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Measuring Divisional Performance

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MEASURING DIVISIONAL PERFORMANCE

by

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TABLE OF CONTENTS

CHAPTER I

INTRODUCTION

One of the most striking characteristics of business operation and organization during the past 20 or 25 years has been the tendency toward decentralized operations. This movement has been going on at the same time that the number of business combinations and mergers has been increasing.[1] It seems that companies are simultaneously seeking the advantages of bigness through combinations and of smallness through decentralizing the management of the combined operations.

In general, a decentralized company is one in which operating divisions are created. Each division is staffed with a management that has some authority for making decisions and thus becomes responsible for a portion of the company's profit. The amount of decision-making authority granted to division management will, of course, vary among companies. For our purposes, a segment of a business will be recognized as a division when it exercises responsibility for both producing (or purchasing) and marketing a line of products. Anything less than this degree of responsibility makes it impossible to hold divisional management answerable for the profitability of the segment of the business it controls. The above

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[1] Carl L. Moore and Robert K. Jaedicke, Managerial Accounting (Cincinnati, Ohio: South-Western Publishing Co., 1976), p. 514.

definition makes it clear that responsibility for production and marketing (or buying and selling) is the minimum extent of responsibility necessary for the existence of a division. This is not meant to imply that a division must market all the products it makes or make all the products it markets. It is quite common to find one division transferring a product it makes to another division. Transfers of products between divisions plays an important part in making divisionalization work, and they do not alter the distinction between divisional and nondivisional organizations.

In any organization, no matter how it is structured, top management retains a very positive concern for the operations of the enterprise. In companies with divisionalized structures, top managers need to establish and maintain a dependable method of measuring performance in each division and a regular system of performance reporting.

In delegating profit responsibility, top management may set up the divisions that it chooses for this emphasis as either profit centers or investment centers. A profit center is an organizational unit that is responsible to top management for some measure of its own profitability. Revenues measure the unit's outputs, expenses measure its inputs, and profit measures the excess of revenues over expenses. An investment center is an organizational unit responsible to top management for its profitability in relation to the unit's own investment base. Revenues and expenses are measured as in profit centers, but the assets employed are also measured. Thus an investment center is an extension of the profit center idea. Profit is measured

for both, but only in an investment center is this profit related to the size of the investment base.

Designating a division as one of these types of centers, then, is actually deciding between two ways of measuring what the division is contributing to the company. Because it takes more factors into account, the investment center approach to measuring a division's financial performance will be the focus of this paper. For our purposes a division will be defined as an investment center.

As a final note here, it is useful to identify the general character of the methods of divisional performance measurement discussed in this paper. The methods used all involve financial data. Thus, they are essentially measures of financial performance. The reader should be aware that there are many other very useful measures of performance that do not employ financial data. Such measures are important to management, but they will not be considered directly here.

CHAPTER II

EVALUATING DIVISIONAL PERFORMANCE BY RETURN ON INVESTMENT AND RESIDUAL INCOME

Over the years, many forms of measurement have been developed and used to evaluate the economic performance of divisions within a business enterprise. To see how major corporations actually were accomplishing the task of measuring divisional performance two independent, yet similar, surveys were conducted. The first of these was done in 1965, by John J. Mauriel and Robert N. Anthony.[1] The second survey was done twelve years later, in 1977, by James S. Reece and William R. Cool.[2] Because of the twelve year gap between the two surveys, it is interesting to compare some of the Mauriel-Anthony findings with some of the more recent Reece-Cool findings to identify significant changes and similarities in companies' approaches to divisional performance measurement.

One of the most important observations that can be made from a comparison of the studies is that the investment center concept has gained maturity. Mauriel and Anthony found that over one-third of their respondents using investment centers had begun doing so in

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[1] John J. Mauriel and Robert A. Anthony, "Misevaluation of Investment Center Performance," Harvard Business Review, March-April, 1966, pp. 98-105.

[2] James S. Reece and William R. Cool, "Measuring Investment Center Performance," Harvard Business Review, May-June, 1978, pp. 28-46, 174-176.

the five years preceding their 1965 study and that over one-half had begun in the previous ten years. Reece and Cool found that less than six percent of the respondents to their 1977 survey using investment centers had begun doing so in the preceding five years and about seventy-five percent had had them for over ten years.

As shown in Exhibit I, both of the surveys found that measuring return on investment (ROI) was by far the most common approach used to evaluate investment centers. The only other method that was frequently made use of was residual income (RI). In 1977, sixty-five percent of the respondents having investment centers were using only ROI, while twenty-eight percent were measuring both ROI and RI, and only two percent were measuring RI alone. The Mauriel-Anthony results were sixty percent for ROI only, twenty percent for both ROI and RI, and 7 percent for RI only. It is also of significance that in the 1965 survey, thirteen percent of the respondents used neither ROI or RI and in the 1977 survey only five percent of the respondents used neither method.

Exhibit I: Methods used to evaluate investment center

	Mauriel-Anthony survey, 1965	Reece-Cool survey, 1977
With ROI only	60%	65%
With both ROI and RI	20%	28%
With RI only	7%	2%
Neither ROI or RI	13%	5%
Total	100%	100%

The Return on Investment Concept

Unquestionably, it has been established that the most common device for reporting performance in an investment center is the rate of return on investment (ROI). It is appropriate, then, to turn our attention to an evaluation of this popular concept.

Background

As a matter of historical note, the ROI approach to financial control was originally pioneered by E.I. DuPont de Nemours & Company.[1] At the time DuPont first developed its ROI control system, it was far superior to anything else then in existence. The interest of many other companies was aroused when the practices of DuPont and other pioneers were reported at conferences and in the accounting literature of the 1950's. The continued growth and expansion which characterized many companies after World War II often led to decentralization of management and to the use of ROI to measure the effectiveness with which managers in charge of divisions within an organization were using assets entrusted to them.[2]

Computing Return on Investment

The rate of return on investment for a division is the ratio of division profit to the total capital invested in the division. It

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[1] C.A. Kline, Jr. and Howard L. Hessler, "The duPont Chart System for Appraising Operating Performance," N.A.C.A. Bulletin, Conference Proceedings, August 1952, pp. 1595-1619.

[2] N.A.A. Research Report No. 35, "Return on Capital as a Guide to Managerial Decisions," p. 1.

may be computed directly as follows:

$$\text{ROI} = \frac{\text{Profit}}{\text{Investment}}$$

Frequently, however, the same result is attained by means of two intermediate calculations. The first is the percentage of profit to division sales revenue:

$$\text{Rate of return on sales} = \frac{\text{Profit}}{\text{Sales}}$$

Then the ratio of sales to total investment is computed. This is called the rate of turnover of investment:

$$\text{Investment turnover} = \frac{\text{Sales}}{\text{Investment}}$$

The rate of return on investment is then compared as the product of the rate of return on sales and the investment turnover, thus:

ROI = Rate of return on sales x Investment turnover

$$\text{ROI} = \frac{\text{Profit}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Investment}} = \frac{\text{Profit}}{\text{Investment}}$$

Clearly, this three-step method of computing the rate of return can be collapsed to the direct computation shown initially. However, the shortened formula does not express the real objective of the concept which deals with two independent variables -- profit on sales and turnover of investment. The use of the full formula gives management a better comprehension of the elements leading to the final result.

Alleged Advantages of ROI

Gordon Shillinglaw, a well known author on the topic of divisional income measurement, has suggested that there are three purposes that divisional profit measurements should intend to serve. They are:

1. To help division managers and their superiors know what actions will be to the company's best interest.
2. To guide division managers toward decisions that will increase company profit.
3. To provide top management with a measure of the profitability of the resources invested in the division.[1]

The accomplishment of these three functions -- knowledge, motivation, and evaluation -- by any measure of divisional profit performance will prove most useful in decentralized financial control. The following discussion will illustrate the success of ROI in accomplishing these goals.

Knowledge

If all divisions earn a satisfactory return on their investment, the company must automatically earn a satisfactory return. If the divisional manager always tries to maximize the return on his investment, the decisions that he will make will be consistent with the best interests of the company. The divisional manager will know what action will be in the best interests of the company because it is the action that will maximize the rate of return of his division. In other words, divisional interests are consistent

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[1] Gordon Shillinglaw, Cost Accounting: Analysis and Control. (Homewood, Ill.: Richard D. Irwin, Inc., 1972), p. 523.

with company interests.

Motivation

Motivation is obtained by rewarding the divisional manager when he earns a satisfactory profit on the investment he controls. It is, therefore, to his personal interest to maximize the divisional rate of return.

Evaluation

The rate of return on investment may be used by top management to evaluate whether the activity is profitable enough to support the amounts of resources devoted to it. The ROI may also serve to identify divisions that need top management attention, either to deal with emerging problems or to take full advantage of opportunities that have arisen.

ROI has inherent capabilities as a management control tool for measuring performance. It is a single comprehensive figure influenced by everything that has happened which affects the financial status of a division. When changes occur in ROI, it is possible to find the reason by examination of the underlying figures and their effects on the end result.

The use in the equation of sales volume, profit margin, and capital invested or employed permits examination of each of these in the light of its effect on the results. If ROI goals are not being met, it should be possible to pinpoint the areas where improvement is needed.[1]

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[1] Henry DeVos and Gordon B.M. Walker, "Return on Investment Concept as a Management Tool," Journal of Accountancy, August, 1968, p. 84.

ROI is also useful in carrying the function of performance measurement a bit further than the criterion suggested by Shillinglaw. Measurement of performance is needed to appraise the abilities of the manager, as well as to assess the profitability of the investment center. ROI accomplishes this function in that it measures how well the division manager uses the property of the company to generate profits. It is also a means for checking automatically on the accuracy of capital investment proposals. If an approved project earns less than that shown in the capital investment proposal, the division rate of return will be affected adversely.[1]

In short, the system is supposed to result in each division manager optimizing his investment return which will in turn result in an optimum total company return. Since the manager is evaluated on his ability to optimize ROI, he will be motivated to do so.

In addition to accomplishing the functions of divisional income measurement -- knowledge, motivation, and evaluation -- ROI has other favorable features. The following are other advantages from the use of ROI.

Common denominator

The ROI ratio is to some extent useful for objective measurement. It is possible to use ROI to compare profitability for units of different sizes and in different companies. Since ROI is a ratio it makes unlikes comparable. ROI is the way outsiders (especially potential investors) measure a company's overall economic performance.

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[1] John Dearden, "The Case Against ROI Control," Harvard Business Review, May-June, 1969, p. 125.

It is wise then for division managers to focus on ROI performance, since outsiders are focusing on it.[1]

Simplicity

The meaning of ROI is well understood. It is widely regarded as a simple and effective measure of the efficiency with which a division of a business is using capital entrusted to it.[2]

ROI Limitations

Despite the fact that ROI is a widely used tool in management control, the ROI system has certain inherent limitations. John Dearden has written a number of articles covering, in great detail, conditions which cause incongruities between divisional objectives and company goals, and which result in motivating division managers to take uneconomic actions. He has also identified limitations to ROI control that result from the inability to evaluate accurately the profit performance of division managers. A list of his articles which provide the foundation for the following discussion can be found in the Selected Bibliography to this paper on pages 54-55.

Oversimplification

A serious limitation of ROI control is that it simplifies a very complex process. The use of a single ratio to measure division performance reduces investment decision making to a simple but unrealistic economic model. Under this system, any change in the investment base can be traded off against a specific amount of profit

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[1] Reece and Cool, p. 29-30.

[2] David Solomons, Divisional Performance: Measurement and Control. (Homewood, Ill.: Richard D. Irwin, 1968), p. 125.

which is determined by the division's target rate of return. Under the ROI control system, the economic trade-off (that is, the ratio of investment to profits) is constant throughout the division. It is the same (a) for all assets, (b) at all times (at least until the target ROI is changed), (c) for adding additional investments, and (d) for reducing the value of the investment currently on the books. Furthermore, although the trade-off between investment and profit is constant throughout the division, it will differ among divisions when their ROI objectives differ.

Uneconomic actions

The most serious objection to the ROI system has been that it provides too strong an incentive to economize capital invested and may discourage investments which should be made by the division manager. Since each division is expected to earn a target ROI, a division manager is not likely to propose a capital investment unless it is expected to earn a rate of return at least equal to his target rate. Thus a division with a target rate of, say, thirty percent would not want to invest at less than this rate, while a division with an objective of ten percent would benefit from anything over this rate. Since it is likely that ROI objectives of most divisions are different from the company's cutoff rate for capital expenditures, this situation can cause incongruities between divisional objectives and the company's best interests.[1]

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[1] Dearden, "Case Against ROI," p. 126-127

For divisions that earn a very high rate of return on their investment, the problem described in the preceding paragraph is accentuated. Such a division can make hardly any investments at all without lowering its ROI. If the division manager believes that the size of his ROI is optimal, the possibility exists that the divisional manager will not try to improve his absolute profit position.[1]

Standard rate of return

Under the ROI method, the same rate applies to all assets. This means that any time any asset is added to the investment base, it must result in annual earnings equal to the amount of the investment multiplied by the target ROI percentage. This creates a problem because different assets might reasonably be expected to earn different rates of return.[2]

Capital investment analysis

Most progressive companies are using some form of discounted cash flow to make investment decisions and some form of accelerated depreciation to write off assets. As a result, the ROI earned by a division differs widely from the returns projected in the investment proposals even when the actual cash flow is the same as projected. This is a serious limitation to the use of ROI for management control. In short, the ROI system will not provide a means for checking on the

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[1] John Dearden, "Limits on Decentralized Profit Responsibility," Harvard Business Review, July-August, 1962, p. 85-87.

[2] John Dearden, "Problem in Decentralized Financial Control," Harvard Business Review, May-June 1961, pp. 72-80.

accuracy of capital investment proposals.[1]

Implementation constraints

The ROI system is subject to some rather critical limitations in application. The idea of establishing a target rate of return for each division and measuring actual performance against this objective is an enticing concept. However, there can be problems with implementing this system.

First, it can be very difficult to set realistic annual ROI objectives. The economic environment may be such that it is often impossible to determine, with any degree of reliability, just what rate of return a division should earn for a given year. Yet the effectiveness of the entire ROI system depends on such an estimation. Second the reported profit for an annual period may not be a fair measure of what has been accomplished during the relevant time span for the division.[2]

The Residual Income Alternative

Although ROI is by far the more popular method of measuring investment center performance, the literature on the subject points out a substantial number of serious drawbacks to this concept. In light of the problems with ROI, several authors have advocated the use of the residual income method as an alternative. In this method, which is an adaptation of ROI, a division is measured by its actual profits minus a prescribed charge for the actual amount of capital.

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[1] Dearden, "Case Against ROI,' p. 128-130.

[2] Ibid., p. 132-133.

invested in that division. As an illustration of how the residual income method works, consider the example of ROI and residual income (RI) in Exhibit II below.

Division A, below, has $100,000 invested on which the profit is $15,000. If the cost of capital to Division A is six percent, we must subtract $6,000 from the profit element to get a residual income of $9,000.

Division A appears to perform better when the simple ROI calculation is considered. However, by applying the cost of capital criteria, we find that this is not true. Division B actually gives us better performance until the cost of capital reaches 10 percent at which point we reach a breakeven point where divisional performance is equal for both Divisions A and B. Then above this point, Division A shows better performance.

Exhibit II: Example of Return on Investment versus Residual Income

	Division A	Division B
Capital invested	$100,000	$150,000
Profit	15,000	20,000
Return on Investment	15%	13.3%
Residual Income when cost of capital is:		
6%	9,000	11,000
8%	7,000	8,000
10%	5,000	5,000
12%	3,000	2,000
14%	1,000	(1,000)

This simple example illustrates that the residual income approach is an improvement over the conventional ROI calculation. Since a manager is looking at the absolute size of his income, it is always to his and the company's advantage to seek a new investment if he can earn any amount over and above the capital charged levied against him for possessing additional capital. It will also encourage a division manager to keep his idle assets at a minimum, since his capital charge can be reduced by lowering his investment base.[1]

The use of the residual income method can avoid some, but not all, of the potential deficiencies of ROI. Advantages of using RI rather than ROI follow:

1. RI is easier for a manager to understand and control because he is asked to maximize a dollar income figure rather than a ratio which at times can be elusive or abstract.[2]

2. The RI method has a great deal of flexibility in that it is practicable to use different capital charges, or minimum rates of return, for different types of assets with different degrees of risk.

3. It can be used to require the same type of asset to earn the same return, regardless of the profitability of the particular division. Thus it establishes consistency among divisions with respect to the desirability of investing in most assets.

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[1]Eliot Terborgh, "Evaluation of Investment Center Performance," Management Accounting, March, 1969, p. 50.

[2]Mauriel and Anthony, p. 104.

4. It avoids the problems that occur when a division has a very high rate of return. Such a division will lower its ROI if it makes almost any new investment. It can, however, increase its RI by any investment that yields a profit higher than the capital charge on the incremental investment.[1]

In any case, it does not appear that the residual income method is being widely used. As pointed out earlier, the Mauriel-Anthony and Reece-Cool studies have shown that RI is used exclusively by a small percentage of respondents to the surveys. However, the studies also show that in 1965 twenty percent, and in 1977 twenty-eight percent, of the respondents used RI in conjunction with ROI as measures of investment center performance (see Exhibit I). This indicates that perhaps ROI alone does not provide for satisfactory management control and that because of RI technical advantages it is a useful supplement to ROI control.

Although the RI approach overcomes some of the drawbacks of the ROI approach, it still does not solve all of the basic problems with ROI control. Both methods inherently depend on definitions and measurements of investment and profit. The use of either ROI or RI to measure and compare the performance of segments within a company can become a source of endless argument. In such cases, it becomes difficult to keep attention fixed on the main goal.

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[1] Dearden, "Case Against ROI," p. 130.

CHAPTER III

DETERMINING DIVISIONAL INVESTMENT

Regardless of whether ROI or RI is used in evaluating decentralized performance, it is still necessary to determine the divisional investment base. Companies using either ROI or RI must decide how to define investment.

Defining Investment

Many discussions of this subject refer to "return on capital" or "return on capital employed" rather than "return on investment". The word "investment" is perhaps intentionally avoided by many authors because its common use in connection with capital investment (fixed assets) or owner's investment (net worth or stockholders' equity) is misleading and confusing. Divisional investment has been defined in many ways, the most predominant being:

1. The division's share of corporate stockholders' equity (total assets minus total liabilities)
2. The division's share of invested capital (total assets less current liabilities or fixed assets plus working capital)
3. The division's total asset

Stockholders' Equity

Stockholders' equity is clearly inapplicable as a measure of divisional investment. The funds provided to a division cannot be

identified specially as debt funds or equity funds. The financing mix is a characteristic of the corporation and is the same for all divisions. Division management is entrusted with a portion of the company's total capital which consists of both debt and equity, and any distinction at the division level is unavoidably arbitrary.[1]

Invested capital or total assets

There appears to be considerable disagreement as to whether the divisional manager whould be evaluated on the sources of capital as well as the uses of capital. Some authors claim that the divisional investment base should be net of current liabilities.[2] Other writers argue that the deduction of current liabilities from total assets amounts to a confusion between asset usage and financial decisions.[3]

In their survey, Reece and Cool asked participants if they deducted current trade payables and other current liabilities in calculating an investment center's asset base. About one-half of the respondents indicated that they did follow this procedure.[4] Since there is, in practice, such an even split of opinion on the treatment of current liabilities, it is worthwhile to present the arguments on both sides.

Return on total assets employed seems to be the most relevant of the two measures of investment because an investment center manager should be held responsible for all the assets under his control.

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[1] Shillinglaw, Cost Accounting, p. 526.

[2] Solomons, p. 133-134.

[3] Reece and Cool, p. 40.

[4] Ibid.

From this manager's viewpoint, the liability and equity side of the balance sheet may be of little interest. Long-term capital decisions are nearly always made by top management at the corporate level. Hence, the division manager has no control over the mix of current liabilities, long-term debt, and stockholders' equity. Furthermore, with respect to trade payables, a division must usually conform to the credit and payment schedules of the industry in which it operates. Therefore, in computing total investment, it does not seem necessary to distinguish between different kinds of liabilities. There is no deduction for long-term debt, so also, none for current liabilities.[1]

However, the "controllable" status of accounts payable may not be the same for all divisions in all companies. If the division manager has the ability to defer payment or settle rapidly trade payables and other current liabilities, there is good reason to deduct them from the division's assets in arriving at the capital invested in that division.[2]

Assignment of Assets to Divisions

There are also investment-base definitional questions on the asset side. To make divisional and corporate ROI or RI comparable, centralized assets must be apportioned according to some measure. However, while these allocations may appear neat and tidy from a

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[1] Terborgh, p. 42-43.

[2] Solomons, p. 135-136.

bookkeeping standpoint, they can be just as misleading as allocated expenses are in costing. Some believe that, at best, any procedure used for allocation is likely to be quite arbitrary. If divisions are compared with one another, this comparison will probably be affected by the basis of allocation chosen. In fact, the basis of allocation could well determine the ranking of each division.[1] Earlier it was suggested that in defining investment, the most relevant measure was one which represented all the assets under the division manager's control. If this criterion is faithfully followed, traceable investment should be a better measure of controllable investment than traceable investment plus some allocated share of common investment.

Central corporate assets

It is not the existence of what David Solomons calls "pure corporate assets,"[2] such as, minority holdings in other companies or holdings of government securities, which presents the difficulty. Such assets, with the income they produce, clearly belong in a corporate division, if such a thing is recognized. At least it is clear enough that there is no case for including any part of such assets in the computation of the amounts invested in the operating divisions, for no purpose could be served by such inclusion. What is not so clear is the proper treatment to be given to corporate assets which serve the divisions or which are used in connection with the central administration of them.

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[1] Moore and Jaedicke, p. 523.

[2] Solomons, p. 143.

When Reece and Cool asked in their survey whether the participants included a pro-rata share of headquarters assets in an investment center's asset base, only sixteen percent of the respondents said they did so.[1] This finding indicates that the ROI and RI measures are being used primarily to measure the division's managerial performance rather than the division's economic performance, since the latter purpose requires full allocation of all balance sheet items.

If such central administrative assets are significant in amount the result of non-allocation will be that the corporate ROI will be somewhat lower than the weighted average of divisional returns. However, that is not important. The target rates of return set for divisions will have to be a point or two higher than they would otherwise be. Where RI is being used for management control and corporate assets are not allocated, the sum of residual incomes from all divisions is equal to the capital charge for the unallocated assets.

Shared assets

Sometimes a group of divisions will share a single location, including the buildings. There may also be services provided to groups, such as power and research. Some of these assets, shared buildings for example, can be accurately traced to each division without difficulty and the total asset value can be allocated accordingly. In other cases, such as shared service departments, an allocation rule would have to be devised. The investment so

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[1] Reece and Cool, p. 40.

allocated would become part of the total divisional investment, though not controllable by division management. Reece and Cool found that fewer than half of the companies responding felt it useful to allocate shared facilities in their calculations of investment center asset base.[1] This further strengthens the contention that ROI and RI are used primarily to measure a division's managerial performance.

Current assets

Among current assets, cash and accounts receivable are usually centrally administered and controlled. However, the Reece-Cool survey results show that, of the total respondents, the following percentages include these items in their calculation of investment center asset base: cash, sixty-three percent; and accounts receivable, ninety four percent.[2] No process of allocation, however refined, can make these centrally controlled assets part of a division's controllable investment. Yet, they are almost always allocated to the divisions..

Solomons appears to be applying the criterion of "avoidable investment," which was developed by Gordon Shillinglaw,[3] when discussing the reasonableness of including a portion of these centrally controlled current assets in a division's investment base.[4] The abandonment or sale of a complete division might reduce the amount

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[1] Ibid.

[2] Ibid.

[3] Shillinglaw, Cost Accounting, p. 527.

[4] Solomons, p. 145-148.

of common investment in current assets. An estimate of this potential reduction would be the measure of the portion of the current assets which may reasonably be regarded as being invested in the division.

Implementation of this concept is extremely difficult, and few companies even try to apply it. Instead, a variety of arbitrary but plausible formulas are used to make the allocations.[1] No one basis of allocation will suit every circumstance. What is of prime importance is that "consistency and uniformity"[2] are maintained for purposes of internal management control.

Presumably, through the subdivision of the account codes, it may be possible to identify receivables by division even though billing and accounts receivable operations are performed centrally. If actual totals of receivables by division can be ascertained readily they become direct divisional assets rather than shared assets. They still do not become part of the division manager's controllable investment, unless the credit and collection activity is a direct responsibility of the division.

Intangible assets

Some companies, and hence divisions, may have resources which do not appear on their respective balance sheets, but nevertheless have an important influence on earnings. Among these resources are patents, trademarks, and accumulated benefits from expensed outlays for research, advertising, and employee training.

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[1] Ibid.

[2] Adolph Matz, Othel J. Curry, Cost Accounting: Planning and Control, Cincinnati, Ohio: South-Western Publishing, Co., 1972), p. 800.

It is usually impossible to include intangible assets in either a company's or a division's investment base because a cost cannot be determined.[1] Hence the presence of such assets is reflected in a rate of return higher than it would be in the absence of these assets. Where human resources are the major source of the earnings of a division, ROI and RI has little significance.

Asset Valuation

What asset categories to include and what liabilities to deduct when one is defining investment is a question quite apart from how to value the assets that are already included. Asset valuation, especially with respect to plant and equipment, is the most controversial issue in discussions about investment center performance measurement and evaluation.

Inventory Valuation

There is seldom any question of omitting inventories, either of products or of materials, from a division's total investment, for inventories usually clearly belong to some division or other. Nor will there usually be any doubt about the propriety of including inventories in a division's controllable investment for a division usually has a substantial degree of control over the level of the inventories which it carries. Even where inventory purchases are made by a headquarters purchasing department, the central department makes purchases strictly on orders by a division. Hence inventory levels are still controlled by the division.

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[1] N.A.A. Report No. 35, p. 11.

The question of how certain inventories should be valued is a question of considerably less than unanimous agreement.[1] Absorption inventory costing would lead one to the conclusion that the unit of production at the end of period 2 is worth less than the units on hand at the end of period 1 (see Exhibit III below), simply because the fixed costs have been allocated over more units in period 2.

Exhibit III. Absorption costing versus direct costing

Period	1	2
Number of units produced	100	200
Total variable cost	$100	$200
Total fixed cost	$200	$200
End of period inventory (units)	50	50
Inventory value:		
Direct costing	$50	$50
Absorption costing	$150	$100

To avoid such unreasonable fluctuations in inventory values, the use of direct costing could be used. Furthermore, as will be discussed in the following chapter, the use of standard direct costing would insure that period costs are charged to the period in which they are incurred. This method of valuing inventories more accurately reflects management performance insofar as it recognizes income at the point of sale rather than at the point of production.

[1] Victor J. Stafford, "Asset Base for Performance Evaluation," Management Accounting, February, 1968, p. 22.

Finally, according to all sources investigated, inventories should be valued on a FIFO rather than a LIFO basis. The LIFO method gives a more realistic approximation of the amount of capital currently invested in inventory. If inventories are carried at a LIFO valuation, they should be adjusted to approximate a current-cost valuation.

Fixed Asset Valuation

The problem of valuing fixed assets for divisional reporting is the source of greatest confusion in the literature on investment centers. We must call to mind that the objective of any system of divisional asset valuation should be to provide an investment base with which to compare periodic profit, so that divisional management will be motivated to make investment decisions in the best interests of the company. Such a system implies goal congruence between the objectives of the division manager and the objectives of the company. It should be a method which will provide a basis for measuring the economic performance of the division and the managerial performance of the division manager. It need not be a method that will provide data for external financial reporting.

The valuation of assets at (1) net book value, (2) gross book value, and (3) economic value, in turn, have been put forward by various authors as the most desirable forms of representing fixed assets in the asset base for investment center performance measurement. To justify the choice of any one method of valuing fixed assets it would appear that one must be able to demonstrate that by using this criterion, decentralized management, acting in its own interests, should also be acting in the best interests of the company. Following

this reasoning we shall scrutinize each method.

Net book value

The Reece-Cool survey[1] indicated that eighty-five percent of the respondents use net book value to measure their divisional investment in plant and equipment. In their earlier study Mauriel and Anthony[2] found only seventy three percent of their respondents using net book value, so its use has increased.

Net book value is widely used in valuing fixed assets primarily because it is readily available from accounting records and because it makes internal management reports congruent with external reports.[3] What we are concerned with, however, is (a) how such a measure will allow the measurement of the division's economic performance, along with the division manager's managerial performance; and (b) how the use of net book value will motivate the division manager.

Consider the following example, based on a division with a single asset costing $1,000, to be depreciated on a straight-line basis over five years, and yielding a return after depreciation of $100 a year (see Exhibit IV).

Exhibit IV: Net book value - depreciation not reinvested

Year	0	1	2	3	4	5
Net asset value	$1000	$800	$600	$400	$200	$ 0
Return	100	100	100	100	100	100
ROI	10%	12%	16%	25%	50%	---
RI*	$ 20	$ 36	$ 52	$ 68	$ 84	$ 100

*Assumes a capital charge of 8% on investment

[1]Reece and Cool, p. 42.

[2]Mauriel and Anthony, p. 100.

[3]Reece and Cool, p. 42.

When depreciation is not reinvested by the division (Exhibit IV), the net book value of the asset declines over the years to zero at the end of year 5. Note that with a level return over the years, book value declines, but ROI and RI rise. Note also that ROI and RI would still increase from year to year even if earnings were falling (from increased maintenance costs), as long as the earnings did not fall as rapidly as book value.

The tendency for ROI and RI to rise with age will favor those divisions with older assets and discriminate against those with newer assets. If earnings fall in later years due to higher maintenance costs on the assets, this fact would be hidden from the analysis.

If, as Eliot Terborgh suggests,[1] the division manager is given full responsibility for all the funds generated from his operations, the funds available from depreciation would also be included in the investment base using net book value. This may partially overcome the weakness of this method, but dysfunctional behavior may still result.

Exhibit V illustrates the same example as before, only this time the funds generated by depreciation are reinvested by the division at the same earnings rate as the original asset (10%).

Exhibit V: Net book value - depreciation reinvested at 10% rate

Year						
Net asset value	$1000	$800	$600	$400	$200	$ 0
Accumulated Depreciation		200	400	400	600	1000
Total asset value	$1000	1000	1000	1000	1000	1000
Return on original asset	100	100	100	100	100	100
Return on depreciation	0	20	40	60	80	100
Total return	100	120	140	160	180	200
ROI	10%	12%	14%	16%	18%	20%

[1] Terborgh, p. 42-50.

Note that the division's total asset value remains constant at $1,000. Yet the earnings resulting from the reinvested depreciation are added to the earnings on the original asset to yield gradually rising total earnings and a gradually rising ROI.

This tendency for a rising ROI to reflect the profitable reinvestment of depreciation funds is favorable, yet notice that the manager is not necessarily motivated to use the funds so efficiently. Exhibit VI illustrates the case in which funds generated by depreciation are held within the division as idle cash and earn no return at all.

Exhibit VI: Net book value - depreciation reinvested at a zero rate

Year	0	1	2	3	4	5
Net asset value	$1000	$800	$600	$400	$200	0
Accumulated depreciation	0	200	400	600	800	1000
Total asset value	$1000	$1000	$1000	$1000	$1000	$1000
Total return	100	100	100	100	100	100
ROI	10%	10%	10%	10%	10%	10%

In this case total assets remain constant at $1,000, earnings remain constant a $100 per year, and ROI remains steady at 10%. Yet, notice what is happening. The funds generated by depreciation are remaining idle in the division's cash account, while the manager's performance is shown to be stable from year to year. Although there is some motivation for the manager to reinvest these funds, he is not penalized for leaving them lie idle.[1] Clearly such behavior

[1] Ibid.

is not what is in the company's best interest.

The point applies even if RI were used. The capital charge on the division's total investment would be the same regardless of the division's reinvestment rate. While the manager could improve his performance by efficiently utilizing his assets, he is not penalized for not doing so.

The use of net assets would also encourage wrong decisions concerning the replacement of assets.[1] This problem results because the investment base of a division will be automatically reduced as the asset ages. Thus the rate of return or residual income will increase simply by the passage of time. This situation is further aggravated when a company uses accelerated depreciation. The amount of depreciation becomes small as the asset becomes older. This can result in very high ROI or RI on old assets. Thus, new investments are discouraged because they will reduce a division's ROI or RI, at least in the short run.

A suggested solution to the above problem of equipment replacement is annuity depreciation.[2] This is the opposite of accelerated depreciation in that the annual amount of depreciation increases over time. Annuity depreciation operates on the principle that the amount of net profit is a constant percentage of net book value, and depreciation represents the return of capital and is equal to the difference between the cash flow and the net profit. With RI,

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[1] John Dearden, "Problem in Decentralized Profit Responsibility," Harvard Business Review, May-June, 1960, pp. 83-84.

[2] Robert N. Anthony and John Dearden, Management Control Systems: Text and Cases (Homewood, Ill.: Richard D. Irwin, Inc., 1976) pp. 342-343.

annuity depreciation results in a constant capital recovery amount by having an increasing rate of depreciation compensate for the decreasing capital charge on net book value. The asset, therefore, decreases in book value slowly at first and then more rapidly as time goes on.

The annuity method of depreciation can become uncomfortably complicated where cash flows are not level in each year.[1] More importantly, there seems to be a general reluctance on the part of management to utilize a method of measuring investment center performance which is so different from that used for tax and accounting, purposes. Reece and Cool found that most managers they spoke with did not even know what annuity depreciation was.[2]

Despite its flaws, the use of net book value does and must have its merits (witness its wide use). If fixed assets are included in the investment base at net book value, a division manager can reduce his investment base upon disposal only by the undepreciated cost. Therefore, the manager cannot improve his ROI or RI merely by disposing of fully depreciated fixed assets that it still contributing satisfactory profits.[3] Consequently, there is a reasonable degree of goal congruence between the division and company with respect to retirements.

Gross book value

Those companies that use the gross book value of fixed assets in determining an investment center's asset base apparently do so for

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[1] Harold Bierman, Jr., "ROI as a Measure of Managerial Performance," Financial Executive, March 1973, pp. 40-46.

[2] Reece and Cool, p. 42.

[3] Dearden, "Case Against ROI," p. 127.

two related reasons. First, there is an awareness that the reported ROI or RI using net book value for an individual asset increases rapidly over time.[1] Second, it is considered inappropriate to hold the manager responsible for the reinvestment of cash freed by depreciation charges, which usually is controlled at higher levels.[2]

Solomons, in discussing this first problem, makes the following comments:

> There is something inherently strange about the view that it is right to include fixed assets in a balance sheet at their depreciated value, but wrong to include them in a computation of capital at that value. The only reason for holding such a view is the irrational behavior of the rate of return on investment when fixed assets are taken at book value rather than cost... If depreciation were handled in a theoretically correct manner (i.e., by the compound interest method) the decline in book value of depreciating assets would not of itself disturb the stability of the rate of return on investment.[3]

The National Association of Accountants has contended that the main problem with respect to division ROI has to do with the recovery of capital.

> The effect of depreciation and reinvestment policies on the rate of return from a limited segment of the company's assets tends to distort rate of return from a limited segment of a company's assets because increases in the allowance for depreciation may not be offset by reinvestment of recovered capital in the same segment. Therefore, a more useful rate of return may be secured by using gross assets as the investment base.[4]

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[1] N.A.A. Report No. 35, p. 13.

[2] Ibid., p. 16.

[3] Solomons, p. 135.

[4] N.A.A. Report, No. 35, p. 16.

The N.A.A. is making the point that capital recovered through divisional operations is ordinarily reinvested elsewhere in the business, and so there is no real tendency for the rate of return on assets valued at net book value for the company to increase. On the other hand, if capital recovered in a division operation is reinvested in some other division, then the net book value asset base, which is decreasing, will cause the ROI for a division to rise. These observations, of course, rest on the assumption that the earning power of an asset declines less rapidly than the net book value of the asset.

To illustrate the use of gross book value consider this example (see Exhibit VII). Again we have a division with a single asset costing $1,000 to be depreciated on a straight line basis over five years, and yielding a profit of $100 a year. Note that now the asset is listed in the division's investment base at gross value.

Exhibit VII: Gross book value - depreciation not reinvested

Year	0	1	2	3	4	5
Gross asset value	$1000	$1000	$1000	$1000	$1000	$1000
Return	100	100	100	100	100	100
ROI	10%	10%	10%	10%	10%	10%
RI*	$20	$20	$20	$20	$20	$20

*Assumes a capital charge of 8% on investment

The use of gross book value, unlike the use of net book value, will yield a steady ROI and RI as long as earnings remain steady. Any decrease in the level of earnings (from increased maintenance costs) will be reflected in a falling ROI or RI.

Continuing Terborgh's suggestion[1] of giving divisional managers responsibility for reinvestment decisions, Exhibit VIII illustrates the effect of using gross asset value in the investment base when funds provided by depreciation are reinvested within the division. If the reinvestment rate is the same as the return on the original asset, ROI will remain constant over the years; however, both total earnings and total assets are rising.

Exhibit VIII: Gross book value - depreciation reinvested at 10%

Year	0	1	2	3	4	5
Gross asset value	$1000	$1000	$1000	$1000	$1000	$1000
Accumulated depreciation		200	400	600	800	1000
Total asset value	1000	1200	1400	1600	1800	2000
Return on original asset	100	100	100	100	100	100
Return on depreciation		20	40	60	80	100
Total return	100	120	140	160	180	200
ROI	10%	10%	10%	10%	10%	10%

These two examples vividly point out the advantages of using gross book value. Exhibit VII shows that where the division manager has no discretion over the reinvestment of funds generated by

[1] Terborgh, p. 42-50.

depreciation, the use of gross asset values in the investment base will result in a stable ROI. Exhibit VIII shows that where the division manager does have control over reinvestment decisions the use of gross book value will result in a stable ROI only if the reinvestment rate remains the same as the return on the original asset. If the division manager is unable to profitably reinvest funds within his division, earnings will not rise as rapidly as total investment, resulting in a falling ROI and RI (the increased earnings will not cover the larger capital charge). In either case, the manager will be motivated to direct his excess funds to wherever he will most improve his performance. In this respect, there is complete goal congruence between the objectives of the division manager and the company's interests.

There is, however, a very serious problem with the use of gross book value in that a manager may be encouraged, against the best interests of the company, to dispose of a perfectly useful asset.[1] It may be possible for a manager to increase his ROI or RI by scrapping assets that are not contributing profits equal to the division's objective. For instance, a division may have a machine which costs $1,000 which now, having been fully depreciated, stands in the books at zero. It is further assumed that the salvage value of the asset is zero and that the division's, and the company's cost of capital is 12%. Under these circumstances, if the machine is earning less than $120 per year (that is, less than 12%), the manager will be encouraged to dispose of this asset even though it is contributing to company profits. Since the use

[1] Dearden, "Case Against ROI," p. 127.

of gross book value in practice is very limited, the motivation to scrap older assets that are still productive must be a highly undesirable characteristic.

Economic values

Since both net book value and gross book value have numerous inherent flaws, many authors on the subject of investment base have suggested some sort of economic value concept as the only acceptable alternative. What has not been agreed upon is deciding how to determine economic values. Conceptually, economic value would be the present value of the future cash flows that will be generated by an asset or a group of assets.[1] As a practical matter, it is not possible to determine this amount with tools we have available. The use of current market values, price-level adjustments, appraisal values, and replacement cost have been suggested as viable substitutes for economic value.

Solomons very effectively states the heart of the matter at hand.

> ....because of time-lag....profits rise somewhat rapidly with rising prices, while the investment base, on the other hand, rises more slowly since recently purchased assets bought at or near current prices usually constitute only a small proportion of the total complex of fixed assets. Hence, the percentage of profits to capital appears to rise in a period of rising prices.[2]

He goes on to indicate that this downward trend in rate of return is not really genuine, because it results from a comparison of

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[1] Ibid., p. 128.

[2] Solomons, p. 142.

investment and profit measured in dollars of differing purchasing power. Where the primary goals of divisional performance are to motivate correct behavior, the use of some type of economic value should be a very serious consideration.

CHAPTER IV

DETERMINING DIVISIONAL RETURN

Use of either ROI or RI calculations in measuring investment center performance requires some form of net profit calculation as well as a determination of divisional investment. As with the definition and measurement of investment, there is considerable controversy on what should be included in net income and also on how certain revenues and expenses should be measured.

The Use of GAAP

One alternative in defining profit is to calculate it according to the same generally accepted accounting principles (GAAP) as are used to calculate net income in the company's published financial statements. Indeed, Reece and Cool found in their survey that two out of five of their respondents calculated investment center profit in a manner consistent with the way net income is reported to their shareholders.[1] Many companies evidently believe that a division manager should easily be able to relate the division's profitability to the total net income that the corporation reports to its shareholders and other interested outside parties.

The use of GAAP, while an obvious alternative, is only one option. A multitude of variations from GAAP for internal reporting no doubt

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[1] Reece and Cool, p. 36.

exists. The remainder of this chapter will discuss those variations for which sufficient published information was studied by the writer and the ever present transfer pricing problems.

Transfer Pricing

If a divisionalized company could arrange its affairs so that its divisions had no dealings of any kind with each other it would have removed one of the principal complexities of divisional profit measurement. It would also, however, have lost a valuable feature of decentralization, namely, the opportunity to enjoy the advantages of specialization and local decision making while simultaneously benefitting from some degree of integration.

Whenever transactions between divisions make up more than a negligible proportion of the total transactions, a division's relative profitability can be very much affected by the method used for pricing interdivisional business. The more important these interdivisional transactions become, the more dependent is the whole system of investment center performance measurement on the method of pricing interdivisional transfers. When transfers of goods are made a portion of the revenue of one division becomes a portion of the cost of another. This means that the price at which transfers are made can influence the earnings reported by each division. If the division manager's performance is to be measured in part by reported profit, then he has a direct interest in the transfer prices that are to be established.

The notion of fairness will undoubtedly enter into the determination of a transfer price used in the performance measurement.[1] The manager of a

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[1] Shillinglaw, Cost Accounting, p. 596.

buying division wants to purchase at the lowest prices, and the manager of a selling division wants to sell at the highest prices. What seems fair to one may seem highly unfair to the other.

The use of transfer prices for performance measurements is only one of three conflicting functions a transfer price may serve. Harold Bierman,[1] a well known author on cost accounting topics, has identified three separate uses of divisionalized data (including transfer prices):

1. Measuring divisional performance
2. Decision making
3. Financial reporting

There appears to be a general consensus among the authors on transfer pricing that these three objectives cannot adequately be accomplished by any one method of setting a transfer price. The major issue of this paper being performance measurement of investment centers, the following discussion will emphasize this function. However, that there is a conflict of interest in using transfer prices for performance evaluation, decision making, and financial reporting is a consideration that cannot be ignored when setting transfer prices.

There are many possible transfer prices that may be used. Some of the commonly recognized possibilities are as follows:

1. Market price
2. Negotiated market price
3. Transfer price based on a cost calculation such as full cost, marginal cost, or variable cost

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[1] Harold Bierman, Topics in Cost Accounting and Decisions (New York: McGraw-Hill Book Company, Inc., 1963), p. 90.

Market price

If the divisions were, in fact, independent businesses, any transfer of intermediate products would require a market transaction for which a market price could be recorded. The independent firm is judged on its ability to buy and sell at market and make a profit. If a purchase price is too high, the independent firm will not buy, and if its selling prices are too high, it will not sell.

The use of a decentralized organization arrangement is largely motivated by a desire to create smaller, autonomous operating divisions that will conduct their business as separate entities. The use of a market price, where possible, will create the actual market conditions under which these divisions would operate if they were actually separate companies rather than divisions of one organization. As a result, a division will not be subsidized by other divisions merely because it cannot produce a profit when transfers are made at market prices. To the extent that market prices can be established on the basis of outside forces, they form an excellent performance indicator because they cannot be manipulated by individuals who have an interest in the resulting profit calculation.[1]

This argument is a strong one, but certain conditions are necessary to make it fully valid. First of all, the use of a market price assumes that a market exists at the transfer point. Even if this is the case, the appropriate market price may be difficult to establish. Frequently list prices are only vaguely related to effective

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[1] Ibid.

market prices. Often market prices will fluctuate. Even if we assume a market price can be determined, the question still remains as to whether it is a fair price. Where the buying division is a captive market, the selling division may incur less cost in selling to the buying division than would be incurred if the product were sold to outsiders. In such an instance, if the market price is not adjusted downward, the selling division will get the entire benefit of the savings in selling costs.

A more difficult problem exists where there is no real market at the transfer point. If the selling division furnishes goods or services that will probably never be produced by an outside supplier, it becomes necessary to estimate a satisfactory market price.[1]

Negotiated market price

The use of negotiated or bargained prices has often been suggested as a refinement of the market pricing scheme. A negotiated market price may solve some of the problems encountered in trying to base the market transfer price on a list price, which may have no meaning, or on a market price, which is really not applicable because the selling costs of selling to the division are much less than those of selling outside the firm. Furthermore, much of the bad feeling that may arise from a centrally controlled market price may be eliminated.

The selfish interest of the division managers during negotiation will tend to result in a price very useful for measuring divisional performance. There are, however, as Shillinglaw has identified, four conditions necessary to make a negotiated transfer price system workable:

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[1] John Dearden, "Interdivisional Pricing," Harvard Business Review, January-February, 1960, pp. 119-123.

1. There must be an outside market for the product
2. Negotiators have all the data on alternative sources, markets, and prices
3. The buyer and seller are free to deal outside the company
4. Top management supports the determination of transfer prices by negotiation [1]

Negotiated prices may solve some of the problems encountered in transfer pricing, but such a method will probably not eliminate all of them. It has often been observed that many of the problems that arise in transfer pricing are created because the buying division is a captive customer and is unable to bargain effectively with the selling division. Negotiation is such circumstances simply may not work.

Transfer price based on cost

For performance evaluation, it is difficult to justify transfer prices based on cost--either full cost or marginal cost--except as a last resort. A transfer price based on marginal cost is useful for division making;[2] and a transfer price based on full cost is useful for financial reporting;[3] but for performance measurement, such figures may well result in no profit or even a loss for the selling division. In such an instance, there is little or no

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[1] Shillinglaw, Cost Accounting, p. 603.

[2] Jack Hirshleifer, "On the Economics of Transfer Pricing," Journal of Business, July 1956, pp. 172-184.

[3] Bierman, p. 92.

motivation for the selling division to supply the goods or services. Where no intermediate market exists or where there are significant imperfections in the intermediate market, there may be little choice on transfer prices and some cost measure may be the only real possibility.

The use of full cost plus a profit percentage has been suggested as a useful transfer price, but this scheme will not eliminate all the difficulties of using full cost as a basis. The use of either full cost or full cost plus a profit percentage may well give rise to arguments over how full cost should be determined--essentially cost allocation arguments.

Controllability of Expenses

Deciding on the appropriate transfer price to use for revenue recognition is only one of the problems associated with income measurement. The element of controllability seems to pervade the variations of expense treatment in practice and in the literature. In computing a net profit figure for either ROI or RI calculations, the following deductions may be made from divisional revenue:

1. Variable cost of goods sold and other operating expenses
2. Fixed division overhead
3. Fixed division overhead that is noncontrollable at the division level
4. Allocated corporate headquarters overhead [1]

The inclusion or exclusion of the above expenses makes it possible to select several different profit calculations. The summary

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[1] Solomons, p. 71-80.

calculation below in Exhibit IX presents some of the commonly suggested alternatives.[1]

Exhibit IX: Different degrees of profit for ROI and RI calculations

	Division Contribution Margin	Division Controllable Profit	Division Direct Profit	Division Net Profit
Revenue	$ XXX	$ XXX	$ XXX	$ XXX
Direct cost:				
Variable cost	XX	XX	XX	XX
	$ X			
Fixed controllable cost		XX	XX	XX
		$ X		
Fixed noncontrollable cost			XX	XX
			$ X	
Indirect cost: Allocated home office overhead				XX
				$ X

The four profit calculations are not the only possible ones, but they do seem to be the most reasonable. The names assigned to each are descriptive of each calculation but by no means has the terminology in this area been standardized. The important thing is to recognize what is included and eliminated in each calculation.

[1] Shillinglaw, Cost Accounting, p. 430-431.

Division net profit

As already noted on page 39, Reece and Cool found that forty percent of the respondents to their study use a profit figure computed in a manner consistent with GAAP in measuring divisional performance. It appears then, that net profit is a popular calculation to use in ROI and RI computations. Unfortunately, however, net profit is usually calculated by deducting some pro rata share of the corporate headquarters overhead. It is true that each division benefits from the incurrence of such costs; but it is highly doubtful if this type of cost is controllable at the division level.

Gordon Shillinglaw has suggested that for divisional profit measurement, each division's profit should reflect all items subject to any substantial degree of control by the division manager or his subordinates.[1] Stated positively, it is easy to accept this rule. More controversial is the view that Shillinglaw appears to hold -- that division profit measurement should reflect only controllable items. If this criterion is accepted in assigning cost for evaluation purposes, then net profit is a poor measure of performance. Indeed, Reece and Cool found that in the companies which do define profit differently from net income, the variations fall almost entirely in the category of eliminating expenses over which a division manager has no direct control.[2] This finding is consistent with the notion that most companies are more interested in measuring the performance of the division manager than the division itself.

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[1]Gordon Shillinglaw, Toward a Theory of Divisional Income Measurement," The Accounting Review, April 1962, p. 211-212.

[2]Reece and Cool, p. 36.

Probably the main argument for using net profit, which implies the allocation of corporate administrative expenses, is that it makes the division manager aware of the full cost of operating the division.[1] The difficulty with this is that the manager may spend time analyzing costs that cannot be influenced rather than concentrating on those costs that can be controlled.

Another difficulty in using division net profit is that some method of allocation must be found for assigning corporate headquarters costs to divisions. Whatever method is chosen is likely to be arbitrary and open to question by the division managers.[2]

Division direct profit

This profit calculation is defined as the total division revenue less the direct cost of the division. This concept avoids the main difficulty of net profit in that the corporate headquarters costs are not allocated to the division. However, there may still be some direct costs in the calculation that are not controllable at the division level; that is, some costs that can be directly traced to the division may not be controllable. Such costs as the division manager's salary may be controllable only at the corporate level. Also, some division overhead, such as interest on corporate debt and taxes, may be so influenced by corporate financial and tax policies that these amounts could not be regarded as controllable by the division. If costs are to be assigned on the basis of controllability, then these above-

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[1]Anthony and Dearden, p. 251.

[2]Solomons, p. 72-76.

mentioned costs should be excluded from the profit calculation. If this is not done, the division profit used for performance evaluation may be increased or decreased by actions of someone who is not in the division.

With regard to interest and taxes in particular, further comment is necessary. Reece and Cool found in their survey that in those companies that do eliminate expenses from their profit calculations, income taxes and the divisions allocated portion of interest on corporate debt were the most frequently excluded expenses.[1] If the total asset amount or total invested capital amount are used as the investment base, it follows that interest on debt should not be deducted in computing division profit because it represents that part of income on the total investment that is paid to creditors. On the other hand, charging interest expense to investment centers serves to remind managers that invested funds are not a free resource. We should note, however, that an investment center's fair share of corporate interest expense understates the total cost of capital. As far as taxes are concerned, tax laws and corporate tax policy may result in so many variations in the process of measuring a division's taxable income and the division's tax, that the amount of tax allocable to the division could not be regarded as controllable by the division.

Division controllable profit

This profit calculation is defined as the total division revenue less all costs that are directly attributable to the division management. It would seem that, according to Shillinglaw's criterion

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[1] Reece and Cool, p. 36.

of controllability for performance measurement, this calculation is the desired one since it best reflects the results of the division manager's ability to carry out the assigned responsibility.

In calculating controllable profit, some fixed costs are included. It may appear that the cost is noncontrollable if it is fixed. This is not necessarily true. Because the behavior of a cost is characterized as fixed does not mean that the cost is fixed in amount. It means fixed with respect to changes in volume.[1]

Before the soundness of the profit measure can be judged, it is necessary to take a closer look at the make-up of fixed controllable costs and the fixed noncontrollable costs which constitute the difference between division controllable profit and division direct profit.

The distinction between what is, and what is not controllable at divisional level may differ from company to company depending on the degree of autonomy enjoyed by divisions. One of the most difficult groups of costs to classify satisfactorily as between controllable and noncontrollable is the group consisting of the costs of capital other than interest, such as, depreciation, property taxes, and insurance on property. But the difficulty is substantially reduced as soon as it is recognized that, corresponding to the distinction between controllable and noncontrollable expenses is the distinction between controllable and noncontrollable investment.[2] A division manager will be able to exercise a great degree of control over the investment in

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[1] Charles T. Horngren, Cost Accounting: A Managerial Emphasis (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1972), p. 24.

[2] Solomons, p. 77.

his division and is capable of determining the asset base on which depreciation and insurance will be charged. Of course if the gross book value of assets is used in the investment base, it follows that no charge for depreciation should be made.

The division manager's ability to control the investment base also brings property taxes within his control. Although the rate is outside the control of the division, in this respect it is not different from the market prices and wage rates which confront the division in the market for its factors of production. If lack of control over the prices paid for resources it buys makes their cost noncontrollable, then virtually all costs are noncontrollable. This is surely not what the term means.

Division contribution margin

The contribution margin of the division is generally calculated by deducting variable costs from total revenue. The main argument for this concept is that it is useful in decision making. However, for performance measurement the defect is obvious: there are some controllable items of fixed cost that are excluded from the calculation.

CHAPTER V

CONCLUSIONS

As mentioned previously, determining the divisional profit figure is only part of the problem of investment center performance measurement. Once the proper income figure is determined there is still the problem of relating it to the divisional asset base in such a way as to provide a guide for managerial motivation and performance measurement. The bulk of this paper has been concerned with examining the variations that exist in measuring divisional investment and divisional return.

Despite the pitfalls of implementing investment center financial measures by using ROI and shareholder-report accounting principles, most companies that measure divisional performance seem to think that the best approach is to use ROI and to make their profit and investment definitions and valuations quite similar to those in their published financial statements. The increased use of ROI and GAAP for investment center performance measurement over the last twelve years seems to indicate that financial managers do not regard the conceptual flaws in the ROI-GAAP approach as anything more than hypothetical.

However, a note of caution is in order. The potential does exist for ROI as commonly implemented to motivate some investment center managers to take actions which improve the measured divisional

ROI yet which are not in the best interests of the company. If a company were to use (a) the residual income method, (b) controllable profit, and (c) net book value based on annuity depreciation, it would be possible to combine the measurement of profit and investment without motivating the manager to take uneconomic action. To do this, however, would take drastic changes in the division's accounting procedures, which most companies seem reluctant to make. Since no company adapts ROI in the ways just described it is my premise that corporate executives are convinced that the pitfalls of a ROI-GAAP system are indeed hypothetical and not real in their company.

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