

The practice of capital investment decision-making in South Africa

1 INTRODUCTION

One of the most important operational and in some cases also strategic business decisions is in respect of the investment of funds. This importance follows inter alia from increased technological developments, changes in consumer demands, increased competition, the crucial influence of capital investments on future profits, cash flows and liquidity, the irreversible characteristic of capital investments, the increased capital-intensive nature of modern production methods and the uncertainty of future gains.

To get a picture of the practice of capital investment decision-making in South Africa the 100 top quoted companies (in terms of total assets) which appeared in the Financial Mail top-100 list in 1971 were approached at the end of 1972. The biggest of these companies had total assets of approximately R290 million and the smallest of approximately R19 million at that time. Positive reactions were received from 57 of the 100 companies and of these 57 companies 48 were included in the investigation and were personally visited by the investigator.

Of the 48 companies included in the investigation 38 were classified as manufacturing companies and 10 as non-manufacturing companies being mainly in the trading field or in supplying services. The 48 companies which co-operated in the survey accounted for 70 per cent of the total assets in the Financial Mail list and 52 per cent of the total employees, an indication that the more capital-intensive companies showed greater interest in the survey than the less capital-intensive companies. The co-operating manufacturing companies were viewed as being representative of the Financial Mail list in respect of industrial spread, total assets, total employees, locality, local or overseas control, assets per employee and fixed assets in relation to total assets.

The required information was gathered by means of a questionnaire which had been tested on four major unquoted companies. The emphasis in the questionnaire fell mainly on capital budgets and systems, financial evaluation methods, the cost of capital and risk in the evaluation of capital projects. The interviewees were mainly financial directors/managers or managing directors.

The major results of the research are first summarized for the 38 manufacturing companies. Subsequently the results for the non-manufacturing companies are compared with the results for the manufacturing companies.

2 CAPITAL BUDGETS AND SYSTEMS

Approximately 95 per cent of the manufacturing companies compiled annual budgets while 92 per cent of them compiled long-term capital budgets. The long-term planning period varied between a time horizon of two and 20 years with 60 per cent preferring five years.

Most of the companies with planning periods longer than five years were able to justify the length of the planning period while the majority of long-term planners (65 per cent), gave only vague reasons for the specific planning period, e.g. it was the most realistic period or high risk and uncertainty. It appears that the more planning orientated a company was, the longer was the planning period.

Standard procedures for proposals were followed by 84 per cent of the surveyed companies where standard request forms were in use. These standard forms were mainly concerned with information in respect of proposed projects, estimated investment amounts, department (or departments) involved and reasons for the investment.

The expected investment amounts for evaluation purposes were principally based on prices quoted by suppliers, installation costs and additional current assets less residual values of assets replaced. The inclusion of additional current assets required in the total investment amount was a very satisfactory aspect.

In calculating expected benefits, profits as well as cash flows were used by the greater part of the manufacturing firms sampled (74 per cent). The firms which used only profits in calculating expected benefits were relatively small in respect of total assets and total employees.

In estimating project lives the practice differed to a great extent. The number of firms which used only the physical life of assets (10 firms) without looking at technological and sales lives was prominent. A personal impression was that project lives were based to a great extent on subjective estimates.

Approximately 40 per cent of the sampled companies ignored residual values of new assets in evaluating proposed investments. Approximately 25 per cent of the firms determined residual values by using subjective forecasts. This was an aspect which could have been looked into to improve the reliability of financial evaluation.

An alarming finding was that financial evaluation was not applied in quite a number of firms (approximately 30 per cent of the sample) for replacement decisions. Financial evaluation could have been applied to determine the optimal time for replacement and to differentiate between alternatives with different investment costs.

The financial departments in the majority of firms (80 per cent) were responsible for financial evaluation while with 50 per cent of the firms sampled, committees were used to assist in financial evaluation. It is of significance that in quite a number of firms (50 per cent), the originating departments were not represented on these committees.

All the co-operating firms which compiled annual capital investment budgets controlled the investment

amounts by progress reports. The periods between consecutive comparisons of actual and budgeted figures were: monthly (67 per cent), two-monthly (3 per cent), quarterly (25 per cent) and once after completion (5 per cent). In the majority of cases attention was paid to budgeted figures, costs to date, revision of budgets, estimated completed costs and variances. More attention could have been paid to the estimated timing of investments, completion dates and reasons for variances in the formal progress reports.

The majority of the co-operating companies had no fixed policy in respect of the re-evaluation of rejected projects. Re-evaluation occurred mainly on an accidental basis.

3 FINANCIAL EVALUATION METHODS

The application of the different evaluation methods by the co-operating companies can be summarised as follows:

| <i>Method</i> | <i>% of co-operating companies</i> |
|--|------------------------------------|
| Priority rating | 82 |
| Accounting (average) rate of return | 74 |
| Payback period | 63 |
| Discounted cash flow (Internal rate of return) | 76 |
| Net present value | 18 |
| MAPI | 3 |
| Annual cost | 0 |
| Net terminal value | 0 |

The percentages for the discounted cash flow and net present value methods compared very favourably with available figures for the UK and USA. The percentage of companies controlled from overseas and which applied the payback, discounted cash flow and net present value methods, was higher than the comparable percentage for locally controlled companies. The converse applied for the priority rating and accounting rate of return methods. Another interesting fact was that the net present value method was mainly applied by the bigger firms (in terms of total assets and employees). The accounting rate of return and the discounted cash flow methods were mainly used as primary evaluation methods, i.e. in 39 and 76 per cent of the cases respectively where they were applied, while the other methods were mainly used as secondary methods. The discounted cash flow method was preferred to the net present value method by 93 per cent of the companies who applied it mainly because it gave a result in terms of a percentage.

It was informative to compare the primary company objectives with the primary evaluation methods of the co-operating companies. Of the companies which applied the discounted cash flow method as a primary evaluation method, about 40 per cent formulated their primary company objective in terms of earnings per share only and about 50 per cent only in terms of average rate of return. This phenomenon appeared to point out a contradiction because it is a well-known fact that there can be considerable differences between a discounted rate of return on the one hand, and an average rate of return or earnings per share on the other hand.

The priority rating method was mainly applied for replacement investments where decisions were taken on the basis of the physical condition of assets. The

method of the accounting rate of return was applied to a great extent correctly, except that about 50 per cent of the companies which applied it ignored the effect of income tax. This practice could have had a detrimental effect on the ranking of projects with different investment amounts (where the ratios of fixed assets to total investment amount were different) and consequently different investment allowances. This method was applied mainly because it was relatively simple and was easily understood.

The payback method was applied incorrectly in quite a number of cases. The most common mistakes were the use of profits instead of cash flows (42 per cent), the exclusion of costs of financing (60 per cent), the exclusion of income tax (20 per cent), the treatment of all investments as initial investments without discounting (60 per cent), and the subjective determination of the critical payback period (70 per cent of the companies did not have any criteria). The payback period method was applied mainly because it was easy to calculate and to understand and because it was an excellent risk indicator in situations of political and environmental uncertainty.

In calculating cash flows to determine the discounted cash flow rate of return, approximately 25 per cent of the companies deducted interest and consequently the effect of interest was taken into account twice, i.e. in the cash flow and the cost of capital. The major reason for the application of this method was the inclusion of the time value of money. Approximately 50 per cent of the interviewees who used this method were not aware of the possibility of multiple yields. The majority of the interviewees who were aware of the possibility of multiple discounted rates of return did not know under which circumstances this situation could arise.

The discounted cash flow method was used by 50 per cent of the companies who applied it for ranking purposes. In 60 per cent of these cases the project with the highest yield was preferred irrespective of different initial investment amounts or project lives. The other companies applied the incremental method which was theoretically the correct procedure.

Another interesting finding was that about 90 per cent of the interviewees who applied this method were aware of the implicit assumption that interim cash flows were re-invested at the yields calculated and 50 per cent of them thought it to be a realistic assumption. The majority of the interviewees who thought that it was not realistic did not make any adjustments. The same position applied in respect of the effect of accepted projects on earnings per share. Approximately 86 per cent of the interviewees agreed that evaluation of projects according to this method could cause fluctuating earnings per share due to the difference between cash flows and profits but the majority of them did not endeavour to overcome this obstacle.

About 86 per cent of the companies which applied the net present value method preferred it to the discounted cash flow method.

The company which applied the MAPI-method was quite satisfied with the results. This method was applied to evaluate replacement methods and was adopted after a careful investigation into the assumptions of the original method and after certain adjustments.

It was surprising that the majority of the interviewees

were not acquainted with the net terminal value, annual cost and MAPI-methods.

Approximately 74 per cent of the co-operating companies did undertake a post-audit evaluation. The majority of these companies, however, undertook such an evaluation on a selective basis, mainly for bigger projects. About 60 per cent of the companies who undertook a post-audit, started only after the completion of the projects concerned. The most common frequency of control was annually and once after completion. Serious problems were experienced in post-audits, e.g. because new projects were integrated into the present company structure, and in determining the reasons for variances.

4 COST OF CAPITAL

The cost of capital of the co-operating companies varied between 10 and 20 per cent after tax at the time of the interviews. It was very difficult to give an exact classification of the companies in respect of the extent of the cost of capital because the cost of capital varied over a certain range in most of the cases. In approximately 50 per cent of the companies, it varied between 10 and 15 per cent after tax and in the other companies between 15 and 20 per cent after tax.

The most common methods for the calculation of the cost of capital was experience and subjective evaluation (37 per cent), weighted cost of capital (24 per cent), profitability allowed by the Price Controller (11 per cent) and the present profitability compared with other companies (11 per cent). The remainder of the interviewees were not quite certain of their practice.

In applying the weighted cost of capital method, six of the nine companies used the present capital structure for weighting purposes and three the expected structure. Market values were used by five companies to determine the weight for ordinary share capital while four companies used book values. Four of the companies indicated that they would accept a project with a yield higher than the present interest rate but lower than the weighted cost of capital if the project could be financed with loan capital; the so-called partial financing principle.

Earnings per share were preferred by seven companies and dividend per share by two companies while eight companies preferred market values and one company book values to calculate the required rate for ordinary share capital. The determination of the required rate of return for the other forms of financing did not create serious problems.

In the cases where the cost of capital was estimated in terms of experience and subjective evaluation no definite method, approach or policy was indicated. The following justification was common: "A profitability of 25 per cent after tax is too high and could lead to new competition, 10 per cent after tax is too low because it does not compensate the firm for risk. Therefore, the cost of capital should be between 10 and 25 per cent after tax."

5 RISK AND THE FINANCIAL EVALUATION OF PROJECTS

The most important risks confronted by the companies surveyed were market and sales volumes (79 per cent of the companies), economic fluctuations (24 per cent) and selling prices (18 per cent). The major methods

applied by the companies to evaluate project risks were the sensitivity method (53 per cent), the payback period method (37 per cent), the method of the risk adjusted discount rate (34 per cent) and the method of conservative estimates (32 per cent). The probability approach was hardly applied and 18 per cent of the companies indicated that they applied no formal risk evaluation methods. The major methods used to evaluate project risk were applied on a subjective basis, e.g. the determination of a criterion for the payback period and the adjustment of discount rates or estimates.

Approximately 60 per cent of the companies indicated that the portfolio risk of major projects was considered. The most important ways to determine portfolio risk were to estimate the long-term effects of projects on a company (50 per cent of the companies which estimate portfolio risk), the comparison of the amounts invested in different products (18 per cent) and to estimate the influence of major projects on future earnings per share (13 per cent).

6 INVESTMENT PRACTICES OF NON-MANUFACTURING COMPANIES

In this section the most important investment practices of the non-manufacturing companies are compared with those of the manufacturing companies. It should be remembered that the number of manufacturing companies surveyed (38) was considerably more than the non-manufacturing companies (10).

The general impression was that the investment practices of the manufacturing companies were more sophisticated than those of the non-manufacturing companies. This conclusion follows from the following differences in practices:

- (1) A greater proportion of manufacturing companies compiled annual capital budgets (95 per cent against 80 per cent) and long-term capital budgets (92 per cent against 60 per cent).
- (2) Approximately 24 per cent of the manufacturing companies compiled budgets for a period longer than five years whereas no evidence of this practice was found in non-manufacturing companies.
- (3) Standard capital request forms were used by 84 per cent of the manufacturing companies and 40 per cent of the non-manufacturing companies.
- (4) Residual values were estimated to a greater extent by the manufacturing companies (58 per cent) than by the non-manufacturing companies (20 per cent).
- (5) Discounting methods were used to a greater extent by the manufacturing companies (76 per cent against 20 per cent for the discounted cash flow method and 18 per cent against nil for the net present value method).
- (6) Post-audits of estimated rates of return were carried out by 74 per cent of the manufacturing companies and by only 60 per cent of the non-manufacturing companies.
- (7) Approximately 24 per cent of the manufacturing companies used the weighted cost of capital approach whereas none of the non-manufacturing companies used this approach.

- (8) Portfolio risk was estimated by 60 per cent of the manufacturing companies and by only 20 per cent of the other group.

7 CONCLUSIONS, COMMENTS AND RECOMMENDATIONS

The capital budgeting system of the average co-operating companies was satisfactory. The major shortcomings were the subjectivity in determining the periods for long-term planning and in estimating project lives and residual values, the exclusion of qualitative aspects in request forms, the exclusion of representatives of originating departments in evaluation committees and the absence of a fixed policy for re-evaluating rejected projects.

In respect of financial evaluation, it was satisfying to note the extent to which discounting methods were applied. The net present value method which is theoretically superior to the discounted cash flow method was not applied so widely but it was applied more correctly from a theoretical point of view than the discounted cash flow method. It appeared that quite a number of the companies which applied the discounted cash flow method regarded it as the solution of their capital investment problems without taking into account the implicit assumptions and the pitfalls of this method. A financial evaluation method ought only to be used to assist management in the decision-making process and not as a final criterion.

It was striking that despite the fact that a number of the co-operating companies considered the payback period method easy to apply, it was wrongly used in many cases. Other important conclusions in respect of the financial evaluation methods were that certain methods which were well-known in theory were not known in practice and that often a contradiction between company objectives and the application of financial evaluation methods existed.

The cost of capital was to a great extent calculated in an unsophisticated manner as could be seen from the fact that about 37 per cent of the co-operating companies indicated that it was estimated by way of experience and subjective evaluation. Only 24 per cent of the co-operating companies indicated that they applied the weighted cost of capital approach. Amongst these companies there was no unanimity in respect of the capital structure to be used, the calculation of weights (market or book values) and the cost of capital where a project can be financed with a specific type of capital, e.g. loan capital.

The co-operating companies provided for project risk mainly by making subjective decisions, e.g. adjustments of discount rates or estimates and the determination of a criterion for the payback period. Sophisticated techniques were hardly applied to provide for project risk. It was also striking that portfolio risk was ignored to a great extent by the co-operating companies.

The investment practices of the manufacturing companies were more sophisticated than those of the non-manufacturing companies. This difference could have arisen from the phenomenon that most of the investments of the non-manufacturing companies were of an expansion type, e.g. the opening of new branches or the extension of services. These were normally big

projects but there was a high correlation between the new and the present projects. Non-manufacturing companies were also confronted with fewer proposals and they consequently did not need standard procedures to the same extent as manufacturing companies. A high proportion of the expansion investments was in respect of current assets which are normally not included in capital investment budgets. Other reasons for the difference between the investment practices of manufacturing and non-manufacturing companies were the higher turnover of assets in non-manufacturing companies and consequently lower risk, and a lower sensitivity in the case of non-manufacturing companies to technological developments.

There are a multitude of reasons for the gap between theory and practice in financial evaluation methods, in the calculation of the cost of capital and in providing for risk. **Firstly** satisfactory historical results, in spite of unsophisticated investment methods, cause resistance to improvement. **Secondly** the additional cost of developing and applying scientific methods is a retarding factor. **Thirdly** managers are frequently unwilling or unable to use modern scientific techniques. **Fourthly** there is resistance to change amongst managers, e.g. they become used to interpreting financial results in terms of a percentage and do not want to change to the use of the net present value method. **Fifthly** theory very often concentrates on aspects which are rare or not important in practice, e.g. the determination of a criterion for the payback period method where practice is not interested in an explicit criterion. **Lastly** modern techniques of financial management are sometimes not covered by teachers of the subject.

To narrow the gap between theory and practice in the field of capital investment certain recommendations can be made. **Firstly** information from more firms (including smaller undertakings) regarding capital investment decision-making in practice needs to be gathered. **Secondly** linkage and co-operation between theory and practice must be encouraged. This can be achieved by means of courses presented by university personnel to representatives of the corporate sector. The Department of Business Economics of the University of Stellenbosch has presented courses to specific firms in the past with great success. Co-operation can also be improved by firms supplying academic personnel with material for case studies, by inviting such personnel to decision-making sessions and by offering the help of their specialised staff to universities. **Thirdly** changes in the structure of education in financial management at universities must be made. The inter-disciplinary approach should be adopted to a greater extent and techniques from other disciplines, e.g. mathematics and statistics, should be incorporated into courses. **Finally** manuals for capital investment systems must be compiled. This will encourage a standardisation of approach in the field of corporate investment.

References:

- 1 This article is based on Lambrechts, I. J.: "Kapitaalinvesteringsmetodes: Teorie en praktyk soos toegepas deur 'n aantal vooraanstaande Suid-Afrikaanse ondernemings." Unpublished thesis, University of Stellenbosch, 1974. The research was completed with financial assistance from the Human Science Research Council. A summary of the findings also appeared in *Management*, October 1975, page 39-43.