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## IS SOUTH AFRICAN AGRICULTURAL LAND OVERVALUED? COMMON MISCONCEPTIONS

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The gap between the average market and agricultural value of South African land showed a steady decline since 1984. The decline is attributable to the withdrawal of some of the major policy support services to the farming community and inflationary conditions, which had a negative influence on both sellers and buyers. The negative effect of the terms of trade was, however, partially countered by an annual growth in productivity of 4,63% since 1983. This had a positive effect on agricultural values, thus closing the gap between the market and agricultural value of land.

Die gaping tussen die gemiddelde mark en produktiewe waarde van Suid-Afrikaanse grond toon 'n afname sedert 1984. Die afname is te wyte aan die onttrekking van sommige van die hoof beleids- ondersteuning dienste aan die landbou en inflasionêre toestande wat op beide kopers en verkopers 'n negatiewe effek gehad het. Die negatiewe effek van die landbou-ruilvoet is egter gedeeltelik teë gewerk deur 'n jaarlikse groei in produktiwiteit van 4,63% sedert 1983. Dit het 'n positiewe uitwerking op produktiewe waardes gehad om sodoende die gaping tussen die mark en produktiewe waarde van grond te verklein.

### 1. Introduction

In most countries the major advantage of ownership of land has been the price appreciation of land over time. Unlike most resources used in farming, land does not depreciate or deteriorate if managed properly. Although the farmer has not received the financial benefits of price appreciation in a cash form that is available for direct consumption, appreciation has increased net worth. This increased net worth can be used as a financial base for borrowing funds to expand the farm operation, as well as a cushion or reserve against short-term financial losses that may require refinancing. Thus, land ownership has important income, capital appreciation, and risk-reduction dimensions for the farm operator, as well as the social and family dimensions of a permanent home and residence for the farm family.

The price that must be paid for these attributes of ownership is the substantial capital outlay needed to purchase land. Most farmers, and particularly emerging farmers, do not have sufficient capital for the down payment required for land acquisition and have enough funds left for machinery and equipment purchases and working capital. The financial requirements of purchasing land can drain valuable funds away from other investment alternatives. The basic question, therefore, becomes one of which method of land acquisition has the highest financial payoff compared to alternative uses of the farmer's funds, and which alternative is "financially feasible" or within the financial capability of the farm operator (Boehlje and Eidman, 1984).

The difference or gap between the market and agricultural value of land does not contribute to the farmer's ability to repay a loan made to acquire land. Often, however, this contributes to the ability of the farmer to obtain credit (Binswanger and Deininger, 1992). Van Schalkwyk and Groenewald (1993) found that non-farm factors like policy distortions, policy and institutional expectations get capitalized into market values, hence the difference between the market and agricultural value of land. The non-farm factors for example also represent expectations of present landowners that their land can be sold for non-farm purposes. Land in the vicinity of cities is usually more expensive than similar land further afield not only because of the mentioned expectations but also because of cost savings on transport. They also found that high gross revenues - partially a result of price supports - become capitalised in land values. This tends to lend some support to arguments by Paarlberg (1962) and Groenewald (1978) that the profitability gains the present farming generation

receives because of price supports, become a cost of doing business for the next generation.

Van Wyk (1967) compared average market prices of land in which the Land Bank was involved (1912-1965) and of all rural transfers (1927-1964), on the one hand, and average agricultural value as estimated by the Land Bank (1912-1965), on the other. His study shows that:

- Between 1912 and 1941, the increase of land values - both market and agricultural - was gradual and consistent;
- since 1941, purchasers throughout the period paid considerably more for land than the agricultural values would indicate; and
- since 1951, the difference between market price and agricultural value increased.

The reasons for the increasing difference between the market and agricultural value of land since 1951 are clear, as farmers got more subsidies and policies were distorted in their favour, this got capitalized into land values.

Van Schalkwyk and Van Zyl (1993) showed that whereas market prices of agricultural land rose gradually in real terms from 1970 until the early 1980s, they generally declined strongly afterwards. Real land prices in the summer rainfall region fell by 45% from their peak between 1981 and 1990, in the cattle grazing areas by 37% from their peak in 1976 to 1990, and in sheep grazing areas by 28% from their peak in 1980.

Van Schalkwyk and Van Zyl (1993) analysed forces driving land market prices between 1955 and 1990. The following conclusions emerged from their work:

- Real land prices were positively related to lagged inflation, suggesting that investments in land were partially made as a hedge against inflation;
- real land prices rose as real interest decreased to negative levels during the 1970s; correspondingly, real land prices decreased as interest rates increased to more normal levels in the 1980s; and
- real land prices followed the trends in real returns per hectare closely, except for most of the period after 1983 when land prices and real returns per hectare followed opposite trends; and real land prices were positively related to real debt per hectare except for the period between 1980 and 1985, when real debt-load rose while land prices plummeted.

The size of the gap between the agricultural and market value of land is of major importance for land reform purposes, especially if the affordability of a basically market-oriented land reform is taken into account. It is therefore important to understand the forces underlining the difference between the market and land-use value of agricultural land in South Africa. This paper aims to identify these forces and to quantify the gap between the market and agricultural value of land.

## 2. Alternative agricultural value estimates

According to Boehlje and Eidman (1984) there are generally three methods by which land can be appraised namely the market, cost and income approach. The market approach to valuing real estate essentially attempts to determine what the property would bring if sold. The basic philosophy of the cost approach is to inventory the various resources of the farm, estimate their cost, and then sum these costs to obtain a total value. Because of the extremely difficult task of associating a cost with land, this approach is quite difficult to use for unimproved land. In essence, the income approach to valuation determines the long-run profitability of a land investment (Boehlje and Eidman, 1984).

The income approach to land valuation was used in this paper because of its consistency with the net present value method of evaluating investments.

## 3. The income capitalization approach

The income-capitalization approach is based on the logic that the market value of a piece of land should equal the present value of the stream of all future incomes. In its most simple form (where income is assumed to accrue in perpetuity), earnings value  $V = I/r$ , where  $I$  is the average yearly return to land and  $r$  is the discount or capitalization rate (Locken, 1978). This simple formula does not consider income taxes; both the income stream and the capitalization rate are calculated on a before-tax basis. If taxes are included as a cash expense, then the capitalization rate must also be reduced to an after-tax rate. There are a number of refinements one can make in this approach to account for changes in the income stream or discount rate, taxes or any other changes that may effect the income generated from a parcel of land over time (Locken, 1976). While these refinements are not difficult to deal with conceptually, empirical implementation requires knowledge of the future income streams and other changes affecting agricultural value. Failure to incorporate these changes by capitalizing current rather than future income streams certainly have an impact on estimates of agricultural values. However, one can argue that agricultural values based on recent performance may be the only acceptable alternative for empirical estimation of the earning value of land. For comparing these agricultural values with those developed through a market approach, one can argue that market participants setting land market values have just as much difficulty in perceiving the future as any researcher. They too may have only crude estimates of the future income potential of land and they may rely most heavily on the recent performance of land as their basis for appraising its future productivity (Locken *et al*, 1978).

One of the most difficult decisions required in using the income approach to valuation is choosing the appropriate capitalization rate. From a conceptual viewpoint, the capitalization rate should reflect the cost of capital or the cost of funds committed to the purchase of land. However,

adjustments are necessary to reflect differences in the risk associated with land compared to alternative investments. Reynolds and Timmons (1969) have suggested that the capitalization rate should reflect the rate of return on other farm inputs, thus representing the opportunity cost of investing in farmland. Scofield (1964, 1965) argues that one should employ rates of interest or rates of return on non-farm investments which represent the opportunity cost of investing in any farm inputs. He argues that non-farm income producing real estate (such as apartment buildings and office complexes) or common stock has similar liquidity and risk characteristics and are analogous to farmland in an investment sense. He objects, however, to the use of interest rates on real estate mortgages as a capitalization rate because it is a fixed monetary (Rand) investment.

Although Scofield's (1964, 1965) opinion that fixed monetary investments have a lower risk than farmland, rates of return on alternative investments may still be useful. It has been suggested that farmers as a group may use a lower capitalization rate because of a propensity for farming and a preference to live in a certain area (Reynolds and Timmons, 1969). On the basis of these arguments the annual return on government bonds was selected as capitalization rate. This is in accordance with the suggestions of Locken *et al*, (1978).

## 4. Empirical results

Refinements were made to the numerator of the mentioned income-capitalization formula in order to measure other important factors which also influences the agricultural value of land. The refined formula involves  $V = (I^* + S - E - L - i)/r$ , where  $I^*$  = total expected cash farm receipts,  $S$  = services received by holding land,  $E$  = total cash farm expenses,  $L$  = the value of the operator's remuneration and unpaid family labour,  $i$  = interest on capital, and  $r$  = the capitalization rate.

Data on the average South African income streams, total cash farm expenses and interest on capital ranging from 1970 to 1992 were obtained from the Directorate of Agricultural Economic Trends (1994), while the interest rate on government bonds were obtained from the Central Statistical Service (1994). Using these data, alternative regimes for expectations on returns per hectare were used to postulate future income streams. Extrapolative expectations on net returns per hectare were specified by extending a four-year trend. Adaptive expectations were specified following a geometric lag structure. These two approaches gave the best results in previous research on land markets in South Africa (Van Schalkwyk and Van Zyl, 1993), and is therefore also used here. Only the results of the adaptive expectations are shown here as it provided the best results. Average salaries for all employees as reported by the Central Statistical Service were used to measure the value of operator's and unpaid family labour as actual figures were not available. Land provides its owner with free housing and water, cheaper food etc (Binswanger and Deininger, 1992). The mentioned services, received by owning land where measured by calculating the actual cost of these services if the operator had to pay for it. The results of the formula are shown in Table 1. Figure 1 compares the actual agricultural value with the market value of land. Evidently, the agricultural value fluctuates much from year to year. These fluctuations are mainly caused by changing weather conditions. This makes it necessary to use an expected annual income attributable to land used for farming, calculated in the manner explained above (See figure 2).

Table 1: Real market and agricultural values in R/ha (1985 = base)

Year	Average real market value per hectare	Adaptive expected agricultural value per hectare	Gap between the market and the expected agricultural value
1960	259	227	32
1961	262	194	68
1962	277	242	35
1963	291	278	13
1964	347	273	74
1965	374	249	125
1966	367	250	117
1967	439	310	129
1968	460	328	132
1969	454	346	108
1970	437	252	185
1971	459	278	181
1972	470	291	179
1973	475	346	129
1974	516	355	161
1975	522	377	145
1976	527	388	139
1977	547	407	140
1978	535	425	110
1979	524	430	94
1980	481	333	148
1981	424	290	134
1982	422	312	110
1983	418	220	198
1984	400	156	244
1985	344	123	221
1986	341	134	207
1987	335	159	176
1988	332	182	150
1989	314	219	95
1990	286	228	58
1991	249	213	36
1992	207	205	2

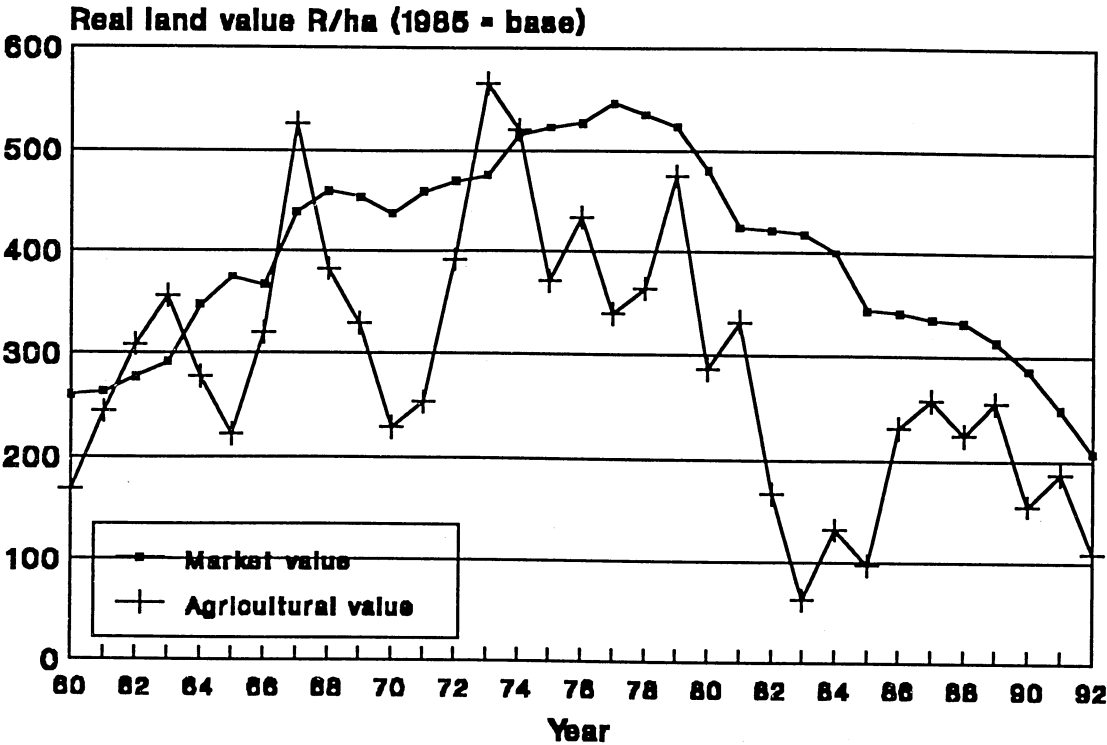


Figure 1: Real market and agricultural value of South African land (1960 - 1992)

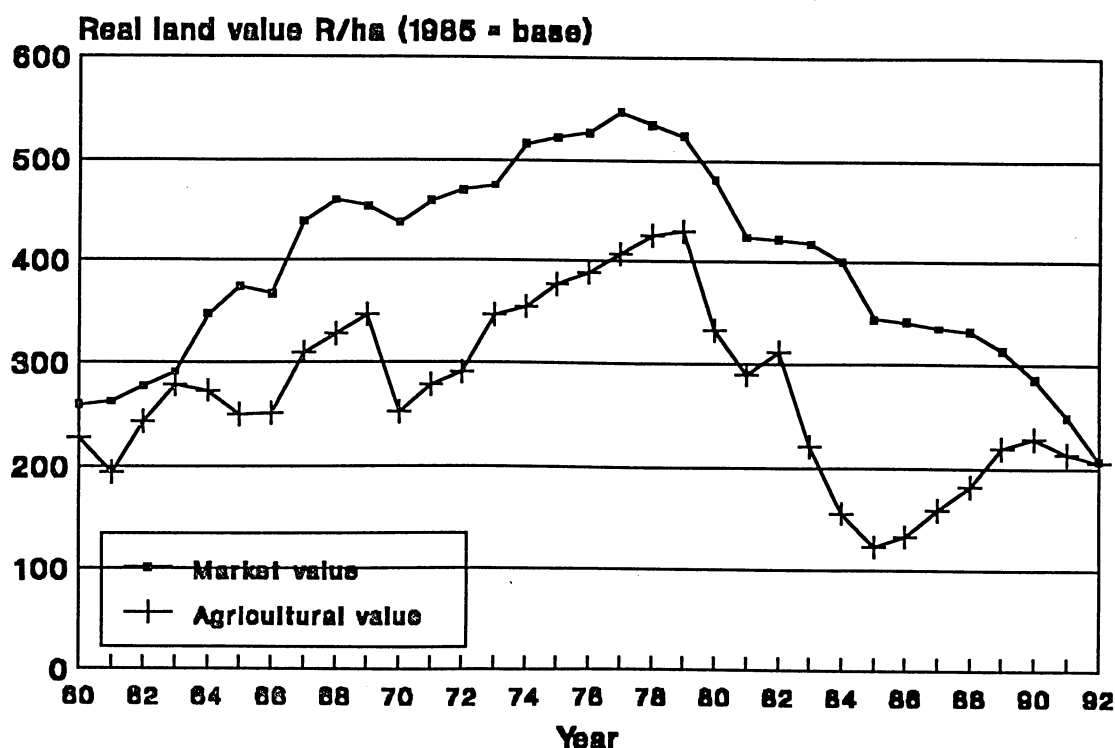


Figure 2: Real market and expected agricultural value of South African land (1960 - 1992)

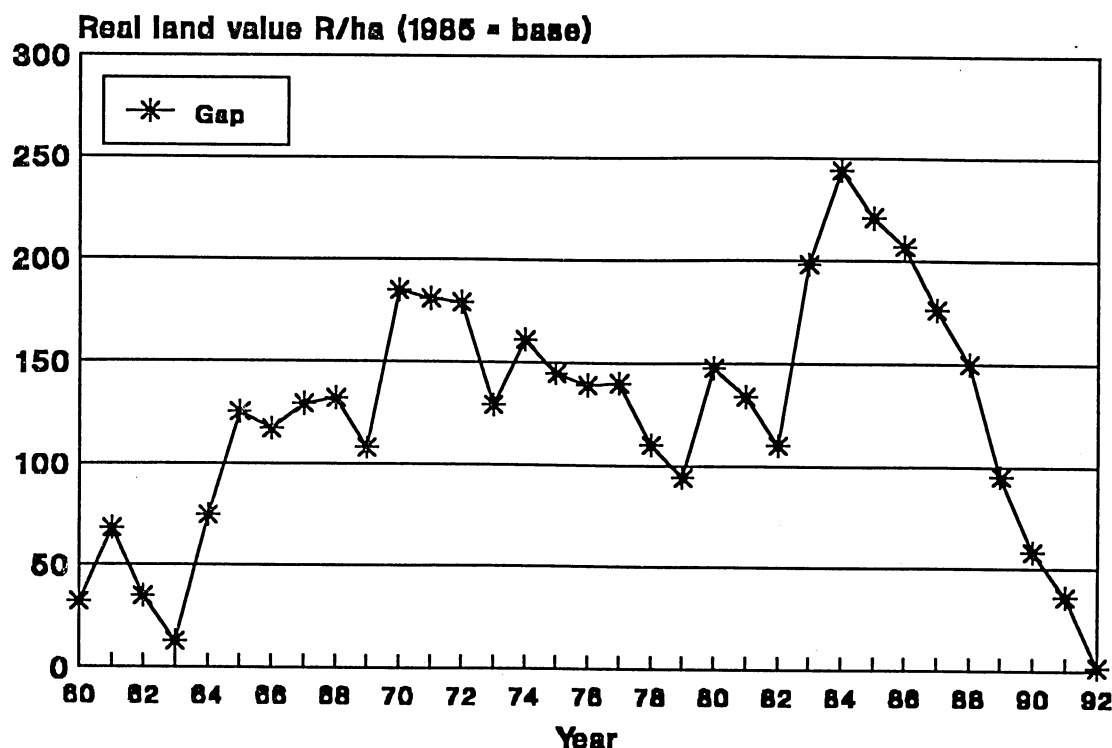


Figure 3: The gap between the market and agricultural value of South African land (1960 - 1992)

Figure 1 and 2 shows that the market and agricultural value of land followed almost the same trend since the 1960's. Agricultural values rose up to the mid seventies and then gradually declined. Figure 3 and the last column of table 1 emphasises Van Wyk's (1976) finding that the difference

between the market price and agricultural value in general increased during the period 1960 - 1969. It does, however, also reveal that the difference between the market and agricultural value of land reached its maximum in 1984 after which it plummeted and reached a minimum in 1992, where

the difference was insignificant. The agricultural values of land declined over the long term. The market value of land did, however, decline at a much faster pace which caused the gap between the agricultural value and the market value of land to decrease.

Inflation has become a major consideration in any investment or disinvestment decision. If buyers expect land to appreciate at a rate similar to the rate of inflation, they can expect to pay more for the same land at some future date. Consequently, if they have adequate financing and want to expand their land base, it may be desirable to make the land purchase now rather than wait. For the seller inflation is also an important consideration. Sellers must be careful not to lock themselves into fixed or constant income investments where the income stream and the investment principal do not adjust with inflation or increase with the general price level.

According to Van Schalkwyk and Van Zyl (1993), the major force in the 1971 take-off period in market prices of land was the opportunity rate of returns on capital. From 1968 to 1974, the real rate of return on savings dropped from 4,6% with 6,5% to -1,9%. This caused investment in land to become more attractive by comparison. Following the 1971 take-off period, much of the ensuing land market price appreciation was due to the 1968-74 effects working through the system and culminating in price expectations effects. While on the surface this explanation may suggest that land market price changes are being explained tautologically with land market price changes, the adjustment process actually works much like a Nerlovian model. Each external shock has a declining distribution of effects over time reflected through land market price expectations (which is a lagged form of market land price). By 1979, opportunity cost had returned to pre-1968 extremes, however, this time coupled with an added high inflation rate. Land market prices started to drop in 1977; a direct effect of the high inflation rate. Furthermore, the land market price volatility in the 1980s led to large increases in perceived risk tending to decrease market prices further.

The agricultural value of land on the other hand is effected by the ability of land to generate profits. Van Zyl *et al* (1993) showed that profits are mainly effected by changes in productivity and price recovery: from 1947 to 1991 total factor productivity increased rather slowly at 1,3% per annum; there was no growth until 1965, then 2,15% until 1981 and fairly rapid growth of 2,88% per annum since 1981. They also showed that land productivity increased at 3,13% per annum since 1947. The increasing rate of growth over the period is in accordance with Van Zyl and Groenewald's (1988) perception that farmer's profits came under increasing pressure as inflation gathered pace.

Since 1974, highly inflationary conditions prevailed. Input prices have risen faster than product prices and a cost-price squeeze has been experienced. This cost-price squeeze obviously exerts considerable pressure on the income and therefore also on the agricultural value of land. Real net farm income has increased by nearly 181% since 1947. This has been ascribed by Van Zyl *et al* (1993) to the growth in total factor productivity of nearly 161% which countered the decline of 27% in terms of trade. However, real net farm income declined by 1,06% per annum from 1973 until 1991 and with 8,14% from 1973 to 1983. This decline is a direct result of the unfavourable growth rate in the terms of trade.

It is evident from the above that inflation had a negative effect on both the market value and the agricultural value of land. This, coupled with the withdrawal of some of the major support services and policy distortions from the state to the farming community, led to the general misconception that the difference between the market and agricultural value of land did not decline, but that at best stayed the same. However, the effect of the fairly rapid growth in productivity, which countered the negative effect of the terms of trade on profits and hence on agricultural values, were never taken into account. The growth in productivity did in fact push up net farm incomes, and hence also agricultural values, which resulted in a declining market/agricultural land value gap.

## 5. Conclusion

The procedure followed in this paper allows one to determine the sources driving the difference between the market and agricultural value of land in South Africa. From the analysis it is clear that the gap between the average market and agricultural value of South African land showed a general decline since 1984. The decline is attributable to the withdrawal of some of the major support services and policy distortions to the farming community and inflationary conditions which had a negative influence on both sellers and buyers. The inflationary conditions had the effect that land was not an effective inflation hedge since the mid 1980s. The agricultural sector showed a steady decline in its financial performance since 1973. The decline is attributable to the cost-price squeeze which obviously exerts considerable pressure on income. The negative trend was, however, countered by an annual growth in productivity of 4,63% since 1983. This had a positive effect on agricultural land values, thus closing the gap between the market and agricultural value of land.

The current relatively small gap between the agricultural and market value of South African land has many advantages. The decreasing gap makes land more affordable and enhances repayment ability as buyers of land will now find it easier to repay a loan from the productive capacity of the land itself. This scenario also affects land reform in the sense that emerging farmers will not have to pay much above the agricultural or productive value of land in a market related land reform. This will enable them to have a better repayment ability or alternatively may decrease the necessity for grants. It should, however, be noted that although economic conditions are the same for the whole of South Africa, the gap between the market and agricultural land value quantified in this article is based on an average of several regions with very different land qualities and productivities. Some regions might therefore experience their market values to be lower than their agricultural values and *vice versa*. It is therefore important to determine the factors driving market and agricultural values in specific regions.

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