LAND VALUES AND PRODUCTION DEREGULATION OF THE SOUTH AFRICAN SUGAR INDUSTRY.

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Much uncertainty surrounds the direction of future land values in the South African Sugar Industry following agreement to abolish sucrose production quotas, pay growers a blend sucrose price and retain a (initially higher) tariff on raw sugar imports from 1 April 1998. An econometric model shows that expected real net realisation revenue/hectare and real interest rates drive real quota land values. Quotas will be worthless on abolition, but some quota rents will be transferred into higher land rents at the new blend price, raising subsequent non-quota land values. This would offset to some extent an expected fall in current A-pool land values which reflect the combined value of land and quota. B-pool land values will rise as the expected new blend price will be above the net export realisation price which currently determines the profitability of B-pool production. The prospect of asset value losses explains why quotas will only be phased out over four years, growers lobbied for a greater proceeds split to support the blend price and the tariff was retained.

1. Introduction

Real farmland values in the South African Sugar Industry have fallen since the late 1980's in line with lower real returns to land (Frean, 1993). There is much uncertainty about the future direction of returns and land values following Industry agreement to deregulate production by abolishing sucrose production quotas, pay growers a blend sucrose price based on domestic and export sales and retain a (initially higher) tariff on raw sugar imports from 1 April 1998. The effects of these changes must therefore be analyzed to help the decision-making of farmers, lenders and policy-makers.

This paper studies how the new measures could impact on sugar farm incomes and land values in future. It is the first sector specific empirical analysis of the link between deregulation, expected farm income and land values in South Africa. The past, present and new pricing structures in the Sugar Industry are first outlined before the estimation of an econometric model of the link between sugar incomes and land values. Model results show the likely response of land values to the new measures.

2. Past, present and new industry pricing structure

The South African Sugar Association (SASA) has monopoly control of the local market as it is the sole buyer and seller of sugar products in South Africa. The Sugar Act (No. 9 of 1978) gives SASA statutory power to divide sugar sale proceeds between growers and millers. Total annual sales revenue for the Industry is made up of local market, export market and molasses sales revenue. After deducting refining costs, industrial charges and loan interest, the balance forms the net divisible proceeds. This is split between the South African Cane Growers Association (SACGA) and the millers on the basis of first covering production costs and then dividing according to respective agreed profit entitlements (return on capital). The final payment to growers is on a price/ton of sucrose basis.

Until 30 April 1985, sugar producers operated under a single-price scheme and received the average (blend) price from domestic and export sales. Sucrose production was controlled with quotas allocated to certain areas of registered land. On 1 May 1985, the Industry introduced a two-tier scheme, in order to reduce export losses caused by relatively low world sugar prices below costs of production. The A-pool caters for domestic market requirements plus about 50% of normal annual sugar exports. Each grower is allocated a sucrose production quota which guarantees a premium price well above export prices. Quotas are only transferable within Mill Group areas. B-pool production is voluntary and growers receive the export realisation price which is a function of the world price. The individual grower who chooses to expand production for the export market therefore bears export price risks. The A-pool price for the 1992/93 season was R 642,05/ton of sucrose, compared to R 407,79/ton for B-pool sucrose.

The new deregulation measures reflect domestic pressures for change and GATT calls to move from quantitative to tariff protection. A-pool sucrose production quotas will be abolished from 1 April 1998 and the two-tier price system replaced by a single-price (blend) scheme, similar to that prior to 30 April 1985. However, sucrose quotas will be increased (without payment) by 2,5% per annum until 1998, compensating quota holders for their purchased quota being worthless on abolition. A tariff on imported raw sugar 124% above the world price with phased reduction to 106% over 6 years has also been offered to GATT.

The Industry's rationale for quota abolition is that the A-pool quota scheme is now less effective at restricting production. Increasing entry into the industry by small growers (43 500 in total on 28% of cane area in 1992) who receive the A-pool price without buying quota, is putting downward pressure on the A-pool price estimated by the division of proceeds formula. Quota removal will likely prompt increased cane production by relatively lower cost growers as the blend price will probably be markedly above the export realisation price. The reason is that SASA is still able to *set* industrial transfer prices and determine the sucrose price payable to millers and growers. Being the sole buyer of sugar, SASA can raise the domestic industrial transfer price - and hence the blend price - above export realisation by regulating sales on the local market. Such price discrimination has raised sugar income in the past, as domestic demand for sugar in South Africa is price inelastic while export demand for South African sugar is price elastic (South Africa produces about 4% of total world sugar supply (Cleasby, 1991)).

Cane growers have successfully lobbied millers to adjust the present grower:miller proceeds split from about 60:40 to roughly 70:30, arguing that increased local production will benefit millers (greater cane throughput will reduce costs per ton of milled sugar). The new split will to some extent offset the downward pressure on the current real A-pool price, so the final blend sucrose price level may be similar to the current real A-pool price. Quota abolition thus represents only *partial* deregulation - growers in their own interests

have secured changes to what remains a *statutory* division of proceeds to gain compensation for possible income loss when quotas are removed. With the proposed tariff not differing much from the current tariff level 113% above the world price, SASA also has some scope to set a domestic industrial transfer price above the export realisation price but below the import price including tariff. Overall, the anticipated real blend sucrose price and real farm income may thus not fall as much as expected if quota abolition alone occurred. Potentially higher sugar export prices following the GATT Uruguay Round compromise may also put some upward pressure on the expected real blend price. The impacts on current A- and B-pool sugar land values of these developments are considered after estimation of the following land value model.

3. Land value model

Since land is an input in sugar-cane production, the demand for land and other inputs is probably derived from the demands determining sugar-cane farm income. An expected change in farm income should thus change the aggregate demand for land and hence change land values. Past studies on factors affecting farmland values in South Africa and the United States (US) have linked land values closely to expected returns from farming (Behrmann and Collett, 1970; Nieuwoudt, 1980; Melichar, 1979; Doll *et al*, 1983). New understanding of asset valuation under inflation suggests that real farm land prices can be explained by capitalizing long term expected future patterns of real earnings growth. Farm land values thus behave in a similar way to "growth stocks" in equity capital markets (Melichar, 1979). Assuming that land will provide returns into perpetuity, land value can be estimated by equation (1):

$$V_o = R(1+g)/(i-g) \qquad (1)$$

where V_o= present land value, R = real expected current return (rent), i = real capitalization rate, and g = annual real expected growth rate in R. With sugar sales revenue having both domestic and export components, a derived demand model which expresses land values as a function of these two sources is plausible. Runge and Halbach (1990) used this approach to identify positive impacts of both domestic and export grain income on returns and land values in the major US grain regions. Consistent with the capitalization formula, an interest rate variable must also be specified. Due to incomplete information about export market prospects and time lags in adjustments, the income and interest rate links to land value are likely to be imperfect. Land market participants know past but not current sugar farm incomes in forming expectations of future returns. This supports the use of lagged farm income values as proxies for expected returns in the structural model (Phipps, 1984). Equation (1) is appropriate as real blend income/hectare grew annually by 1,4% from 1950/51-1985/86, while real A-pool and B-pool income/hectare fell by 3,4% and 5,2% per annum respectively, over 1986/87-1992/93, at constant 1990 prices (Frean, 1993).

As land rental/hectare data over time are not available for sugar production areas (Frean, 1993), returns to land were estimated by a residual income proxy - annual net realisation revenue/hectare of quota land (total income less marketing costs). Data from the homogeneous North Coast sugar production area in Natal were chosen to represent the sugar sector. At present this area accounts for a quarter of total annual South African sugar production. Land value/hectare data are the combined values of land and buildings, and comprise all *bona fide* land sales during 1950/51-1992/1993. Sucrose quota values are also reflected in the land value data as sugar cane farms are usually sold with their allocated quotas. Ortmann (1987) estimated that quota values in the North Coast area in 1979/80 were about 46% of sugar quota land value/hectare.

Ordinary Least Squares regression was used to estimate quota land value/hectare (QLV) as a function of lagged net realisation revenue/hectare (returns proxy) and lagged Land Bank mortgage interest rate over the study period. All variables were expressed in terms of constant 1990 prices, with lagged variables, reflecting the role of investor expectations in conditioning land values, derived as outlined below.

Net realisation revenue/hectare (NRR) for the North Coast area was first divided into three components: total expected annual net blend realisation revenue (NPRR) (export and domestic blend returns proxy) from 1950/51-1984/85, and total expected annual net A-Pool (NARR) and net B-Pool (NBRR) realisation revenue from 1985/86-1992/93:

$$NRR = NPRR + NARR + NBRR. \qquad (2)$$

Lagged net realisation revenue/hectare (NRR_{t-1}) was obtained by lagging each component of NRR in equation (2) by one period as per equation (3):

$$NRR_{t-1} = NPRR_{t-1} + NARR_{t-1} + NBRR_{t-1}. \qquad (3)$$

With QLV in turn a function of NRR_{t-1} and lagged Land Bank mortgage interest rate (IR_{t-1}), it was estimated by equation (4) as:

$$QLV = a_0 + a_1D_1NPRR_{t-1} + a_2D_2NARR_{t-1} + a_3D_2NBRR_{t-1} - a_4IR_{t-1} \qquad (4)$$

where the parameters a_1, a_2, a_3 and a_4 show the anticipated sign of the coefficient to be estimated for each variable. Dummy variable D_1 equals 1 between 1950/51-1984/85 and 0 otherwise. Dummy variable D_2 equals 1 during 1985/86-1992/93 and 0 otherwise, to enable analysis of the relative effects of A-pool and B-pool revenues on land values since 1985/86. Equations (3) and (4) establish the possible relative links from domestic and export net realisation revenues to quota land values. Based on equation (1), QLV should be positively related to $NPRR_{t-1}$, $NARR_{t-1}$ and $NBRR_{t-1}$, but negatively related to IR_{t-1}.

4. Empirical Results

The estimated model, with all variables in natural logarithm form, is shown by equation (5) (L represents logarithm, while round brackets below the coefficients give corresponding t-statistics). All coefficient signs agree with *a priori* expectations: LQLV is positively related to lagged LNPRR, LNARR and LNBRR, but negatively related to lagged LIR. The Durbin-Watson d statistic indicates inconclusive evidence about the presence or absence of positive first-order serial correlation. The chosen variables explain 65% of the total variation in LQLV. The estimated coefficients for lagged LNPRR and LNARR are significant at the 1% significance level, while that for lagged LIR is significant at the 10% level. All three variables have influenced LQLV over time, with the lagged blend revenue proxy LNPRR (1950/51-1984/85) and the lagged A-pool revenue proxy LNARR (1985/86-1992/93) having the greatest impact.

$$LQLV = \underset{(4.1405)}{4.5380} + \underset{(4.811)}{0.5605}D_1LNPRR_{t-} + \underset{(3.1800)}{0.5474}D_2LNARR_{t-1} + \underset{(0.3394)}{0.0615}D_2LNBRR_{t-1} - \underset{(-1.9526)}{0.1253}\,LIR_{t-1}. \quad (5)$$

$R^2 = 65\%$ $d = 1.57$

Expected revenue is thus the main factor driving LQLV, as shown by the estimated coefficients which give direct estimates of elasticities. *Ceteris paribus*, a 10% increase in lagged LNPRR, LNARR and LIR would result in a 5,6% increase, 5,5% increase and 1,3% decrease in LQLV, respectively. Lagged B-pool revenue did not influence LQLV (non-significant lagged LNBRR coefficient) after April 1985.

5. Discussion and conclusion

Lagged real export and domestic blend income (1950/51-1984/85) and lagged A-pool income (since 1985/86) have driven sugar quota land values over time. Policies that increase (reduce) expected sugar income will hence raise (lower) sugar land values. The future direction of land values thus depends on how sucrose quota removal, the larger proceeds split for growers and the GATT tariff offer will affect the expected new blend sucrose price and farm incomes.

Sucrose production quotas will be worthless (no quota rents) when abolished, implying a fall in current A-pool land values which reflect combined land and quota value. However, a portion of existing quota rents will be transferred into higher land rents when production expands at the blend price after quota removal (see Nieuwoudt, 1976), raising subsequent non-quota former A-pool land values. The more favourable proceeds share for growers would also to some extent offset the downward pressure on the real blend sucrose price due to increased production following quota removal. Partial world sugar trade liberalisation may also lead to higher world export prices which would raise the expected real blend sucrose price. The net result would be lower expected values of current A-pool land, but the fall would not be as much as expected if quota abolition alone occurred. The potential fall in real A-pool sugar quota land values can only be quantified after quota abolition in 1998. The specified model using representative North Coast data estimates that a real income fall of 10% would reduce land values by some 5,5%, *ceteris paribus* (although it assumes quotas remain in place). Given the average sugar quota land value on the North Coast of R 11000/ hectare in 1992/93, this suggests a loss of some R 605/hectare. In addition, Ortmann (1994) reports that nominal sucrose production values in the Natal Midlands area have recently declined from R500/ton to R100/ton. Sugar-cane farmers seem to already be discounting sucrose quota abolition in 1998. Potential asset value losses for sugar quota holders explain why quotas will only be *phased out* over four years, growers lobbied for a greater proceeds split to support the new blend price and the tariff on raw sugar imports was retained.

Asset value gains will likely accrue to holders of current B-pool land. These gains would be driven by expected higher land rents resulting from the expected blend sucrose price being above the net export realisation price which currently determines the profitability of sugar-cane production on B-pool land. Farmers who own more B-pool land would obviously gain relatively more asset value. Lenders need to consider how the expected relative changes in current A- and B-pool land values could affect client asset values and hence loan collateral.

Land tenure arrangements will influence the impact of the new measures on grower wealth. Commercial growers who privately own A-pool quota land would lose quota rents and values, but gain some land rents, leading to a net fall in land value. Private owners of land previously not profitable for B-pool production will gain higher land rents and higher land (asset) values. Small growers who farm land under a tribal tenure system do not own land and so would not experience the net A-pool land value loss, but would also not gain the higher values of land previously unprofitable for B-pool production.

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