UNIVERSITY OF QUEENSLAND PAPERS

The Theory of Profit Determination on Long Term Contracts and an Appraisal of Australian Practice

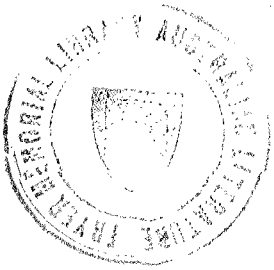
BY

G. W. BECK

DEPARTMENT OF ACCOUNTANCY

Volume I Number 3

UNIVERSITY OF QUEENSLAND PRESS
ST. LUCIA



The Theory of Profit Determination on Long Term Contracts and an Appraisal of Australian Practice

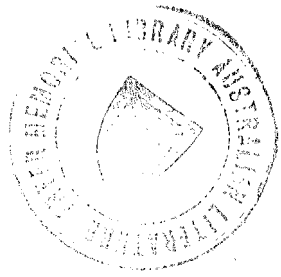
by
G. W. BECK

Price: Four Shillings

University of Queensland Papers
Department of Accountancy
Volume I Number 3

THE UNIVERSITY OF QUEENSLAND PRESS
St. Lucia

2 February 1965



WHOLLY SET UP AND PRINTED IN AUSTRALIA BY
WATSON FERGUSON AND COMPANY, BRISBANE, QUEENSLAND
1965

REGISTERED IN AUSTRALIA FOR TRANSMISSION BY POST AS A BOOK

CONTENTS

THE THEORY OF PROFIT DETERMINATION ON LONG TERM CONTRACTS AND AN APPRAISAL OF AUSTRALIAN PRACTICE

1. PRELIMINARY CONSIDERATIONS

Introduction

Industrial enterprise engaged on work to special order for which a firm price must be tendered comprises a large proportion of the business volume in the Australian economy. It appears to be impossible to assess the proportion with precision because of the wide range of work carried out on this basis. Contracting is common not only in the building construction industry but in light and heavy engineering, fabrication, civil engineering, plant installation, and even in some service industries. There are numerous fringe areas of business which engage, in part at least, in contracting. The relative importance of this type of business in the economy makes it essential that accounting and reporting procedures be founded on sound accounting theory and it is therefore surprising that both in this country and overseas there has been comparatively little attention given to the special nature of contract accounting. In July 1959 a committee of the American Institute of Certified Public Accountants stated: "Although the construction industry ranks as one of the largest in volume of

business in the United States one finds few authoritative treatises on the application of generally accepted accounting principles to the construction industry."[1]

Several problems exist in contract accounting that are common to accounting for many types of business. Treatment of special income tax allowances, price level changes, allocation of overheads, and the merging of interests are examples of these. In this study, however, attention will be concentrated on a problem which appears to be both of prime importance and specific to contracting—the determination of contract profitability when work extends over more than one accounting period.

The significance of the accounting period

Accountants have adopted a convention that for accounting purposes the economic life of a business can be divided into a series of equal periods. In a completely rural economy where a cycle of seasons makes up one year, it is logical and reasonable that a review be made at the end of each cycle and each year is thus a suitable accounting period. In industrial economies, the accounting period of one year is purely artificial. It bears little or no relationship to a cycle of business activity and the use of the convention is an impediment to sound accounting.

The *raison d'être* of the convention is therefore to be found not in logic but in the social framework within which industry functions. Brief consideration of the social factors that make the retention of the accounting period convention necessary is worthwhile.

The so-termed "private enterprise" economy in which business is initiated by capital subscribed by individuals creates a responsibility on the part of the accountant to report to these individuals on how and how effectively this capital has been applied. The growth of the limited liability company with widely diffused capital sources and the complete divorce of ownership from management has increased this responsibility. The need to report on a uniform time basis for all businesses becomes obvious in these circumstances. As no other period has the definitude of the calendar year this has continued to be used as the accounting period. Two major factors have reinforced this continued use. Firstly, there is the social convention of individuals using twelve calendar months as a basis of reference for income purposes. This causes shareholders to expect that companies will also ascertain profits annually and distribute dividends at least annually. Secondly, there has been the recognition of the year as a basic accounting period by statutory authorities, notably in legislation dealing with governmental revenue collection and social control of business units.

It thus appears that accountants must accept the use of artificial periods in the life of a business in spite of its obvious deficiencies from an accounting point of view. The convention is, however, extremely troublesome in the accounting for contracts. It is the fundamental cause of the difficulties in assessing profit on long term contracts, for if the accounting period matched the term of the contract no problem would exist.

Definitions

The following definitions make explicit the meaning of words or phrases used throughout:

"Long term contract" will be used specifically for contracts that are on a fixed-price basis and for which work will extend over more than one accounting period. Work carried out on the basis of cost plus a percentage of cost which represents profit is excluded, because profit is simply calculated in these circumstances, provided the cost collection and recording procedures are satisfactory. In addition, discussion

---

[1]*Generally Accepted Accounting Principles for Contractors.* (New York: American Institute of Certified Public Accountants, 1959), Foreword.

is intended to relate only to long term contracts of material amount. A business organization engaged on a large number of small value and consequently short duration contracts is not considered to be significantly affected by the period convention, even when some of these contracts are carried out in more than one accounting period.

"Contract revenue" is the total tendered contract price which will be received by the contractor.

"Contract costs" are all costs assigned or assignable to the contract.

"Progress claims" are demands for payment by the contractor whilst the contract is still in progress. The claims are usually equal to the value of work or work and materials "certified" to be done or on hand by the contractee's professional adviser such as an architect or consulting engineer.

"Retentions" are amounts withheld by the contractee after the contract is completed. The period of retention is invariably set out in the contract document.

"Warranty" is an undertaking by the contractor that the work carried out is of such standard that certain minimum service will be received from the item constructed or the work done. In the event of this service not being received the contractor incurs certain liabilities which usually include rectification but may include replacement.

A "contractor" is a business unit which embarks on the performance of long term contracts as defined above, and a "contractee" is a person or business unit that agrees to pay the contract revenue in return for satisfactory completion of contract work by the contractor.

II. PROFIT

The existing bases of profit determination

The Committee on Accounting Procedure of the American Institute of Accountants (now called the American Institute of Certified Public Accountants) in October 1955 stated: "Two accounting methods commonly followed by contractors are the *percentage-of-completion method* and the *completed-contract method.*"[2] (Italics supplied.)

The words "accounting methods" in this context refer to the methods adopted to determine profit on contracts. Although the methods are said to be commonly followed, and this would imply that there are other methods which are sometimes used, Bulletin No. 45 issued by the Committee does not mention any other methods. The comparatively small amount of other writings from Australian and American sources on this subject does not appear to mention a method which could not be classified as one or other of percentage-of-completion or completed-contract. It is therefore contended that these are the only available methods of profit assessment although great variation of detailed procedure has in the past taken place within each of these.

Very generally, the two methods can be described as resulting in the bringing to account of profit earned on contract work only after the contract is concluded (completed-contract method) or in bringing profit to account in each accounting period during which work on the contract is carried out (percentage-of-completion method).

Before the relative merits of these methods can be discussed it would appear necessary to consider what profit is and how it may be generated and then to relate

---

[2] *Long-Term Construction-Type Contracts. Official Research Bulletin No. 45.* (New York: American Institute of Certified Public Accountants, 1955), p. 4.

this discussion to the economic activity of contracting. Without such a consideration it is impossible to make a decision as to what circumstances are relevant for the selection of a basis of profit determination.

What is profit?

The accountant, in the accounting process, has not adopted the economist's view of profit which is to consider it as a change in worth. This does not imply that the accountant does not agree that the precise measure of profit is the change in the worth of an object or unit. It seems safe to say that accountants generally would agree that, from the point of view of logic, the possessor of an item that was worth £500 last week and is now worth £600 has indisputably made £100 profit during the week (assuming stable currency). It also seems safe to say that accountants would be prepared to account on this basis if there were available to them a reliable and objective method of assessing worth.

The economist views the worth of an item, theoretically, as the present value of future cash flows which that item will generate. Measurement of worth on this basis would necessitate the forecasting of future cash flows and this involves practical difficulties that appear to be insurmountable.

The accountant has ignored forecast cash flows when considering worth and instead has regarded the worth of an item as its money value in exchange. Kohler[3] defines "worth" as "value expressed in terms of some standard of equivalence or exchange". The Shorter Oxford English Dictionary (1950 edition) gives its first definition of "worth" as "pecuniary value". This can only be pecuniary value in exchange and therefore the accounting definition and that adopted in English usage generally are similar. In order to measure worth defined in this way, and in the absence of a sale, one must assume a buyer who has a use for the item in its existing condition, and in many cases, in its existing location. Because any such measurement must be very subjective accountants have never practised valuation of plant items or stocks on the basis of worth. Instead they have adopted cost as the basis for accounting and have considered that profit is earned, not by a change in worth, but by realizations of revenue in excess of all associated costs. The assignment of costs to specific revenues is the essence of the accountant's matching concept.

The use of the matching concept has tended to create an attitude of retrospectivity in accountants. Invariably, revenue generation is the culmination of a transaction and it has become accepted that not until this revenue (or claim to revenue) is to hand can the foregoing costs be matched against it and profit calculated. This attitude also embodies the traditional accounting concept of realization. The inherent risk involved in business transactions (i.e. whether any revenue at all will be generated by expenditure incurred) has added strength to the accountant's retrospective matching process.

Profit and long term contracts

It is contended that long term contracting carries no risk of revenue generation provided the contract will be completed by the contractor, and therefore a retrospective matching process is not a satisfactory theoretical basis of accounting for this type of business undertaking. Value in exchange for the contract work is determined and fixed at the time the agreement to carry out the work is made. As a change in worth is theoretically the most satisfactory measure of profit—and accepting the accountant's definition that "value in exchange" is "worth"—it would appear most

---

[3]E. L. Kohler, *A Dictionary for Accountants* (3rd ed.; Englewood Cliffs, N. J.: Prentice-Hall, 1963), p. 522.

satisfactory to base profit assessment on long term contracts on changes in contract worth. After this change in worth is ascertained it is matched against the expenditure incurred in creating it. But it is a current process rather than a retrospective process.

It is reasonable to question whether a partly completed contract has any value in exchange. If it is assumed that the contract will be completed (and this is a very realistic assumption very like the assumption of continuing business in all accounting) it must be considered that a partly completed contract does have value directly proportional to its stage of completion.

The American Institute of Certified Public Accountants Committee on Co-operation with Surety Companies has stated: ". . .since work performed is the primary basis for income allocation, certain costs may be disregarded as a measure of performance in the early stages of a contract for the purposes of determining income allocation."[4]

This statement is open to dispute unless "work performed" is interpreted as "the stage of physical completion of the contract". If this interpretation is adopted the latter part of the statement is irrelevant. The Committee does not define "income" but uses it in context which gives it the same meaning as "revenue" previously defined in this study. If "income", as used by the Committee, has the same meaning as "revenue", contract costs would appear to have no place in its allocation. Costs are relevant for assessing profit *after* contract revenue has been allocated but cannot be regarded as significant in that allocation. (This will be further discussed subsequently.) Work performed cannot alone create profit since the work may have no value in exchange. Nor is it a satisfactory basis of allocating revenue to be received from a contract, for a major part of the work may be unproductive. Similarly costs incurred cannot create profit; only the willingness of a buyer to reimburse the costs and pay something extra can do that.

At this stage it would appear reasonable to say that the most satisfactory measure of contract profit is the change in worth of the contract determined by the change in its stage of physical completion and reduced by the costs incurred in effecting that change in worth.

Methods of determining profit on long term contracts have in the past laid much stress on the fact that a contract transaction is precisely the reverse of usual business transactions. Assuming reasonable accounting records, in usual business transactions costs are always known but revenue realization is doubtful until an item is actually sold. In contracting, future revenue is known, but costs are doubtful until the contract is completed. Writers have therefore stressed the need for reliable estimates of future costs.[5] It will subsequently be shown that this difference is irrelevant to the assessing of contract profit.

The effect of billing on profit determination

The contract document relating to a long term contract invariably provides for progress claims by the contractor. There is some variation in claim clauses; some permit only claims for materials and labour costs, some permit the inclusion of overhead costs, and some (the majority in the experience of this study) clearly include a profit element. The usual provision appears to permit the claiming or billing for a percentage of work certified. "Work certified" statements are issued by the contractee's professional consultant and represent his assessment of the value of the work done in relation to the total contract price.

---

[4] *Generally Accepted Accounting Principles for Contractors*, p. 9.

[5] See, for example, W. E. Coombs, *Construction Accounting and Financial Management* (New York: McGraw-Hill, 1958), pp. 468 ff. and Le Roy H. Cole, "Accounting Problems in the Construction Industry", *The Arthur Young Journal*, VII. (July 1959), 20.

It should be recognized that progress claims are a financial measure designed to reduce the working capital needs of the contractor. They can in no way influence the gap between contract worth and contract operating costs and they therefore have no relation to profitability of the contract.

The only Australian writing on this subject recommends that no profit should be brought to account unless it is represented by progress claims actually received.[6] No substantiating reasoning is set forth to support this recommendation and it is submitted that neither claims made nor cash received is relevant. Determining profit on the basis of claims made or cash received could result in the following profit assessments for similar contracts:

	A	B	C
Contracts—each of £100,000			
Stage of physical completion	½	½	½
Worth created	£50,000	£50,000	£50,000
Related costs	40,000	40,000	40,000
Assessed profit according to this study	£10,000	£10,000	£10,000
Claims made	£60,000	£60,000	Nil
Cash received	£60,000	£40,000	Nil
Profit if claims made considered relevant	£10,000	£10,000	Nil
Profit if cash received considered relevant	£10,000	⅘=£8,000	Nil

Logically, the three similar contracts, at the same stage of completion and with equal costs, could be expected to create the same amount of profit. If the accounting process fails to reflect this it is failing in its representative function.

Presumably the above recommendation results from the writers' interpretation of the realization concept. But even if the traditional concept of realization were applicable—and this is refuted throughout this study—the recommendation should relate only to claims made and not to cash received. In normal sale transactions revenue is deemed to be realized when a debtor is charged the selling price. The accountant does not wait until the debtor pays the amount to ascertain the profit earned.

It is therefore reiterated that neither claims made nor cash received has a bearing on profit assessment of long term contracts.

III. THE EXISTING METHODS OF PROFIT DETERMINATION

The completed-contract method

As the term implies contracting businesses which adopt this method bring no profit to account until all work on a contract is completed. This statement is subject to slight modification in that minor costs which may occur at the end of a contract (such as supplying the contractee with copies of technical drawings or technical supervision during the early operating period of plant) may be ignored when deciding whether the

[6] R. K. Yorston, E. B. Smyth, and S. R. Brown, *Advanced Accounting* (Sydney: Law Book, 1959), I, 222.

contract is completed or not. In all cases, however, the contractual obligations would be very substantially completed with the exception of possible costs resulting from a warranty which has been given. Warranty costs are subsequently discussed.

Profit determination on this basis emphasizes the matching concept in the long run, but ignores the need to match revenue and expenditure in each accounting period. Costs are accumulated and then matched against the contract revenue which is deemed to be earned when the subject of the contract is available to the contractee. The procedure is completely retrospective and the method appears to be influenced to a large extent by the realization concept which has been traditionally adopted in accounting for ordinary business transactions. As already pointed out, revenue realization is a doubtful factor in transactions of this type; but it is not doubtful when work is to specific order and under contract. For this reason alone the completed contract method would appear to be unsatisfactory.

The earlier discussion on the significance of the accounting period convention indicated that in spite of the fact that these periods are artificial and troublesome they form part of the environment in which the accountant must work. They therefore must be accepted, and the adoption of accounting procedures that take no cognisance of the period convention is scarcely reasonable. It will be recognized that the completed-contract method is likely to produce wide fluctuations in reported profits over a period of years in which business activity has been at similar levels and conditions of work equally favourable. On grounds of logic such accounting must be regarded as unsatisfactory.

Brief mention is required of the legal aspect of the passing of ownership (i.e. property in the goods subject to contract) from the contractor to the contractee. In a normal business transaction, not subject to prior contract, property in goods passes from vendor to purchaser at point of sale. Most, if not all, contracts for the manufacture of plant, construction of roads, buildings or other civil engineering projects, provide for the passing of legal ownership when the contractee's technical representative or consultant has given a certificate that the contract has been satisfactorily completed. As revenue on a normal sale has never been considered earned until legal ownership has passed from vendor to purchaser it may at first appear that contract revenue cannot be considered earned until legal ownership has similarly passed. Because this cannot take place until the conclusion of a contract it may be seen as an argument in support of the completed-contract method of profit assessment. However, there appears to be a serious flaw in this argument. In a normal sale the purchaser can refuse goods right up to the moment that property passes. The vendor thus has no rights to revenue collection until that time. Contracts for long term work invariably make it obligatory for the contractee to accept the passing to him of legal ownership provided the contractor satisfactorily completes the contract. It therefore seems that a right to revenue, contingent upon satisfactory completion of the contract, accrues to the contractor at the time the contract is signed. In a practical sense there is a guarantee to the contractor that legal ownership will pass, and from the accountant's point of view this would appear to be sufficient for contract revenue recognition.

It is interesting to note that discussions with a number of accounting executives in large contracting companies in Australia, several of which adopted the completed-contract method of profit assessment, revealed that none was concerned with this legal aspect, and in no instance was it put forward as a reason for adopting the method. Company executives stated that conservatism was the fundamental reason for its adoption.

The completed-contract method therefore does not assess profit on the basis of matching realized revenue and expenditure by accounting periods nor does it assess profit on the more satisfactory basis of matching increased worth of the contract over each accounting period with the costs of creating that increase. The accounting for

contract profit by the completed-contract method is frequently made more unsatisfactory, however, by the inconsistent treatment of certain overhead costs. The Committee on Accounting Procedure of the American Institute of Certified Public Accountants recognized this problem and stated in Bulletin No. 45:

> When the completed-contract method is used, it may be appropriate to allocate general and administrative expenses to contract costs rather than to periodic income. This may result in a better matching of costs and revenues than would result from treating such expenses as period costs, particularly in years when no contracts were completed.[7]

It seems logical that if the allocation of contract revenue is deferred to a subsequent accounting period all related costs should also be deferred. Obviously every contract will create general and administrative costs of the business and, although a satisfactory basis of apportioning these costs between contracts will be difficult to devise, some attempt must be made or the method is inconsistent. However, the Committee also recognized that when business activity slackened, but there occurred little or no reduction in general and administrative costs—and this is likely, for most of these costs would be strongly fixed—the deferring of such costs could postpone reflecting this fall in business activity to the accounts of a subsequent accounting period. They therefore stated: ". . .there should be no excessive deferring of overhead costs such as might occur if total overhead were assigned to abnormally few or abnormally small contracts in process."[8]

It is difficult to agree that general and administrative costs should be deferred in some years but not in others. At the same time the danger that the Committee foresees in consistent deferral is well recognized. The only conclusion that can be drawn is that determination of profit on a completed-contract basis is unsatisfactory.

The percentage-of-completion method

This method attempts to bring profit to account in each accounting period during which the contract progresses. The profit is determined and accounted for in proportion to the physical advance in contract stage. This would appear to be the more logical method of determination. However, the method has been considered by all writers to suffer from the need to estimate final contract costs while the contract is still in progress.[9] Because this is an inherently difficult estimate to make, profit assessment during the term of a contract could never be precise. It is contended that there is no need to estimate future costs in order to determine profit on long term contracts on a percentage-of-completion basis and that the reasoning of writers on this subject to date has been fallacious. Examples will show this subsequently.

It is considered that the percentage-of-completion method should be adopted for profit determination on long term contracts on the following grounds:

(*a*) it is a more logical representation of contracting activity.
(*b*) it avoids difficulties in certain overhead cost allocations.
(*c*) it is the only method which is compatible with the adoption of a convention that the life of a business can be accounted for by a series of periods each of one year.

---

[7] *Long-Term Construction-Type Contracts*, pp. 5 and 6.
[8] *Ibid.*, p.6.
[9] See, for example, *Auditing in the Construction Industry* (New York : American Institute of Certified Public Accountants, 1959), p. 10.

(*d*) it is in accord with statutory and social acceptance of the year as a period of accountability.

(*a*) Representation of contracting activity. The accounting process was developed as a means of expressing physical transactions in quantitative terms. The need for such a process was felt as soon as economic conditions carried trading beyond the barter stage, and the increasing complexity of business transactions into and throughout the present century has made it essential that accounting possess the maximum precision in representing physical transactions. Accounting is thus a representative process. Unless it can faithfully represent in the books of record the physical transactions that have occurred it would appear that it is not fulfilling a prime function. It follows from this that accountants are obliged to seek the accounting procedures that will best reflect the business transactions that have taken place.

If this obligation is acknowledged it becomes obvious that accountants cannot seriously contemplate accounting for contract profit in such a way as to imply that the profit was completely earned in the year of completion of a contract. During a period of, for example, several years a contractor may bring into existence an asset for which some party has indicated willingness to pay £1,000,000. At the conclusion of the contract the worth (value in exchange) of the asset is indisputably £1,000,000. But this worth has been created over several years; the work took place over several years. If one-third of the asset was created in the first year it must be considered that one-third of the worth was created in that year. This proportion may bear no relation to wages paid, productive hours spent on the work, or total costs incurred on the third. These items might be more or less than one-third of the total wages, hours, or costs on the complete contract. The physical fact that becomes paramount is that one-third of the contract has been completed and consequently one-third of the contract revenue has been earned.

The following picture might emerge after the contract is completed:

	PROPORTIONS		
	of Contract Completed	of Man Hours Spent	of Costs Incurred
Year 1	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{5}{12}$
Year 2	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{3}$
Year 3	$\frac{1}{3}$	$\frac{1}{4}$	$\frac{1}{4}$
	1	1	1

Ignoring the possibility that some of the costs in years 1 and 2 should be deferred to a subsequent year (or, alternatively, assuming that the proportions of costs incurred are after allowing for necessary deferrals), it becomes obvious that year 3 was more profitable than year 2 which was more profitable than year 1. The accounting allocation of contract revenue on any basis other than stage of physical completion would not reflect this position. For example, allocation of contract revenue on the basis of costs incurred would reflect the following position:

Year 1 $\frac{5}{12}$ revenue—$\frac{5}{12}$ costs = profit on contract for year
Year 2 $\frac{1}{3}$ revenue—$\frac{1}{3}$ costs = profit on contract for year
Year 3 $\frac{1}{4}$ revenue—$\frac{1}{4}$ costs = profit on contract for year

In actual fact the position was:

Year 1 $\frac{1}{3}$ revenue—$\frac{5}{12}$ costs = profit on contract for year
Year 2 $\frac{1}{3}$ revenue—$\frac{1}{3}$ costs = profit on contract for year
Year 3 $\frac{1}{3}$ revenue—$\frac{1}{4}$ costs = profit on contract for year

In year 1 contracting activity has (*a*) created one-third of the value of the contract and (*b*) incurred five-twelfths of the costs and the accounting process should result in this position being reflected in the accounts. It appears that only revenue allocation based on the stage of physical completion will achieve this.

The term "percentage-of-completion" should therefore only be interpreted as "percentage-of-*physical*-completion". It is therefore interesting to see in American writings statements such as the following: "Several different practices are followed in determining percentage of completion, but the ratio of costs incurred to date to the total estimated costs is the approach most frequently used."[10]

It is contended that proportionate costs on a contract have no significance unless it can be assured that these proportionate costs closely match the physical progress.

Example to further illustrate the principle in the example above and to show the fallacy of incorrect methods of profit determination

Assume the following contract position on a contract to lay ten miles of rail track. Six miles of the track have been laid and tested.

Costs to date	£120,000
Less, costs which have not yet contributed to contract completion (materials on hand, a proportion of estimating expense, etc.)	20,000
	100,000
Further costs (estimated) to complete	50,000
Total estimated costs	£150,000
Contract price	£210,000
Total estimated profit	£60,000

Incorrect determinations

1. Total profit allocation on a cost basis
   Earned to date $= \frac{100,000}{150,000} = \frac{2}{3}$ of 60,000 = £40,000
2. Total profit allocation on a physical appraisal basis
   Earned to date $\frac{6}{10} = \frac{3}{5}$ of 60,000 = £36,000
3. Revenue allocation on a cost basis

Revenue earned to date $\frac{100,000}{150,000} = \frac{2}{3}$ of 210,000 =	£140,000	
Less, costs to date	100,000	
Profit earned to date		£40,000

Correct determination

4. Revenue allocation on a physical appraisal basis

Revenue earned to date $\frac{6}{10} = \frac{3}{5}$ of £210,000 =	£126,000	
Less, costs to date	100,000	
Profit earned to date		£26,000

[10] *Accounting and Reporting Problems of the Accounting Profession* (New York: Arthur Andersen & Co., 1962), p. 177.

It can be seen that only *revenue* allocation on a physical stage of completion basis (*not* allocation of estimated profit on this basis) provides satisfactory representation of the contract position in the accounts of the contractor. This method reflects:

(i) $\frac{3}{5}$ of the total contract worth has been created at a cost of £100,000. These costs are estimated to be $\frac{2}{3}$ of total costs, but this may not be so. Under determination (4) this is not significant.

(ii) the low earning power of this part of the contract compared with the earning power expected on the balance of the work. This aspect is of great importance to management who should seek reasons therefor.

(iii) the matching of worth created against the costs involved in creating it so as to arrive at profit.

The incorrect determinations require consideration. The allocation of either contract revenue or total estimated contract profit on the basis of costs incurred results in the same profit of £40,000. This figure overstates by almost 54 per cent the true profit based on worth created. As has already been seen, this distortion will always occur when costs do not reflect the stage of physical completion. As most contracts have both difficult and easy sections this would appear to be the usual rather than the unusual situation in contracting.

The allocation of total estimated *profit* (an unknown as opposed to the known, revenue) also results in distortion. This results from, in effect, mixing high cost and low cost work and then spreading these costs as if all physical stages incurred them pro rata.

The most striking feature of the correct determination is that the calculations are based completely on known, or ascertainable, factors—contract revenue, costs to date, and the physical stage of completion of the contract.

(*b*) Obviating difficulties in overhead allocations. It has been mentioned previously that unless general and administrative overheads are deferred when profits on contracts are deferred under the completed-contract method of assessment, profit on one contract will be reduced in the Profit and Loss account by general and administrative costs that relate to other contracts. This unsatisfactory position does not arise when profit on contracts is determined as the contract progresses, for in each year there will be included in the Profit and Loss account both contract profits and related general and administrative expenses. This takes place automatically and does not require any troublesome allocation of general and administrative overheads to individual contracts. For purposes of management assessment of individual contract profitability an allocation of these overheads may be worthwhile, but whether or not such allocation is made, the net reported profits on all contracts in progress (which is the matter under consideration here) will reflect a matching of expenditure incurred and revenue generated by the operations of that period.

Example

PROFIT DETERMINED ONLY ON COMPLETION

	Assessed Profit	General and Administrative Overheads	Reported Profits
Year 1			
Contract A	£10,000	£5,000	£5,000
Contract B	Nil		
Year 2			
Contract B	£15,000	£7,000	£8,000
Contract C	Nil		

Obviously the profit on Contract A has been reduced by overheads applicable to Contract B in Year 1. Similarly profit on Contract B has been reduced by overheads applicable to contract C in Year 2 but has not borne applicable overheads which have already been charged against profit on Contract A. This distortion of reported profit will be significant when contracts vary in size and, especially, in nature. Although there appear to be few arguments in favour of the completed-contract method of assessment, if it is adopted general and administrative overheads would require to be allocated to contracts and deferred until contract profit is brought to account. As has already been mentioned, it is difficult to devise a basis for such allocation. One large Australian contracting company which determines profit only when contracts are completed indicated awareness of this problem and was deferring overheads until profit was brought to account. A second company in similar circumstances did not defer, and considered it unnecessary, because the company followed "conservative" accounting practices.

PROFIT DETERMINED AS CONTRACT PROGRESSES

	Assessed Profit	General and Administrative Overheads	Reported Profits
Year 1			
Contract A	£4,000		
		£5,000	£6,000
Contract B	£7,000		
Year 2			
Contract B	£8,000		
		£7,000	£6,000
Contract C	£5,000		

It is apparent that each year's overheads are matched against that year's contracting profit. If management require to ascertain a net profit on each contract, allocation of the overheads is required, but for company profit reporting this is unnecessary.

(*c*) Compatibility with the accounting period convention. It has already been seen that the period convention cannot be ignored because of numerous social factors. It must also be recognized that the completed-contract method of profit determination ignores this convention, but the percentage-of-completion method does not. There are important national implications involved when contracting business makes up a large part of the economy as it does in Australia, United States of America, Britain, and most other industrialized countries. If contract profit is not brought to account until contracts are completed, national income figures (which are measured on a yearly basis) must invariably be distorted. In addition, the omission of profit from contract work in progress will have a significant effect on national product estimates.

(*d*) Statutory and social acceptance of the year as a period of accountability. Although it would be most undesirable for accountants to accept the status quo it is essential that professions are conscious of the social environment in which they work. It is an established fact that government revenue is collected on an annual basis, statutory control of company reporting requires accounts to be supplied to shareholders at least yearly, and continued support from the money market requires yearly dividend considerations.

It is contended that this social acceptance of the accounting period of one year is so firmly established that attempts to alter it would be futile. It does not suit contracting organizations; but this is not an argument for adopting accounting procedures that ignore it. Social responsibility by professions demands that accounting procedures cater for the needs of society as far as this is possible. At the same time

of course, the profession should always be free to work for the re-education of society in any way it sees fit. The relevance of this to profit assessment on long term contracts is obvious—the accountant is obliged to adopt procedures that cater for these social wants. The completed-contract method of profit determination would appear to disregard them.

There exists no realization problem in long term contract accounting. The businessman's argument in support of the realization concept in accounting for normal business transactions is from the standpoint of business finance (as compared with the theoretical argument of inherent risk that no profit will ever accrue), and these arguments have caused accountants to accept the realization concept. This traditional viewpoint is not accepted entirely by researchers working on behalf of the American Institute of Certified Public Accountants.[11] A business which purchases an item of stock does not know whether that item will be:

(i) sold above cost, and produce a profit
(ii) sold at cost, and merely recover outlays
(iii) saleable only below cost and produce, at worst, a loss equal to its cost.

There is thus strong theoretical argument for treating such an item on hand simply as an asset at cost. However, if the accountant is certain that the item will be sold for more than cost it may be reasonable that the item should be considered to resemble a contract, and be deemed to be "worth" a certain amount thus creating a profit. But there is still the practical consideration that no finance is available to recoup the cost of the item or monetize the profit. Businessmen, generally, would resist strongly the accounting for profit before it is realized by sale, claiming that this is one way to get into severe financial difficulties. This, however, is not a theoretical accounting argument.

In accounting for long term contracts neither the theoretical argument of inherent risk, nor the practical argument of financing difficulties, can be maintained. Because of this the traditional realization concept is not relevant and there would appear to be no reason for not meeting the social requirement of yearly assessment of profit.

There are no unknowns in determination of contract profit if the method previously recommended is adopted (see page 66). Consequently there is no risk factor to cause consideration of the realization concept. The practical financial aspect does not create problems because long term contracts invariably provide for progress claims of cash by the contractor, and in most cases from quite early in the contract cash claimed exceeds costs incurred. There is thus cash available for distribution of available profit.

From the point of view of national revenue collection the percentage-of-completion method is the one that should be adopted. Under existing income tax legislation in Australia there is no obligation to adopt this method, and it is thus possible for businesses to defer the payment of taxes for a considerable time—occasionally for several years. Whilst there is no need for accounting procedures to match the income calculations for tax purposes it is socially undesirable for businesses to adopt accounting procedures that defer profits earned during a period and so form a basis for income tax payment deferrals.

IV. LOSSES AND WARRANTIES

Accounting for losses and anticipated losses on contracts

The arguments presented so far have strongly favoured the percentage-of-completion method of profit determination. It is now necessary to consider the accounting

[11]See Robert T. Sprouse and Maurice Moonitz, *A Tentative Set of Broad Accounting Principles for Business Enterprises* (New York: American Institute of Certified Public Accountants, 1962), Principle D (c) (3) (2).

for losses. Conceptually, in order to be valid, a method of revenue allocation must apply equally well to profit or to loss situations.

It is contended that both profits and losses will be properly determined by the percentage-of-completion basis using physical measurement of completion.

Example

Contract price £100,000

	Periods		
	1	2	3
Costs incurred	£38,000	£52,000	£20,000
Stage of completion	$\frac{2}{5}$	$\frac{9}{10}$	Complete
Reported profit or loss:			
Revenue allocation	($\frac{2}{5}$) 40,000	($\frac{5}{10}$) 50,000	($\frac{1}{10}$) 10,000
Costs incurred	38,000	52,000	20,000
Profit or (loss)	£2,000	(£2,000)	(£10,000)

This is exactly the same method of determination as appears in the calculation of profit on a profitable contract and shown on page 66, and it is submitted that the above reported profit in period 1 followed by two period losses can be theoretically supported. In period 1 two-fifths of the contract worth are created: therefore £40,000 of the contract revenue is earned. This fraction of worth has cost £38,000. There is no doubt that the contract has been carried out profitably during this period. Future costs would appear to have no significance for assessing profit or loss in period 1. If costs will exceed contract worth created during subsequent periods this is an unknown factor at the end of period 1, and even if subsequent losses are anticipated, this should not affect the bringing to account of the profit in period 1. The creation of a provision for future possible losses is accounting action fundamentally different from omitting the profit earned so far.

It is not suggested that anticipated losses in future periods should be ignored, although it is recognized that bringing to account future losses and ignoring future profits is inconsistent. This is the action demanded by the well-known "doctrine" of conservatism and may be justified by businessmen as "accounting for survival". This is a practical reason for taking action rather than a theoretical accounting consideration, but its social implications (i.e. avoiding showing profits as available for dividends when some will be required to meet future losses and the need to view continued existence of the business as a long term goal) have won support from accountants generally.

From the accountant's point of view it would appear that most emphasis requires to be placed on the method of presenting the accounting reports. It does not appear reasonable to dispute a provision for losses required by business management provided it is satisfactorily disclosed.

Example

Assume the following figures:

	Profit for Year	Assessment of Future Profitability
Contract A	£20,000	Profitable
Contract B	15,000	Profitable
Contract C	4,000	Future losses £10,000
	£39,000	

Accountants should object to this position being reflected in the published accounts as:

Statement of Profit and Loss		
Profit on contracts in progress		£29,000
Less, General and Administrative Expenses	.....	
Provision for Income Taxes	.....	.....
Net Profit for year		.....

However, presentation as follows would seem to be satisfactory:

Statement of Profit and Loss		
Profit on contracts in progress		£39,000
Less, General and Administrative Expenses	.....	
Provision for Income Taxes	.....	
Provision for Loss on Contract C in future years, reduced by saving in income tax resulting therefrom	£6,000	.....
Net Profit for year		.....

The determination of contract losses is therefore carried out on the same basis as determination of profits. However, when it is required to bring to account anticipated (future) losses on contracts an estimate of future costs will be necessary. This appears to be the only occasion upon which such an estimate is necessary.

It is conceptually incorrect to net assessed profit on contracts in one year by anticipated losses on one or more contracts in future years, but it would not seem to be unsatisfactory to net profits and losses on contracts in the same year. The accounting for a loss in a year thus requires bringing the loss to account in the Contract account. The accounting for losses expected in future years merely involves creating a provision by a charge to the Profit and Loss account. This latter accounting action is really inconsistent with the strict logic of the accounting period convention which has been accepted throughout but it appears to be justified by the social implications if possible future losses are ignored.

It will be noticed that the future losses have been provided for after reduction by the amount of tax benefit that will accrue. This would only be logical if it appeared certain that there would be future profits to benefit from the tax saving.

Accounting for costs of warranties

Most contractors offer warranties which carry the risk of contingent costs after the contract is completed. The costs involved in honouring warranty clauses in the contract document could in some cases be high and, because warranty periods often extend for a considerable time after a contract is completed, they are very difficult to account for on a logical basis. Most contracts also contain provision for retentions of contract revenue to be made for a time after the contract is completed and this period usually, but not always, matches the period of the warranty. Warranty costs are always contingent, for on most contracts little or no cost is incurred.

However, contractors emphasize that at some time or other heavy costs are met and it is evident that there is a need to cater for this occasion in the accounting for contracts. It is possible to obtain insurance cover to reimburse the contractor any rectification costs that are incurred through employee errors (e.g. incorrect assembly)

and this is easily handled by charging the premium against the contract. But most warranty costs are not occasioned by mistakes that can be traced to employees and no insurance cover is available to meet them.

Logically, it must be contended that warranty costs result from work done during the contract and therefore the costs are a valid charge against the contract. But in order to charge these costs against the contract, the contract account would have to remain open and some contract revenue be omitted from the contract revenue allocation (or some assessed contract profit withheld) until the warranty period has expired. This is contrary to the method of contract revenue allocation and profit accounting recommended throughout this study. By the time the contract is physically completed all profit or loss should have been brought to account.

It can thus be seen that accounting for warranty costs does not fit into the foregoing pattern of accounting for contracts generally. Furthermore, no way can be discerned by which the costs can be charged against the contract without causing the abandonment of the theoretically sound basis of accounting for profit on long term contracts by periods.

It is therefore recommended that the only satisfactory way to account for contingent warranty costs is to create a provision by a charge against Profit and Loss account. Once a provision has been created it should be reviewed from time to time (at least annually) to see that it is adequate to meet possible warranty expense on contracts in progress at that time, and on completed contracts the warranty period for which has not expired. Although this is not theoretically sound accounting it appears to be the only way of handling these extraordinary costs.

V. CONCLUSIONS

The annual determination of profit on long term contracts involves no difficult estimates of future costs or complicated allocation of overheads. If the creation of the item subject to contract is viewed as the creation of worth equal to total contract revenue, it is a logical step to conclude that physical progress on the contract creates increased worth. This increase in worth is brought about by the incurring of certain costs. If the increase in worth is reduced by the applicable costs, contract profit is obtained.

If some contracts appear liable to incur losses in future accounting periods, it is prudent to provide for these losses by a charge against the contractor's Profit and Loss account. Assessed profit on contracts in progress in one period should not be reduced by anticipated future losses on any one or more of the contracts. Similarly, because warranty liability may accrue in the future, a provision should be made of sufficient size to meet all possible warranty costs on contracts undertaken but for which the warranty period has not expired.

Neither the provision for future losses nor the provision for warranty costs therefore enters into the determination of contract profit. The omission of future losses from these profit calculations has been shown to be founded on logic; the omission of warranty costs is not so founded. The latter omission is due to the impossibility of devising a suitable method of charging the contract account. It is not considered that this theoretically unsatisfactory treatment of warranty costs is material or significant.

Allocation of long term contract revenue and determination of contract profit is therefore a simple process of matching increased worth during the accounting period and the costs incurred in creating that worth. Practical difficulties will almost certainly intrude when the assessment of the stage of physical completion is made by technical

experts such as engineers. These difficulties are not accounting difficulties and, in any case, are no greater than those experienced in allocating revenue and determining profits on less satisfactory bases.

VI. SUPPLEMENTARY DISCUSSION

Since the foregoing study was completed a number of interesting comments and criticisms have been received regarding the theory expounded. Whilst it is still considered that the logic of the procedures recommended is sound and that they are capable of application in the practical environment, it appears to be desirable to include a brief discussion of the main points raised.

Almost without exception criticism has concerned either the practical application of profit assessment on the basis of physical progress on contracts or the dangers of overstating profits in an early period of a contract. Considerable difficulty is envisaged by practitioners in measuring physical progress and, in addition, certain factors intrude that can cause physical progress, as an overall quantum measurement, to be not entirely satisfactory for profit assessment. It has been pointed out that frequently different profit margins are applied to different stages of a contract and that quite small parts of a contract may entail very high costs that are disproportionate to the physical progress made.

It can be shown that different profit margins are irrelevant to the profit assessment calculation but for the moment it will be assumed that they are significant.

These comments make it evident that more attention should have been given to discussing precisely what was intended by "stage of physical completion". This was not done because the study was intended primarily as a theoretical exposition. Perhaps, also, there is contained in the study an implication that the measurement of physical progress is easily made. It is well recognized that this is not so.

Ignoring the difficulty of the physical measurement, there remains the problem of fitting the theory herein espoused to the practical situation when there are various stages with different profit margins and, a more difficult but related situation, when there are small segments of the contract which involve very high costs, e.g. the installation of marbled lobbies or similar expensive finishes in a major construction undertaking.

First of all it should be pointed out that, although stage of completion was illustrated by the expression of fractions of the whole contract for the sake of simplicity, it is recognized that a contract may consist of a series of stages or units to which it is expected at the time of tendering that different profit conditions will apply. This does not refute the soundness of assessing profit on the basis of physical progress, but merely creates the need for a number of separate assessments. It may, in fact, simplify the procedure by breaking the whole contract into a series of more easily assessed parts. Further, physical progress on part at least of a contract may be represented by costs incurred (for sub-contracted portions for example) and costs then become a valid basis of profit assessment. The important aspect is that a measure of physical progress is determined and this determination is used rather than simply using costs incurred and costs anticipated regardless of whether costs to date have been productive of proportionate contract worth.

Illustration

A contract was estimated and tendered on the following basis:

Reference Number		Estimated Costs £	Margin %	Total £
1	Establishment	10,000	10	11,000
2	Excavations	20,000	10	22,000
3	Steelwork	18,000	5	18,900
4	Poured concrete	30,000	20	36,000
5	Brickwork	25,000	10	27,500
6	Internal finishes	22,000	20	26,400
7	Sub-contractors	45,000	3	46,350
				188,150
8	Administrative cost recovery	11,300		11,300
		£181,300		£199,450
	Tendered			£200,000

This tendered price is, in reality, the summation of eight prices each of which relates to a stage or aspect of the contract. Although as work progresses there may *appear* to be inextricable mixing of the stages each *must* retain its identity unless the work is to degenerate into utter confusion. There is little doubt that the technical supervisors of items reference numbered 2 to 6 should be expected to assess physical progress of work in their charge at any point of time. Items 1 and 8 will require an appraisal of overall progress but these will in all cases be relatively minor amounts. Sub-contracted work could well be one area in which it is realistic to allocate the 3 per cent (in this instance) supervision margin on the basis of costs to date. A hypothetical work-sheet using the above figures might appear as follows:

Reference Number		Proportion of Work Completed	Tendered Price Earned £	Costs to Date £	Profit to Date £
2	Excavations	Wholly	21,000	22,000	(1,000)
3	Steelwork	$\frac{4}{5}$	15,120	14,500	620
4	Concrete	$\frac{2}{3}$	24,000	20,000	4,000
5	Brickwork	$\frac{1}{2}$	13,750	13,000	750
6	Internal finishes	nil	—	—	—
			73,870	69,500	4,370
1	Establishment	overall estimate $\frac{1}{2}$	5,500	6,000[1]	(500)
8	Administrative cost recovery	overall estimate $\frac{1}{2}$	5,925[2]	5,400	525
			£85,295	80,900	4,395
7	Sub-contractors	paid		15,000	
		∴ earned $\frac{1}{3}$ x 1350			450
				£95,900	£4,845

Notes: [1] Establishment costs to date £12,000 of which £6,000 is applicable to the remaining half of the contract.

[2] The extra £550 of tender price over the estimated costs plus margins, £199,450, has been treated as administrative costs to be recovered for convenience. The administrative costs here would be costs allocated to the contract only.

The above method is not perfect, but it does appear to facilitate the relating of contract profit to physical progress with substantial accuracy. It also caters for varying margins and for the situation in which work of a special nature involving relatively small physical effort but very large cost (such as the example previously mentioned of finishing lobbies, stairways, etc. with special materials) may be experienced late in the contract. In fact it will now be recognized that the problem of different profit margins is irrelevant to profit assessment except that the existence of different margins causes a complete contract to be split up during original estimating into a number of component parts. This actually facilitates profit assessment because physical progress is more easily measured for each separate part. The essential basis of profit assessment remains—contract revenue calculated in proportion to physical progress on each part or stage is reduced by costs to date on that stage to provide the progress profit on the stage. The desired margin may not be achieved (as in the above example where no stage has produced the desired margin) or the original margin may be substantially exceeded.

It should be emphasized that the use of one fraction in the body of this study to represent physical progress was a matter of convenience. At no time was it envisaged that one measure could be used in practice except in rare circumstances. It should also be emphasized that there will be innumerable technical difficulties in applying the recommended procedures. But it is not a solution to ignore these difficulties and seek an easier method if the easier method is illogical and conceptually unsatisfactory.

VII. AN APPRAISAL OF AUSTRALIAN PRACTICE

Appraisal method adopted and response

It has already been pointed out that the American Institute of Certified Public Accountants recommendations on accounting for contract profits are unsatisfactory. No recommendations directed at contract accounting have been made by accountancy bodies in Australia, and the only textual material on this subject suggests methods of profit assessment that are incapable of theoretical justification. It is therefore not surprising that the methods adopted by Australian contractors vary considerably and less than 30 per cent would appear to be assessing contract profit on a basis that is theoretically supportable. This has national consequences, for contracting business occupies an important place in the Australian economy.

In order to test the practices of Australian contractors a questionnaire was sent to forty public companies whose shares are listed on the stock exchanges. It was considered that these companies, all subject to statutory audit, could be expected to be more sophisticated in their approach to accounting for contract profit than would contracting businesses operating as proprietary companies, partnerships, or sole traders. The results obtained could reasonably be considered to represent the best practice adopted by Australian contractors.

The following summarizes the response to the questionnaire:

Number sent	40
No response after one follow-up request	12

Questionnaire acknowledged but not completed because contracting formed an insignificant part of the business, contracting discontinued, or similar reason	7
Completed questionnaires received	21
	40

As an indication of the size of the companies which returned questionnaires, the total of paid-up capital, reserves, and undistributed profits and debt capital is given below:

Funds Employed	Number of Companies
Over £5m	1
£2m to £5m	4
£1m to £2m	8
£½m to £1m	3
£¼m to £½m	4
£100,000 to £¼m	1
	21

Types of contracting businesses responding

The types of contract undertaken by the twenty-one companies which returned questionnaires were (most companies engaged in more than one type):

Building construction	8
Plant installation	12
Plant manufacture	16
Civil engineering	6

Accounting procedures adopted

(*a*) *Profit assessment*

The methods of determining profits were as follows:

Completed-contract method	8
Percentage-of-completion method	10
Both methods used, depending on the type of contract	3
	21

Of the thirteen companies that invariably, or sometimes, used the percentage-of-completion method:

Based percentage-of-completion on costs incurred to total estimated costs	7
Based percentage-of-completion on physical appraisal of the contract	3
Based percentage-of-completion on both costs and physical appraisal	3
	13

It can be seen that at most six companies out of the twenty-one which completed the questionnaire determine profit on a theoretically sound basis—this is 28.6 per cent of the companies participating. Even so it is not certain that these companies allocate

contract revenue on this basis or whether it is used to allocate estimated contract profit. Unfortunately the questionnaire did not require this to be made clear.

In addition, four of the twenty-one companies responding were influenced in profit assessment by progress claims made or received. It has been seen in the preceding study that arrangements for claims and collections are financial considerations that are incidental to profit calculations.

(*b*) *Providing for anticipated losses*

The following accounting action was taken by the twenty-one companies as soon as it appeared that a loss would be sustained on contracts in progress:

Provide immediately for the full loss anticipated	11
Provide an amount proportional to the stage of completion	7
Take no action	3
	21

The questionnaire did not require the manner in which provision is made to be stated, but discussions with several company executives indicated that, in their companies, assessed profits on all contracts are reduced by any anticipated losses on contracts in progress. It has been shown that this practice is theoretically unsound as it results in the reduction of the profits of one period by losses of a future period.

As could be expected, the companies that take no accounting action also defer profits until contracts are completed. However, five of the eight companies that adopt the completed-contract method of profit assessment do bring to account anticipated losses. This would appear to be insupportable inconsistency.

In view of the almost universal acceptance of the accounting practice of conservatism (i.e. bringing to account losses as soon as they are anticipated but taking profit only when it is realized) the above results were not unexpected.

Logically, the most appropriate action is to provide for the loss in proportion to the physical advance of the contract on which the loss is anticipated. Unless this provision is clearly shown in the final accounting reports there would appear to be inadequate disclosure and the reporting of a net figure of assessed profits reduced by anticipated losses is unsatisfactory.

(*c*) *Providing for warranty costs*

Three of the responding twenty-one companies did not offer warranties and two companies did not answer the question. The remaining sixteen companies adopted the following practices:

Provide fully for total estimated warranty costs before bringing profit to account	9
Provide an amount of the total estimated costs proportional to the stage of completion	2
Take no action	5
	16

There is no doubt that when warranties are offered under the contract document the cost of fulfilling them is part of the contract cost. As the costs (if incurred at all) will be incurred after the contract is completed it is difficult to account for them on a

logical basis. However, it seems reasonable to assume that each part of the contract carries with it a risk of creating situations in which costs under warranty will be incurred. It therefore appears that the two companies which provide pro rata are adopting the most satisfactory method.

Four of the five companies which take no accounting action also defer profit assessment until contracts are completed. Although it could be expected that most warranty expense would therefore fall in the same accounting period as that credited with contract profit there is no guarantee that this will be so, especially if contracts are completed late in the accounting year.

Summary of the appraisal of Australian practice

Informal discussions with executives in contracting companies engaged on various types of work indicated that there is a striking similarity in conditions under which contracts are carried out. In spite of this there is a striking dissimilarity in the theoretical accounting bases upon which profits are assessed. This is no doubt largely due to the complete absence of an authoritative statement of theoretically sound and logical practice. In addition, many of the traditional fields of contracting business (notably building, civil engineering, and plant manufacture) are very severely affected by economic downturns, and this appears to have fostered extreme conservatism. Conservatism appears to be the most cogent reason in the minds of contractors for the adoption of the completed-contract method of profit assessment, and for bringing to account all possible losses regardless of contract stage.

Although a consideration of the accounting statements issued by contractors is beyond the scope of this study, it is apparent that the wide diversity of practice prevents comparisons of the results of contracting businesses.

The importance of sound profit assessment procedures in a type of enterprise that occupies such an important place in the economy is obvious. Many of the responding companies are large by Australian standards and one could expect that their accounting practices would be both sophisticated and logically supportable. This appraisal has indicated that the contrary is frequently true.

BIBLIOGRAPHY

Books

ANDERSEN, ARTHUR, and Co. *Accounting and Reporting Problems of the Accounting Profession.* New York: 1962.

COOMBS, WILLIAM E. *Construction Accounting and Financial Management.* New York: McGraw-Hill, 1958.

KOHLER, E. L. *A Dictionary for Accountants.* 3rd ed. Englewood Cliffs, N. J.: Prentice-Hall, 1963.

SPROUSE, ROBERT T., and MOONITZ, MAURICE. *A Tentative Set of Broad Accounting Principles for Business Enterprises.* New York: American Institute of Certified Public Accountants, 1962.

YORSTON, R. K., SMYTH, E. B., and BROWN, S. R. *Advanced Accounting* Sydney: Law Book Co., 1959.

Booklets (Official Releases)

AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS. *Auditing in the Construction Industry.* New York: 1959.

AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS. *Generally Accepted Accounting Principles for Contractors.* New York: 1959.

AMERICAN INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS. *Long-Term Construction-Type Contracts.* (Official Research Bulletin No. 45.) New York: 1955.

Periodicals

BLACKMAN, W. A. "Accounting Principles for Long-Term Construction Contracts", *The New York Certified Public Accountant,* XXX, No. 11 (November 1960), 759–67.

BLOUGH, CARMAN G. (ed.) "An Example of Conflicting Generally Accepted Accounting Principles", *Journal of Accountancy,* CVII, No. 6 (June 1959), 64–65.

COLE, LE ROY H. "Accounting Problems in the Construction Industry", *The Arthur Young Journal,* VII (July 1959), 17–26.

HECK, W. R. "Accounting for Warranty Costs", *The Accounting Review,* XXXVIII, No. 3 (July 1963), 577–78.

APPENDIX

A sample of the questionnaire form used in the appraisal of the profit assessing and accounting practices of the companies contacted.

DEPARTMENT OF ACCOUNTANCY UNIVERSITY OF QUEENSLAND

Research project U543: An investigation into the methods adopted by Australian contracting companies in assessing profits on contracts in progress at balance dates.

Please insert the total funds employed by your company at last balance date, i.e. issued capital, plus reserves and undistributed profits, plus fixed interest securities:.....

Please place a CIRCLE around the relevant number or numbers in front of the answers to the following questions which accord with the practice of your company.

A. What type of contract is normally undertaken:
   1. Building construction 3.Plant manufacture 5. Other (specify).....
   2. Plant installations 4. Civil engineering .....

B. At what stage of contract completion do you bring profit to account—at the first balance date after contract is at least:
   1. One-quarter completed 3. Three-quarters completed
   2. One-half completed 4. Not until contract completed
   5. Whenever it seems possible to assess contract position
   6. Some other basis (please specify).....

C. If stage of work completed determines whether or when you bring profit to account do you ascertain contract stage from:
   1. "Work certified" statements from contractee's architects, engineers, etc.
   2. Estimates of completion prepared by your own staff engineers, supervisors, etc.

D. If you determine contract completion stage from "work certified" statements do you ignore profit assessment on work done but not "certified"?
   1. YES 2. NO

E. If your own staff determine the stage of contract completion do they:
   1. Work on the basis of proportion of costs already incurred to total estimated costs.
   2. Work on the basis of a physical appraisal of progress such as cubic yards moved, poured, etc.

F. Do the following factors affect your calculation of profit earned on incomplete contracts:
   1. Progress claims made to date on the contractee.
   2. Cash received to date from contractee for progress claims.

G. If the factors in (F) do influence the calculation of profit please describe briefly how they do so.

.....

.....

H. If during the course of a contract it appears that an eventual loss will be incurred do you:
   1. Provide immediately for the total anticipated loss.
   2. Provide for part of the total anticipated loss in proportion to the work done to date.
   3. Take no accounting action.

I. Do your company's contracts involve warranties or service costs, etc. extending for some time after the contract is completed?
   1. YES 2. NO

   If YES, do you reduce calculated profit on each contract in progress:
   1. By the relevant total estimated warranty costs.
   2. By part only of the total estimated costs in proportion to work done on the contract.
   3. By nothing at all.