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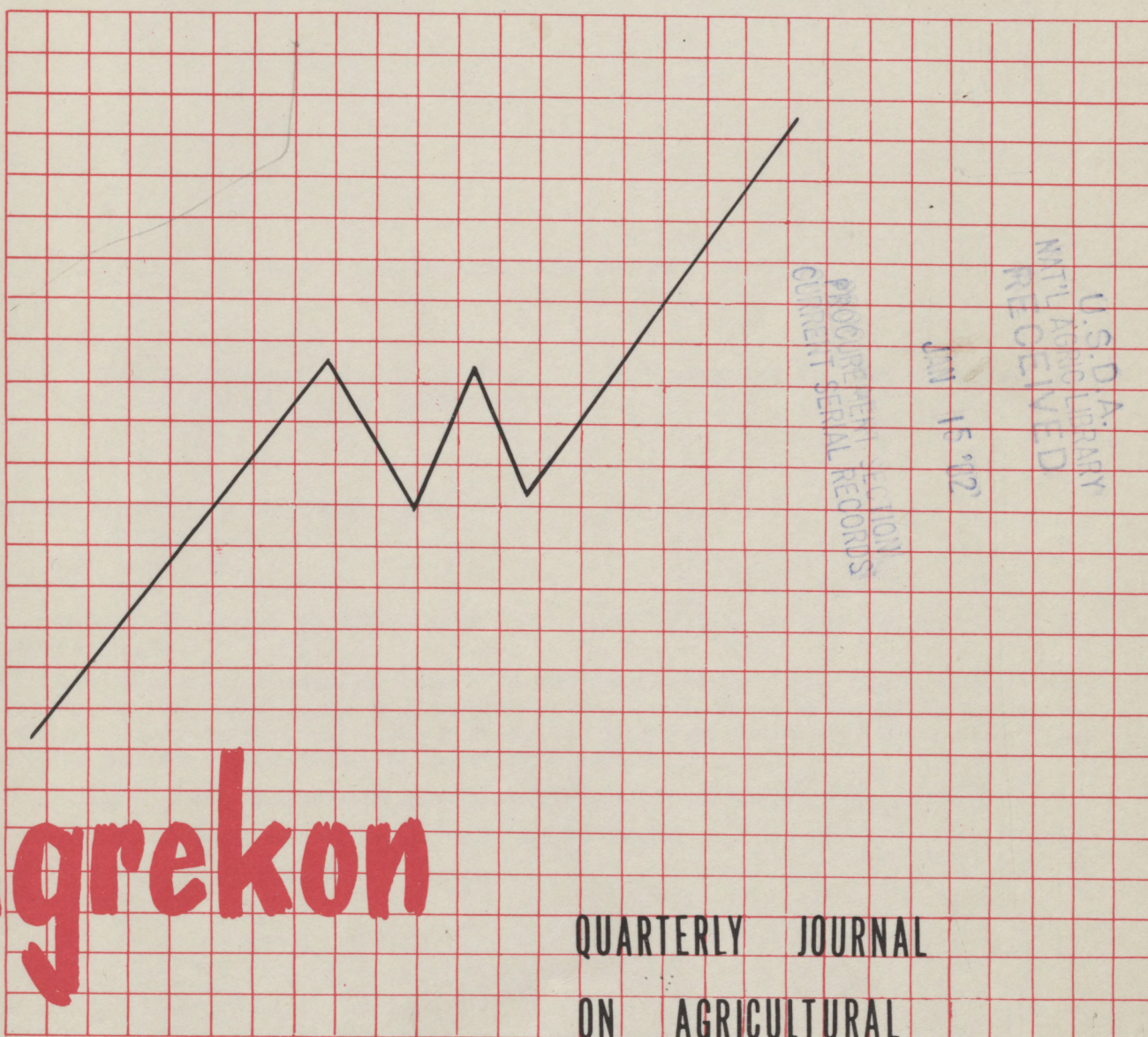
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# BUSINESS GROWTH IN AGRICULTURE III: THE EFFECT OF INFLATION ON BUSINESS GROWTH

by

A. LOUW  
University of South Africa

## 1. INTRODUCTION

The various growth strategies discussed in the previous article were simulated under both deterministic and stochastic conditions. The effect of inflation on the growth capacity of the above-average as well as the average and the beginner as well as the established farmer was striking. In this article the effects of inflation and various growth strategies on firm growth are analysed under deterministic conditions, where yields and prices can be accurately predicted. A later article will deal with the stochastic model.

## 2. EFFECT OF MANAGERIAL ABILITY

Managerial ability can be expected to have a considerable influence on the final strategy that is possible under various rates of inflation, loan restrictions and beginning situations. In Table 1 the effect of management on eventual net value is illustrated. Indices are expressed in terms of land-acquisition strategy 3 (lease and purchase at every opportunity) with the conservative loan restriction 1 in the situation without inflation. Simultaneously the effects of inflation can be observed. It appears from the table that, throughout, there is a considerable difference in achievement between farmers with different managerial abilities. The greatest total difference occurred in the case of strategy 3 with the more liberal loan restriction 2 ( $739 - 212 = 527$ ), a difference of 71 per cent.

Under no-inflation and high-inflation conditions strategy 2 fared best in the case of the above-average entrepreneur (761). The only case where another strategy fared better was strategy 3 with the more liberal loan restriction 2 under high-inflation conditions. The difference between the strategies is, however, not so clearly perceptible in the case of the average entrepreneur. It appears that under specific conditions other strategies give better results than strategy 2, although strategy 2 shows the highest total with loan restriction 1 and the second highest with loan restriction 2. Nevertheless, under loan restriction 1 strategy 2 shows the best results under no and moderate inflation, while there was no difference between strategies under high inflation. With loan restriction

2, strategy 2 fares best only under high inflation; with no inflation, strategies 3 and 4 fare better and with moderate inflation strategies 3 and 5. In Table 2 those strategies associated with the highest net values are summarised. On the whole, strategy 2 with the conservative loan conditions gives the best results in the case of the above-average entrepreneur (761) while strategy 2 loan restriction 1 (337) gives the best results in the case of the average entrepreneur. It appears that strategy 2 with loan restriction 1 also results in survival as well as better results in the case of the average entrepreneur.

From Table 2 it appears, amongst others, that percentage-wise there is a smaller difference between the results of managerial abilities with moderate inflation than under the other two inflation conditions. It appears that the relatively favourable price movements during the moderate inflation conditions are fully utilised by the average entrepreneur and that shortcomings can be overcome while the effects of cost-push inflation as well as no inflation hamper him drastically and his shortcomings create serious problems.

## 3. THE EFFECT OF INFLATION ON GROWTH

The effect of inflation on an enterprise can be measured by its

- (1) real growth in net value over a period of time,
- (2) real capital investment and
- (3) debt position

Although the effect of inflation on growth with various managerial abilities and beginning situations has already been mentioned, more emphasis is here placed on real growth. The real growth can be determined in either of two ways, namely by deducting the average rate of inflation from the gross growth rate or by deflating the net values by the average rates of inflation.

If the former method is followed, the net growth rate is determined and comparison of different cases is easier than in the case of deflated net values. An example of deflated net values is given in Table 3. It was decided to take the average land price increases as the inflation rate.

TABLE 1 - Indices of net value in 15th year for both above-average and average firms expressed in terms of strategy 3, loan restriction 1 in the no-inflation case (100 = R985 573)

Strategy <sup>a</sup>	LR*	No inflation		Moderate inflation		High inflation		Total		Difference
		M1**	M2	M1	M2	M1	M2	M1	M2	
1	1	69	39	220	140	80	93	369	272	97
	2	58	34	209	118	71	(50)***	338	202	136
2	1	116	40	314	204	331	93	761	337	424
	2	114	34	314	202	264	(50)***	692	286	406
3	1	100	36	354	188	249	93	703	317	386
	2	104	37	338	220	297	-45	739	212	527
4	1	69	36	250	161	196	93	515	290	225
	2	81	37	259	170	108	27	448	234	214
5	1	100	36	354	188	249	93	703	317	386
	2	98	34	325	209	190	(50)***	613	293	320

a. The five different land-acquisition strategies can be summarised as follows:

1. Land only leased above fixed beginning amount.
2. Only cash purchases of land. Extra land may be leased.
3. Purchase and lease of land at every opportunity.
4. Land purchases only every 5th year. Additional land may be leased.
5. Land purchased only when liability:asset ratio is smaller than 0,5. Otherwise additional land may be leased.

\*LR = Loan restriction

\*\*M1 = Above-average managerial ability

M2 = Average managerial ability

\*\*\* Farm was sold and an index of 50 was taken arbitrarily (expressed as percentage of value with high managerial ability).

TABLE 2 - Strategies associated with highest net value with different inflation rates and managerial abilities

LR*	No inflation		Moderate inflation		High inflation	
	M1**	M2	M1	M2	M1	M2
1	2	2	3; 5	2	2	***
2	2	3; 4	3	3	3	2; 5

\*LR = Loan restriction

\*\*M1 = Above-average managerial ability

M2 = Average managerial ability

\*\*\* No difference between the 5 strategies

From Table 3 it can already be deduced that under the high inflation condition a farmer is worse off in real terms after 15 years than under a condition of no inflation. It also appears that strategy 2 (cash land purchases) fared best under the no-inflation and high-inflation conditions (R1 147 000 and R543 000 respectively). Under conditions of moderate inflation, strategy 3 (lease and purchase at every opportunity) yielded the best results. Under the moderate inflation condition the net value was considerably higher than under the other inflation conditions. Generally speaking, the real net value in the case of high inflation came to

just under 50 per cent of the value under the no-inflation condition. On the other hand, the moderate inflation condition (owing to relatively bigger product as well as input price increases) fared about twice as well as the no-inflation condition. The same observations can be made in respect of the deflated capital investment in Table 4.

In Tables 5, 6, 7 and 8 net growth rates for all situations dealt with over a period of 15 years are given. The effect of inflation on growth can clearly be seen from these tables. It appears that the nature of inflation, especially in so far as it changes relative price ratios, can benefit or harm the financial position of the farmer to such an extent that it can certainly be regarded as an especially important economic phenomenon. Although managerial ability is of absolutely decisive importance, especially under conditions of high inflation, it can be observed from the tables that high inflation had an eroding effect on the entrepreneur's capital position. Only the above-average entrepreneur was able to maintain a positive net growth rate under high inflation conditions. However, if it is borne in mind that this

TABLE 3 - Deflated net values in the 15th year of the above-average established firm (R1 000)

Strategy	No inflation		Moderate inflation*		High inflation**	
	Loan restriction		Loan restriction		Loan restriction	
	1	2	1	2	1	2
1	683,9	569,3	1 220,5	1 160,4	129,0	114,1
2	1 147,0	1 123,8	1 739,7	1 741,5	534,0	426,4
3	985,6	1 028,1	1 959,8	1 871,9	402,4	478,6
4	682,7	796,8	1 386,3	1 435,5	316,0	174,2
5	985,6	967,5	1 959,8	1 802,6	402,4	306,4

\* Moderate inflation deflated by 4,2 per cent

\*\* High inflation deflated by 13,8 per cent

TABLE 4 - Deflated capital investment in the 15th year of the above-average established entrepreneur (R1 000)

Strategy	No inflation Loan restriction		Moderate inflation* Loan restriction		High inflation** Loan restriction	
	1	2	1	2	1	2
1	683,9	569,3	1 220,6	1 160,4	445,5	386,8
2	1 147,0	1 123,8	1 740,6	1 741,6	695,0	584,5
3	985,6	1 028,1	1 961,6	1 871,9	443,5	537,1
4	682,7	796,8	1 386,3	1 435,6	458,1	561,5
5	985,6	967,5	1 961,6	1 803,5	443,5	454,3

\* Moderate inflation, deflated by 4,2 per cent

\*\* High inflation, deflated by 13,8 per cent

positive growth rate includes capital appreciation which is not realised income, it is to be expected that such a relatively low growth rate and high inflation rate may give rise to cash flow problems. It also appears that, with few exceptions, the more conservative loan restriction ought to be applied under all the inflation conditions.

Very high average net growth rates - considerably higher than under conditions of no

inflation - are obtained in the case of moderate inflation. In general, relatively higher net growth rates were obtained in the above-average beginner entrepreneur's situation than in the case of the established entrepreneur. This phenomenon must, however, be seen against the background of the lower beginning position of the beginner farmer and the concomitant faster growth. It is nevertheless remarkable that such high growth rates

TABLE 5 - Net growth up to the 15th year for above-average established entrepreneur (%)

Strategy	No inflation Loan restriction		Moderate inflation Loan restriction		High inflation Loan restriction	
	1	2	1	2	1	2
1	8,54	6,87	13,69	12,97	-4,09	-4,42
2	12,62	12,19	16,71	16,41	7,63	5,43
3	11,41	11,52	17,74	17,08	5,20	6,48
4	8,53	9,50	14,76	14,80	3,16	-1,90
5	11,41	10,99	17,74	16,71	5,20	2,65

TABLE 6 - Net growth up to the 15th year for above-average beginner entrepreneur (%)

Strategy	No inflation Loan restriction		Moderate inflation Loan restriction		High inflation Loan restriction	
	1	2	1	2	1	2
1	10,66	8,91	15,92	15,36	4,62	-7,51
2	14,21	12,83	19,26	19,01	10,08	8,12
3	12,84	12,79	19,41	15,27	4,59	4,90
4	11,87	10,85	17,30	17,39	4,59	5,90
5	12,84	11,76	19,41	19,58	4,59	4,68

TABLE 7 - Net growth rate up to 15th year for average established entrepreneur (%)

Strategy	No inflation Loan restriction		Moderate inflation Loan restriction		High inflation Loan restriction	
	1	2	1	2	1	2
1	4,81	3,54	10,74	9,08	-2,09	-
2	5,03	3,54	13,85	13,54	-2,09	-
3	4,39	4,41	13,17	14,45	-2,09	-15,29
4	4,39	4,41	11,86	12,31	-2,09	-11,41
5	4,39	3,55	13,17	13,79	-2,09	-

TABLE 8 - Net growth rate up to 15th year for average beginner entrepreneur (%)

Strategy	No inflation Loan restriction		Moderate inflation Loan restriction		High inflation Loan restriction	
	1	2	1	2	1	2
1	-	4,99	14,45	12,48	-4,18	4,41
2	-	4,99	17,19	16,91	4,90	4,41
3	-	6,19	17,07	15,75	-2,05	2,72
4	-	6,19	15,60	14,74	-2,05	2,72
5	-	4,99	17,07	15,75	-2,05	4,41

could be maintained.

In the case of entrepreneurs with average managerial abilities it appears that the established entrepreneur has a constant negative growth rate under high inflation conditions. In real terms, therefore, net value decreased annually by an average of 2,09 per cent. In general a lower net growth rate was maintained under moderate inflation conditions than in the case of the above-average entrepreneur. It appears that there is very little difference between the more conservative loan restriction 1 and the more liberal loan restriction 2.

The more liberal loan restriction 2 gives better results to the average beginner farmer in both the no-inflation and high inflation conditions (Table 8). Under moderate inflation conditions the conservative loan restriction gives better results, and strategy 2 appears to be the best strategy (17, 19 per cent). Under high inflation conditions, however, strategy 2 with loan restriction 1 gives the best results. This can be ascribed to cash land purchases. The positive growth rate with loan restriction 2 can be ascribed to the fact that no land was purchased and that all funds were made available for replacement of machinery.

Table 9 gives a clearer picture of the effect of inflation on net income as well as a partial explanation of the poor growth rates that were obtained under high inflation conditions. Using the relative price increases of products and inputs a break-even point was calculated in years after which input price increases overtake product price increases.

TABLE 9 - Break-even point for costs and incomes in years after which gross margin becomes negative under different inflation rates

Gross margin (%)	Inflation difference (%)			
	1 <sup>1</sup>	2,5 <sup>2</sup>	5,0 <sup>3</sup>	7,5 <sup>4</sup>
	Year			
60	96	40	20	14
50	73	30	15	11
40	54	22	11	8
30	38	16	8	6
20	25	10	6	4

1. Product price increases 4 %	Input price increases 5 %
2. Product price increases 6 %	Input price increases 8,5 %
3. Product price increases 8 %	Input price increases 13,0 %
4. Product price increases 9,4 %	Input price increases 16,9 %

It appears from Table 9 that the effect of an increasing difference between input and product price increases is considerable. Where a gross margin of, for example, 40 % is maintained, it takes 11 years in the case of a 5 per cent difference and only 8 years in the case of 7,5 per cent difference for the break-even point to be reached at the rates that are assumed. Once more the effect of inflation should therefore not be underestimated. If gross margin is taken as an efficiency level at a specific stage, it appears that in the case of an

above-average managerial ability and high gross margin it takes considerably longer to reach the break-even point. The lower the efficiency level, the sooner the break-even point is attained. As soon as the firm attains the break-even point, a negative operating gearing results after which losses increase quickly. This indicates that gross margins are already negative and that funds are required to finance this loss. If a loss is already experienced at the gross margin level, the loss at the NFI level is greater. Yield increases, savings on variable costs (as a result of less waste, more systematic administration and more research) and judicious financing and control appear to be possible solutions to this problem.

As the difference between the rate of growth of input prices and product prices increases (high inflation conditions), it is to be expected that the farmer's debt burden will also increase. Various growth strategies will, however, show different trends.

Tables 10, 11 and 12 show considerable differences in debt burden patterns over a period of time between the various strategies - notwithstanding similarities in net values between strategies 2, 3 and 5. The lease strategy (1) under the no-inflation and moderate inflation conditions resulted in considerably faster declines in debt burden than any of the other strategies. This state of affairs can largely be ascribed to the fact that no long-term loans were negotiated. The same observation can be made in respect of strategy 2, where no long-term loans are negotiated in respect of land purchases, and in respect of strategy 4, where land is purchased only every 5th year. Strategy 3, especially if it goes hand in hand with loan restriction 2, is aimed at early and fast land purchases. This leads to rapid initial accumulation of debt; after a longer period (10 years or more) the debt burden associated with this strategy/loan restriction combination with no or moderate inflation is not necessarily higher than with other strategies.

Table 12 deals with the high-inflation condition. Here the reference case (strategy 3, loan restriction 1) and strategy 5, loan restriction 1 showed the lowest debt burden at the end of the period. During the middle years all three the other strategies had a relatively lower debt burden and virtually the same net values. Debt obligations and debt burden remain in proportion, consequently they influence both the cash position and the net value. The relatively earlier land purchases associated with strategies 3 and 5 apparently resulted in higher debt obligations at an earlier stage where the negative effect of inflation was not yet as great.

## CONCLUSIONS

1. The bigger the difference between the increases in product and input prices (that is, the high-inflation condition), the more

TABLE 10 - Indices of total debt burden of various strategies and loan restrictions expressed in relation to reference case<sup>a</sup> (no inflation, above-average established entrepreneur)

Strategy	LR*	Year			
		1	5	10	15
		Reference case values (R1 000)			
		144,5	116,9	31,2	0**
1	1	100	43	9	0
	2	107	37	1	0
2	1	100	69	125	0
	2	107	27	53	0
3	1	100	100	100	0
	2	156	152	101	0
4	1	100	43	92	0
	2	156	66	45	0
5	1	100	100	100	0
	2	107	37	145	x

\*LR = Loan restriction

\*\*When the debt burden of the reference case is equal to 0, its index as well as the index of others with no debt burden is shown as 0. If there is debt it will be indicated by an x.

a) All values are expressed in terms of the reference case, strategy 3, loan restriction 1 so that an easy method of comparison can be obtained.

TABLE 11 - Indices of total debt burden of various strategies and loan restrictions expressed in relation to reference case (moderate inflation, above-average established entrepreneur)

Strategy	LR*	Year			
		1	5	10	15
		Reference case values (R1 000)			
		144,5	119,4	50,1	3,2
1	1	100	42	4	0
	2	107	48	17	0
2	1	100	48	36	0
	2	107	50	15	0
3	1	100	100	100	100
	2	156	183	43	0
4	1	100	42	23	0
	2	156	65	28	0
5	1	100	100	100	100
	2	107	97	101	40

\*LR = Loan restriction

important it becomes to maintain a high level of technical and financial management. This greatly increases the chances of survival especially if a conservative loan strategy is applied.

- According to the deterministic model the chances of survival for the average beginner farmer already appear to be very slim. Since a healthy establishment stage is of great importance to a young farmer, high inflation conditions can be a serious setback to his chances of survival.
- Inflation, especially the high inflation condition, where cost-push takes place, creates serious cash flow problems for all farmers. Expansion can only take place if sufficient cash is available. Expansion by means of

TABLE 12 - Indices of total debt burden of various strategies and loan restrictions expressed in relation to reference case (high inflation, above-average established entrepreneur)

Strategy	LR*	Year			
		1	5	10	15
		Reference case values (R1 000)			
		145,3	255,7	326,3	251,0
1	1	100	24	110	*770
	2	109	39	48	664
2	1	100	20	67	392
	2	109	15	43	385
3	1	100	100	100	100
	2	158	108	114	142
4	1	100	24	32	346
	2	158	35	77	943
5	1	100	100	100	100
	2	109	83	61	360

\*LR = Loan restriction

additional loans increases the pressure on cash flow since it creates additional obligations.

- Growth is explained largely by the characteristics of the assets that are obtained. An asset such as land is a hedge against inflation and it appreciates in value. The net value of the firm is therefore increased by unrealised capital profits and additional income earned from land. Assets which depreciate in value with additional use contribute to the net value only to the extent in which their yields are bigger than their costs. Although a depreciating asset such as machinery is as important as the land from a production point of view, its contribution to net value accumulation is smaller.
- When replacement costs of machinery and equipment increase at a speed at which the entrepreneur's product prices cannot keep abreast, intermediate-term loans may increase at a ratio beyond normal limits. Even if medium-term obligations can be met, the short-term debt burden increases. This trend also appears from the fact that loans from co-operatives and commercial banks jointly increased from R600,4 million in 1974 to R1 152,9 million in 1978.
- Financing of rising replacement costs while gross margin decreases results in the entrepreneur having to plan for survival and no longer for expansion. The fact that survival becomes the goal is of particular importance, since judicious cash management and management of the enterprise become more critical.
- Where risk and uncertainty, as reflected in price and yield variability, increase, the debt burden position and cash flow can be expected to deteriorate as will be shown in the next article.