APPENDICES

APPENDIX A
FACTORS AFFECTING THE PERFORMANCE OF CANE GROWERS

As is well known that choosing the relevant variables for measuring performance is not trivial. Several dimensions can be taken into account and several indicators can be chosen, such as objective (financial, economic, or even physical) and subjective. Researchers studying organizational performance often have difficulty finding objective data. As a result multi-firm relationship is difficult because of (1) firm-specific factors, and (2) the different influences of profitability. Performance data must be accurately allocated across different business units. Performance measurement for privately held firms is difficult because owners are reluctant to release performance data, and if they do it is often censored and data may not be comparable across firms because of different accounting procedures. In this study, it is shown that, when adequate objective performance data are not available for firms, researchers may use subjective performance data to supplement performance measurement.

A 1 Variables in the model

In order to analyse the factors affecting the performance of cane growers in the sugar industry supply chain, the following dependent variables were identified as a measure for performance of the cane growers: revenue per hectare, the amount of profit as reported by the respondents, farmers' perception whether they make profit or not and finally by the level of satisfaction the farmer attach to the exchange relationship with the millers. Table A.1 presents a summary of the variables used in the regression equations for factors affecting performance.

The independent variables include yield per ha, percentage change in the cane grower's quota (Quotachg), distance from the cane grower's farm and the processing mill (milldist), average sucrose content from 1997 to 2001 (average sucrose %) and duration of relationship (measured in years of sugarcane farming).

Table A.1: Dependent and independent variables used in the performance of smallholder farmers

• Dependent variable for performance	• Independent variables
• Revenue per hectare (R) • Do you make profit (0=No, 1=Yes) • How much profit (R) • Satisfaction (1= vmds, 4= vms)[8]	• Distance to the mill (km) • Transport cost per tonne (R) • Percentage change in quota (%) • Yield per ha (tonnes/ha) • Average sucrose content (%) • Number of years in sugarcane farming (years)

A.1.1 Distance to the mill (Milldist) and transport costs

The cost of transporting sugarcane from the farmers' loading zone to the mill is charged on per tonne per kilometre basis. Therefore, the difference in transport costs among farmers could be a result of farmers using transport that does not charge the same rate or in terms of distance between the farmer's loading zone and the processing mill. As a result of differences in distance farmers who are further away from the mill are likely to experience high transportation costs even if the rates are the same.

A1.2 Percentage change in quota (quotachg)

A production quota is the tonnes of sucrose a particular farmer is contracted to supply to the specific mill as per agreement. A higher quota means the farmer can deliver more sucrose at the prevailing quota price compared to a farmer with fewer quotas. However, farmers are allowed to deliver up to their quota, beyond that they are penalized by being paid a segregated price. Therefore, farmers with big quotas, if they deliver their entire quota, are likely to have higher income than those with fewer quotas.

[8] Measured by four items in a likert-scale, where 1= very much dissatisfied, 2 = dissatisfied, 3 = satisfied, and 4 = very much satisfied.

A1.3 Yield per hectare and sucrose content

Sugarcane yields may vary widely according to the physical environment, farm infrastructure (such as irrigation system and amount of water), crop management and varieties used. The average yield in Swaziland is 96t/ha. However, there may be a variation from farmer to farmer. High yield per ha contribute to high income on condition the sucrose content is also high.

The amount paid to cane growers is a function of the sucrose content in the sugar cane. High sucrose content per tonne of sugarcane is related to high income per tonne of sugarcane delivered. Therefore, farmers with high yields and high sucrose content in their sugarcane are expected to get better payment and thus will be satisfied with their business exchange relationship.

A1.4 Duration of exchange relationship

Number of years a farmer is involved in sugarcane farming is a proxy of the duration of the relationship between the farmers and the miller to which the farmer is attached and is expected to have an influence in the farmer's management skills as well as improved interaction with the mill where he deliver his sugarcane. Through the interaction, the farmer may develop some confidence in sugarcane farming and to the mill. Such behaviour is expected to breed trust and cooperation, which further improves the farmers' performance. Thus, farmers who had been involved in the sugarcane farming for several years are expected to perform better than relatively new farmers or rather the same. Therefore, factors that affect the performance of smallholder cane growers can be modelled as follows:

Performance = f (yield per ha, quotachg, milldist, years in sugarcane farming, average sucrose %, and transport cost)

A 2 Estimation procedure

Regression analysis was used to estimate the relationship between the independent factors (*Xi*) and the performance factors (PF). In each performance factor, the least-squares technique was used to estimate the regression coefficients (*bi*) in an equation form:

$PF = b_o + b_1X_1 + b_2X_2 \ldots\ldots + b_nX_n + u$

Where u is a random disturbance term. While the regression coefficient (bi) represents the expected change in the performance indicator associated with a unit change in the independent variable. The backward stepwise regression method was used to determine the independent variables that affect each of the performance measures. Backward stepwise regression method starts by putting all the independent variables in the equation and then deletes one at a time in order to remain with those that reduce the sum of the squared errors.

A 3 Factors affecting farmers' perception about making profit

The logit technique was employed to determine the factors that influence the cane growers' perceptions on making profit from sugarcane production. Farmers in this study were asked if they were making profit from sugarcane production and their response was either yes or no. This response was then used as a dependent variable measuring the performance of the cane growers. When a dependent variable is a dummy (0 or 1) the logit or probit becomes the appropriate technique to use. The logit was preferred in this study compared to the probit because the logistic does not depend on the assumption that the independent variables are normally distributed. As a result many other independent variables may be included. The logistic model may be expressed as:

$$p_i = E(Y_i = 1/X_{ni}) = \frac{1}{1+e^{-(\sum_{i=1}^{k} \beta_n X_{ni})}}$$

Where pi is the probability of cane growers' perception of making profit and e is the base number of the natural logarithm. Taking the natural log of the odds ratio in favour of being classified as making profit is expressed as:

$$L_i = \ln(\frac{p_i}{1-p_i}) = \sum_{i=1}^{k} \beta_n X_{ni}$$

The results of the logistic regression are presented in Table A. 2. The results indicate that cane growers' perceptions on whether they make profit on sugarcane is influenced by the yield of sugarcane they obtain per hectare. Observing the percentage change in odd ratio, the results show that an increase in the grower's yield per ha by 1% would result to a 96.9% change in the odd ratio in favour of making profit. Farmers consider improvement in the yield of cane as an important determinant of performance. This view is attributed to the fact that the profit they obtain from growing cane is a function of the sucrose content in the cane and the amount of cane delivered. Assuming that farmers would have the same sucrose content in their cane, therefore, the difference in their profit would be among other things a result of differences in their cane yield per ha. The results indicate that 86.5% of the variation in the odd ratio in favour of making profit is predicted correctly.

Table A 2: Factors affecting cane growers' perception on profit making

Item	Coefficient	Std error	wald	sig
Intercept	-0.8387	1.1472	0.5344	0.4648
Yield per ha	0.0314	0.0135	5.3938	0.0202

Percent predicted correctly = 86.5

-2log likelihood = 72.665

Cox & Snell R-sq = 0.156

Nagelkerke R-sq= 0.279

% change in odd ratio = 96.86

A 4 Factors affecting cane growers' profit

A regression analysis was conducted to identify the factors that determine the profit received by cane growers from sugarcane production. Using a backward stepwise method, out of the six variables entered in the equation, only two of the variables were significant in explaining the profit of cane growers. Results in Table A.3 indicate that percentage change in the farmer's production quota has a positive and significant relationship ($p<0.01$) with the farmer's profit, while the distance between the millers and the production site has a significant ($p<0.01$) and negative relationship with the profit to cane growers. About 47% of the variation in the farmers' profit is explained by the percentage change in their quota and their proximity to the mill.

The results suggest that an increase in the farmer's quota has a considerable impact on the farmers' output and subsequently their profit. The distance between farmers' production areas and the processing mill negatively affects the farmers' profit. The profit for farmers further away from the receiving mills is highly compromised due to the costs they incur in transporting their cane to the mills over long distances. This suggest that for farmers to realise profit from the sugarcane business, they need to be closer to the mill, to which they deliver.

Table A.3: Factors affecting cane growers' profit per ha

Independent	Coefficient	Std error	F	sig
Intercept	10213	982.479	108.06	0.0001
Quotachg	1081.225	166.846	42.00	0.0001
Milldist	-219.569	46.191	22.60	0.0001

R square = 0.4740 F = 31.09

A 5 Factors affecting cane growers' revenue

The results of the factors affecting the revenue received by cane growers are presented in Table A.4. The results indicate that the revenue to cane growers is significantly (p<0.01) and positively affected by yield per hectare as well as the sucrose content in the sugarcane. One would expect farming experience to be positively related to the amount of revenue farmers obtain from cane production. However, the results in this study indicate a negative impact of farming experience to revenue. This could be attributed to that, farmers who had been in farming for many years tend to be complacence as they realise that they have the knowledge of farming sugarcane. As a result they ignore some of the important crop husbandry. Thus obtaining low yields and ultimately low revenues.

Table A 4: Factors affecting cane growers' revenue per ha

Item	Coefficient	Std error	F	Sig
Intercept	-13415	2117.302	40.14	0.000
Yield per ha	166.738	4.418	1424.24	0.000
Years in farming	-726.422	280.467	6.710	0.011
Average sucrose %	0.993.968	147.807	45.220	0.001

R square= 0.956 F = 31.09

A 6 Factors affecting farmers' satisfaction

The final measure of performance used in the study was the satisfaction of the cane growers in their contractual relationship with the millers. The results in Table A.5 show that cane growers' satisfaction is positively affected by percentage change in their production quota ($p<0.10$), and the duration of the relationship measured by the number of years a farmer is involved in sugarcane farming. Yield per ha, though has a positive relationship with farmers' satisfaction, it has no significant impact ($p>0.10$) on the farmers' satisfaction. The results indicate that about 25% of the variation in the farmers' satisfaction with the millers' relationship is explained by change in their production quota and the number of years being engaged with the millers. The lack of significance by yield per ha in explaining farmers' satisfaction, could be attributed to the way farmers evaluated their satisfaction. Satisfaction refers to the overall evaluation of the relationship, which includes economic and non-economic evaluation of benefits. Although, farmers gain economic benefits, they are not happy with the non-economic aspect of their relationship. For, example, they have limited trust in the millers, and they perceive poor cooperation between themselves and the millers.

Table A 5: Factors affecting cane growers' satisfaction

Independent	Coefficient	Std error	F	sig
Intercept	8.3043	0.9803	71.76	0.0000
Quotachg	0.1248	0.0700	3.17	0.0786
Yield per ha	0.0135	0.0087	2.41	0.1244
Years in farming	1.0880	0.4590	5.62	0.0202

R square = 0.2487 F = 6.70

APPENDIX B

CFA FOR UNAGGREGATED MANIFEST VAIABLES

Fit criterion			13.8910
Goodness of Fit index (GFI)			0.6204
GFI Adjusted for Degrees of Freedom (AGFI)			0.5735
Root Mean Square Residual (RMSR)			0.1118
Parsimonious GFI (Mulaik, 1989)			0.5767
Chi-square = 1708.5911	df = 962	prob>chi**2 =	0.0001
Null Model Chi-square:	df = 1035		2738.9
RMSEA Estimate	0.0794		90% C.I [., 0.0855]
ECVI Estimate	17.0226		90% C.I [., 18.1155]
Probability of Close Fit			0.0000
Bentler's Comparative Fit Index			0.5618
Normal Theory Reweighted LS Chi-square			1730.8943
Akaike's Information Criterion			-215.4089
Bozdogn's (1987) CAIC			-3890.5198
Schwarz's Bayesian Criterion			-2928.5198
McDonald's (1989) Centrality			0.0493
Bentler & Bonett's (1980) Non-normed Index			0.5286
Bentler & Bonett's (1980) NFI			0.3762
James, Mulaik, & Brett (1982) Parsimonious NFI			0.3496
Z-Test of Wilson & Hilferty (1931)			13.8998
Bollen (1986) Normed Index Rho1			0.3288
Bollen (1988) Non-normed Index Delta2			0.5798
Hoelter's (1983) Critical N			76

Covariance Structure Analysis: Maximum Likelihood Estimation

Covariances among exogenous variables

Var1	parameter	Estimate	Std Error	t Value
e1	u1	0.95756	0.12288	7.79
e2	u2	0.79124	0.10624	7.45
e3	u3	0.78153	0.10537	7.42
e4	u4	0.65275	0.09576	6.82
e5	u5	0.79749	0.10680	7.47
e6	u6	0.95780	0.12285	7.80
e7	u7	0.58945	0.08306	7.10
e8	u8	0.29531	0.05873	5.03
e9	u9	0.94756	0.12172	7.78
e10	u10	0.99193	0.12662	7.83
e11	u11	0.23517	0.05640	4.17
e12	u12	0.64009	0.08836	7.24
e13	u13	0.78476	0.10493	7.48
e14	u14	0.80458	0.10698	7.52
e15	u15	0.71895	0.09823	7.32
e16	u16	0.63884	0.09030	7.07
e17	u17	0.42985	0.07284	5.90
e18	u18	0.96148	0.12342	7.79
e19	u19	0.78715	0.10518	7.48
e20	u20	0.91280	0.11784	7.75
e21	u21	0.57498	0.08196	7.02
e22	u22	0.84954	0.11087	7.66
e23	u23	0.74569	0.09961	7.49
e24	u24	0.89963	0.11638	7.73
e25	u25	0.44542	0.07048	6.32
e26	u26	0.89660	0.11605	7.73
e27	u27	0.81357	0.10557	7.71
e28	u28	0.96978	0.12546	7.73
e29	u29	0.78372	0.10976	7.14
e30	u30	0.80287	0.11104	7.23
e31	u31	0.84738	0.11430	7.41
e32	u32	0.68429	0.10498	6.52
e33	u33	0.67902	0.09013	7.53
e34	u34	0.88104	0.11320	7.78
e35	u35	0.87745	0.11277	7.78
e36	u36	0.66983	0.08914	7.51
e37	u37	0.68576	0.09086	7.55
e38	u38	0.58204	0.08008	7.27
e39	u39	0.92749	0.12254	7.57
e40	u40	0.68521	0.13661	5.02
e41	u41	0.98442	0.12628	7.80
e42	u42	0.32125	0.22733	1.41
e43	u43	0.93919	0.12265	7.66
e44	u44	0.43352	0. 11901	3.64
e45	u45	0.51002	0. 11274	4.52
e46	u46	0.89278	0.11909	7.50

Covariance Structure Analysis: Maximum Likelihood Estimation

Squared multiple correlations

	Variable	Error variance	Total variance	R-Square
1	Dep2	0.95756	1.00000	0.0424
2	Dep22R	0.79124	0.99999	0.2088
3	Dep33R	0.78153	0.99999	0.2185
4	Dep7	0.65275	1.00000	0.3473
5	Dep8	0.79749	0.99999	0.2025
6	Inflby1	0.95780	1.00000	0.0422
7	Inflby3	0.58945	1.00000	0.4106
8	Inflby4	0.29531	0.99999	0.7047
9	Rinflov1	0.94756	1.00000	0.0524
10	Rinflov2	0.99193	1.00000	0.00807
11	Rinflov3	0.23517	0.99999	0.7648
12	Rinflov4	0.64009	1.00001	0.3599
13	Trust1	0.78476	1.00000	0.2152
14	Trust2	0.80458	1.00000	0.1954
15	Trust3	0.71895	0.99999	0.2810
16	Trust5R	0.63884	1.00000	0.3612
17	Trust6R	0.42985	1.00000	0.5701
18	Rpleave1	0.96148	1.00000	0.0385
19	Rpleave2	0.78715	1.00000	0.2129
20	Coop1	0.91280	1.00000	0.0872
21	Coop2	0.57498	0.99999	0.4250
22	Coop3	0.84954	0.99999	0.1505
23	Coop4	0.74569	1.00000	0.2543
24	Coop5	0.89963	1.00000	0.1004
25	Benefit2	0.44542	0.99999	0.5546
26	Benefit3	0.89660	0.99999	0.1034
27	Benefit4	0.81357	0.92873	0.1240
28	Benefit5	0.96978	1.08494	0.1061
29	Satis1	0.78372	0.99999	0.2163
30	Satis2	0.80287	0.99999	0.1971
31	Satis3	0.84738	0.99999	0.1526
32	Satis4	0.68429	1.00001	0.3157
33	Cert2	0.92749	0.99999	0.0725
34	Cert3	0.68521	0.99999	0.3148
35	Cert4	0.98442	1.00000	0.0156
36	Cert5	0.32125	1.00002	0.6788
37	Comit2	0.93919	1.00001	0.0608
38	Comit3	0.43352	0.99999	0.5665
39	Comit4	0.51002	0.99999	0.4900
40	Comit5R	0.89278	1.00001	0.1072
41	Rconf1	0.87745	0.99999	0.1225
42	Conf2	0.67902	0.99998	0.3210
43	Rconf3	0.88104	1.00000	0.1190
44	Opp1	0.66983	0.99999	0.3302
45	Opp2	0.68576	0.99998	0.3142
46	Opp3	0.58204	0.99997	0.4179

Covariance Structure Analysis: Maximum Likelihood Estimation

Covariances among exogenous variables

Var1	Var2	Estimate	Std Error	t Value
f1	f2	-0.39140	0.11464	-3.41
f1	f3	0.42965	0.12214	3.52
f2	f3	-0.30733	0.10260	-3.00
f1	f4	1.02036	0.07244	14.08
f2	f4	-0.55209	0.08465	-6.52
f3	f4	0.62026	0.08721	7.11
f1	f5	0.85627	0.11988	7.14
f2	f5	-0.40275	0.11934	-3.37
f3	f5	0.71084	0.10688	6.65
f4	f5	0.88456	0.09224	9.59
f1	f6	-0.68025	-0.10749	-6.33
f2	f6	0.59889	0.08423	7.11
f3	f6	-0.93983	0.05648	-16.64
f4	f6	-0.78927	0.07362	-10.72
f5	f6	-0.70016	0.11310	-6.19
f1	f7	-0.33317	0.13469	-2.47
f2	f7	0.03013	0.11299	0.27
f3	f7	-0.07742	0.12129	-0.64
f4	f7	-0.22785	0.11948	-1.91
f5	f7	-0.10711	0.14375	-0.75
f6	f7	0.21314	0.12378	1.72
f1	f8	0.10242	0.13985	0.73
f2	f8	-0.07739	0.11386	-0.68
f3	f8	0.10211	0.12213	0.84
f4	f8	0.13748	0.12156	1.13
f5	f8	0.05833	0.14566	0.40
f6	f8	0.23968	0.12256	1.96
f7	f8	0.12878	0.12477	1.03

Covariance Structure Analysis: Maximum Likelihood Estimation

Manifest variable equations with standardized estimates

Dep2	=	0.2060*F1 F1 Dep2	+	0.9785 e1
Dep22R	=	0.4569*F1 F1Dep22R	+	0.8895 e2
Dep33R	=	0.4674*F1 F1 Dep33R	+	0.8840 e3
Dep7	=	0.5893*F1 F1Dep7	+	0.8079 e4
Dep8	=	0.4500*F1 F1 Dep8	+	0.8930 e5
Inflby1	=	0.2054*F2 F2Inflby1	+	0.9787 e6
Inflby3	=	0.6407*F2 F2 Inflby3	+	0.7678 e7
Inflby4	=	0.8395*F2 F2 Inflby4	+	0.5434 e8
Rinflov1	=	0.2290*F2 F2 Rinflov1	+	0.9734 e9
Rinflov2	=	0.0898*F2 F2 Rinflov2	+	0.9960 e10
Rinflove3	=	0.8745*F2 F2 Rinflove3	+	0.4850 e11
Rinflov4	=	0.5999*F2 F2 Rinflov4	+	0.8001 e12
Trust1	=	0.4639*F3 F3 Trust1	+	0.8859 e13
Trust2	=	0.4421*F3 F3 Trust2	+	0.8970 e14
Trust3	=	0.5301*F1 F3 Trust3	+	0.8479 e15
Trust5R	=	0.6010*F3 F3 Trust5R	+	0.7993 e16
Trust6R	=	0.7551*F3 F3 Trust6R	+	0.6556 e17
Rpleave1	=	0.1963*F3 F3 Rpleave1	+	0.9806 e18
Rpleave2	=	0.24614*F3 F3 Rpleave2	+	0.8872 e19
Coop1	=	0.2953*F4 F4 Coop1	+	0.9554 e20
Coop2	=	0.6519*F4 F4 Coop2	+	0.7583 e21
Coop3	=	0.3879*F4 F4 Coop3	+	0. 9217e22
Coop4	=	0.5043*F4 F4 Coop4	+	0.8635 e23
Coop5	=	0.3168*F4 Coop5	+	0.9485 e24
Benefit2	=	0.7447*F4 F4 Benefit2	+	0.6674 e25
Benefit3	=	0.3216*F4 Benefit3	+	0.9469e26
Benefit4	=	0.3521*F4 F4 Benefit4	+	0.9359 e27
Benefit5	=	0.3258*F4 F4 Benefit5	+	0.9454 e28

Covariance Structure Analysis: Maximum Likelihood Estimation

Manifest variable equations with standardized estimates cont:

Satis1	=	0.4650*F5	+	0.8853 e29
		F5 Satis1		
Satis2	=	0.4440*F5	+	0.8960 e30
		F5Satis2		
Satis3	=	0.3907*F5	+	0.9205 e31
		F5 Satis3		
Satis4	=	0.5619*F5	+	0.8272 e32
		F5 Satis4		
Conf2	=	0.5665*F6	+	0.8240e33
		F6Conf2		
Rconf3	=	0.3449*F6	+	0.9386 e34
		F6Rconf3		
Rconf1	=	0.3501*F6	+	0.9367 e35
		F6Rconf1		
Opp1	=	0.5746*F6	+	0.8284 e36
		F6Opp1		
Opp2	=	0.5606*F6	+	0.8281 e37
		F6O pp2		
Opp3	=	0.6465*F6	+	0.7629 e38
		F6O pp3		
Cert2	=	0.2693*F7	+	0.9631 e39
		F7 Cert2		
Cert3	=	0.5611*F7	+	0.8278 e40
		F7 Cert3		
Cert4	=	0.1248*F7	+	0.9922 e41
		F7 Cert4		
Cert5	=	0.8239*F7	+	0.5668 e42
		F7 Cert5		
Comit2	=	0.2466*F8	+	0.9691e43
		F8 Comit2		
Comit3	=	0.7526*F8	+	0.6584 e44
		F8 Comit3		
Comit4	=	0.7000*F8	+	0.7142 e45
		F8 Comit4		
Comit5R	=	0.3274*F8	+	0.9449 e46
		F8 Comit5R		

Covariance Structure Analysis: Maximum Likelihood Estimation

Equations with standardized estimates

Confirmatory Factor Analysis (CFA) results of indicator variables

Indicator variable	Measurement item	Factor loading (λ)	Std Error	t - statistics
Dep2	Relative dependence	0.2060	0.0953	2.1624
Dep8		0.4500	0.0929	4.8462
Dep7		0.5893	0.0913	6.4554
Dep22r		0.4569	0.0928	4.9249
Dep33r		0.4674	0.0926	5.0452
Opp1	Opportunistic behaviour	0.5746	0.0853	6.7340
Opp2		0.5606	0.0857	6.5439
Opp3		0.8961	0.6465	0.0835
Rconfl		0.3501	0.0897	3.9047
Conf2		0.5665	0.0855	6.6247
Rconf3		0.3449	0.0897	3.8440
Cert2	Certainty	0.2693	0.1067	2.5239
Cert3		0.5611	0.1249	4.4910
Cert4		0.1248	0.1054	1.1838
Cert5		0.8239	0.1542	5.3418
Inflby1	Influence by partner	0.2054	0.0949	2.1654
Inflby3		0.6407	0.0850	7.5400
Inflby4		0.8394	0.0774	10.8498
Inflov1R		0.2290	0.0946	2.4207
Inflov2R		0.898	0.0957	0.9383
Inflov3R		0.8745	0.0759	11.5161
Inflov4R		0.5999	0.0864	6.9449
Satis1	Satisfaction	0.4650	0.0981	4.7383
Satis2		0.4440	0.0984	4.5141
Satis3		0.3907	0.0989	3.9491
Satis4		0.5619	0.0977	5.7515
Trust1	Trust	0.4639	0.0917	5.0579
Trust2		0.4421	0.0923	4.7919
Trust3		0.5301	0.0900	5.8925
Trust5R		0.6010	0.0878	6.8430
Trust6R		0.7551	0.0826	9.1424
Pleave1R		0.1963	0.0964	2.0368
Pleave2R		0.4614	0.0918	5.0263
Comit2	Commitment	0.2466	0.1037	2.3774
Comit3		0.7526	0.1036	7.2661
Comit4		0.7000	0.1023	6.8423
Comit5R		0.3274	0.1027	3.1889
Coop1	Cooperation	0.2953	0.0935	3.1583
Coop2		0.6519	0.0848	7.6875
Coop3		0.3879	0.0919	4.2208
Coop4		0.5043	0.0892	5.6515
Coop5		0.3168	0.0932	3.4003
Benefit2		0.7447	0.0816	9.1246
Benefit3		0.3216	0.0931	3.4541
Benefit4		0.3394	0.0674	5.0333
Benefit5		0.3394	0.0674	5.0333

APPENDIX C

CFA FOR AGGREGATED MANIFEST VAIABLES

Fit criterion				2.6381
Goodness of Fit index (GFI)				0.8060
GFI Adjusted for Degrees of Freedom (AGFI)				0.7131
Root Mean Square Residual (RMSR)				0.0913
Parsimonious GFI (Mulaik, 1989)				0.6024
Chi-square	= 324.4922	df = 142	prob>chi**2 =	0.0001
Null Model Chi-square:		df = 190		1017.0
RMSEA Estimate	0.1022			90% C.I [., 0.1169]
ECVI Estimate	3.9715			90% C.I [., 4.4642]
Probability of Close Fit				0.0000
Bentler's Comparative Fit Index				0.7793
Normal Theory Reweighted LS Chi-square				295.9287
Akaike's Information Criterion				40.4922
Bozdogan's (1987) CAIC				-501.9878
Schwarz's Bayesian Criterion				-359.9878
McDonald's (1989) Centrality				0.4791
Bentler & Bonett's (1980) Non-normed Index				0.7047
Bentler & Bonett's (1980) NFI				0.6809
James, Mulaik, & Brett (1982) Parsimonious NFI				0.5089
Z-Test of Wilson & Hilferty (1931)				0.0569
Bollen (1986) Normed Index Rho1				0.5731
Bollen (1988) Non-normed Index Delta2				0.7914
Hoelter's (1983) Critical N				66

Covariance Structure Analysis: Maximum Likelihood Estimation

Covariances among exogenous variables

Var1	parameter	Estimate	Std Error	t Value
e1	u1	0.45487	0.07785	5.84
e2	u2	0.77757	0.10520	7.39
e3	u3	0.34650	0.07471	4.64
e4	u4	0.45895	0.07832	5.86
e5	u5	0.67517	0.09352	7.22
e6	u6	0.65985	0.09209	7.17
e7	u7	0.13942	0.23561	1.13
e8	u8	0.99240	0.13712	7.24
e9	u9	0.50190	0.07833	6.41
e10	u10	0.54591	0.08193	6.66
e11	u11	0.47620	0.07643	6.24
e12	u12	0.61247	0.10798	5.67
e13	u13	0.69280	0.10629	6.52
e14	u14	0.90620	0.15280	5.93
e15	u15	0.16817	0.91578	1.50
e16	u16	0.30708	0.08010	3.83
e17	u17	0.46871	0.08218	5.70
e18	u18	0.65986	0.09506	6.94
e19	u19	0.64090	0.10874	5.89
e20	u20	0.65558	0.10826	6.06

Covariance Structure Analysis: Maximum Likelihood Estimation

Squared multiple correlations

	Variable	Error variance	Total variance	R-Square
1	Tag1	0.45487	1.00000	0.5451
2	Tag2	0.7776	0.99999	0.2224
3	Tag3	0.3465	0.99999	0.6535
4	Pag1	0.4589	1.00000	0.5410
5	Pag2	0.6752	0.99999	0.3248
6	Pag3	0.6598	1.00000	0.3401
7	Mag1	-1.3941	1.00000	2.2964
8	Mag2	0.9924	1.00000	0.0876
9	Oag1	0.5019	1.00000	0.4981
10	Oag2	0.5459	1.00000	0.4541
11	Oag3	0.4762	1.00000	0.5238
12	Dag1	0.6125	1.00000	0.3875
13	Dag2	0.6928	1.00000	0.3072
14	Cag1	0.9062	1.00000	0.0938
15	Cag2	-1.1682	0.99999	2.1682
16	Sag1	0.6409	1.00000	0.3591
17	Sag2	0.6555	1.00000	0.3444
18	Iag1	0.3071	1.00000	0.6929
19	Iag2	0.4687	1.00000	0.5313
20	Iag3	0.6599	1.00000	0.3401

Covariance Structure Analysis: Maximum Likelihood Estimation

Covariances among exogenous variables

Var1	Var2	Estimate	Std Error	t Value
f3	f4	0.68975	0.08721	7.91
f3	f8	0.04961	0.17718	0.28
f4	f8	0.12298	0.43426	0.28
f3	f6	-0.84356	0.06339	-13.31
f4	f6	-0.77471	0.08061	-9.61
f8	f6	-0.09358	0.33095	-0.28
f3	f1	0.44836	0.13041	3.44
f4	f1	0.96937	0.11150	8.69
f8	f1	0.12808	0.45256	0.28
f6	f1	-0.68752	0.11869	-5.79
f3	f7	-0.08335	0.08318	-1.00
f4	f7	-0.11848	0.09962	-1.19
f8	f7	-0.05027	0.18044	-0.28
f6	f7	0.08986	0.08639	1.04
f1	f7	-0.21573	0.15116	-1.43
f3	f2	-0.28668	0.10810	-2.65
f4	f2	-0.60163	0.09344	-6.44
f8	f2	-0.11599	0.40954	-0.28
f6	f2	0.60890	0.08650	7.04
f1	f2	-0.36668	0.13202	-2.78
f7	f2	-0.02804	0.06823	-0.41
f3	f5	0.65067	0.11773	5.53
f4	f5	0.94018	0.11073	8.49
f8	f5	0.09733	0.34466	0.28
f6	f5	-0.61342	0.12247	-5.01
f1	f5	0.85869	0.14816	5.80
f7	f5	-0.05180	0.08737	-0.59
f2	f5	-0.34306	0.13257	-2.59

Covariance Structure Analysis: Maximum Likelihood Estimation

Manifest variable equations with standardized estimates

Tag1	=	0.7383*F3 F3 tag1	+	0.6744 e1
Tag2	=	0.4716*F3 F3 tag2	+	0.8818 e2
Tag3	=	0.8084*F3 F3 tag3	+	0.5886 e3
Pag1	=	0.7356*F4 F4Pag1	+	0.6775 e4
Pag2	=	0.5699*F4 F4Pag2	+	0.8217 e5
Pag3	=	0.5832*F4 F4Pag3	+	0.8123 e6
Mag1	=	3.3610*F8 F8Mag1	+	1.0000 e7
Mag2	=	0.0872*F8 F8Mag2	+	0.9962 e8
Oag1	=	0.7058*F6 F6Oag1	+	0.7084 e9
Oag2	=	0.6739*F6 F6Oag1	+	0.7389 e10
Oag3	=	0.7237*F6 F6Oag1	+	0.6901 e11
Dag1	=	0.6225*F1 F1 Dag1	+	0.7826 e12
Dag2	=	0.5543*F1 F1 Dag2	+	0.8323 e13
Cag1	=	0.3063*F7 F7Cag1	+	0.9519 e14
Cag2	=	1.4725*F7 F7Cag2	+	1.0000 e15
Sag1	=	0.5993*F5 F5 Sag1	+	0.8006 e19
Sag2	=	0.5869*F5 F5Sag2	+	0.8097 e20
Iag1	=	0.8324*F2 F2Iag1	+	0.5541 e16
Iag2	=	0.7289*F2 F2Iag2	+	0.6846 e17
Iag3	=	0.5832*F2 F2Iag3	+	0.8123 e18

Covariance Structure Analysis: Maximum Likelihood Estimation

Equations with standardized estimates

Confirmatory Factor Analysis (CFA) results of aggregate indicator variables

Aggregate Indicator variable	Measurement item	Factor loading (λ)	Std Error	t statistics
Tag1	Trust	0.7383	0.0846	8.7313
Tag2		0.4716	0.0928	5.0810
Tag3		0.8084	0.0828	9.7587
Oag1	Opportunistic behaviour	0.7058	0.0844	8.3590
Oag2		0.6739	0.0855	7.8806
Oag3		0.7237	0.0838	8.6324
Cag1	Certainty	0.3063	0.1854	1.6515
Cag2		1.4725	0.7843	1.8774
Iag1	Influence by partner	0.8324	0.0841	9.8963
Iag2		0.7289	0.0864	8.4349
Iag3		0.5832	0.0905	6.4462
Mag1	Commitment	0.3769	1.7287	1.5879
Mag2		0.2872	0.3159	1.6760
Pag1	Cooperation	0.7356	0.0848	8.6791
Pag2		0.5699	0.0885	6.4387
Pag3		0.5832	0.0882	6.6133
Dag1	Relative dependence	0.6225	0.1007	6.1815
Dag2		0.5543	0.0986	5.6205
Sag1	Satisfaction	0.5993	0.1013	5.9184
Sag2		0.5869	0.1008	5.8209

APPENDIX D

RELIABILITY OF SCALE ITEMS FOR CANE GROWERS

Trust

Item	N	Mean	Std	Item-total corr	Alpha if deleted
Trust1	124	2.74194	0.73109	0.42467	0.68126
Trust2	124	3.00000	0.70998	0.47747	0.66790
Trust3	124	3.25009	0.67021	0.50639	0.66044
Trust5R	124	2.41123	1.02022	0.45783	0.67291
Trust6R	124	2.51610	0.88789	0.52211	0.65635
Rpleave1	124	3.63710	0.73623	0.25710	0.72157
Rpleave2	124	3.07268	0.71196	0.33237	0.70385
Overall		2.94702			

Alpha : Raw = 0.71167

Standardized = 0.71407

Dependence

Item	N	Mean	Std	Item-total corr	Alpha if deleted
Dep2	124	2.82258	1.03632	0.16255	0.54285
Dep22R	124	2.20968	1.03023	0.33468	0.43812
Dep33R	124	2.00806	0.95845	0.19051	0.52668
Dep7	124	2.69355	1.06058	0.46276	0.35185
Dep8	124	3.31452	0.77948	0.31929	0.44799
Overall		2.60968			

Alpha : Raw = 0.51972

Standardized = 0.52253

Influence by partner

Item	N	Mean	Std	Item-total corr	Alpha if deleted
Inflby1	124	2.66129	0.86379	0.11438	0.70673
Inflby3	124	3.08871	0.98783	0.51438	0.59591
Inflby4	124	3.37903	0.94217	0.62183	0.56235
Rinflov1	124	1.88710	0.74582	0.21980	0.67959
Rinflov2	124	3.12903	0.94540	0.07472	0.71657
Rinflov3	124	3.21774	0.99233	0.72113	0.52981
Rinflov4	124	3.66935	0.64671	0.48885	0.60365
Overall		3.00461			

Alpha : Raw = 0.67361

Standardized = 0.67083

Certainty

Item	N	Mean	Std	Item-total corr	Alpha if deleted
	124	3.48387	0.59104	0.263831	0.456738
Cert2	124	3.54032	0.70306	0.235298	0.474877
Cert3	124	3.10484	0.79448	0.261602	0.458168
Cert4	124	3.43548	0.62784	0.160693	0.520620
Cert5	124	3.34677	0.65076	0.478254	0.308426
Overall					

Alpha : Raw = 0.500103

Standardized = 0.504682

Satisfaction

Item	N	Mean	Std	Item-total corr	Alpha if deleted
Satis1	124	2.55645	0.94828	0.26984	0.499207
Satis2	124	2.61290	0.94318	0.347645	0.424758
Satis3	124	3.00806	0.96690	0.289367	0.475950
Satis4	124	3.21774	0.78150	0.360868	0.412817
Overall		2.848788			

Alpha : Raw =0.519130

Standardized = 0.526169

Cooperation

Item	N	Mean	Std	Item-total corr	Alpha if deleted
Coop1	124	3.27419	0.62909	0.202544	0.696558
Coop2	124	2.52419	1.15092	0.467332	0.643765
Coop3	124	2.80645	0.76166	0.402655	0.657189
Coop4	124	2.50806	1.03982	0.438053	0.649886
Coop5	124	3.09677	0.59015	0.374045	0.663016
Benefit2	124	1.90323	1.21253	0.495122	0.637890
Benefit3	124	1.18548	0.49987	0.322026	0.673440
Benefit4	124	1.23387	0.58586	0.439747	0.649533
Benefit5	124	1.80645	0.95149	0.156456	0.705175
Overall		2.25985			

Alpha : Raw =0.681870

Standardized = 0.690812

Commitment

Item	N	Mean	Std	Item-total corr	Alpha if deleted
Comit2	124	3.37097	0.66830	0.248541	0.595244
Comit3	124	3.36290	0.62904	0.502690	0.390865
Comit4	124	3.54032	0.57593	0.381614	0.493032
Comit5R	124	2.86290	1.02279	0.328151	0.535331
Overall		3.28427			

Alpha : Raw =0.546385

Standardized = 0.580283

Opportunistic behaviour

Item	N	Mean	Std	Item-total corr	Alpha if deleted
Opp1	124	2.91129	0.96282	0.461169	0.641034
Opp2	124	3.41935	0.76612	0.344827	0.678563
Opp3	124	2.41935	0.81746	0.471123	0.637718
Rconf1	124	2.75000	0.79250	0.439374	0.648237
Conf2	124	2.65323	0.91992	0.479770	0.634823
Rconf3	124	2.58871	0.84596	0.347997	0.677570
Overall		2.79032			

Alpha : Raw =0.694154

Standardized =0.693605

APPENDIX E

SEM FOR SUB MODELS 1, 2, AND 3

Appendix E (a): SEM for sub model one

Fit criterion			1.1778
Goodness of Fit index (GFI)			0.8296
GFI Adjusted for Degrees of Freedom (AGFI)			0.7116
Root Mean Square Residual (RMSR)			0.1647
Parsimonious GFI (Mulaik, 1989)			0.5882
Chi-square = 144.8740	df = 39	prob>chi**2 =	0.0001
Null Model Chi-square:	df = 55		510.08
RMSEA Estimate	0.1486		90% C.I [., 0.1748]
ECVI Estimate	1.6643		90% C.I [., 2.0118]
Probability of Close Fit			0.0000
Bentler's Comparative Fit Index			0.7673
Normal Theory Reweighted LS Chi-square			132.8533
Akaike's Information Criterion			66.8740
Bozdogn's (1987) CAIC			-82.1170
Schwarz's Bayesian Criterion			43.1170
McDonald's (1989) Centrality			0.6525
Bentler & Bonett's (1980) Non-normed Index			0.6719
Bentler & Bonett's (1980) NFI			0.7160
James, Mulaik, & Brett (1982) Parsimonious NFI			0.5077
Z-Test of Wilson & Hilferty (1931)			7.3448
Bollen (1986) Normed Index Rho1			0.5995
Bollen (1988) Non-normed Index Delta2			0.7753
Hoelter's (1983) Critical N			48

Covariance Structure Analysis: Maximum Likelihood Estimation

Latent Variable Equations Estimates

F8	=	0.5834*F3	+	-0.8031*F6	+	1.0000 D1	
Std Err		0. 4281PF8F3		0.3443F8F6			
t Value		1.3628		-2.3326			
F3	=	-0.7121*F6			+	1.0000 D2	
Std Err		0. 0845PF3F6					
t Value		-8.4278					
F4	=	0.0004*F8	+	0.3820*F3	+	-0.6011*F6	+1.0000 D3
Std Err		0. 0003PF4F8		0.2842PF4F3		0.0865PF4F6	
t Value		1.6838		1.3441		-6.9472	

Covariance Structure Analysis: Maximum Likelihood Estimation

Equations with standardized coefficients

F8	=	-0.0306*F3	+	-0.0522*F6	+	0.9996 D1
		PF8F3		PF8F6		
F3	=	-0.8819*F6	+			0.4715 D2
		PF3F6				
F4	=	0.00878*F8	+	0.3923*F3	+	-0.4185*F6 + 0.6172 D2
		PF4F8		PF4F3		PF4F6

Squared Multiple correlations

Squared Multiple correlations

Variable	Error Variance	Total Variance	R-squared
1. F8	236.0769	236.2764	0.0008
2. F3	0.144900	0.65192	0.7777
3. F4	0.23534	0.61784	0.6191

Appendix E (b): SEM for sub model two

Fit criterion				1.4302
Goodness of Fit index (GFI)				0.8255
GFI Adjusted for Degrees of Freedom (AGFI)				0.7439
Root Mean Square Residual (RMSR)				0.1913
Parsimonious GFI (Mulaik, 1989)				0.6562
Chi-square	= 175.9206	df = 62	prob>chi**2 =	0.0001
Null Model Chi-square:		df = 78		551.58
RMSEA Estimate		0.1222		90% C.I [., 0.1437]
ECVI Estimate		2.377		90% C.I [., 2.3355]
Probability of Close Fit				0.0000
Bentler's Comparative Fit Index				0.7594
Normal Theory Reweighted LS Chi-square				159.2513
Akaike's Information Criterion				51.9206
Bozdogn's (1987) CAIC				-184.9369
Schwarz's Bayesian Criterion				-122.9369
McDonald's (1989) Centrality				0.6317
Bentler & Bonett's (1980) Non-normed Index				0.6974
Bentler & Bonett's (1980) NFI				0.6811
James, Mulaik, & Brett (1982) Parsimonious NFI				0.414
Z-Test of Wilson & Hilferty (1931)				7.0036
Bollen (1986) Normed Index Rho1				0.5988
Bollen (1988) Non-normed Index Delta2				0.7673
Hoelter's (1983) Critical N				58

Covariance Structure Analysis: Maximum Likelihood Estimation

Latent Variable Equations Estimates

F7	=	-0.2677*F3		+	0.3921*F4	+	1.0000 D1	
Std Err		0.1840 PF7F3			0.1906F7F4			
t Value		-1.4550			2.0565			
F5	=	-0.0108*F7	+	0.6717*F4		+	0.0362*F2	+1.0000 D2
Std Err		0.830PF5F7		0.0878PF54F4			0.0682PF5F2	
t Value		-0.1303		7.6473			0.5313	

Covariance Structure Analysis: Maximum Likelihood Estimation

Equations with standardized coefficients

F7	=	-0.0942*F3	+	0.1379*F4	+	0.9961 D1		
		PF7F3		PF7F4				
F5	=	-0.0411*F7	+	0.8987*F4	+	0.0485*F2	+ 0.4394 D2	
		PF5F7		PF5F4		PF5F2		

Squared Multiple correlations

Variable	Error Variance	Total Variance	R-squared
1. F7	8.01755	8.0797	0.0077
2. F5	0.10784	0.5586	0.8069

Appendix E (c): SEM for sub model three

Fit criterion					1.6056
Goodness of Fit index (GFI)					0.8345
GFI Adjusted for Degrees of Freedom (AGFI)					0.7571
Root Mean Square Residual (RMSR)					0.1554
Parsimonious GFI (Mulaik, 1989)					0.6633
Chi-square	=	197.4907	df = 62	prob>chi**2 =	0.0001
Null Model Chi-square:			df = 78		607.22
RMSEA Estimate		0.1333			90% C.I [., 0.1554]
ECVI Estimate		2.377			90% C.I [., 2.5356]
Probability of Close Fit					0.0000
Bentler's Comparative Fit Index					0.7440
Normal Theory Reweighted LS Chi-square					149.2807
Akaike's Information Criterion					73.4907
Bozdogn's (1987) CAIC					-163.3667
Schwarz's Bayesian Criterion					-101.3667
McDonald's (1989) Centrality					0.5791
Bentler & Bonett's (1980) Non-normed Index					0.6779
Bentler & Bonett's (1980) NFI					0.6748
James, Mulaik, & Brett (1982) Parsimonious NFI					0.5363
Z-Test of Wilson & Hilferty (1931)					7.9331
Bollen (1986) Normed Index Rho1					0.5908
Bollen (1988) Non-normed Index Delta2					0.7515
Hoelter's (1983) Critical N					52

Covariance Structure Analysis: Maximum Likelihood Estimation

Latent Variable Equations Estimates

F2	=	-0.4883*F1	+			1.0000 D2
Std Err		0. 0931 PF2F1				
t Value		-5.2441				
F4	=	0.6779*F1	+	0.3984*F3		+ 1.0000 D1
Std Err		0. 0817 PF4F1		0.0675PF4F3		
t Value		8.02956		5.9004		
F5	=	0.7513*F4	+	-0.0704*F2		+ 1.0000 D3
Std Err		0. 1322 PF5F4		0.1215PF5F2		
t Value		5.6827		-0.05800		

Covariance Structure Analysis: Maximum Likelihood Estimation

Equations with standardized coefficients

F2	=	-0.3758*F1	+			0.9267 D2
		PF2F1				
F4	=	0.6003*F1	+	0.6269*F3	+	0.4966 D1
		PF4F1		PF4F3		
F5	=	0.8689*F4	+	-0.0730*F2	+	0.4594 D3
		PF5F4		PF5F2		

Squared Multiple correlations

Variable	Error Variance	Total Variance	R-squared
1. F2	0.1444	0.5857	0.7534
2. F4	0.3572	0.4159	0.1412
3. F5	0.0818	0.3878	0.7889

APPENDIX F

ITEMS USED TO MEASURE MILLERS' PERCEPTIONS

Millers' dependence on cane growers	Strongly Disagree	Disagree	Agree	Strongly Agree
1. The mill can easily get other cane growers should the present ones decide to terminate their contract. (R)	SD	D	A	SA
2. If cane growers can stop growing sugarcane the mill would be in serous trouble as it would be short of raw material	SD	D	A	SA
3. The mill can buy sugarcane only from the farmers assigned to it by SSA.	SD	D	A	SA
4. The mill's output can be affected if farmers are not contracted to produce sugar cane.	SD	D	A	SA
Certainty:				
1. The mill is assured of a constant supply of sugarcane	SD	D	A	SA
2. The mill is assured of good quality cane from the cane growers.	SD	D	A	SA
3. Farmers have all the technical know how on growing sugarcane	SD	D	A	SA
4. Farmers can always get technical information from the SSA extension department whenever they need it.	SD	D	A	SA
Opportunistic behaviour:				
1. Cane growers try to cheat the mill to get higher price pay	SD	D	A	SA
2. Farmers try to delay harvest in order to gain sucrose content	SD	D	A	SA
3. Farmers honour their supply quota as per their contract.	SD	D	A	SA
4. Farmers do not care whether they meet their quota, as long as they make profit.	SD	D	A	SA
Trust on growers:				
1. The mill has relatively trust on the cane growers.	SD	D	A	SA
2. There is a mutual understanding between the mill and the cane growers	SD	D	A	SA
3. The mill can rely upon cane growers as faithful and just.	SD	D	A	SA

Appendix F: Items used to measure millers' perceptions (cont:)

4. Cane growers try to cheat the mill to get higher price pay.	SD	D	A	SA
5. One has to monitor and double check whatever information the cane growers could claim to have about the sugar industry.	SD	D	A	SA
Commitment:				
1. Given a chance the mill would cancel its sugarcane contract supply with some farmers.	SD	D	A	SA
2. The mill has invested a lot of capital in the establishment of the contract with farmers.	SD	D	A	SA
3. The mill does not care whether farmers meet their quota or not	SD	D	A	SA
Cooperation:				
1. The mill and cane growers' activities are well coordinated.	SD	D	A	SA
2. The mill plans production and delivery schedules with the farmers.	SD	D	A	SA
3. The mill takes farmers concerns seriously	SD	D	A	SA
4. The mill seeks farmers' opinions whenever it considers implementing changes that will affect farmers as well.	SD	D	A	SA
5. Farmers are very much cooperative	SD	D	A	SA
Influence by partner:				
1. Farmers try to dictate terms to the mill	SD	D	A	SA
2. The mill can make buying decisions independently of the farmers (R)	SD	D	A	SA
3. Cane growers should take whatever the mill says because they do not have bargaining power (R)	SD	D	A	SA
4. The mill has more bargaining power than farmers (R)	SD	D	A	SA

ITEM	Very much Dissatisfied	Dissatisfied	Satisfied	Very much Satisfied
Satisfaction:				
1. Quality of sugarcane from farmers.	VMD	D	S	VMS
2. Sucrose content of sugarcane from farmers.	VMD	D	S	VMS
3. Quantity of sugarcane from farmers.	VMD	D	S	VMS
4. Delivery of sugarcane by farmers.	VMD	D	S	VMS

Note: R denotes reversed statements