EVALUATING SUPPORT TO AGRICULTURE IN SOUTH AFRICA: THE CALCULATION OF NET PROTECTION COEFFICIENTS (NPCS)

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The Effective Protection Ratio (EPR) is used in this study as a measure of the impact of policy distortions on agricultural producers. The results of the EPR analysis show that in 1995, most of the interventions supporting agricultural production have disappeared, particularly if the production is aimed at the domestic market. This holds for basic grains and oilseeds, as well as other products such as potatoes, cotton and tobacco, across all regions. Beef cattle and sheep production is also not being favoured by support in any of the regions. On the contrary, a number of commodities are effectively being taxed.

1.   INTRODUCTION

There has been a long history of state intervention in South African agriculture, which reached a zenith around 1980 with a host of laws, ordinances, statutes and regulations. These affected, and in many cases still affect, all aspects of agriculture, including prices of, access to and use of natural resources, finance, capital, labour, local markets, foreign markets and foreign exchange, etc. However, history has shown that neither racial discrimination nor price distortions in South African agriculture could be sustained, and the pressures on agriculture for reversal of these polices began to mount during the 1980s. The sector faced increasing deregulation and market liberalisation from the mid-1980s (Vink, 1993). Within a general climate of macroeconomic and political change, a number of shifts in agricultural policy took place during the 1980s and 1990s (see Brand *et al.*, 1992 and Vink, 1993, among others).

These changing policies had a major effect on the domestic support agriculture received. Helm & Van Zyl (1994) calculated the total domestic support received by South African agriculture during the period 1988/89 to 1993/94, using the Producer Subsidy Equivalent (PSE) measure. Table 1 shows their findings.

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The net total support of agriculture received was relatively small (see Table 1), particularly when compared to that of some trading partners within the developed world (Helm and Van Zyl, 1994). However, the liberalisation of agriculture was neither complete by 1993, nor have the effects of earlier changes had time to permeate throughout the agricultural economy. Also, while the aggregate figures provided by Helm and van Zyl (1994) are useful, it is also important to take note of what the situation is with respect to individual commodities in different parts of the country.

Table 1:   Total domestic support to South African agriculture (% PSE)

Year	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
% PSE	11,70	11,56	13,69	16,74	31,04	14,50

Source: Helm & Van Zyl (1994).

In this paper, the support to agriculture is examined on a regional basis for individual crops.

2.   METODOLOGY USED, ENTERPRISE BUDGETS AND PRICING ISSUES

The Effective Protection Ratio (EPR) is used in this study as measure of the impact of policy distortions on agricultural producers. A comprehensive discussion on this (and other measures) can be found in Monke and Pearson (1989) and Masters (1995). For purposes of the EPR calculations, South Africa was divided into six agro-ecological regions or zones while 1995 was used as base year for all calculations.

Farm prices for inputs and outputs, as well as transport costs, differ in different regions in South Africa. It was therefore necessary to calculate the market profitability of each region. The main source of data to calculate market profitability is the COMBUD publication (COMBUD, 1994; 1997), which is published each year by the National Department of Agriculture and which contains data on production costs, fixed costs as well as yields and prices of produce.

Due to market failure and government intervention, market prices often do not necessarily reflect the scarcity value of goods and services. It is therefore necessary to calculate the economic price (shadow price) of goods and services. Bradfield (1993) gives an extensive explanation of the different

theoretical methods that can be used to calculate different shadow prices. He concluded that the world price method is the most practical for the calculation of the shadow price of goods and services. Mullins (1992) states that this approach takes into account world prices of goods and services, especially with regard to those goods that are freely traded on international markets. There is, however, one issue which the world price method cannot address, namely the calculation of shadow prices for non-traded products and services.

In this study, cases where the world price approach could not be used, shadow prices were determined by the opportunity cost approach. The opportunity cost approach uses the production that is given up elsewhere, by withdrawing these inputs from alternative uses, as the shadow prices of inputs. On the other hand, for the shadow prices of outputs, the additional incremental benefit achieved by undertaking the project, relative to the situation, had it not been undertaken, is used (see Gittinger, 1994).

Shadow prices of fuel, electricity and water was determined from earlier studies. Jooste & Van Zyl (1997) provide a detailed analysis of the procedures followed.

The effective protection ratio (EPR), which is a measure of policy distortions at the economic exchange rate, is presented. An EPC of higher than one (1.0) indicates that the private profit is higher than what it should have been without any commodity policies in place. However, if EPC<1.0, then that commodity is effectively taxed.

3.1   Field and horticultural crops

The net policy effect (NPE) and effective protection ratio (EPR) for the different crops in each agro-economical zone are shown in Table 2 for large-scale, commercial farming.

The table yields very interesting results. Only maize yields EPRs of higher than one, and then only when regarded as an export crop. All other crop yield EPRs of less than one. This implies that, in general, all of the field crops, which were analysed and being produced for domestic production, are effectively being taxed. This holds for both dryland and irrigated production.

However, several of these commodities have EPRs of close to one, for example potatoes (dryland and irrigation), cotton (dryland and irrigation) and tobacco. On the other hand, the EPRs for maize, wheat, sunflower, sorghum and soybeans are significantly less than one, indicating that present policies effective

tax these commodities. Except for irrigated wheat in Zone 4, this holds for all these commodities.

Table 2:   Effective protection ratios (EPR) for different crops in different zones, 1995

Item	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Maize – dryland*			1.52		1.61	1.49
Maize – irrigation*			2.38	4.78	2.02	3.41
Maize – dryland**			0.56		0.49	0.59
Maize – irrigation**			0.54	0.46	0.54	0.55
Wheat – dryland	0.64		0.80		0.83	0.70
Wheat – irrigation			0.70	0.69	0.96	0.67
Potatoes – dryland			0.97			0.91
Potatoes – irrigation	0.99		0.98			
Sunflower – dryland			0.33			0.40
Sunflower – irrigation			0.34			
Sorghum – dryland					0.41	
Sorghum – irrigation					0.34	0.42
Soybeans – dryland					0.50	0.19
Soybeans - irrigation					0.68	0.21
Cotton – dryland			0.97		0.93	
Cotton – irrigation				0.95	0.99	
Tobacco – irrigation						0.97

Notes: *   Maize is regarded as an export crop (export parity price)
             **   Maize regarded as an import substitution crop (import parity price)

3.2   Livestock

The effective protection ratios for beef cattle and sheep are shown in Table 3. Similar to field crops, beef cattle and sheep production is effectively being taxed, yielding EPRs of less than one.   However, the EPRs are all still relatively close to one, indicating that the taxation level is relatively low.

Table 3:   Effective protection ratios (EPRs) for beef cattle and sheep, 1995

Item	Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Zone 6
Beef:						
Commercial	0.95	-	0.95	0.89	0.95	0.89
Small scale	-	-	0.95	0.95	0.95	-
Sheep:						
Extensive	0.99	0.96	0.93	0.96	0.97	0.99
Intensive	-	-	0.97	-	-	-

4.   CONCLUSIONS

The results of the EPR analysis show that in 1995, most of the interventions supporting agricultural production have disappeared, particularly if the production is aimed at domestic market. This holds for basic grains and oilseeds, as well as other products such as potatoes, cotton and tobacco. Beef cattle and sheep production is also not being favoured by support. On the contrary, a number of commodities are effectively being taxed.

Three main factors contributed to the market distortions observed in this paper, namely: distortions in product and input prices, mainly due to the statutory powers of the different Marketing Boards and protection afforded to input suppliers; the exchange rate; and tariffs. Clearly, the implementation of the new Marketing Act (Act 47 of 1996) is a step in the right direction if the aim is to minimise market distortions. Under this Act all the statutory Marketing Boards were to be abolished during 1997.

However, for the playing field to stay level, structural adjustment of the agricultural economy will have to take place. Particularly protection afforded to input suppliers, mostly in the form of tariff protection in the domestic market, will also have to be addressed. Signs of these structural adjustments are already visible since the deregulation process started in some industries. For example, Jooste (1996) has shown that since abolishment of the compulsory auction markets and controlled marketing of red meat slaughter, distribution patterns of beef started to change. The structural adjustment process should, however, not be isolated at farming level, but must expand throughout the agricultural economy, *i.e.* structural adjustment must also take place on the input and output sides. The high level of concentration on the output side in different industries, such as the red meat and grains industries, is an impediment within an open economy.

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