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FARMING WITHOUT DROUGHT RELIEF: TIME TO REVISIT AN INCOME EQUALIZATION DEPOSIT SCHEME?¹

W.L. Nieuwoudt² and J. Howell³

In a recent report to government, an Income Equalisation Deposit (IED) Scheme for commercial farmers and crop insurance for small scale farmers have been recommended as risk management strategies. An IED has been considered in the past in South Africa but rejected largely due to tax implications. Conditions have now changed as various countries (Australia, Canada and USA) strongly promote such a scheme as a risk management strategy while the South African crop insurance program has failed to attract farmers. A main criticism of an IED in the past was that if it is used in conjunction with the In/Out farmer' tax provision, that farmers can obtain tax benefits if they destabilise their incomes. This can be avoided by adopting a tax rule that farmers may only invest the positive difference between their current taxable income and their moving average taxable income in an IED. It is further recommended that the Land Bank deposit scheme (Income Tax Paragraph 13A) be abolished and be replaced by an IED that covers both livestock, crops and horticulture.

'N EKONOMIESE EVALUASIE OOR DIE AANVAARDING VAN 'N INKOMSTE GELYKSTELLINGSDEPOSITO SKEMA VIR KOMMERSIËLE BOERE

In 'n onlangse regeringsverslag is 'n Inkomste gelykstellingsdeposito (IGD) skema vir kommersiële boere en oesversekering vir kleinskaalse boere voorgestel as risikobestuursmaatreëls. 'n IGD is al voorheen oorweeg in Suid Afrika maar verwerp hoofsaaklik weens belastingsimplikasies. Toestande het egter verander en verskeie lande (Australië, Kanada, VSA) beveel die skema aan terwyl die oesversekeringskema in Suid Afrika misluk het om boere te lok. 'n Deurslaggewende kritiek teen 'n IGD in die verlede was dat, indien dit saam met die In/Uit landboubelastingstoegewing gebruik word, boere 'n belastingoordeel kan kry as hulle hul inkomste destabiliseer. Dit kan vermy word deur 'n reël te aanvaar dat 'n boer alleen die positiewe verskil tussen die huidige belasbare inkomste en die skuiwende gemiddelde belasbare inkomste kan belê in so 'n skema. Dit word verder aanbeveel dat die Landbank skema vir lewendehawe (Inkomstebelasting Paragraaf 13A) herroep word en dat 'n enkele IGD vir beide vee-, gewas- en tuinbouboerdery geld.

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1. INTRODUCTION

South Africa has to cope with low average rainfall relative to its main competitors, and a wide variability in rainfall between and within seasons in most parts of the country. There is therefore an ever-present risk of drought-induced crop failure which also impacts upon the rural economy as a whole, including labour, livestock production, input suppliers, banks etc. Particularly serious periods of drought can have the effect of driving farmers and suppliers out of business and leading to a long-term contraction in the industry, especially where farm enterprises have yet to be firmly established.

Until the mid 1990s, the Government response to agricultural risk was principally through the regular provision of financial assistance to minimise the adverse income consequences of drought to farmers. The culmination of the policy was the 1992\93 drought relief programme amounting to R3.8 billion to provide debt relief to commercial producers.

The incoming ANC government in 1994 announced a major change in policy, arguing that drought relief has been abused in the past. Furthermore, it was held that previous policies had weakened the willingness and ability of farmers to adopt strategies that would minimise risk, thereby encouraging cultivating and grazing practices which were not economically viable.

The new Government also quickened and deepened the process of marketing deregulation which began in the 1980s. One consequence of this, to the Government's evident satisfaction, was the swift establishment of a private sector futures market in agricultural commodities which provided opportunities for producers, processors and trade to manage the price risk inherent in South African agriculture. There were particularly sharp increases in volumes traded in maize futures from 1996\97.

The establishment of such market mechanisms for coping with risk was clearly insufficient, however, for a Government committed to maintaining a strong and competitive agricultural sector. Farmers, especially emerging farmers from the African community, felt they were entitled to government support in developing risk-reduction farm strategies whether in the form of improved climate and market intelligence or technological development in known measures to reduce vulnerability (drought-tolerant crops, water harvesting, fodder enhancement etc.)

The nub of the problem for Government, however, remains: how to provide financial assistance for incentives so that farmers manage their own risk, which do not –at the same time- involve the state in large subsidy programmes. There

are two principal options for such assistance: intervention in the insurance industry and innovation in the fiscal system.

This article is concerned with the latter and, in particular, with the feasibility of an Income Equalisation Deposit scheme. First, we outline the nature of such schemes; second, we review past proposals for such schemes in South Africa and we feel they are flawed; third, we examine how particular difficulties relating to current fiscal arrangements and farmers risk management operate in practice; fourth, we summarise the lesson of IED schemes elsewhere; and, finally, we examine the feasibility of a new IED scheme for South Africa.

2. WHY RECONSIDER IED SCHEMES?

Income instability has tax implications as aggregate taxes paid are higher with variable incomes. In response, South African farmers often elect to be taxed on a rate based on an income average. This tax instrument does not, however, promote better risk management (or cash flow) as the farmer is not provided with any incentive to save in good years in preparation for lean years.

Income Equalisation Deposits (IEDs) - whereby tax paying farmers deposit funds in good years and only pay tax on the amount when withdrawn - have been seen by several (NDA, 1997 and Fuchs, 1999) as a tax vehicle whereby better cash flow and risk management will be promoted. This Scheme has been suggested in South Africa in the past but rejected (see below) although the economic feasibility of such a Scheme was not fully researched - apart from the outstanding work by Lamont (1990) which focused on tax implications.

Certain conditions in the meantime have changed which may have made such a scheme more attractive:

- (i) agricultural departments in both Australia and Canada are strongly promoting this scheme at present
- (ii) the South African government subsidised crop insurance programme for commercial farmers has ceased altogether
- (iii) deregulation in South African agriculture has exposed farmers to more risks and
- (iv) real interest rates have increased in recent years making an IED more attractive.

3. PAST EXPERIENCE IN SOUTH AFRICA

According to Lamont (1990:406-410) IEDs have been discussed at different times during the past 50 years. The Steyn Committee recommended against IEDs in 1951 as other forms of industry were also subjected to income variations (Lamont, 1990:406).

In 1960 the De Swardt Study Group on agricultural credit recommended IEDs as means to counter excessive capital expenditure and consequent financial difficulties of farmers. The principle was not accepted. The Jacobs Committee in 1979 again supported IEDs in principle, but this Committee did not consider themselves to have the expertise to evaluate the practical implications of the proposal. The proposal was referred to the Standing Commission of Taxation and the Commission for Inland Revenue who found that the proposal was open to serious objections. The Government rejected the Scheme in 1982 based on the recommendations of the latter (RSA, 1982:4287-4294). Finally the Margo Commission recommended against IEDs in 1987 (RSA, 1987:228-240). The more recent major commission on agricultural tax (Katz Commission), did not consider IEDs, according to a member of this Commission (Vink, 2000).

An IED Scheme is currently being considered in South Africa and it is important to revisit past objections. Was the best information considered and have conditions changed to prompt the introduction of such a scheme?

The main advantages of IEDs mentioned in the past were (Lamont, 1990:407 and RSA, 1987):

- (1) Stability. Greater stability in the agricultural sector will be promoted as this sector is subject to income and production variations from year to year.
- (2) Self-help. Farmers will be more able to overcome crises and setbacks on their own.
- (3) Welfare. If farmers are more able to help themselves, then it will reduce the dependence on State assistance in adverse times.
- (4) Efficiency. Income fluctuations will be smoothed and also the bunching of investment expenditure.
- (5) Administration. If funds are deposited with one approved institution (say the Land Bank), the scheme will be easy to administer.

(6) Equity. IEDs can contribute to tax equity (period equity).

Against this, major criticisms of IEDs were:

- (1) It will favour the rich (Lamont, 1990:408) and indications are that only a small percentage of farmers would be able to use an IED (RSA, 1987:237).
- (2) The proposed scheme impinges on the sound principle that revenue should be taxed in the year in which it accrues (Lamont, 1990:409) while the scheme offers considerable tax sheltering (RSA, 1987:237).
- (3) There are other sectors that suffer from vagaries of fluctuating markets.
- (4) Current averaging schemes lend themselves well to enable farmers in good years to make provisions for poorer years by means of tax saving.
- (5) A high tax burden on the death of a taxpayer because of estate duty.
- (6) Potential misuse of scheme (Lamont, 1990:410-411).
- (7) On account of the great difficulty of accurately predicting future income streams, potential tax saving and income smoothing may not be maximised under an IED (RSA, 1987:237).

4. EVALUATION OF PAST CRITICISMS

It favours the rich farmers and indications are that a small percentage of farmers would be able to use an IED.

Although a relatively small percentage of farmers may find such a scheme attractive, it is desirable for farmers to move into a category where their business is financially sound, they pay tax and are able to withstand averse conditions without State assistance. Current deposits in the Land and Agricultural Bank Scheme for livestock sales (drought relief), a scheme that operates on a similar basis as an IED, are R227.2 million (Marais, 2000). The number of depositors in this Scheme has increased from 202 in 1984 to 380 in 1986 (RSA, 1987) and 1178 in 1999 (Marais, 2000). Use has increased three fold since the Margo Commission concluded that a small percentage of farmers may use it based on these figures (RSA, 1987).

This shows that deposits will not be insignificant if an IED is adopted and **if it caters for both crops and livestock**. Deposits in the Land and Agricultural Bank

Scheme for livestock can only be made under conditions of drought, a restriction that will no longer apply under an IED and which could lead to more use. If deposits are further allowed in a financial institution of the investor's choice as in Australia, use may be higher. Interest on deposit (monthly rate) in the Land and Agricultural Bank Scheme was 12.66% in 1999 and 9.75% in 2000 (Marais, 2000). The annual rate can be calculated by dividing the monthly rate by 12 and raised to the power of 12. These rates appear competitive to commercial rates.

The proposed scheme impinges on the sound principle that revenue should be taxed in the year in which it accrues while the scheme offers considerable tax sheltering.

First, the farmer does not benefit from deferred taxes during the period that the funds are deposited as he does not have access to these funds. The farmer is taxed in the year that the funds are withdrawn. Any interest that is received on a deposit will be assessed as income in the period that it is earned, according to the Australian IED scheme (Petrolati, 2000).

Second, the average income falls in the year that the deposit is made and the tax rate thus falls in that year. When the funds are withdrawn average income and the tax rate corresponding to this income increases. The Australian experience of an IED is that significant tax savings may be comparatively rare and rely on prolonged high incomes followed by prolonged low incomes with the tax rate falling significantly in between (Neilson, 1999). Tax rates will increase with fiscal drag and the farmer will thus pay more taxes (Pienaar, 2000) under conditions of inflation as experienced in South Africa.

Third, the timing of tax payments is affected but it is unclear whether this is a problem as cash flow may not be such a problem for the government as for an individual (for instance government can issue bonds). It is suggested that restrictions be placed on how much may be invested and for how long. For instance in the Australian IED, a maximum of Australian \$ 300 000 may be deposited (Petrolati, 2000) while in the South African Land Bank Scheme for livestock (similar to an IED) the maximum period for the deposit is 6 years (Huxham & Haupt, 2000).

Fourth, the tax sheltering arising from deliberate destabilising need not occur, as discussed in misuse below.

Fifth, the principle that revenue should be taxed in the year in which it accrues is already been ignored as livestock farmers are given this concession under a Drought Relief measure. Paragraph 13A of the First Schedule of the Income Tax

Act, a drought relief provision for livestock farmers, allows a farmer to deposit the proceeds from the sale of his livestock with the Land and Agricultural Bank. If the farmer abides with the conditions of this Paragraph he is only taxed on withdrawal of the funds (Huxham & Haupt, 2000:192).

There may be other sectors that suffer from vagaries of fluctuating markets, sales and income.

Agricultural risks have different dimensions which distinguish them from risk in other sectors. The first is that risk that arises from adverse weather affects vast areas at the same time. This is common in South African Agriculture. A well known economic textbook refers to such risks as Uninsurable Risks(Landsburg, 1992:610). Landsburg's definition of an uninsurable risk, is a risk that can not be diversified. This occurs when many people are all adversely affected in the same state of the world (Landsburg, 1992:610).

Due to this non-randomness of weather related events agricultural insurance agencies need to keep large reserves to meet claims in adverse situations. Also, the cost of the programme is high. For instance, crop insurance programmes have not been viable internationally without substantial state support. This is the case in South Africa's dryland cropping areas. Sentraoes drought crop insurance has ceased to exist (NDA, 1997) while according to Standard Bank (2000) no drought insurance policies are written largely because of high premium cost. South African farmers are thus not protected in event of droughts.

The second component of agricultural risks in Southern Africa is the severity of it compared to North America and Europe. According to the writer's experience in the USA a drop in corn production in a given state of 30% is seen there as a disaster while a decline of over 60% in maize production is not uncommon in SA. This happened as recent as 1994/95 (NDA, 2000).

Finally, the farmer has little control over his environment and often has little scope to diversify. This is especially true in South African cropping areas. Other sectors experience risk but greater opportunity exists to spread business risks.

Current averaging schemes lend themselves well to enable farmers in good years to make provision for poorer years by means of tax savings.

Current averaging schemes are allowed for in the First Schedule of the Income Tax Act in paragraphs 15(3) (plantation farming) and paragraph 19(2) (Average taxable income). According to these paragraphs, the farmer can elect to pay tax on his current income but at a tax rate that corresponds to his moving average

income. This concession provides the farmer with tax relief. It further removes some of the incentive to overcapitalise in good years as the tax rate is derived from an average income. This paragraph, however, provides no incentive to the farmer to make provision for bad years.

A high tax burden on the death of a tax payer could result because of estate duty.

The same criticism applies to paragraph 13A (Drought relief scheme) as according to the latter paragraph, the money on deposit will be deemed to be gross income on the day before his death.

An IED could be misused.

If an IED is used along with an averaging scheme which has an In/Out provision, then farmers may obtain tax benefits from destabilising their income (Lamont, 1990:369 & 410). This possibility is further explained below.

Current averaging schemes in South Africa (paragraphs 15(3) and 19(2)) have an automatic In/Out provision (Huxham & Haupt, 2000). That is, a farmer pays tax on his current income but can elect that the tax rate be derived from a five year moving average of farming income (paragraph 19(2)). A further concession is that in a year when current farm income is below its moving average, the farmer is taxed on current farm income at the rate that corresponds to that income.

When current farm income is below average income, the farmer will be taxed at a rate lower than the rate that corresponds to the moving average income. The tax rate thus falls in a bad year, providing the farmer some relief in adverse conditions.

If an IED is used in conjunction with an averaging (In/Out) scheme then the farmer may derive benefit from deliberately destabilising his income. The following example will illustrate this procedure. Assume that a farmer has a constant annual income of R50 000 per year. Assuming no other income, then his tax rate will be the rate that corresponds to an income of R50 000 per year. Assume now that he withdraws and deposit funds so that in some years his income is low and other years it is high. In years when his income is low, his tax rate will be zero (if income is below minimum scale), or at least lower than the rate that corresponds to approximate R50 000 per year income. (The moving average income will vary now above and below R50 000). In years when his income is high, he pays tax at a rate that corresponds to a R50 000 income. Because of these problems Lamont (1990:411-416) suggests block averaging

which implies that farmers can not exit in adverse times.

To avoid misusing of an IED, a rule is required that no funds may be deposited in an IED if current taxable income is below the moving average taxable income. If this rule is applied no tax sheltering is possible. SARS (2000) at present require information on a farmer's current income and the moving average income in terms of the income-averaging rule. Thus, if the farmer uses the present income-averaging rule, no more information is required in order to enforce the proposed rule.

On account of the great difficulty of accurately predicting future income streams, potential tax saving and income smoothing may not be maximised under an IED

Tax saving should not be an objective or a desirable feature of a scheme. The future is completely uncertain and not predictable and the only certainty is that droughts will recur. The purpose of an IED is not to maximise income smoothing but to provide more liquidity in adverse times and promote more stability to agriculture.

We now turn to three of the main policy areas that must be addressed for the successful implementation of IEDs: averaging farm income measures, risk management and overcapitalisation.

5. AVERAGING FARM INCOME MEASURES IN SOUTH AFRICA

5.1 Anti-bunching measures

The thrust of anti-bunching provisions in the First Schedule of the Act is to ignore abnormal receipts in the calculation of the rate of tax. The following provisions apply (Huxham & Haupt, 2000; SARS, 2000).

- (1) Paragraphs 13 and 13A (Stock reduction).
- (2) Paragraph 15(3) (Rate formula for plantations).
- (3) Paragraph 17 (Sugar cane damage by fire)

Forced sales of livestock (Paragraph 13)

Paragraph 13 provides relief for a farmer who has been forced to sell livestock due to drought, disease, plague or fire. If livestock is replaced within 4 years after the end of the year of assessment in which livestock was sold the farmer has the option of deducting the cost of the new livestock from his income in the original

year of assessment or from the current year of assessment according to Paragraph 13(1)(a) (Lamont 1990:396 and Huxham & Haupt, 2000). From a tax point of view the farmer may gain or loose depending upon whether tax rates are higher or lower in the year of restocking than in the year that sales took place.

If the farmer purchases livestock to replace stock which he sold in terms of a Government livestock reduction scheme, the same provisions apply, except that he has nine years to replace the Stock (Paragraph 13(1)(b)). He may not elect this paragraph if he elects to be taxed in terms of Paragraph 19 in the year that the livestock is sold.

Drought relief provision (Paragraph 13A)

If a farmer receives proceeds from the sale of his livestock because of drought and has deposited the proceeds (or a portion of it) with the Land and Agricultural Bank of South Africa within 3 months, this deposit will not be included in his gross income. If he withdraws the money between 6 months after the end of the year of sale but before 6 years have passed from the end of the tax year of sale, he will be taxed on the withdrawal (Huxham & Haupt, 2000:192). The total amount invested under this provision on 31/12/1999 was R227.2 million (Marais, 2000).

This drought relief provision is similar to an IED, but the difference is that this provision only applies to the sale of livestock under drought conditions.

Plantation farming (Paragraph 15(3))

If a farmer (other than a company or close corporation) derives taxable income from the disposal of plantations or forest produce, and the taxable income exceeds the annual average taxable income from the plantation for the preceding 3 years then the excess (actual minus average) is subject to tax in terms of the rating formula in section S5(10). The farmer is thus taxed on his actual income, but the tax rate is derived from his average income (Huxham & Haupt, 2000:194-195).

Sugar cane destroyed by fire (Paragraph 17)

Where sugar cane has been sold by a farmer (other than a company) because cane fields have been damaged by fire, the taxable income from such a sale shall be taxed in accordance with the rating provision in section S5(10). If the farmer is taxed on his annual income per Paragraph 19 in that year, Paragraph 17 will not apply.

5.2 Averaging of taxable income (Paragraph 19)

This concession applies to all farmers and allows them to be taxed at a tax rate that corresponds to a moving average income. This concession is widely used by farmers (Krause, 2000).

Current provision

If a farmer is taxed under this formula, the following provisions will cease to apply; Paragraph 13(1)(b) (Government livestock reduction scheme), 15(3) (plantation farming) and 17 (sugar cane destroyed by fire) (Huxham & Haupt, 2000). It is noteworthy that Paragraph 13A (Land and Agricultural Bank Scheme) still applies.

Average farming income is calculated as follows. The sum of the current year plus previous 4 year's taxable income from farming is divided by 5. Tax is paid on actual (current) income at a rate based on his average income. (If he has non-farm income then this is added to his farm income and he is taxed at a rate that corresponds to his total income). If actual farming income is lower than the average farming income, tax will be paid on actual income. In the latter case the tax rate is based on actual income and not on average income.

Discussion of averaging formula

The current averaging formula is also referred to as the General Rating Formula or General Averaging Scheme. This Scheme has several advantages (RSA, 1987); it is well understood by taxpayers and administered with relative ease, and avoids inequity in the assessment periods to which it relates. It is, however, seen as creating inequity as only those with fluctuating incomes benefit (RSA, 1987).

The South African averaging scheme includes the In/Out provision as farmers automatically exit the average scheme when farm income is below the average. The latter provision was introduced because one of the serious drawbacks of a moving average scheme is that taxpayers are subject to a burdensome tax liability in years when they have little or no income. The In/Out provision meant that farmers are favoured by the taxation system in the sense that the tax rate is reduced below that of the tax rate of a moving average income. Some commissioners on the Margo Commission believed that the In/Out option should be abolished (RSA, 1987:235) because of this reason. However, as a risk management strategy this provision provides the farmer with some tax relief in a bad year as his tax rate is calculated on his actual income on that year and not on his moving average income (which is higher).

Pienaar (2000) contends that due to fiscal drag the benefit of the General Rating Formula has declined as farmers have moved into higher income brackets. Also, if the farmers' tax rate on average and current income is at the maximum (42%) there is little benefit to be derived from the system (Pienaar, 2000). It is possible that farmers with large incomes that are more stable will not benefit (Pienaar, 2000).

6. RISK MANAGEMENT

6.1 Tax provisions

Some current tax provisions may mitigate the impacts of droughts.

Sale of livestock in early stages of drought (See also Anti-bunching measures above)

Paragraphs 13 and 13A provide farmers with a positive incentive to take actions to reduce the impacts of droughts and finance restocking (Fuchs, 1999). Paragraph 13A provides an incentive to smooth the taxable income of a livestock farmer. No such provisions are available for crop farmers who are more severely impacted by droughts (Fuchs, 1999 and NDA, 1997). Dry land crop farmers are much more vulnerable to the effects of seasonal and disastrous droughts than livestock farmers in terms of the dependence of crops on timing of rainfall at critical times.

Land improvements to reduce erosion and increase water harvesting and the building of dams

Paragraph 12(1) provides that certain expenditure, subject to certain limitations, incurred during the year of assessment by a farmer, may be deducted in the determination of taxable income. Some of the allowable deductions are listed below although the list is not complete in the interest of space (Huxham & Haupt, 2000 and Fuchs, 1999).

- (i) eradication of noxious plants;
- (ii) prevention of soil erosion;
- (iii) dipping tanks;
- (iv) dams, irrigation schemes, boreholes and pumps and
- (v) fences;

Amounts allowed under (i) and (ii) are deductible in full in year of assessment while limitations are placed on the amount allowed for on other items. These

measures provide a positive incentive to farmers to increase the productive value of the land and reduce the vulnerability to drought (Fuchs, 1999). Some of the positive incentives mentioned by Fuchs (1999) are improved carrying capacity of farms and increased water harvesting.

6.2 Management of production risk

Price risk can be managed by forward contracting. Production (yield) risk management options include; selection of less risky production technologies, diversification and maintaining flexibility in production systems. These production risk strategies are important but of limited benefit to producers to cope with disastrous droughts that occur regularly in the dryland crop farming sector of South Africa.

A production risk strategy in many countries is crop insurance which is a yield insurance programme. However, crop insurance has several shortcomings such as

- (a) high administration cost,
- (b) moral hazard (the incentive for an individual to take more risks when insured),
- (c) adverse selection (due to information cost problem the insurer can not separate farmers into classes of low and high risk and the low risk drop out) and
- (d) non randomness of risks (high reserves need to be kept by the insurer as droughts are often widespread and claims enormous in such a year). Because of these problems, a crop insurance programme will require state assistance (subsidy).

For commercial farmers who pay taxes an IED will provide incentives to be more liquid and be better prepared to handle production risk. An IED does not suffer from any of the problems of crop insurance. Administration cost is nil to the government as funds could be deposited in private institutions. During 1998 US growers paid \$900 million in crop insurance premiums while during 1995-98 the US government spent \$1.2 billion per year on premium subsidies, administration and operating subsidies, and net underwriting losses (Dismukes, 1999). The US Treasury's contribution to the Programme is thus significant and greater than the farmers' contribution while farmers receive twice as much in indemnities as they pay in premiums. Under an IED a farmer invests in good years and withdraws in

a bad year which means that it acts as a 'self insurance' scheme.

7. OVER CAPITALIZATION IN GOOD YEARS

The de Swardt Study Group recommended the introduction of IED's in 1960 (Lamont, 1990:406) to counter excessive capital expenditure in good years. Current tax provisions (Paragraph 12 of the First Schedule of the Income Tax Act) allow the farmer the following special depreciation allowances on the cash cost of any machinery, implements or utensils or articles (other than livestock) (SARS, 2000);

| | |
|-------------------|-----|
| First year of use | 50% |
| Second year | 30% |
| Third year | 20% |

The farmer can thus bring down his income tax in a good year by buying capital items. The farmer's disposable income is higher with these high depreciation rates. In the absence of these high depreciation rates he may have postponed purchase. However, since the farmer can elect to be taxed on an average income, his income tax rate will not be higher in a good year. Most of the tax advantages from overcapitalisation in good years thus may disappear as he does not face high marginal tax rates in such a year.

However, the instability in farm income may create instability in the Agri-support industries such in the input demand sector. If agricultural cash flow can be improved through risk management strategies (IED's) then the rural sector and its support activities may benefit. In the following section the impact of farm income variations on the purchase of a durable capital asset namely farm tractors and machinery is studied (using data for 1976 to 1999) in order to determine whether there is a significant relation between farm income and purchases of capital items. The hypothesis is that purchases increase in good years because of better liquidity and also because of tax considerations.

Investment Demand for Durable Farm Inputs (Farm Tractors and Machinery) 1976-1999

An attempt is made here to estimate the demand for the services of tractors and machinery empirically and thereby to cast some light on the factors contributing to this mechanisation process.

Various researchers have tried to estimate and explain farm investment behaviour. At least five studies of machinery investment were undertaken in the

United States of America during the 1960s (Cromarty,1959, Fox,1966, Harberger (ed),1960, Minden,1965 and Tweeten, 1962). Similar studies were undertaken for the United Kingdom (Rayner & Cowling, 1968) and South Africa (Nieuwoudt, 1973).

Griliches (Gujarati, 1988:550) used the stock of machines as the dependent variable since this variable enters the production function as an input. Heady and Tweeten (1963) maintain that the variable manipulated by farmers to achieve the proper level of stock is 'annual purchases' and used this variable as the dependent variable.

When stock numbers are used, then it is assumed that, for instance, a tractor a few years old can do the same work as a new tractor. The aggregate value may be a more appropriate measure if the service yield of individual tractors is proportional to their value and if durables depreciate annually by a constant percentage of their value. However, to derive the quantity demanded in real terms, expenditure data must be deflated by the price of the input. This may introduce a bias if input prices and expenditure data are not accurate.

At any point in time, great differences in quality exist among durable items. Also, over time, the quality changes in the durable sector are much greater than in any other sector. The price of a durable item is also a weighted price of different sizes of this item.

When a flow demand is estimated instead of measuring the stock of durable assets, the influence which the existing stock has on the rate of purchase is ignored. New purchases of a durable item in a given period, will be lower, the higher the level of service obtainable from the existing stock carried into the period.

From this discussion it is clear that no ideal measure exists to capture services from durable items. In practice the researcher must rely on available data and often is not given a choice of alternative data series. In this study annual purchases were used as the latter was seen as more reliable than stock values.

The economic model used is that the demand for farm inputs is derived from the demand for the product (product produced by the inputs), the production function (the technical relationship between inputs and output) and the supply conditions of other inputs (other inputs that can replace input in question).

In the statistical model (section 6.3) single equation investment functions are used as it is believed that current prices are predetermined in the non-farm sector. It is

thus assumed that the supply of farm tractors and machinery is highly elastic and that the supply and demand functions of tractors and machinery need not be estimated simultaneously.

Empirical demand function for farm tractors and machinery

A demand model for farm tractors and machinery for the period 1976 to 1999 is specified in equation 1 where the original variables were transformed to logarithms (base 10).

$$\text{Log (Y}_t\text{/CPI)} = -7.67 - 1.656 \log (\text{P}_t\text{/CPI)} + 1.729 \log (\text{I}_t\text{/CPI)} \quad (1)$$

(t = - 3.04) (t = 4.41)

where

Y_t = annual purchases of tractors and machinery in million rand for year t (NDA, 2000).

CPI = consumer price index (1995 = 100) (STATSSA, 2000)

P_t = Price of tractors and machinery, year t (1990 = 100) (NDA, 2000)

I_t = gross value of field crops and horticultural products in thousand rand (NDA, 2000)

R² = 0.681

DW = 1.51

According to model 1, the t values are highly significant while the adjusted R² is good. Of the total variation in the dependant variable, 68% is explained by the model. The conclusion is that the real purchases of tractors and machinery are negatively related to real prices of this item and positively related to gross income of crops and horticultural products. As equation 1 is an investment demand model, consideration was given to including the real interest rate. This variable was however not significant.

The above model was estimated in two stages. In the first stage, autocorrelation was serious. The Theil-Nager estimate of the autocorrelation coefficient ρ was used (Gujarati, 1988: 392) as the sample is relatively small. The estimated ρ was lagged out of the original variables and the model was re-estimated in the second stage and expressed in terms of its original variables. After the second stage the Durbin-Watson = 1.51 which is near the upper bound of the indecision stage (d_L = 1.188, d_u = 1.546).

As model 1 is expressed in logarithms, coefficients are elasticities. Model 1 indicates that a 1% increase in real gross income from crops and horticultural

products is estimated to increase real purchases of tractors and machinery by 1.73% in the same year. A 1% increase in real prices of tractors and machinery is expected to depress real purchases of the durable item by 1.66%. In both cases, the impact on purchases is more than proportionate to the change in the exogenous variable (Pt/CPI and It/CPI).

As fluctuating farm incomes appear to have a disproportionate impact on purchases it indicates that the instability of agricultural incomes may have ripple effects on the agric-support sectors such as the farm input supply sectors.

The reasons why farmers buy more inputs in good years could be

- (a) better liquidity in a good year and
- (b) possible tax advantages.

Case (b) implies that under an IED, agricultural income taxes will increase.

It is concluded that improving the cash flow of farmers, may have income stabilising impacts on the agri-support sectors. There appears to be definite benefits from income saving schemes as those operating in countries such as Australia and Canada (Agriculture and Agri-Food Canada, 2000).

8. IEDs IN OTHER COUNTRIES

8.1 Australia

The Australian government introduced IEDs in 1976 with the aim of encouraging farmers to stabilise their incomes. These schemes were intended to provide farmers with a 'self help' means of handling income stability, but there was limited uptake and they were subsequently repealed in the light of the following:

- (a) The interaction of the averaging scheme and the IED scheme produced anomalous results. A tax benefit could be gained from IEDs if they were used to destabilise taxable income by lodging deposits in low income years and withdraw them in high income years.
- (b) Averaging provisions enabled individuals to include up to \$5000 non-farm income under farm income for averaging. It was thus possible for the farmer to deposit non farm income in IED's and withdraw deposits as part of the farming income stream. This can not be seen as a major weakness of an IED as a rule preventing this is required.

The present IED scheme in Australia is called Farm Management deposits (FMDs). FMDs have the same purpose as IEDs namely to encourage farmers to save money in good times for use in bad times. A tax deduction is allowed when an amount is invested while it is taxed when it is redeemed. FMDs provide a tax linked savings tool for farmers which can complement other risk management strategies such as developing fodder and water reserves, financial planning, diversification of production systems, forward selling and future contracts. The purpose is to improve the viability and sustainability of farm businesses (Petrolati, 2000).

The terms and conditions (rules) of an FMD are:

- (a) Only individuals who are primary producers and have non-primary production income less than (Au) \$50 000 may claim a deposit as a tax deduction,
- (b) The deduction can not exceed the net taxable primary production income.
- (c) The minimum deposit is (Au) \$1000 and the maximum amount that may be deposited is (Au) \$300 000.
- (d) FMDs must be held at any time at only one financial institution. Institutions must meet Government's prudential requirements for deposit taking or Government guaranteed, such as banks, building societies etc.
- (e) The deposit can be withdrawn at any time after 12 months. It will be repaid if depositor dies.
- (f) On withdrawal, 20% tax will be deducted. After 1 July 2000 a withholding tax will no longer apply (Petrolati, 2000).
- (g) Interest will be paid on FMDs at the commercial rate offered by the finance institution. Any interest will be assessed as income (Petrolati, 2000).

Some changes have already been approved to FMDs. The customer (farmer) will be entirely responsible for reporting on the FMD while the bank will only provide an account for the farmer (Herbst, 2000).

Interaction of FMDs and averaging schemes

Most Australian farmers are taxed on an averaging system. They pay tax on their **current** (present year) primary production income and limited non-primary

production income at the **rate** applicable to their average taxable income for the past five years. This is identical to the current South African income averaging provision except that Australian farmers do not have the advantage of the South African In/Out system. That is Australian farmers pay tax based on the rate calculated for a moving average income whether taxable income is above or below the moving average income. It is important to note that without the In/Out provision of the averaging scheme, they can not misuse an FMD by deliberately destabilising income in order to obtain tax advantage.

If a farmer invests in FMDs, his taxable income falls by the amount invested while his average income also falls. His tax rate calculated from the lower average income is thus also lower. When FMD's are redeemed, taxable income increases. Also, the moving average income and thus the tax rate increases. The tax rate paid by the farmer is based on the average income for the most recent five years and the 20% tax paid on redemption of FMD's is a preliminary tax. According to Neilson (1999) significant tax savings from the use of FMD's may be comparatively rare. Tax savings rely on periods of prolonged high incomes followed by prolonged low incomes, with the tax rate falling significantly in between.

A concession is that if a farmer can show that he is in serious financial difficulty, tax will not be deducted when funds are withdrawn. The need for this concession will disappear as, after July 1, 2000, a withholding tax will no longer apply.

8.2 Canada

Prior to 1988, block averaging (BA) was available in Canada on an elective basis to individuals whose chief source of income was farming or fishing. Under BAs, periods are taken as blocks, say five year periods. Taxes are paid annually upon each years income. At the end of the blocked period, total income is distributed equally over the period and income tax is calculated on the average annual income. Taxes are then recomputed.

The disadvantages of BAs are:

- (1) refunds are only available at the end of the block,
- (2) there is no systematic relationship between the refund at the end of the block period and the income at the time and
- (3) if tax rates are progressively lowered during periods of high inflation then BA's may result in higher taxes than in the absence of averaging.

Under BA's the income tax rate is thus low in a bad year. There is thus no need for an In/Out provision which is a feature of the South African averaging scheme.

Canada has now(2000) instituted a programme to help producers achieve long-term farm income stability on an individual basis, referred to as the Net Income Stabilisation Account (NISA). Producers can make deposits in their NISA accounts and receive matching contributions from the government. In lower income years, producers can make withdrawals from the funds. The NISA account operates as an IED. The main difference is that under NISA, Canadian farmers receive significant matching contributions from the State.

With NISA, producers can annually deposit up to 3% of their Eligible Net Sales (ENS) into their NISA account and receive matching government contributions. Some provinces may offer enhanced matching contributions. Producers can also deposit an additional 20% of their ENS into this account. Although the latter is not matched, financial institutions offer producers a 3% interest bonus over and above regular interest rates (Agriculture and Agri-food Canada, 2000). Funds can be withdrawn when needed in lower income years. Anyone who files an individual income tax return reporting farming business can participate in the programme (NISA).

The portion of the NISA account which holds the farmers' own contribution is referred to as Fund 1 and is invested in a financial institution of the farmers choice. The Fund 2 portion, which is held in Canada's Consolidated Revenue fund, holds the government's matching contribution and all accumulated interest on both funds. The account balance is limited to 1.5 times a farmer average ENS in the most recent five years. Funds are first withdrawn from Fund 2 and then from Fund 1. Withdrawals from Fund 2 are taxable while farmers' own deposits (Fund 1) are neither taxable nor tax deductible (Agriculture and Agri-food Canada, 2000).

ENS generally includes all commodities except those covered by supply management (dairy, poultry and eggs). For NISA purposes, individuals are limited to ENS of \$250 000 per year.

As with all IEDs, the administrative cost of NISA is low relative to other risk management programmes such as crop insurance. The financial contribution by the Canadian Government to NISA is, however, substantial.

9. THE FEASIBILITY OF INTRODUCING AN IED IN SOUTH AFRICA

An IED will promote better cash flow over time and risk management and it is shown that an IED could be feasible in the South African situation. A very desirable feature of an IED is that it is a 'self help' scheme.

Australia has an IED but their farmers do not have access to an In/Out provision on their income averaging scheme. That is, the tax rate to SA farmers falls in a bad year while Australian farmers pay the same tax rate in good and bad years. The In/Out provision in SA benefits all tax paying farmers and is an important tax concession to farmers in adverse times as the tax rate is lower. The Margo Commission, however, saw this as a generous concession to farmers (RSA,1987:236).

The SA Land and Agricultural Bank Scheme (Paragraph 13A) allows livestock farmers to deposit proceeds from the sale of livestock because of drought. The farmer is only taxed (provided certain conditions are met) when the funds are withdrawn which works the same way as an IED. Because funds are only deposited during drought, a farmer can not deliberately destabilise his income to take tax advantage.

Possible capital bunching in good years was studied. Research conducted in this study for the period 1976-1999, indicates that purchases of tractors and machinery are positively associated with gross income from crops and horticultural crops. The income (proxy for liquidity) elasticity was estimated at 1.7 indicating that a 1% increase in real gross income is estimated to lead to a 1.7% increase in real purchases of these capital items. The increase in farm income has a greater than proportional impact on capital purchases. If farmers have access to an IED then this bunching of capital purchase may be less which will also have a stabilising impact on the non farm sector. As an IED will reduce the incentive to over capitalise the long-term level of taxation from the farm sector will rise. Generous tax concessions regarding depreciation of capital items (section 12B of the income tax act) may lead to bunching and over capitalisation. The major reason for the bunching is expected to be simply a liquidity effect as SA farmers at present pay tax on a moving average income. That is the marginal tax rate is not higher in a good income year as the tax rate is determined by the moving average income. The farmer can, however, bring down his taxable income and his tax rate (which is based on the moving average income).

The conclusion from the Australian scheme is that 'significant tax saving from the use of FMD's may be comparatively rare' (Neilson, 1999). Income taxes may in

fact increase with an IED because of fiscal drag or if an IED could prevent over-capitalisation.

Disastrous droughts are common in Southern Africa which have led to massive state support in the past. These droughts affect the whole agri-support sectors with implications on employment. Droughts are recurring and risk management strategies should be pro-active and not reactive.

Due to the problem with providing drought insurance through private markets—such as the non randomness of weather related events and the high cost of premiums—drought insurance offered by Sentraoes and Standard Bank ceased altogether. Also, crop (drought) insurance requires high subsidies from the state while administration cost has been high. No administration cost is borne by the state in an IED. In Australia funds are deposited in a financial institution of the customer's choice, the customer is responsible for reporting on the FMD (formerly IED) and the bank only provides an account.

Given the alternative risk management strategies, an IED should be given favourable consideration. If farmers have access to both an In/Out tax provision and an IED then they may use the IED to deliberately destabilise income to obtain tax advantage. The problem is that funds may be deposited in low-income years to bring down the tax rate further. **This practice could be avoided by making a rule that funds can not be deposited in the current year if actual taxable income in that year (current) is below the moving average taxable income.** The rule could state that the maximum deposit in any year is the amount by which current taxable income exceeds the moving average taxable income. In any case why would somebody want to deposit funds in a low-income year other than misusing the scheme for tax purposes. The purpose of the scheme is to smooth cash flow and it must be used for that purpose. This rule requires no additional information for tax purposes because the current SA income averaging concession uses information on both average taxable income and current taxable income. There may be a difference between current disposable income and current taxable income as a result of debt repayment (not tax deductible) and the farmer may not have funds in good years to invest. However, repaying of debt in good years will have also have a smoothing effect on the income stream and should be encouraged.

Further, it may be possible to replace the livestock scheme (Paragraph 13A) with an IED, and have one scheme (IED) that caters for both crops and livestock. The above rule should apply to both enterprises. This implies that deposits (for crops and livestock) can only be made if current taxable income is above the moving average taxable income. Livestock farmers will still be able to

deposit into this fund during drought conditions as incomes will be above the moving average. The present livestock scheme (Paragraph 13A) allows deposits during drought which must raise the issue how is a drought defined (is there a cut off point). The above proposed rule provides an objective and measurable test to whether deposits qualify. Various rules govern the use of IED's in Australia and a closer look at these rules would be appropriate.

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