC. The ultimate managerial responsibility for the FSC’s performance rests with the Managing Director who is also a member of the Board of Directors. The Board of Directors comprises five other persons appointed by the government. The Board is answerable to FSC’s shareholders and direct stakeholders, including the almost 23,000 registered growers.

Each mill represents an organisational form of coordination and management of activities involving several sequential steps and several types of inputs/ resources that transform sugarcane into raw sugar. The final output, raw sugar, is a result of the marginal product of a team whose individual marginal products are not directly observable or separable. Consistent with the economic theory of organisations (Alchian and Demsetz 1972; Putterman and Kroszner 1996b; Richardson 1996), a mill structure is required in the processing of sugarcane because of the technological processes involved in extracting and processing sugar. It also helps avoid the difficulty that each group of workers would have had in monitoring the inputs of the workers in prior stages of the production process whose
products form intermediate inputs (Barzel 1982). The output of each stage of the processing provides the input into the next stage along the production chain, which involves a series of complementary activities. Richardson defines complementary activities as ‘different phases of a process of production [required] to be coordinated both quantitatively and qualitatively’ (Richardson 1996:140).

Ultimately, the percentage of sugar recovered directly reflects a mill’s efficiency (Queensland Sugar Corporation 1993). Milling efficiency also underpins a miller’s gross revenue since the miller receives a fixed share of the net revenue generated from the sale of sugar less industry costs. Industry costs deducted are those incurred in activities such as marketing, transport, bulk storage and research. Of the estimated F$132 per tonne of industry costs, freight-related costs are the largest, accounting for 69 per cent of all costs; little can be done to reduce these costs because of the physical distance between Fiji and its export destinations.

Under the Master Award (Sugar Industry Tribunal 1989), the FSC is assured of 30 per cent of net returns from the sale of sugar and molasses; this share falls to 27.5 per cent for sugar produced in excess of 325,000 tonnes. FSC meets the costs of all its inputs (including capital) from this 30 per cent and claims the residual as business profit.

FSC’s financial performance

Business profit is usually used as a measure of the performance of a business organisation (Demsetz 1995). FSC’s before-tax profits have steadily decreased in nominal terms from F$9.6 million in 1974 to a net loss of F$13.6 million in 2002. Its share value has fallen from the F$0.50 a share when initially issued to F$0.25 in 2003. Public share trading has been almost non-existent for some time, with only a small number of shares traded in 2003 after trading was suspended for several years (South Pacific Stock Exchange 2004).

The decline in financial performance in recent years has taken place despite an increase in gross revenue, suggesting an increase in FSC’s costs. These costs (in 2001 dollars) per tonne of sugar have increased from an average F$66 per tonne in 1975–84 to an average F$222 per tonne over 1995–2002, an increase of more than 300 per cent. In 2003 average sugar production costs were reported to be about F$280 per tonne, with the Lautoka and Penang mills recording over F$320 per tonne (Sugar Technology Mission 2004). In essence, Fiji’s factory costs have increased to the point where Fiji has gone from being ranked the third most efficient sugar producer in the world, ahead of Australia, to now having factory costs almost 160 per cent of Australia’s, or 28th in the world (Landel Mill International 1994, 2002).

Milling and processing performance

Total industry revenue, and thus miller gross revenue, is directly determined by the amount of sugar recovered, which is a function of the efficiency of operations at each stage in the milling and processing of sugarcane and the sugar content of the cane. Fiji’s sugarcane processing and milling system is similar to those in many other parts of the world. The sugarcane is passed through a set of crushers, rollers and knives called milling tandem. At this stage the cane is shredded and crushed and water is added, and the slurry of sucrose and muddy impurities is separated from the fibrous cane material, bagasse. Bagasse (a byproduct) is used as fuel for the boilers or to generate electricity. In the second stage, extracted first juice (‘first-expressed juice’) is adjusted for PH using lime, heated and clarified. The waste, filter mud, is discarded after the juice is pressed.
out and separated. The clarified juice then enters the third stage, where it goes through a series of evaporators before the extracted syrup is sent to vacuum pans in which crystal growth occurs. Further crystallisation occurs in the crystallisers before it passes through the centrifuges, separating out raw sugar as commercial sugar. The byproduct of the final stage is molasses. The quantity and quality of raw sugar produced thus depends not only on the sugar content of the sugarcane but also on the efficiency of each stage of extraction and processing.

The four mills have been operating well below their capacity in most years and have processed on average 3.5 million tonnes of cane annually, producing on average about 400,000 tonnes of sugar. According to Booker International, the Fiji mills have the capacity to produce 500–550,000 tonnes of sugar (Booker Agriculture International Limited 1981).

Sugar recovery in the four mills has gradually declined (Figure 3). On average, sugar recovery has fallen from about 89 per cent in 1968 to the current 81 per cent. At least one of the mills reported a recovery rate as low as 79 per cent in 2003. By way of comparison, in Queensland a sugar recovery rate of about 90 per cent is the norm (Fry 1997). Reductions in the sugar recovery rate are generally divided into two types of losses: those that occur during the course of sugar manufacture and those that cannot be accounted for when determining the sucrose level in cane (Rivalland 2001). The former include losses due to weighing errors, losses due to spillage, and deterioration due to delays in acceptance at the weighbridge and during the milling process. The size of these losses is not possible to determine without access to internal company records. The nature of losses in the milling process can, however, give some idea about the possible extent of these losses.

Losses in bagasse, mud and molasses
Loss of sugar can occur in all three stages of processing and milling—in bagasse exiting the final extraction unit (mill or diffuser

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Figure 3  Fiji Sugar Corporation: trend in sugar recovery, 1968–2004 (per cent)

dewatering mill), in mill mud, in molasses, and in the liquid effluent or the wastewater. In addition, there are ‘undetermined losses’, indicating the balance after the other losses that can be accounted for. These losses could be due to occasional mechanical spillages, chemical losses by inversion, microbiological losses, and destruction of sucrose by heat or alkali degradation (Broadfoot 2001).

In the usual course of a mill’s operations, the amount of sugar retained in these different byproducts, called sugar retent, is regularly monitored. The mill superintendent will compare these values against the accepted industry standards, or the par values, which are set according to the type and age of the machinery used. The accepted par values for bagasse, mud and molasses retent and undetermined losses are summarised in Table 2. These values reflect the industry-wide sugar recovery par value of 85.2 to 85.9 per cent.

Sugar losses over the par values in each of these stages indicate that the plant at that stage of processing is not operating efficiently. Thus, for example, if the bagasse retents is greater than 3.2 per cent, it would mean that there is poor extraction of cane juice at the crushing stage. Similarly, if the mud retent value is higher than 0.3 per cent, one can conclude that poor filtration is the cause; or if the molasses retent is greater than 10.7 per cent, there are problems in the evaporation and crystallisation stage of the processing. Sugar retent values above the norms in these byproducts means a loss of sugar revenue, 30 per cent of which is FSC’s loss (see ISSCT 2001 for details of the effects of problems in key stages of processing and milling and sugar recovery).

Sugar losses in byproducts, 1986–2001
The amount of sugar lost in bagasse, in mud, and in molasses at all mills has been above the acceptable par values for years (Table 2). For example, the bagasse sugar retent values have exceeded the par values in each year since 1987. The bagasse sugar retent values have been in the range of 4–7 per cent, when the par value was less than 3.2 per cent (Figure 4). That is, each mill annually lost from 500 to 3,500 tonnes of sugar in bagasse. Similarly, sugar has regularly been lost in molasses. Except for a few years in the Rarawai and Penang mills, molasses retent values since 1987 have consistently been higher than the acceptable par values for molasses, costing the industry at least F$1.2 million a year at the world sugar price of F$373 per tonne.

Table 2 Accepted industry par values for sugar lost in bagasse, mill mud, molasses

<table>
<thead>
<tr>
<th>Byproduct</th>
<th>Par Value</th>
</tr>
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<tbody>
<tr>
<td>Bagasse retent</td>
<td>&lt;3.2 per cent</td>
</tr>
<tr>
<td>Mud retent</td>
<td>&lt;0.3 per cent</td>
</tr>
<tr>
<td>Molasses retent</td>
<td>Depends on the cane quality</td>
</tr>
<tr>
<td></td>
<td>For the average industry cane purity of 82 per cent during 1988–2001, the molasses retent par value is 10.7 per cent</td>
</tr>
<tr>
<td>Waste water</td>
<td>&lt;0.2 per cent</td>
</tr>
<tr>
<td>Undetermined retent</td>
<td>+/- 0.3 per cent</td>
</tr>
</tbody>
</table>

Figure 4  Value of sugar lost in milling byproducts, 1988–2001 (F$)


Figure 5  Mill operating hours as a percentage of expected industry norm, 1988–2001

These losses are particularly significant because the par value for molasses reflects the quality of cane, measured in terms of the level of impurities (which increase with burnt cane), received by the mills. This means that with poor quality cane, and thus lower cane purity, the expected par value is adjusted upwards. Thus, when determining the par value for sugar lost in molasses, the effect of poor quality burnt cane has already been accounted for. Any difference between the par value and the actual molasses retent value is entirely due to the inefficiency in processing. A similar picture of poorly performing mills emerges when mud retent values are examined closely.

Each additional per cent of sugar lost directly translates into about 4,000 tonnes of sugar or about F$1.5 million loss to the industry. On average, the industry has lost almost F$6 million annually in sugar that had already been produced in the sugarcane and supplied to the mills but not recovered by FSC.

In addition to the loss in income due to sugar losses in byproducts, costs increase because of poor mill operations, as reflected in mill operating hours. An efficiently operating mill means that sugar is extracted and manufactured in the least amount of time. Any delay in processing caused by mill stoppages means that the sugar deteriorates and less sugar is recovered. The accepted industry norm for crushing time is 144 hours per week, after allowing for mill stoppages for such activities as cleaning, unexpected mechanical breakdowns and repairs, and outside stoppages because of shortages in cane supply, such as transport delays or poor harvesting.

Each mill’s operating hours, as a percentage of the expected ‘normal’ crushing time, has declined over time (Figure 5). In recent years, mill crushing hours have been down by almost 40 per cent. These increased stoppages can help explain the loss in sugar recovery in recent years. Regular breakdowns also mean that mill workers are not being used efficiently as they are forced to stand around idle while the machinery is being fixed. Further, mill stoppages extend the crushing season beyond the optimal length of 22–24 weeks. With an extended crushing season, the sugar content is reduced. Mill breakdowns also cause delays in cane delivery. With delays between harvest and crushing, the sugar content in cane declines, reducing industry efficiency and increasing milling and processing costs.

Quality of cane

There are two dimensions to the cane quality issue, the proportion of burnt cane supplied by the growers and the sugar content of the cane (Figure 6). Burnt cane adversely affects milling performance in two ways. First, it increases the impurities in the cane juice, and second, burning causes some problems in the processing of cane, particularly at the clarification and pan boiling stages. Burnt cane, particularly burnt cane that is not milled quickly, causes a reduction in recoverable sugar (Londhe 1989) and an increase in processing costs. It is estimated that the reduction in sugar content due to burning has resulted in an industry loss of about F$1.7 million per year. In addition, there is an increase in milling costs because of increased dextran content caused by bacterial infection inverting sucrose into dextran (Landel Mill International 1994). High levels of dextran cause the liquor extracted from cane to become highly viscous, reducing the processing rate (Davis 2001). The high viscosity causes scaling of evaporating surfaces, which require regular de-scaling with caustic chemicals, and means an increase in the use of dextranase enzymes and other chemicals. All of these additional activities mean higher milling cost, which has been reported to have increased by as much as F$2.8 per tonne of
burnt cane (Davies 1999). Furthermore, the long polysaccharides dextran produces from inversion of sucrose interferes with crystallisation and reduces the crystal growth rate. The sugar produced is consequently of poorer quality and could fetch a lower price or, in extreme cases (as was the case recently with a shipment to Japan), lead to total rejection.

Sugar content, which has also declined slightly over time, is determined by several factors including cane variety and when the cane is processed. More importantly, however, it depends on the level of rainfall and the daily mean temperature at key stages of the sugarcane plant cycle (Muchow et al. 1997; Peterson and Gaunt 1967). Sugar content is also a direct function of the length of the harvesting season and its start date. A 22–24 week period of harvesting is regarded as optimal, with early June as the optimal time for the start of the crushing season (Landel Mill Commodities Studies Ltd 1991). The later the start date, the higher is the sugar content. The longer the crushing season the lower is the average POCS. Later in the season rainfall increases, which adversely affects the sugar content (Chapman and Milford 1997).

As a result of the combination of these factors, the POCS in Fiji has shown large variations but there has been a visible downward trend. In the 1960s the average POCS was about 14 per cent and recently the POCS has averaged about 11.8 per cent. In recent years, because of frequent mill breakdowns, the crushing season has extended well into the middle of the rainy season with some mills closing as late as February of the following year. The preferred crushing season is early June to late November/early December.

The question thus posed is: to what extent do these various factors—those under the control of the miller or those largely influenced by growers’ behaviour—contribute to the recent decline in the performance of the FSC?

Empirical results

It is difficult to determine conclusively the relative importance of the various factors, particularly because of the web of interactions amongst them. The industry is estimated to have lost an average of $5.7 million in unrecovered sugar during milling and processing stages over and above industry par values. This is almost three times greater than the $1.7 million loss due to the decline in POCS as a result of burning (Lal 2003). On the other hand, if one accepts the estimated additional milling cost of $2.8 per tonne of burnt cane, the miller is estimated to incur about $3.3 million in increased costs. The factors under the control of the millers appear on balance to have had a slightly greater influence on FSC’s poor financial performance than the factors under the influence of growers.

In an effort to isolate the effects of actions by growers and millers on FSC’s financial performance, a simple regression analysis was carried out. It was assumed that FSC’s before-tax profit is a function of revenue and costs, both of which are dependent on the actions of millers and growers. Total revenue is a function of price and volume of sugar produced and cost is a function of the quality of cane supplied as well as milling and processing efficiency and management quality. The volume of sugar produced is a function of the sugar content (POCS) of cane supplies and the milling and processing efficiency. Sugar content is also a function of the volume of burnt cane and the delays caused in delivery to the mills, a factor largely influenced by mill operating hours.

Thus, the primary set of variables that directly affect milling costs and revenue are: cane throughput, POCS, the sugar recovery rate, and the quality of management. The proxy indicator for management is the asset turnover ratio, which is the ratio of miller revenue to non-current asset value; a low asset turnover ratio indicates that the ‘management is using assets in non-cash flow generating and probably value destroying ventures’ (Singh and Davidson 2003:799).

Thus, the following functional relationship was estimated using simple regression analysis.

\[
\text{Profit before tax} = \text{TR} - \text{TC} = f(SR \text{ per cent}, Q_{\text{sugarcane}}, \text{POCS}, \text{management quality})
\]

Using 1986–2001 data, the regression estimated is summarised in Table 3. The sign

| Parameter                  | Parameter estimate | P > |t| | P > F |
|----------------------------|--------------------|-----|----|-------|
| Intercept                  | -285.17            | 0.0025 |
| Cane throughput            | 0.00467            | 0.4090 |
| POCS                       | -3.921             | 0.2786 |
| Sugar recovery             | 3.048              | 0.0338 |
| Management quality         | 233.18             | 0.0259 |
| R²                         | 0.75               | P > F = 0.0047 |

Source: Data from Mill Work Advice and Fiji Sugar Corporation (various years). Annual Report, Fiji Sugar Corporation, Lautoka.
of each coefficient is as expected, except for POCS, for which it is negative. However, this parameter is insignificant. Only the factors under the control of the millers are statistically significant in explaining FSC’s before-tax profit. The quality of management and milling and processing efficiency are the two parameters that are significant in explaining FSC’s before-tax profit over the 15-year period.

However, these results need to be treated with a degree of caution since there is not a direct cause and effect relationship but a complex web of interactions that determine the miller’s financial performance. Nonetheless, the question remains as to why the FSC’s performance continues to decline despite technical monitoring each year highlighting the problem.

**The mills’ poor performance and principal agency**

In hierarchical organisations, such as a sugar mill, heads of departments and managers direct people to carry out specific roles using resources allocated to them, and organisational structures are designed to minimise transaction costs. Therefore, decision-makers within FSC—General Managers, the Management Committee and the Managing Director—would ideally obtain appropriate information in a timely manner and direct people lower down the chain, monitor their actions, and enforce rules in order to maximise FSC’s goals.

Within FSC, performance at each stage of processing and milling is monitored daily, and in some cases hourly, by the production superintendent who is responsible for technical production matters. Similarly, engineering and machinery matters are monitored and managed by the head of the engineering department. Each day, the mill production manager compiles a report summarising the trends in the mill’s performance as reflected in indicators such as sugar retent values in bagasse, mud and molasses, and mill operating hours. This report is discussed with the mill’s General Manager and heads of the other departments. Based on the previous day’s operations, decisions are made about operational adjustments and daily targets are identified. There are also weekly meetings between the General Manager and the heads of departments, reviewing the previous week’s performance, any budgetary requirements and human resource issues. The final decision’s about resource allocation rests with the General Manager who is not only the day-to-day manager of the mill but also reports to the Managing Director and the senior management committee of the FSC.

Despite having such an administrative process in place, the poor performance of the FSC suggests that General Managers, the senior management, and ultimately the Board and the Government as the main shareholder, are not performing the duties expected of them. The root causes of the ongoing poor mill performance could be explained in terms of the principal-agent problem and *nomenklatura*. A principal-agent problem arises when the agent’s interests are not aligned with those of the organisation (principal) and agents take actions in their own interest. The lack of appropriate incentives is often the reason the agent’s interests are different from those of the principal (Fama 1996; Fama and Jensen 1983; Jensen and Meckling 1976). Motivation and actions of individuals determine the behaviour and performance of organisations, the levels of monitoring needed, and the potential for shirking influencing individuals’ incentives (Milgrom and Roberts 1990).

Reddy has noted that the the strict control exhibited by management during the time the mills were under the control of the
Colonial Sugar Refining Company (CSR) no longer exists (Reddy 2003:267). There is also evidence of a lack of appropriate incentives for individuals as well as the FSC as a whole to improve performance. At the individual level, the lack of incentives can be seen at all stages of the processing and milling—from the factory floor, middle managers and mill managers, to the Senior Management Committee and the Managing Director. Mill workers, General Managers, and the Managing Director are paid a fixed salary, that is, they are not paid according to their performance. The FSC did experiment with a performance-based payment system for general workers but not for senior management. The experiment was abandoned because of the difficulty of designing objective measurements of individual workers’ performance.

There is a lack of incentive at the mill level as well because costs and revenues of the four mills are pooled and reported as a single entity. Thus, although mill workers identify with their mills, individuals may not have much incentive to improve their performance when the effects of their effort cannot be directly attributed, and benefits of improvement in a mill are shared with the other mills. Because of such ‘free-rider’ problems, incentives are diluted and individuals.

At the corporation level, too, the millers lack incentives to make improvements. Under the current cane-sharing formulae, the miller is paid a fixed 30 per cent of the total sugar and molasses proceeds minus the industry-wide costs. With such a payment system, 70 per cent of any improvements in the millers’ performance will be shared with the growers and only 30 per cent of the net proceeds accrue to the FSC. Several authors have argued that such a cane payment system does not provide appropriate incentives to the miller to improve performance (Davies 1998; Landel Mill Commodities Studies Ltd 1994).

Principal-agent problems also arise when lower-level management provide distorted information upwards to either protect their own interests or to benefit from the decisions made by upper management. Such ‘influence costs’—losses that arise from activities of individuals designed to influence key decisions by management for their own benefit—could help explain why a centralised Management Committee may have failed to reverse FSC’s poor financial performance.

Key management decisions are made by the FSC’s Management Committee to which each mill’s General Manager reports on a regular basis. It is possible, though difficult to prove, that the General Managers may not have reported in detail the underlying causes of poor sugar recoveries because it is easy to shift the blame elsewhere. It has been relatively easy for management to hide behind the general perception (likely a wrong perception, as we have seen above) that increases in the proportion of burnt cane are primarily responsible for FSC’s poor financial performance. Such statements are regularly made in the local media by each General Manager during the crushing season.

As a result of such activities, which may be regarded as political, FSC management has been able to shift the blame from the millers to the growers. It is also not difficult to see why the Board (and the government) would have bought into such arguments. In Fiji, the sugar industry has always been dominated by the politics of race. The government of the day during the colonial and post-independent periods often did not see much political gain to be had by siding with the growers, the majority of whom are Indo-Fijians. Governments have thus been more inclined to believe the FSC or its predecessor, CSR (Lal 1997; Moynagh 1981), rather than find fault with them. Growers, who are mainly descendents of Indian
indentured labourers brought to work in the sugar plantations in the late 19th century, have not had much political influence with the governments of the day, and are consistently seen as the cause of many of the industry’s woes (Lal 1997).

Principal agency and the shareholders
As the primary shareholder, owning 68 per cent of the shares, the government has failed in its duty as well. The government, in its role as the agent of taxpayers, has not scrutinised the performance of FSC and demanded improvements. If anything, the government has provided a perverse incentive by providing grants to the FSC and underwriting its loans. In 2003, for example, the government increased the sugar export tax from 3 per cent to 10 per cent and used the funds to help restructure the FSC; 70 per cent of the revenue was raised from the growers, effectively increasing the millers’ share of net industry profit to about 34 per cent. Here, too, the classic principal-agent problem is observed, since the agent, the government, is not likely to be voted out just on their managerial record on the FSC.

The government has also been the victim of influence activities by accepting the FSC’s propaganda that its poor financial performance was primarily due to the increased proportion of burnt cane. This is not surprising. During the 2003 cane season there were between 6 and 12 reports per month in the local print media about the levels, and potential effects, of burnt cane. There was not a mention of poor milling efficiency and poor sugar recovery. This is a classic example of what Milgrom and Roberts (1990) call ‘influence activities’. Without closely examining the root causes of the problem, the government has periodically agreed to either defer tax payments by the FSC and/or provide the FSC with additional funds, giving them perverse incentives to continue business as usual.

Other shareholders have also failed to monitor the actions of the FSC. This may have been a rational decision on their part. Most of the shares are held by large institutional interests, such as FNPF and Fijian Holdings. These bodies are likely to have a diversified portfolio of investments. Consequently, because their risks are spread across many different investments they may not have special reasons for closely overseeing the activities of any one firm.

Furthermore, in the absence of ‘real’ stakeholders, companies are susceptible to machinations of CEOs to secure and institutionalise his or her power (Tosi et al. 2003:188). Theory in managerial capitalism also argues that there is no ‘justification for assuming that those in control of a… corporation will choose to operate it in the interest of the owners’ (Tosi et al. 2003:181). Particularly with firms that do not have large individual stockholders (management-control firms), Jensen and Meckling (1976) note that the directors, as managers of other people’s money, cannot be expected to exercise the same vigilance as they would over their own.

FSC’s performance thus would have continued to slide not only because of inadequate shareholder scrutiny but also due to ‘rational’ behaviour of the management in their own interest rather than in the interest of the shareholders or the company. It is also possible that individuals in decision-making positions were not necessarily appointed on merit, and as a result they did not have the necessary technical background to make informed decisions.

Poor performance and nomenklatura
In the sugar mills it is also possible that, at least within the corporation, the General Managers have reported poor performance to the Management Committee, which did not
have appropriate technical expertise to make the right decisions. Lack of technical expertise in Fiji has become a problem following the flight of skilled labourers after the 1987 coups, and more recently following the 2000 coup. Over 80,000, mainly skilled workers and professionals, have migrated to Australia, New Zealand, Canada and the United States. People who were left behind did not always have the necessary technical knowledge or experience to make good decisions.

This problem has been exacerbated by discriminatory promotion and appointment policies adopted by FSC. There, like elsewhere in public organisations, managers seem to have rewarded ethnicity and patronage rather than merit. This means that people in positions of responsibility within the mills may not have been well equipped to handle the challenges of milling operations.

Even at the mill management level, people appointed to the position of mill General Manager did not necessarily have technical and/or management capabilities. For example, only one of the current General Managers has a production and engineering background. Furthermore, before 1999 the FSC Management Committee included at least one person with production operations expertise (General Manager Operations), as well as Divisional Manager Technical, and Chief Mechanical Engineer. Recently, this has changed and since 2000 the day-to-day Management Committee does not have anyone with appropriate technical production expertise (Fiji Sugar Corporation 1999; Fiji Sugar Corporation 2000; Fiji Sugar Corporation 2001). The Managing Director himself did not have any prior experience in sugar processing and milling. This may suggest that although regular technical monitoring is carried out on the factory floor, the information may not have been taken into account when key policy and management decisions were made at the Management Committee level. As a result, incomplete information could be the reason for poor decision-making, not necessarily because lower-level managers did not provide information but because upper-level managers are not equipped to handle information provided by the staff lower down the chain. This phenomenon became particularly apparent after skilled technical staff resigned from the FSC following the political coups of 1987 and 2000 and subsequent discrimination against people of a non-indigenous background.

There is also some evidence that people with experience and technical knowledge are marginalised or excluded from the central decision-making process. The reasons for such changes are not known, though speculation from people in the industry suggests that people have been promoted because of loyalty rather than competence. In some cases people already in the system are fearful of losing their jobs if they are not seen to be supportive of top-level decisions; for example, there is a case before the Independent Arbirtator in which a senior technical officer was fired for disagreeing with senior management (Independent Arbirtator, personal communication, February 2004).

Incompetent people being appointed to managerial positions is one of the causes of poor performance in state-owned enterprises elsewhere in the world. Winiecki (1996), for example, discusses a similar problem in the Soviet Union (1996), and she called this the principle of nomenklatura—‘the right of the communist party apparatus…to “recommend” and “approve” appointments for all managerial positions…on the basis of loyalty rather than managerial competence’ (Winiecki 1996:67). In Fiji, such actions are easy to disguise under the rubric of ‘affirmative action’ when not promoting or appointing people even if they have the relevant training and experience.

The effects of nomenklatura are common throughout the industry. This can be seen in
FSC’s capital investment decisions. FSC has invested around F$8 million each year since 1999 (see Table 2), however, its technical or financial performance has not improved. If anything, its milling performance has declined, largely because of decisions to order inappropriate capital equipment or to dismantle well-functioning equipment. The FSC has tended to invest funds to improve the feeding and crushing capacities in mills when the underlying problem appears to be at the processing end of the chain. An example of such inappropriate decision making can be seen in case of the Lautoka mill. In 2002, a decision was made to install a two-roller mill and to remove a perfectly functioning ‘A-crushing tandems’. Subsequently, the Lautoka mill’s performance has deteriorated and it is one of the poorest performing mills in the country.

It is therefore not surprising that although FSC’s non-current asset investment has increased, the asset turnover rate has decreased since 1990 (Table 4, Figure 7). This is consistent with Singh and Davidson’s observation that a low asset-turnover ratio indicates that the ‘management is using assets in non-cash flow generating and probably value destroying ventures’ (Singh and Davidson 2003:799). Why is it possible that despite annual investment in non-current assets, the FSC has showed declining profits in recent years? *Nomenklatura* at the Board level could also help explain poor performance of the Fiji Sugar Corporation.

**The Board**

Ultimately, the Board of Directors shoulders the responsibility for any corporation’s poor performance. It can put pressure on the Managing Director to perform or fire him. The FSC’s Board of Directors, most of whom are ‘outsiders’, does not appear to have fulfilled its responsibilities. Tosi et al. (2003) note that the presence of a majority of outside Board members does not guarantee effective monitoring of management decisions and better performing corporations.

There are possibly two reasons for this. First, the Managing Director may have been able to manage the Board members in such a way as to have a supportive Board that seldom challenged his decisions. This could have been relatively easy because the Managing Director is a member of the Board and, as is the experience internationally, the Board may have ‘act[ed] like they are members of the emperor’s court, either approving the CEOs’ action or not being terribly interested in what the CEOs do as long as they are [were] able to hold out their Board status’ (Tosi et al. 2003:181). Such

**Table 4**  
Fiji Sugar Corporation: non-current asset investments, 1997–2002 (F$ million)

<table>
<thead>
<tr>
<th>Year</th>
<th>Non-current asset investments (F$ million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>18.7</td>
</tr>
<tr>
<td>1998</td>
<td>11.0</td>
</tr>
<tr>
<td>1999</td>
<td>5.0</td>
</tr>
<tr>
<td>2000</td>
<td>8.5</td>
</tr>
<tr>
<td>2001</td>
<td>8.0</td>
</tr>
<tr>
<td>2002</td>
<td>8.4</td>
</tr>
</tbody>
</table>

behaviour is possible because the Board members owe their place on the Board to the goodwill of the government. Government has been seen to appoint individuals to Boards of government enterprises in Fiji as payback to them for their loyalty rather than on merit.

Second, and perhaps more importantly, the Board was not able to effectively scrutinise the FSC’s performance because it did not have anyone with relevant expertise in sugarcane processing and milling to scrutinise the technical performance of the corporation. The FSC Board has comprised people mainly of accounting, legal and/or business backgrounds, a civil servant representing the government, in addition to the Managing Director (Fiji Sugar Corporation 2001). It is thus possible the Board did not have the capacity to adequately assess the appropriateness of technical strategies proposed by the management. Thus, although international experiences (Fama 1980; Fama 1996; Fama and Jensen 1983) suggest that outside board members add value to firms by critically disciplining the managers, this did not happen in the case of FSC because they did not have the appropriate technical background. In the case of the FSC, the Board may have been nothing more than a rubber stamp for technical strategies proposed by management. Furthermore, since none of the Senior Management Committee had direct sugar technology background, information that was passed on to the Board, too, may have been incomplete. The Board may have accepted whatever the Management Committee because it too did not include anyone with technical background to scrutinise the advice given, resulting in inappropriate decisions.

Often it is argued that CEOs are disciplined by the fear of the loss of future earnings (Fama 1980). But in this case, poor decisions by the Managing Director may not get punished because his future salary may not be affected by his performance in the sugar mills, particularly since he is not a career sugar technologist or sugar mill

Figure 7  Change in agency costs, 1986–2003 (gross revenue and asset value)

Source: Based on industry data and Fiji Sugar Corporation (various years). Annual Report, Fiji Sugar Corporation, Lautoka.
manager. The current Managing Director was not selected from a pool of sugar technologists or milling and processing experts available in the region. Nor is he likely to seek future employment in this sector since he does not have any background in sugar milling and processing. Furthermore, since the Managing Director’s remuneration is based on a fixed salary plus an undisclosed bonus payment, he may not have any direct incentives to change his management behaviour beyond some fixed target level negotiated with the Board.

Proposed policy responses

In light of this discussion it is highly unlikely that recent policy proposals will result in much improvement in the industry because they do not address the root causes of poor decisions—principal agency and nomenklatura. If anything, the proposed solutions may make the situation worse.

FSC recently put forward several proposals, including the introduction of minimum cane prices, setting a limit on the amount of cane accepted, and the restructuring of the FSC. The Indian Mission Team emphasised capital investment in the milling sector to bring about the much-needed improvements.

Minimum cane price

Fixing the minimum cane price will have a perverse effect on both the growers and the miller. Growers would still be motivated to increase the volume of cane rather than improve the quality of cane. The miller would have an incentive to continue ‘business as usual’, since the corporation will be assured of the balance of net returns regardless of its performance. It seems the FSC has taken a leaf out of the book of its predecessor, the CSR, which paid the growers a fixed price before the 1960s. The difference between then and now is that the CSR was a highly efficient organisation and it used such a policy to increase its profits, extracting super-profits to cross subsidise its Australian operations (Narsey 1979). The FSC is a highly inefficient organisation and struggling to be financially viable.

Restricting throughput

Regulating cane throughput does not make economic sense either. As seen above, cane throughput has no effect on FSC’s before-tax profit. If anything, millers should want to increase throughput as long as the marginal cost of crushing and milling additional cane is less than the expected price, particularly when none of the mills have been running at capacity and the fixed costs of the mills would already have been covered (Fiji Sugar Corporation 2001; White 2003). By accepting additional cane, the miller could expect to reduce its unit cost. However, in this case, it seems either because of nomenklatura or incompetence on the part of management, the millers believes that limiting the cane throughput is the only way to control costs.

Organisational restructuring

The proposed restructure of the FSC into separate subsidiaries, without any other changes, is not likely to reverse the recent poor performance. Structural adjustment alone is not enough. There are other proposals, such as establishing a stakeholder-based company involving the growers and the landowners. While this may help provide a sense of ownership in the industry for the key stakeholders (Lal and Reddy 2003), such a restructuring in company ownership will not address the fundamental problems within the mills.

Capital investment

There is no doubt that some capital investment is needed to replace some of the old machinery. However, it is hard to justify
the F$85 million investment approved by the government, particularly when poor equipment does not appear to be a major reason for the recent poor performance of the mills. Such a large capital investment is also questionable in the light of the fact that millers need to reduce milling costs—by over 50 per cent to break even—even at the current high preferential prices (see Lal and Rita 2005).

Policy implications

The root causes of FSC’s poor performance appear to be directly related to milling inefficiency and principal-agent problems at all stages of the management chain—from the factory floor to the government. Understanding the underlying causes of inefficiencies in FSC and the root causes of poor financial performance provides a good starting point for examining various types of policies.

Essentially, if the industry is to survive, even under the current favourable sugar pricing regime, changes in incentives and motivation at all levels of decision-making in FSC are critically needed. Economic theory tells us that to minimise principal-agent problems, institutional design should encourage the alignment of individual agent’s goals with those of the principal. (for example, Alchian and Demsetz 1972; Jensen and Meckling 1976; Milgrom and Roberts 1990; Milgrom and Roberts 1992; Tosi et al. 2003). This principle suggests that productivity can be improved by introducing performance-based payment systems for decision makers and increasing the degree of accountability at each level of management.

First, a performance-based payment system is essential at the highest level of sharing of industry net returns between growers and millers. Under such a system, millers would be rewarded for improvements in sugar recovery and poor performance would be penalised. Growers too would be paid according to the quality of sugarcane they supply (Atherton 1998; Lal 2003; Landel Mill Commodities Studies Ltd 1994). Such a payments system would provide appropriate signals to growers to improve the quality of their cane and reduce the proportion of burnt cane.

Experience elsewhere suggests that a performance-based payments system can bring about much needed improvements. For example, Mauritius reported a 10 per cent reduction in the cane to sugar (TCTS) ratio, suggesting a 10 per cent increase in the quantity of sugar produced from each tonne of sugar cane (Landel Mill Commodities Studies Ltd 1994). Recent analysis of a performance-based payment systems proposed for Fiji suggests that for every unit POCs increase, growers could expect to receive about F$5 per tonne, without affecting the miller’s revenue. The miller could expect to receive about F$2 per tonne for every percentage increase in its milling efficiency, assuming the growers’ performance does not change (see Lal, this issue).

To implement such a payment system effectively, a transparent system is required for objective monitoring of each consignment of cane. This is likely to be very costly. There are too many growers supplying small quantities of sugarcane. Moreover, the harvesting and transport system encourages small cane consignments. Many structural changes would also be required to the front end configuration of the mills. This would mean large capital investments, which the FSC cannot easily do at this stage.

As a second-best policy, a grower-miller equity based cane quality payment system could be implemented at each mill since the average performance of millers and growers is already measured and monitored regularly. In a grower-miller equity system, mill performance and the collective performance of the growers in a mill area would be assessed against base performance measures. Any improvement by the miller against the base sugar recovery measure would be rewarded,
just as any improvement in the POCS in the cane would increase the payments to the growers. This would at least separate the grower-miller equity issue and provide signals to growers and millers to improve their performance. However, the system is prone to ‘free-rider’ problems on the part of growers. Although not ideal, such a system has worked in Mauritius and Brazil (Rene Noel, Sucre International, pers comm, February 2004). Grower-grower equity can be addressed at a later stage when the overall performance of the miller and the growers is on a better financial footing than it is currently.

Further, to make mills more accountable and transparent, they must be treated as separate cost centres, with each mill setting its own pricing arrangements. The individual efficiency of the miller and the growers can then be evaluated and rewarded or penalised accordingly. Stand-alone subsidiaries, as suggested by the FSC, could evolve once accountability is demonstrated and each cost centre is able to reduce its costs to the point of generating before-tax profits. Stand-alone subsidiaries also may prove to be attractive if and when stakeholder participation can generate rewarding cooperation and the cost of additional highly skilled management can be a cost-effective investment (Lal and Reddy 2003; White 2003).

Incentive-based payments also need to be introduced at the heads of department levels within each mill. Because marginal products of individual efforts in a team situation cannot be separated and rewarded, a second-best solution could be introduced that reflects intermediary technical performance measures, such as the sugar recovery rate. Such technical monitoring is already part of the mills’ routine and could easily become part of an incentive-based payments system.

Moving up the hierarchy, a combination of technical and financial performance measures could be introduced in the system used to pay General Managers, Management Committees, and Managing Directors. Such a system should reflect their short-term and long-term performance. Further, to strengthen the productivity-based payment system, senior management within each mill and at the company level must include relevant technical staff. These staff must have appropriate background and experience to provide greater production and engineering technical scrutiny of the mills’ performance and inject such considerations into key management decisions. This would improve the effectiveness of the routine monitoring and reporting system already in place as well as improve the overall performance of the mills and the FSC by encouraging greater and more direct considerations of such technical matters. Although difficult to achieve quickly, a governance culture that promotes merit rather than loyalty, patronage and ethnicity needs to be cultivated, without which efficiency gains will always be less than possible.

Effectiveness of the Board

The Board has the ultimate responsibility for a firm’s success. To minimise the possibility of collusion between the Board and the Managing Director, the Managing Director of FSC should not be a full member of the Board, but be answerable to the Board. The Board’s duty is to monitor and scrutinise management decisions—a responsibility difficult to fulfil if the Managing Director is a member. To further increase its effectiveness, the Board must also include a person with appropriate expertise in sugar technology and experience in the production aspects of sugar milling and processing. Furthermore, it may be desirable to have an outside agency, rather than the government, involved in the shortlisting of candidates for the position of Managing Director and in some aspects of the selection of Board members (Tosi et al. 2003).

To encourage board members to go beyond simply attending meetings and
rubber stamping management decisions, directors’ fees could be linked to the performance of the FSC. Directors should bear the risk of its failure along with the management they hire (Tosi et al. 2003). Other stakeholders should also take responsibility and closely monitor the performance of the FSC’s management and Board. This particularly applies to the Sugar Cane Growers Council, whose members have a direct stake in the performance of the mills—70 per cent of all losses are currently borne by the growers. The Council’s role in the industry has been more of an advocacy role, focusing on matters related to field operations of harvest and transport. Mill-level monitoring has been minimal.

The relationship between the miller and the growers has always been an adversarial one rather than a relational one that can foster trust and cooperation. In order to address this mistrust, a routine exchange of information between growers and the miller could help minimise the need for active monitoring and enforcement. In the absence of this, the Council needs to actively monitor the technical performance of the mills, which they have the legal basis to demand under the Master Award. This would involve some transaction costs, including the cost of a technical person within the Council staff.

In the light of the principal-agent problems that plague the industry, it is clear that the reforms suggested and or implemented by the FSC and the government are not likely to lead to improvements in the financial performance of the corporation. Instead incentive-based performance payments systems need to be adopted.

Conclusion

The poor financial performance of the FSC can be attributed more to factors under the control of the millers rather than those under the control of the growers. Further, principal-agent problems within the management of the mills and the FSC and inappropriate incentives facing both growers and millers appear to explain much of the poor performance that is characteristic of the Fiji sugar industry.

There are milling inefficiencies in all four mills, leading to reductions in the sugar recovery rate. Although the poor quality of cane supplies does marginally affect the FSC’s financial situation, the key underlying determinant of the poor financial performance directly relate to the sugar losses that have occurred in the byproducts—bagasse, molasses and mud. Such losses are a direct result of poor management decisions. The root cause of the poor performance is the divergence of interests of individuals and the FSC, which leads to the classic principal-agent problem.

The principal-agent problem appears to be pervasive throughout the FSC—from the factory floor managers, to divisional heads and mill General Managers, and all the way to the central Management Committee and the Managing Director, the Board, and the government as the majority shareholder. Poor performance can also be explained by the lack of technical expertise within the mill management, Senior Management Committee, the Board and even the government contributing to poor management decisions that ultimately result in the inefficient use of FSC’s assets.

Thus, little improvement in FSC’s financial performance can be expected from the recent injection of F$85 million, without accompanying institutional changes that address the underlying principal-agent problems. Nor are other proposals from the FSC, such as fixing a minimum cane price or limiting cane throughput, likely to produce the outcomes desired. If anything, such ill-conceived strategies would continue to provide inappropriate incentives and perhaps make things worse.

At a minimum, a productivity payment system giving the FSC and the growers
appropriate incentives to improve the milling efficiency and the sugar content, respectively, is required. Each mill should be treated as a separate cost centre, giving each General Manager greater autonomy and demanding greater accountability for each mill’s technical and financial performance.

Similarly, the General Managers, members of the Management Committee, the Managing Director, and the Board members all need to submit to a performance payment system and be held responsible for the inefficiencies within the FSC. A culture of merit-based appointment and promotion within the mills and in the Management Committee should be encouraged if the problem associated with nomenklatura is to be minimised.

Without such institutional changes, it is highly unlikely that the Fiji sugar industry will survive in the short term, despite the currently highly subsidised sugar price, let alone have any hope of surviving when Fiji loses its preferential access to the European market.

Notes

1 Delays in transport are largely caused by mill breakdowns, discussed below, and the deterioration of the transportation system (Davies 1997). With every day cane milling is delayed, the POCs decreases by 0.2 units (unpublished trial results, Jai Shree Gawander, Director, Fiji Sugar Cane Experimental Station and Habib Mohammed, NIR Manager, Sugar Commission of Fiji, pers comm. March 2003).

2 According to M. Habib, the NIR Manager of the Sugar Commission of Fiji, the additional cost is in the less than half this amount.

3 Since this paper was presented to the government and the industry in September 2004, the FSC Board was reconstituted and the new Board includes at least one person with sugar technology expertise. Furthermore, for the 2005 season the FSC has introduced a reward payment system for mills that perform within the industry par values for milling hours.

References


——, 1998. The causes and consequences of cane burning in Fiji’s sugar belt, University of the South Pacific, Suva.

——, 1999. Reforming the Leasing and the Use of Agricultural Land in Fiji: an economic incentive approach, Native Land Trust Board, Suva.


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