

The planning of project finance

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No experienced manager of a business would deny the essential need for financial planning any less than the programming of the work itself, and the Author attempts to illustrate such a process for a small to medium sized firm in the construction industry. This technique has now long been taught in management courses and described in publications to bring the uninitiated to a realization of how the money goes, and hopefully, where it may come from.

29. Unfortunately contracting, small or large, does not follow the hypothetical Utopian situation of the Author's examples: in § 19 he aptly says that 'the excess has not been occasioned by lack of planning, but rather because of circumstances outside the contractor's control'. Common among such circumstances are that tender documents seldom arrive when forecast, contract awards are delayed, and the loser is often never informed, and no definite date is given for the start of work.

30. To cope with this, enlightened contractors have had to adopt flexible planning and the use of computers. The opportunity to employ more rigid planning would make the planning of project finance more realistic and no doubt reduce the large number of bankruptcies in the construction industry, especially among the smaller firms of the kind the Author describes.

31. The Paper would be the more relevant had he illustrated the erratic nature of awards and start of works when £6719 nett profit (less 45% tax for a £90 000 turnover) would show the business not to be viable. This of course should be one of the main purposes of planning with finance: the test of viability.

Mr W. B. Jepson, Department of Building, University of Manchester Institute of Science and Technology

It can rarely be all the same to a supplier that a consumer should adopt extended credit terms. He also must plan his flows of cash and will surely quote in such a way that he does not favour those who saddle him with a large slice of their over-draft.

33. Discount for cash is not the only benefit of prompt payment. Surely anxiety to be of service is scaled according to the value placed upon the continuance of custom. It may well be that a general swing towards the extension of credit could cause suppliers to reduce their stock-holding capacity, leading to local shortage, emphasizing the benefit of preference extended to some consumers, and requiring the others to hold additional stock to ensure supplies. Credit policy must surely be flexible and reflect the nature of the market for essential materials.

34. Dr Higgin¹ has stated interdependence and uncertainty to be characteristic of building. The former warns us against the assumption of simple variables and the latter reminds us that, in a state of complete uncertainty, forecasting fails by definition. How far then Mr Parker's techniques are practical depends upon the validity of the forecasts and the reaction time of the control system onto which they are grafted.

35. May I add that planning derived from a technique such as critical path analysis assumes a tactical rigidity proportionate to the detail with which activities are identified in sequence in the plan. The object of a critical path is however to gain operational control and the greater the superstructure of associated procedures erected upon such a plan the less flexibility becomes tolerable.

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36. It would seem perhaps most profitable to experiment in this field where there is a marked element of repetition in the project.

Mr N. M. L. Barnes, Department of Civil and Structural Engineering, University of Manchester Institute of Science and Technology

The Paper sets out the basis of planning to make the best use of a contractor's capital. Mr Parker's examples illustrate very clearly that a company's financial status is very sensitive to varying periods of delay in the payment of certificates: delay in payment is shown as the strongest single influence on the contractor's financial status since it affects the whole of his turnover. Variations in the period of delayed payment of outgoings such as plant, labour and material costs, are individually less influential since they only affect a portion of the turnover.

38. The Banwell and Harris Reports exhorted the construction industry to try to achieve a 'better cash flow to the contractor'; the figures in this Paper show the effect that such improvement in cash flow can have. It is significant that, in the examples which Mr Parker gives, when the period of certificate payment is reduced from 60 to 30 days, the profit on turnover increases in one case by $\frac{1}{2}\%$, and in the other case by 1% . Where strong competition between tenderers exists, these percentages represent the maximum saving which a client might expect to achieve by undertaking to reduce the payment period by 30 days. They derive from the hypothetical figures used in the Paper, but can be generalized by using the following relationship.

39. If the period of payment of certificates is reduced, then the percentage effect on contractor's cost equals the interest rate on contractor's borrowing $\times$ reduction in delay period (in weeks), divided by 52. For example, if the interest rate is $9\frac{3}{4}\%$, and certificates can be paid two weeks earlier, the saving is $9\frac{3}{4} \times \frac{2}{52} = \frac{3}{8}\%$, or £3750 on a £1 million contract. This assumes that the contractor has a debit balance on his operating account throughout the contract period, as in the examples given in the Paper.

40. As the Paper shows, accelerated cash flow has a more significant effect on the demand for capital generated by an individual project than it does on the net profit of each project. Acceleration will benefit the contractor most if he is operating close to his overdraft limit, or is controlling his operations on the basis of a planned internal rate of return rather than a planned profit on turnover. Acceleration will benefit the client if it has a reducing effect on tender sums, and then only if the client's arrangements for obtaining money to pay the contractor's certificates do not involve paying interest charges of the same order as those incurred by the contractor.

41. Mr Parker's figures show that overdrafts can be reduced by improved cash flow. For the three cases he considers, the overdraft reduces from 53% to 33% of the contract sum when the payment period reduces from 60 to 30 days. As before, these figures are for the hypothetical case used, but can be quite simply generalized for a real project. The effect on maximum overdraft of a reduced payment period is equal to the contractor's rate of spending at the time of maximum overdraft $\times$ the reduction in payment period being considered. Using the same example again, if the period of payment can be reduced by two weeks, the maximum overdraft will be reduced by £20 000, if the rate of spending is £10 000/week at the time of maximum overdraft. The figures would be of this order for a £1 million contract with a two year contract period.

42. A difficulty which is experienced with many financial forecasts is, of course, that the reality will often speedily diverge from the forecast. Effective use of forecasts requires that they should be capable of easy revision to take account of variations in work content, in programme, and in cost. Without regular revision of the financial planning graphs which are described in the Paper, unforeseen peaks in capital requirement are still likely to occur. Such revisions of calculations are so

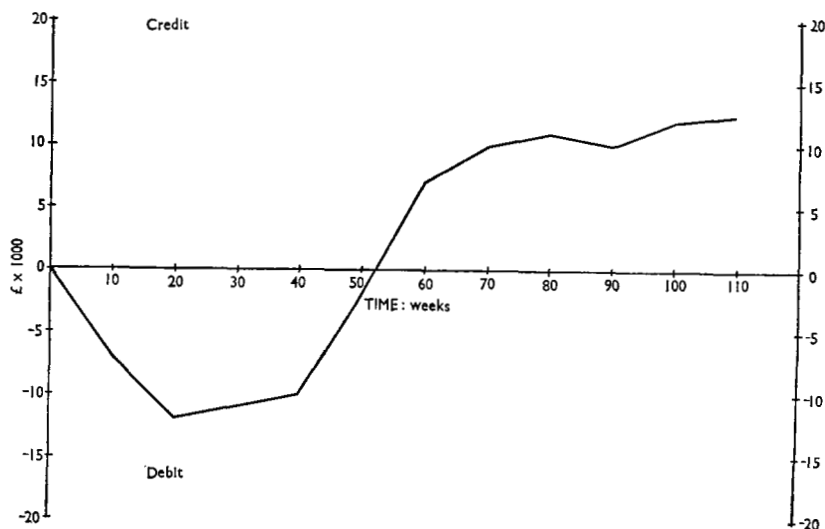


Fig. 8. Barchester Bridge: income and expenditure vs time

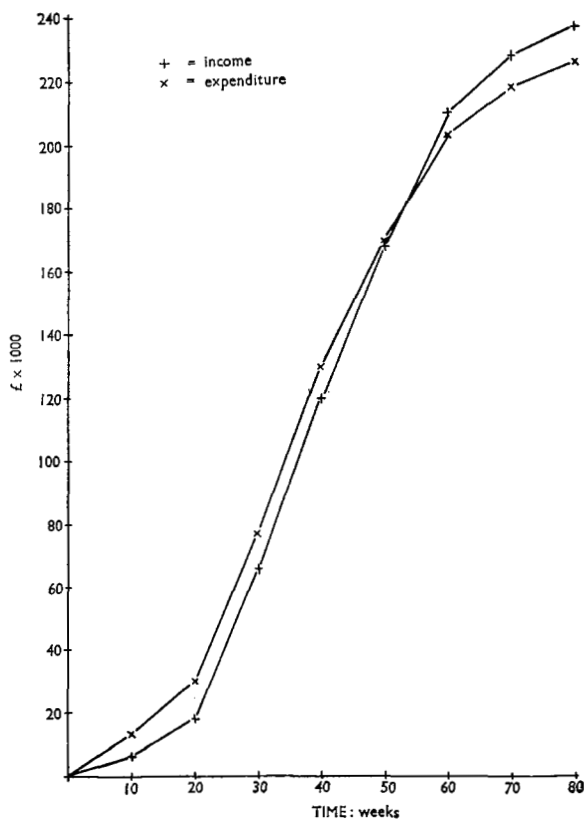


Fig. 9. Difference between income and expenditure

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time-consuming that they are unlikely to be done regularly unless a computer can be used. Figs 8 and 9 illustrate a form of output from a computer programmed to perform calculations similar to those used in the Paper; being capable of easy revision, their use might add to the reliability of the type of financial planning discussed.

43. The input comprises data taken from the programme for the project, from the Bill of Quantities, and from the estimate build-up. Payment delay period and retention characteristics are also specified for each category of payment. The payments are normally divided into categories of valuation: plant, labour, material, overheads, and a category for each sub-contract. A cumulative payment forecast is obtained for each category specified. The output consists of a tabulation of these forecasts, or an automatically plotted graph. Fig. 8 shows total income and total expenditure plotted in this way. Fig. 9 is the difference between income and expenditure, indicating the forecast overdraft for the project. These graphs were produced from a set of hypothetical figures by an IBM 1627 Mark II Plotter. An off-line plotting machine can also be used.

Mr Parker

Mr Harris is correct in that management courses do provide techniques for financial planning. These techniques are, in general, based on the principle of 'cash flow' as far as the overall financial position of the company is concerned and have been used in other forms to provide some idea of the movement of money when preparing quotations for work. Other techniques include the 'cost estimate' and its variations, yet few, if any provide a system of project financial planning which can be linked easily to the critical planning of the project. The Paper outlined a method of planning which will allow for this to be done.

45. The CPA method of planning projects and industrial production arose out of the need to become fully aware of how the labour, plant and material resources were to be used in order to keep within a time schedule, yet even this method of planning has to be modified in the light of actualities and it is seldom that any manager can say that the initial planning is the way the project will be undertaken. Mr Harris has given some of the reasons for this in his comments, but in spite of this no person would reject such planning. Exactly the same arguments apply to the critical planning of project finance; the original plan may need to be amended as the work proceeds but it still forms the basis of the movement of the financial resources and allows for the early adjustment of the programmes (work and finance) before it becomes too late to do anything but to try to obtain 'extras' to offset the losses arising from inadequate financial planning.

46. Mr Harris's remarks concerning unsuccessful tenderers not being informed is surprising. It has been my experience in contracting that such information is forthcoming, together with a list of the actual tender prices, although obviously not the names of the tenderers, and from this one is able to assess the percentage figure by which the tender was lost. This information then provides very important data for future tendering and if this is not being requested and used by Mr Harris then I would suggest he is without one of the useful tools for estimating.

47. Although these are difficult times for the contracting industry and the opportunity of obtaining 'cost-plus' contracts is very rare, smaller firms are still able to work profitably, are still able to obtain contracts in competition with others, and are still able to cope with 'the erratic nature of awards'. Most contractors have long since assessed the percentage success of their tenders and plan accordingly (many of them also use the percentage adjustment basis of tendering by reference to the results obtained from past tendering, already mentioned above). To have gone into details regarding the awarding of contracts and the starting dates for work would have required a much longer paper and would have detracted from the essence of it,

namely the *critical* planning of finance at the same time as the *critical* planning of the work programme, for the project. Similarly the viability test, as applied to the financing and the financial standing of a business is but one test; there is also the test of the validity of the tender and this can only be determined by the actual planning of *all* the resources and not just the prime cost ingredients.

48. Mr Jepson's comments are interesting because they direct attention to the fact that the structure of our society and industry is based on credit. Although the ideal is for the individual (and industry) to be able to pay his way without resorting to credit, increasingly over the past few years our financial structure has tended more and more towards the 'creditworthiness' of the customer as the yardstick in determining the amount and extent of credit to be granted.

49. The anxiety to be of service is not conditional on the payment of cash but rather on the ability of the company to fulfil its financial commitments and obligations over a period of time; the extent of that time period or length of credit being related to the efficient manner in which the customer company conducts its affairs. All companies are saddled with a large share of others' overdrafts and this process has become an accepted method of trading. The general swing towards extended credit has been going on since the last war and over the past few years has speeded up considerably. It must be remembered that the fewer liquid assets are available the more credit becomes the means of conducting business transactions. Stock holdings do not tend to fall off because of the lack of ready money but rather because of the variation in the demand, a variation which need not be associated with a fall in the work load but rather to the use of alternative, and new, materials. There are many reasons for stockholding variations and the lack of available financial liquid resources does not head the list. If it did and in the extreme, very little stocks would be held by suppliers at the present time.

50. Not having read Dr Higgin's book, one can only ask in what context the state of interdependence and uncertainty is to be judged. This state exists in all industries—nothing is certain until the signed order has been placed or the contract signed—yet this does not detract from the highly desirable need to plan the financial aspects of any project. Finance is but one of the resources and must be planned with them. The techniques suggested in the Paper lend themselves to being linked with a critical planning system, although not so easily to CPA network planning. Critical planning, using the Gantt or bar chart, has been clearly set out in textbooks and the financial planning system set out in the Paper can be adapted to this method with little adjustment.

51. Mr Barnes's reaction to the Paper is interesting and I would agree that possibly the strongest influence on the contractor's financial status is the speed with which he can recover the money he has spent on the project; the quicker he can obtain payment the sooner he can finance more work and the better his turn-over becomes. Yet it must not be overlooked that finance is but one of the resources of the contractor and in consequence, unless planned in this context, the planning is incomplete.

52. I have to thank Mr Barnes for his interesting contribution. It emphasizes the benefits of planning and of the need for the chief executive to be fully informed of the variations in the programme which may affect him financially. Without financial planning he would be in difficulties. The Paper sets out a simple manner of doing this with, at the same time, easy means of relating it to the planned programme for the work.

53. Computerized control is indeed beneficial to any form of planning, but unless the contractor is sufficiently large to afford the cost of a computer or can afford to pay for time on a collectively owned machine then it is not of great help to him. However this does not detract from the example put forward by Mr Barnes. Fig. 9 is interesting since it shows the point at which the project is expected to move out of the red. However it must be kept in mind that each operation must make its

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share of the profit and it is for this reason that financial planning must be undertaken at the same time and included with the work planning of the project. Each project can then be indicated such that each operation is linked on the critical planning chart with its cost: the cost of each operation is critical even though the operation may not be. It is by so planning the financial aspects of the project that the chief executive is able to see where operations are costing more than planned and he can take remedial action without delay, as well as determine quickly the reason for the over-expenditure; the work may have been completed on time but it may have cost more to do the work. Without an integrated financial/work planning schedule or chart, the busy chief executive would be unaware that although the work was proceeding according to plan, the finances were not. This is the essence of planning finance for projects: to know that the best possible use is being made of the resources available.

54. The contributors' comments have been most useful in emphasizing the need for planning in respect of finance and in the need to apply the tests of viability and validity, which have long been accepted in the sciences but which tend to be overlooked when considering the use of finance for projects.

Reference

1. HIGGIN G. W. and JESSOP W. N. *Communications in the Building Industry*. Tavistock Institute of Human Relations, London, 1965.