THE EFFECT OF POLICY ON THE SOUTH AFRICAN VALENCIA INDUSTRY

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The policy analysis matrix (PAM) was used in this study to determine the definable impact of policies on the Southern African Valencia industry. By using a PAM the effects of divergences between private and social values of revenue, tradable inputs, domestic inputs and profits are determined. With the calculation of the private cost coefficient, domestic resource cost coefficient, nominal protection coefficients on tradable outputs and inputs, effective protection coefficient, profitability coefficient and the producer subsidy ratio the effect that government policies had on the Southern African Valencia industry was highlighted. The results show distortions in the market, comparative advantages and the sensitivity of the industry.

1. INTRODUCTION

The South African Citrus industry currently supplies more than 50 million cartons of citrus to more than 60 different countries across the globe. Nearly R2 billion is received in foreign exchange. Although only 65% of all citrus produced in South Africa is exported, it contributes more than 75% of the total income of this industry. The industry suppliers employ more that 100 000 South Africans – 8% of the total labour force of the agricultural sector. There are more than 600 000 South Africans dependant on this industry for a livelihood (Outspan Briefing Document, 1997). Policies that affect the performance of the citrus industry therefore hold very important implications for the balance of payment of the country, socio – economic welfare and the agricultural industry of South Africa.

This paper investigates the effect of different policies on the South African Valencia industry. Valencia represents 43% of the total exports of the South African Citrus industry. The remaining exports are represented by the following varieties: Navel – 30%, Grapefruit – 13%, Easy Peelers – 5%, Lemons – 5%, Midseason – 2%, Exotics – 2%. Production of citrus in South Africa is widespread throughout the country. There are a lot of differences in input costs, varieties, production techniques, climate and age distribution of the trees throughout the production areas in South Africa. To analyse the effect of policies on the total valencia industry many diverse factors have to be incorporated.

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2. METHODOLOGY USED, ENTERPRISE BUDGETS AND PRICING ISSUES

The policy analysis matrix (PAM) is used in this study to evaluate the effects of policies on the Valencia industry. The PAM is a product of two accounting identities, one defining profitability per hectare as the difference between revenues and costs (see table 1), the other measuring the effects of divergences (distorting policies and market failures), as the difference between observed parameters and parameters, that would exist if the divergences were removed (see table 2). In the PAM approach farm budget data (sales revenues and input costs – valued as private values) are collected for the principal agricultural system. The determination of profit actually received by farmers shows which farm enterprises are currently competitive and how their profit might change if price policies were changed. The difference between revenue and costs for a system – valued in social prices – is social profits, a measure of economic efficiency. A comprehensive discussion regarding technicalities of a PAM can be found in Monke & Pearson (1989).

In order to calculate an average private price per hectare for Valencia's at farmgate level a model was constructed with a breakdown of input costs and revenues for each region and for each year of the average lifespan of a valencia orchard. Private revenue and private cost are farmgate prices paid or received for the inputs or product. Revenue comes from fruit exported, deliveries to national fresh produce markets and to processors for further processing. Revenues were also weighted with the contribution of each region towards the total South African Valencia industry, average export percentage and breakdown of the cost and revenue components. This consists of different yields per hectare per year per region, different costs per hectare per region, and furthermore also different quantities supplied for the export market, the local market and for further processing.

If incomes and expenditure costs are not weighted, and a simplistic model averaging revenues and costs is used, profit will be overestimated because crop production has more costs relative to income in the early growing periods (Monke and Pearson, 1989).

The weighted average approach was also applied to calculate the PAM for the total Valencia industry, according to each region's market share. The current market share of Valencia's are as follow: Northern province – 46%, Rustenburg and Groblersdal area – 12%, Eastern parts of Mpumalanga – 17%, Kwazulu- Natal – 5%, Eastern Cape – 14%, Western Cape – 6%.

The main source of field statistics was adopted from a study conducted by Agriconcept (Prop) Ltd (Van Zyl & Ferreira, 1996) for Outspan International in 1996, Combud publications (COMBUD, 1994, 1996) and Citrus Production Guidelines (Citrus Production Guidelines, Outspan, Vol. III, 1997). The above mentioned sources contain data on production costs, fixed costs as well as yields and prices of produce for the main production areas.

Due to market failure and government intervention, market prices often do not reflect the scarcity value of goods and services. It is therefore necessary to calculate a shadow or economic price (social price) of goods and services. Monke and Pearson (1989), Bradfield (1993) and Tsakok (1990) give an extensive explanation of the different theoretical methods that can be used to calculate different shadow prices. Bradfield (1993) stipulates that the world price method is the most practical for the calculation of shadow prices of goods and services. This method was used in the calculation of the social value for revenues and tradable costs.

3. POLICY ANALYSIS MATRIX

The policy analysis matrix and the effects of the divergences are shown in Table 1, the calculated ratio indicators are shown in Table 2. Due to limited space only the essential information of the analyses will be discussed. For a more complete discussion please contact the authors.

Table 1: Policy analysis matrix for Valencia's

	Revenues per ha	**Tradable inputs per ha**	**Domestic factors per ha**	**Profits per ha**
Private prices	R40 903	R12 741	R12 609	R15 553
Social prices	R43 119	R7 252	R12 718	R23 149
Effects of divergences and efficient policy	(R2 216)	R5 489	(R109)	(R7 596)

Private profitability -

The observed profit from revenues (R40 903) and costs (R12 741 + 12609) reflected by the actual market prices received and paid by the South African Valencia producers in an average year is R15 553 per hectare (Table 1). The private or actual market prices incorporate the underlying economic cost and valuations plus the effects of all policies. The profitability calculations indicate that the Valencia industry is highly competitive in normal years. The cost of

capital, defined as the pre-tax return that owners of capital require to maintain their investment, is included in the domestic costs. The result of this is an estimated growth in supply of Valencia's of about 10 to 15% per year.

Social profitability -

Free on board (FOB) export prices were used to calculate the social revenue on the same bases as the private revenues. Social domestic factors are services provided by domestic factors of production (labour, land & capital) and were calculated by using the opportunity cost approach (Bradfield, 1993).

According to the social profitability the Valencia industry has a comparative advantage in a normal year. The industry is highly efficient with a social profit of R23 149 (table 1).

Effect of divergences and ratio analysis -

Any divergence between observed private prices and the estimated social price must be explained by the effects of policy or by the existence of market failures. Output and input transfers originate because of commodity specific and exchange rate policies (Monke & Pearson, 1989).

- *Output transfer*

This is the difference between the actual market price per hectare and the efficiency valuation for Valencia's. Governments use instruments such as trade restriction and taxes or subsidies if they want private prices to differ from social values set by world prices (Monke and Pearson, 1989). Taxation and tariffs on transport is one of the major reasons for the negative divergence of R2 216 per hectare of Valencia's produced in South Africa (Table 1). Another contributor to this divergence is customs duties on citrus when it is exported.

- *Tradable input transfer*

The cause for a positive divergence is nearly always distorting policies rather than market failures (Monke and Pearson, 1989). The difference between the total cost of tradable inputs valued in private prices and social prices for Valencia's is R5 489 per hectare (table 1). Tariffs on tradable inputs such as pesticides, herbicides, other chemicals, packing material, packing equipment, tractors, implements, mechanical parts and taxation on diesel are the main contributors for this divergence.

- *Factor transfer*

Unskilled labour, especially from neighbouring countries like Mozambique and Zimbabwe, is the main contributor of the negative divergence of R109 (table 1). These labourers are also prepared to work for smaller wages than the South African labourers do. In the Cape labour is more efficient (Van Zyl & Ferreira, 1996) than other regions but the cost regional of this labour is much higher than in the other regions.

- *Net transfer*

Efficient agricultural industries earn additional profit without any help from the government. Subsidising policies increases the final level of private profit (Monke and Pearson, 1989). The net transfer for the Valencia industry of negative R7596 indicates that no support is provided, in fact the industry is over taxed.

Table 2: Ratio indicators for comparison

Private cost ratio	0.45
Domestic resource cost ratio	0.35
Nominal protection coefficient on tradable outputs	0.95
Nominal protection coefficient on tradable inputs	1.76
Effective protection coefficient	0.79
Profitability coefficient	0.66
Subsidy ratio to producers	-0.18

Private Cost Ratio (PCR) -

This ratio measures how much the industry can afford to pay for domestic factors and still remain competitive. The problem is circumvented by construction of a private cost ratio (PCR) – the ratio of domestic factor cost to value added in private prices. The value added is the difference between the value of output and the costs of tradable of tradable inputs (Monke and Pearson, 1989). The PCR of 0.45 shows that the added value is relative large in comparison with domestic factor costs. It shows that this industry is competitive in normal years.

With a decrease in production, such as in 1995 in the Letsitele/Tzaneen area, due to drought, the PCR for this area was well above one, which indicates the relative sensitivity of the industry to any factor that can influence the volume.

Domestic Resource Coefficient (DRC) -

A DRC of smaller than one indicates that the economy saves foreign exchange from local production, because the opportunity cost of its domestic resources is less than the net foreign exchange it gains. The DRC of 0.35 also indicates the international competitiveness (Tsakok, 1990) of the local industry. Minimising the DRC is equivalent to maximising social profit (Monke and Pearson, 1989). With permanent crops, the DRC will be bigger in the earlier periods because input costs are very high, to such an extent that the DRC can be greater than one for the first few years until a profit is realised. It can therefore be deduced that the Valencia industry is a competitive, established and efficient.

Policy transfers -

Efficient systems earn additional profit without any help from the government. Subsidising policies permits inefficient systems to survive, consequently waste of resource needs to be justified in terms of nonefficient objectives. The extent of policy transfers require the calculation of ratios such as nominal protection coefficients on tradable outputs (NPCO) and inputs (NPCI), effective protection coefficient (EPC), profitability coefficient (PC), and subsidy ratios to producers (SR).

- *Nominal protection coefficient on tradable outputs (NPCO)*

The NPCO is a ratio that contrasts the observed (private) commodity price with a comparable world (social) price. This ratio indicates the impact of policy and market failures caused by the policies (Monke and Pearson, 1989). The NPCO for this industry is 0.95, which indicates that the policies are decreasing local market prices to a level of approximately 5% lower than the world price. The cause of this can be ascribed to customs and exchange costs and tariffs and taxation on transported goods and fuel.

- *Nominal protection coefficient on tradable inputs(NPCI)*

The NPCI shows the degree of tradable input transfer (Monke and Pearson, 1989). A NPC on inputs of 1.76 shows that policies increase tradable input cost with 76% above world prices. This means that producers are taxed with 76% on tradable inputs. The cause of this increase is primarily tariffs on tradable inputs such as pesticides, herbicides, other chemicals, packing material, packing equipment, tractors, implements, mechanical parts and taxation on diesel.

- *Effective protection coefficient (EPC)*

Government pricing policies often affects production inputs directly such as tariffs and taxes on inputs. By calculating the EPC we can capture the incentive impact of policies on the production structure. The EPC refers specifically to production at the farm level (Tsakok, 1990). This is the ratio of value added in private prices to the value added in world prices. This coefficient measures the degree of policy transfer from product market output and tradable input policies. The EPC ignores the transfer effects of factor market policies (Monke and Pearson, 1989). With an EPC of 0.79, production can receive a higher return of 21% if producers pay border prices for their inputs. Valencia producers in South Africa are taxed. With an EPC less than one, but greater than zero the suggestion is that the industry suffers under-expansion or that resources, which have been withdrawn, could have earned higher returns. If we can move to a situation were domestic prices of inputs more adequately reflect border prices the efficiency of resource allocation will improve (Tsakok, 1990).

Profitability coefficient (PC) -

The profitability coefficient (PC) is an expansion of the EPC because factor transfers are excluded (Monke and Pearson, 1989). The PC measures the incentive of all policies and services as an estimation of the net policy transfer. A profitability coefficient of 0.66 indicates that there is a net transfer of 34% from the private to social values.

Subsidy ratio to producers (SRP) -

The SRP indicates the net policy transfer as a proportion of the total social revenue. This shows the proportion of revenues in the world prices that would be required if a single subsidy or tax were substituted for the entire set of commodity and macroeconomics (Monke and Pearson, 1989). The negative SRP of 0.18 indicates that 18% of the divergence is used to subsidise other commodities or another industry.

4. CONCLUSION

The Valencia industry in South Africa is currently an established and competitive industry. This industry is an important contributor to the welfare of the agricultural sector. Currently the industry does not receive any protection. The industry is sensitive to any factors that can influence foreign revenue received. Any factor that can effect this must be eliminated. Taxation

in the form of tariffs on production inputs is the main controllable contributor towards the sensitivity of the industry. Due to the high employment figure and contribution to the total agricultural sector and balance of payments, it is very important to ensure that this industry maintains its competitive advantage, which should rather be protected than taxed unjustly. If trade policies are reduced in terms of taxation and tariffs a further expansion of this industry may happen and since this industry has one of the largest multipliers of all agricultural sectors this will have large positive implications for the general welfare of the country.

REFERENCES

BRADFIELD, R.E. (1993) *Skaduprys berekeningsmetodes vir omvattende kostevoordeelanalis*. PhD thesis, Potchefstroom: PU vir CHO.

MASTERS, W.A. (1995). *Guidelines on national comparative advantage on agricultural trade.* APAP III Methods and Guidelines. No 4001. A paper for Agricultural Policy Analysis Projects. USAID contract No LAG –4201-C-00-3052-00

COMBUD, (1994; 1996) *Enterprise budgets*. Directorate of Agricultural Economics, national department of Agricultural.

MONKE, E.A & PEARSON, S.R. (1989) *The policy analysis matrix for agricultural development*. Cornell University Press, Ithaca

CITRUS PRODUCTION GUIDELINES, (1997) Vol. III, Outspan, Pretoria, Centurion.

BRIEFING DOCUMENT (1997). Outspan International LTD, Pretoria, Centurion.

TSAKOK, I. (1990). *Agricultural price policy*. Cornell University Press, Ithaca

VAN ZYL, J.L. & FERREIRA, S.G. (1996*). Bepaling van sitruspakkoste (1995 Produksieseisoen).* Agriconsept (Edms) Beperk.

VAN ZYL, J.L. & FERREIRA, S.G. (1996*). Ontleding van finasiële resultate van sitrusprodusent in sitrusproduserende gebiede (1995 Produksieseisoen).* Agriconsept (Edms) Beperk.