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The Evolution of Management Accounting

Robert S. Kaplan

ABSTRACT: This paper surveys the development of cost accounting and managerial control practices and assesses their relevance to the changing nature of industrial competition in the 1980s. The paper starts with a review of cost accounting developments from 1850 through 1915, including the demands imposed by the origin of the railroad and steel enterprises and the subsequent activity from the scientific management movement. The DuPont Corporation (1903) and the reorganization of General Motors (1920) provided the opportunity for major innovations in the management control of decentralized operations, including the ROI criterion for evaluation of performance and formal budgeting and incentive plans. More recent developments have included discounted cash flow analysis and the application of management science and multiperson decision theory models. The cost accounting and management control procedures developed more than 60 years ago for the mass production of standard products with high direct labor content may no longer be appropriate for the planning and control decisions of contemporary organizations. Also, problems with using profits as the prime criterion for motivating and evaluating short-term performance are becoming apparent. This paper advocates a return to field-based research to discover the innovative practices being introduced by organizations successfully adapting to the new organization and technology of manufacturing.

THE challenges of the competitive environment in the 1980s should cause us to re-examine our traditional cost accounting and management control systems. Virtually all of the practices employed by firms today and explicated in leading cost accounting textbooks had been developed by 1925. Despite considerable change in the nature of organizations and the dimensions of competition during the past 60 years, there has been little innovation in the design and implementation of cost accounting and management control systems. Therefore, it is not only appropriate but necessary that we understand the sources of today's practices, reflect on the new demands for planning and control information, and develop a research strategy to meet these new demands.

Section 1 traces the development of

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cost accounting practices from the early textile mills and railroads (circa 1850) through the formation of the great industrial enterprises in the U.S. and the emergence of the scientific management approach. This phase culminated about 1920. Section 2 describes the management control innovations of the DuPont Corporation (founded 1903) and the General Motors Corporation after its reorganization by Pierre du Pont and Alfred Sloan in 1920. The origins of decentralization through Return on Investment (ROI) control of both functional and multi-divisional organizations can be found in these two corporations. Section 3 surveys developments in cost accounting and managerial control from 1925 to the present. Section 4 poses challenges from the contemporary environment that may not be met by the cost accounting practices developed more than 60 years ago for a substantially different competitive situation. Section 5 concludes with an agenda for field-based research to document or develop innovative management control practices appropriate for the changing industrial environment.

1. A SUMMARY OF HISTORICAL DEVELOPMENTS IN COST ACCOUNTING

The development of cost accounting and management control practices in U.S. corporations has been well traced by Thomas Johnson (see Johnson [1972, 1975a, 1975b, 1978, 1980, 1981, and 1983]). This research builds upon the history of the development of U.S. corporations in Chandler [1962 and 1977], in which we learn of the great importance of cost and management control information to support the growth of large transportation, production, and distribution enterprises during the 1850–1925 period. Littleton [1933],

Solomons [1968], and Garner [1954] provide additional historical perspectives on the evolution in cost accounting thought. I will briefly summarize these historical developments so that we can understand the sources of many of today's practices, though the interested reader should consult the above references for a more complete treatment.

The demand for information for internal planning and control apparently arose in the first half of the 19th century when firms, such as textile mills and railroads, had to devise internal administrative procedures to coordinate the multiple processes involved in the performance of the basic activity (the conversion of raw materials into finished goods by textile mills, the transportation of passengers and freight by the railroads).¹

Johnson [1972] describes the cost accounting system of Lyman Mills, a New England textile mill (established about 1855), that enabled the managers to monitor the efficiency of the mill's conversion of raw materials into a variety of finished goods. The system was based on the company's double-entry book of accounts and provided information on the cost of finished goods, on the productivity of workers, on the impact of changes in plant layout, and as a control on the receipt and use of raw cotton. Chandler [1977, pp. 109–120] provides evidence of how U.S. railroads, in the 1860s and 1870s, developed accounting procedures to aid them in their extensive planning and control procedures. Railroads handled a vastly greater number and dollar volume of transactions than had any previous business and, as a

¹ The economic motivation for forming centralized firms to carry out the multiple processes for these basic activities, as opposed to allowing decentralized units to perform these functions by continuous contracts and transactions with other market-based units, has been developed by Coase [1937] and Williamson [1975 and 1981].

consequence, had to devise procedures to record and summarize an enormous number of cash transactions. These procedures also generated summary financial reports on the operations of the many sub-units within the large, geographically dispersed railroad companies. In addition to the financial summaries, the railroads developed a system of reporting operating statistics for evaluating and controlling the performance of their sub-units. Statistics such as cost per ton-mile and the operating ratio (operating income divided by sales) were routinely reported for various sub-units and classes of service.

Later in the 1880s, the newly formed mass distribution [Chandler, 1977, Chapter 7] and mass production [Chandler, 1977, Chapter 8] enterprises adapted the internal accounting reporting systems of

used by railroads was not yet in general use in manufacturing concerns. By this method, each department listed the amount and cost of materials and labor used on each order as it passed through the sub-unit. Such information permitted Shinn to send Carnegie monthly statements and, in time, even daily ones providing data on the costs of ore, limestone, coal, coke, pig iron, spiegel, molds, refractories, repairs, fuel, and labor for each ton of rails produced. These cost sheets [were] called "marvels of ingenuity and careful accounting."

These cost sheets were Carnegie's primary instrument of control. Costs were Carnegie's obsession. . . . Carnegie concentrated . . . on the cost side of the operating ratio, comparing current costs of each operating unit with those of previous months, and where possible, with those of other enterprises. . . . These controls were effective. "The mi-

call today prime or direct costs; that is, little attention was paid to overhead and capital costs.

Carnegie's concern was almost wholly with prime costs. He and his associates appear to have paid almost no attention to overhead and depreciation. This too reflected on the railroad experience. As on the railroads, administrative overhead and sales expenses were comparatively small and estimated in a rough fashion. Likewise, Carnegie relied on replacement accounting by charging repair, maintenance, and renewals to operating costs. Carnegie had, therefore, no certain way of determining the capital invested in his plant and equipment. As on the railroads, he evaluated performance in terms of the operating ratio (the cost of operations as a percentage of sales) and profits in terms of a percentage of book value of stock issues [Chandler, 1977, p. 268].

Thus, cost accounting practice in the late 1800s did not include the allocation of fixed costs to products or to periods.²

Despite the enormous capital invested in these new manufacturing enterprises, there was apparently no systematic method for forecasting investments or coordinating and monitoring capital investment. Andrew Carnegie is reported to have undertaken almost any new investment that would reduce his prime operating costs:

Carnegie's operating strategy was to push his own direct cost below those of all competitors so that he could charge prices that would always ensure enough demand to keep his plant running at full capacity. . . . Secure in his knowledge that his costs were the lowest in the industry, Carnegie then engaged in merciless price-cutting during economic recessions. While competing firms went under, he still made profits [Johnson, 1981, p. 515].

Johnson [1980] proposes that because firms relied almost exclusively on internal sources of capital to finance new investments, and second, because firms were basically in only one line of business, the choice was only to invest more in this line of business or not to invest further in this business. For this decision, the effect of the new investment on reducing prime costs or in improving the operating ratio was deemed sufficient to guide the investment decision.³

The scientific management movement in American industry provided a major impetus to the further development of cost accounting practices [Chandler, 1977, pp. 272–283]. The major figures in this movement were engineers who, by detailed job analyses and time and motion studies, determined "scientific" standards for the amount of labor and material required to produce a given unit of output. These standards were used to provide a basis for paying workers on a piece-work basis, and to determine bonuses for workers who were highly productive. The names associated with

² Richard Brief pointed out to me that late 19th-century texts and journals contained active discussions on both the allocation of fixed capital costs to periods and the allocation of fixed operating costs to products (see, for example, references in Edwards [1937]). Neither of these possibilities, however, was practiced by companies at that time.

³ Habakkuk [1962, p. 59] argues that the relative scarcity of labor in the U.S. and the inadequacy of methods for estimating relevant capital costs explain why industrialists were willing to invest solely on the basis of increasing the productivity of labor.

The American manufacturer was averse to retaining old equipment when more labour-productive equipment was available because the old equipment made poor use of his scarce labour. So long as the saving of labour was vouched for, the capital-costs were less important, at least within a fairly wide range, and in the absence of clear ideas and relevant data about the proper components of capital-costs, manufacturers were probably disposed to underestimate rather than overestimate them.

I am grateful to Richard Brief for this reference.

developing the scientific management approach include Frederick Taylor, Harrington Emerson, A. Hamilton Church, and Henry Towne.⁴ This approach included not only the development of work standards but also a new form of organization, supplementing the traditional operating or line functions with staff function designed “not to accomplish work, but to set up standards and ideals, so that the line may work more efficiently.”

The “scientific management” advocates also started the practice of measuring and allocating overhead costs to products.

Innovations came primarily in determining indirect costs or what was termed the “factory burden,” and in allocating both indirect and direct (or prime) costs to each of the different products produced by a plant or factory so as to develop still more accurate unit costs. . . . In a series of articles published in the *Engineering Magazine* in 1901, Alexander Church began to devise ways to account for a machine’s “idle time,” for money lost when machines were not in use. Henry Gantt and others then developed methods of obtaining standard costs based on standard volume of throughput by determining standard costs based on a standard volume of, say, 80 percent of capacity; these men defined the increased unit costs of running below standard volume as “unabsorbed burden” and decreased unit costs over that volume as “over-absorbed burden” [Chandler, 1977, pp. 278–279].

The practice of allocating fixed capital costs to products or to periods, however, had still not emerged.

. . . Nor did they concern themselves with the problem of depreciation in determining their capital account. The reason was that, until well into the twentieth century, nearly all large indus-

trial firms continued to use replacement accounting, which their managers had borrowed from the railroads . . . they defined profits as the difference between earnings and expenses, and the latter included repairs and renewal [Chandler, 1977, p. 279].

The development of standard costs also came to fruition during this time. In a series of articles in 1908 and 1909, Harrington Emerson clearly describes the value of standard costing for timely planning and control. The literature of standard costing continued to evolve so that by 1918, G. Charter Harrison published a series of articles in *Industrial Management*, exhibiting

[a] sureness of touch and a comprehensiveness in their treatment which shows standard costing to have left the experimental stage and to have attained the status of established practice. In these articles, he produced the first set of formulas for the analysis of cost variances [Solomons, 1968, pp. 46–47].

In addition to these innovations by practicing managers and engineers, extensive discussions on cost accounting concepts appeared in textbooks, monographs and articles during this time (see Solomons [1952]). *Factory Accounting* by Garcke and Fells, first published in 1887, integrated cost accounts into the firm’s double-entry financial accounting system and clearly identified a position that fixed overhead costs should not be allocated to production costs.

To distribute the charges over the articles manufactured would, therefore, have the effect of disproportionately reducing the cost of production with every increase, and the reverse with every diminution of business. Such a

⁴ Epstein [1978] documents the important influence on cost accounting practices of the “scientific management” approach.

result is greatly to be deprecated, as tending neither to economy of management nor to accuracy in estimating for contracts. The principals of a business can always judge what percentage of gross profits upon cost is necessary to cover fixed establishment charges and interest on capital [Garcke and Fells, 1887, p. 74].

The use of breakeven charts to express the variation of cost with output could be found in writings in England and the United States in 1903 and 1904 [Solomons, 1968, p. 35].

Vangermeesch [1983] summarizes the extensive writings of A. Hamilton Church, an insightful observer of early twentieth-century cost accounting practices. Church disagreed with the practice of allocating all overhead based on direct labor cost:

We find that as against \$100 direct wages on order, we have an indirect expenditure of \$59, or in other terms, our shop establishment charges are 59 percent of direct wages in that shop for the period in question. This is, of course very simple. It is also as usually worked very inexact. It is true that as regards the output of the shop as a whole a fair idea is obtained of the general cost of the work. . . . And in the case of a shop with machines all of a size and kind, performing practically identical operations by means of a fairly average wages rate, it is not alarmingly incorrect.

If, however, we apply this method to a shop in which large and small machines, highly paid and cheap labor, heavy castings and small parts, are all in operation together, then the result, unless measures are taken to supplement it, is no longer trustworthy [Church, 1908, pp. 28–29].

In commenting on the importance of accounting for overhead costs directly rather than averaging them together and

allocating them proportional to direct labor, Church observes:

These shop charges (overhead) frequently amount to 100 percent, 125 percent, and even much more of the direct wages. It is therefore often actually more important that they should be correct than that the actual wages cost should be correct [Church, 1908, p. 40].

Church's admonitions against loading all overhead costs onto direct labor, though, seem to have gone largely unheeded even in today's manufacturing environment where direct labor can represent less than ten or 20 percent of the value added to a product in the manufacturing process.⁵

J. Maurice Clark at the University of Chicago made one of the few academic contributions to the emerging cost accounting literature during this time. Clark [1923] provides an extensive discussion of the nature of overhead costs and their use in managerial decisions. Driven by a concern with the regulation of railroads and public utilities and with the broader societal implications of cost measurement (including price discrimination, cut-throat competition, and labor compensation), Clark examines in depth the nature of overhead costs. Many cost concepts that are widely used today, such as escapable or avoidable overhead, sunk costs, incremental or differential costs, and the relevant time period for determining whether a cost is fixed or variable, can be found in Clark's book. An entire chapter is devoted to a discussion of "Different Costs for Different Purposes," a concept illustrated by considering the changing definition of cost in nine different decisions to be made about a plant and its output. The notion of opportunity cost is implied by the follow-

⁵ See Schwartzbach and Vangermeesch [1983] for a proposal to implement Church's proposal by developing a separate costing rate for each important machine in a production process.

ing statement:

... for certain purposes cost is not a mere present fact, but depends on the alternative offered [Clark, 1923, p. 483].

Also, Clark proposes that a statistical method be used to estimate cost behavior. This would be an alternative to the accountant's somewhat arbitrary allocations, or subjective estimates, of fixed and variable components of total costs. He notes the possibility of both time-series and cross-sectional statistical analyses:

A concern may watch the monthly fluctuations of its expenses and compare them with the fluctuations of output, in order to learn what the differential cost of added output is. Or it may be possible to compare the costs of different establishments some of which are integrated and others of which are not (for example, sugar factories which buy their beets and factories which raise their own) ... [Clark, 1923, p. 217].

and the advantages of statistical over judgmental analysis:

The statistical method has a further advantage in that it catches everything which expert judgment might overlook, and corrects automatically any possible fallacies due to the semi-intuitive methods of arriving at conclusions [Clark, 1923, pp. 223-224].

An excellent discussion of the dangers and limitations of statistical analyses also is presented [pp. 224-227], a discussion that could well be incorporated in many of today's cost accounting texts.⁶

Finally, Clark understood the importance of keeping the cost accounting information separate from the financial accounting system.

Undoubtedly, the ultimate solution lies in the development of systems of cost analysis which shall be separate from the

formal books of account, though based on the same data [Clark, 1923, p. 68].

Thus, by 1925 sophisticated cost accounting theories and practices had been developed.⁷ Many of these innovations were being used to improve the the efficiencies of enterprises actively engaged in the mass production of standard products with relatively high direct labor content. Unlike the situation today, the cost accounting, capital accounting, and financial accounting systems were kept separately, with the cost accounting system typically designed for and operated by the manufacturing departments. Cost information was used to assess operating efficiencies, to aid in pricing decisions, and to control and motivate worker performance. The emphasis was on job and factory efficiency, not on the commercial success of the overall corporation.⁸ The demand for a management accounting system to facilitate the control and coordination of a firm's diverse activities did not occur until the appearance of vertically integrated, multi-activity firms (see Johnson [1975b]). The emergence of these firms in the early 1900s probably marked the start of modern managerial control practices.

2. HISTORICAL DEVELOPMENT OF MANAGERIAL CONTROL

Both Chandler [1977] and Johnson [1975a, 1975b, 1980] look to the DuPont Company as the innovator in developing modern managerial control systems:

⁶ Of particular concern to Clark is the existence of confounding factors that distort the statistical relationship between output and cost. Today, we would recognize the role of multiple regression to control for these additional explanatory factors.

⁷ See Garner [1954] for a summary of the state-of-the-art of cost accounting practices and literature as of 1925.

⁸ Church's writings (see Vangermeersch [1983] and Wells [1977; p. 53]) seem to be an exception to this observation.

In 1903, three Du Pont cousins consolidated their small enterprises with many other small single-unit family firms. They then completely reorganized the American explosives industry and installed an organizational structure that incorporated the "best practice" of the day. The highly rational managers at DuPont continued to perfect these techniques, so that by 1910 that company was employing nearly all the basic methods that are currently used in managing big business [Chandler, 1977, p. 417].

The DuPont Powder Company became a centrally managed enterprise coordinating through its own departments most of the manufacturing and selling activities formerly mediated through the market by scores of specialized firms. A centralized accounting system was indispensable to the DuPont Powder Company's elaborate department structure.

Information provided by the Powder Company's centralized accounting system enabled top management to carry out two basic activities that comprised the task of planning: the allocation of new investment among competing economic activities (including the maintenance of working capital) and the financing of new capital requirements [Johnson, 1975a, pp. 186-187].

The development of vertically integrated, multi-activity organizations for mass production and mass distribution provided the potential for dramatic breakthroughs in efficiency. The complexity and diversity of these enterprises, however, could have caused the firms to fail due to lack of coordination, planning, and control, had not new organizational forms evolved to allow senior managers to guide their operations.

One innovation was to develop the functional or unitary form of organization that is still characteristic of many contemporary firms. Firms were decentralized into separate departments—

manufacturing, sales, finance, and purchasing. The managers of each department became specialists in that area and could pursue strategies that maximized the performance of their departments and the entire firm. The senior managers, freed from day-to-day operating responsibility, could focus more on coordinating the firm's diverse activities and developing its long-term strategies (including capital allocation and financing).

The decentralized, functional organization required a performance measurement system to motivate and evaluate departmental performance and to guide overall firm strategy. The DuPont Company devised an accounting measure, Return on Investment (ROI), to serve both as an indicator of the efficiency of its diverse operating departments and as a measure of financial performance of the company as a whole. Pierre du Pont rejected the (then) widely-used measure of profits or earnings as a percentage of sales or costs, because it failed to indicate the rate of return on capital invested.

A commodity requiring an inexpensive plant might, when sold only ten percent above its cost, show a higher rate of return on the investment than another commodity sold at double its cost, but manufactured in an expensive plant. The true test of whether the profit is too great or too small is the rate of return on the money invested in the business and not the percent of profit on the cost [A DuPont executive writing in 1911 as quoted by Johnson, [1975, p. 88].

The ROI measure was used to evaluate new proposals for building manufacturing facilities and thereby facilitated the allocation of funds among competing product lines; capital was allocated to those products and mills that were earning the highest returns. Apparently, depreciation was used both to compute net income and as a deduction from gross

assets to determine investment (see Johnson [1975a, fn. 12, pp. 187–188]), but how depreciation was computed is not indicated.

The ROI approach was extended in about 1912 by one of DuPont's financial officers, Donaldson Brown, when he decomposed the ROI calculation into the product of the sales turnover ratio (sales divided by total investment) and the operating ratio of earnings to sales. These two ratios were decomposed into their component parts many times further so that each of DuPont's departments knew how its performance affected either the sales turnover or the operating ratio, and hence the company's overall return on investment. As a further benefit, the disaggregation of the ROI measure enabled management to explain the reasons why actual ROI would have differed from budgeted ROI in any given period.

Pierre du Pont also established a formal capital appropriation procedure and a systematic process for formulating and approving both operating and capital budgets. The treasurer's office prepared short- and long-term financial forecasts. All these procedures were in place by 1910 [Johnson, 1975a; Chandler, 1977, pp. 448–449].

The functionally departmentalized DuPont system is the first example of applying local profit measures to evaluate the performance of operating departments. It was successful in coordinating and rationalizing the operations of the large industrial corporations that formed in the early 1900s. The basic functional organization is still used in many worldwide corporations today, more than 70 years after its introduction. The development of the ROI criterion, applied at a departmental level, seems to be the origin of the profit and investment center concept used in most modern corporations. It is remarkable to note these lasting legacies of

Pierre du Pont and Donaldson Brown on modern industrial enterprises.

Nevertheless, there were still problems in organizing the large industrial corporations in the World War I era. The allocation of responsibility between the top managers in the centralized office and the middle managers in the operating departments was not clearly delineated. Senior managers intervened excessively in day-to-day operations, frequently neglecting their responsibilities for long-range planning and assessing the impact of trends in the external environment on their company's operations [Chandler, 1977, pp. 453–454].

The recession following the end of World War I dramatically revealed the shortcomings of the planning and control systems of most industrial enterprises. From these difficulties, General Motors and DuPont developed a new form of organizational structure, the multi-divisional firm. The two companies are linked because the DuPont Corporation became a leading GM stockholder, and Pierre du Pont became president of General Motors after GM's financial difficulties in 1920, when many other senior DuPont executives also transferred to General Motors. Pierre du Pont promoted Alfred P. Sloan to work with him in rehabilitating GM's organizational structure. (The details of this story are described in Sloan [1963], Chandler [1977, pp. 456–463], and Johnson [1978].) Johnson [1978] provides an excellent description of the innovative managerial accounting system established by Pierre du Pont, Donaldson Brown, and Alfred Sloan at General Motors in the early 1920s. The following summary indicates the scope and impact of the system.

GM's management accounting system did three things to help management accomplish "centralized control with

decentralized responsibility.” First, it provided an annual operating forecast that compared each division’s *ex ante* operating goals with top management’s financial goals. This forecast made it possible for top management to coordinate each division’s expected performance with company-wide financial policy. Second, the management accounting system provided sales reports and flexible budgets that indicated promptly if actual results were deviating from planned results. They specified, furthermore, the adjustments to current operations that division managers should make to achieve their expected performance goals. The sales reports and the advanced flexible budget system provided, then, for control of each division’s actual performance. Third, the management accounting system allowed top management to allocate both resources and managerial compensation among divisions on the basis of uniform performance criteria. This simultaneously encouraged a high degree of automatic compliance with company-wide financial goals and greatly increased the division manager’s decentralized autonomy [Johnson, 1978, pp. 493–494].

From this summary (and the supporting details in Sloan [1963] and Johnson [1978]), it is clear that the organizational form and reporting and evaluation system for virtually all modern enterprises had evolved in General Motors by 1923—60 years ago.

A few highlights of the GM system are worth noting. First, the goal of General Motors was to earn an average satisfactory Return on Investment over an entire business cycle, not to achieve annual increases in earnings. There was ample recognition that a below-average ROI would be earned in a year when car demand was slack, to be offset by an above-average ROI in an exceptionally strong sales year.

Second, Donaldson Brown devised an

ingenious pricing formula [Johnson, 1978, pp. 498–500, 505–507] to determine a target price that would yield the desired ROI when production and sales were at a “standard” or “normal” volume, defined to be 80 percent of capacity. This formula recognized not only the investment in fixed plant and equipment but also the investment in working capital, especially accounts receivable and inventory, which Brown assumed to vary with the level of production and sales activity. Donaldson Brown’s formula, devised in the early 1920s, is as good an approach to a target, cost-based pricing scheme as any that can be found today. Johnson notes that the Brown pricing formula was not followed blindly:

GM did not use standard price data to determine the actual prices to be charged during any given model year. . . . Top management professed the position that the proposed price for any particular year was determined in the competitive marketplace. . . . If the proposed price for any model fell below the dollar equivalent of the standard price ratio, and if the gap between these two prices could not be attributed to short-run competitive pressures, then top management requested a division manager to reduce his proposed operating cost [Johnson, 1978, p. 500].

Thus, the pricing formula provided a powerful link between a division’s short-term operating plan and the top management’s financial strategy.

An additional feature of the Brown pricing formula is that depreciation is included as a fixed expense. Just when this allocation became part of the overall management control scheme is not clear from reading the secondary sources available. Perhaps the institution of the U.S. federal income tax before and during World War I made this accounting treatment more important and visible to

senior U.S. managers than it had been prior to 1910.

The third highlight of the GM system is an explicit incentive and profit-sharing plan for the senior managers of the corporation.⁹ The practice of a formula-based incentive plan, widespread in today's U.S. corporations (and also heavily criticized), can be traced back to the innovative organization designed by Pierre du Pont and Alfred Sloan:

Before we had the Bonus Plan in operation throughout the corporation, one of the obstacles to integrating the various decentralized divisions was the fact that key executives had little incentive to think in terms of welfare of the whole corporation. . . . Under the incentive system in operation before 1918, a small number of division managers had contracts providing them with a stated share of profits of their own divisions, irrespective of how much the corporation as a whole earned. Inevitably, this system exaggerated the self-interest of each division at the expense of the interest of the corporation itself. It was even possible for a division manager to act contrary to the interests of the corporation in his effort to maximize his own division's profits.

The Bonus Plan established the concept of corporate profit in place of divisional profits. . . . At first total bonus awards were limited to 10 percent of the net earnings after taxes and after a 6 percent return (on net capital employed) [Sloan, 1963, p. 409].

The GM bonus plan was administered through an elaborate process designed to provide rewards to those employees and managers who had made substantial contributions to the company's performance. While guided by accounting measures, such as divisional return on invested capital, the system involved a systematic review of each individual's performance and also considered special

circumstances in a division [Sloan, 1963, pp. 422-428].

Fourth, a sophisticated market-based transfer pricing system was established among General Motors' many operating divisions. The pricing of interdivisional transfers arose initially in the functional organization of DuPont. For DuPont, at about 1905, we learn that:

Each of the company's mills manufactured many of the intermediate products, such as acids, that were used to make explosives. An important question, therefore, was whether money could be saved by purchasing these intermediate products from outside firms instead of making them in the Powder Company's mills. The Powder Company's cost figures for intermediate products could not be compared with outside market prices, however, because mill overhead and general administrative charges were allocated only to finished goods and not to intermediate products. This accounting policy caused an understatement of the cost of company-made intermediate products [Johnson, 1975a, p. 195].

Alfred Sloan, ten years later, had already worked out the market-based solution to this problem. As president and chief operating officer of United Motors, Sloan reports:

My divisions in the United Motors Corporation had sold both to outside customers and to their allied divisions at the market price.

When the United Motors group was brought into the General Motors Corporation in late 1918, I found that if I followed the prevailing practice, I would no longer be able to determine the rate of return on investment for these accessory divisions individually, or as a group. . . .

⁹ In an unpublished interview with Professor Alfred D. Chandler, Donaldson Brown reported that the GM bonus plan was actually modeled after one established at the DuPont Corporation in 1903.

At that time, material within General Motors was passing from one operating division to another at cost plus some predetermined percentage [Sloan, 1963, p. 48].

Sloan recommended to Durant, then president of GM:

For exclusively interdepartmental transactions . . . the starting point should be cost plus some predetermined rate of return, but only as a guide. To avoid the possibility of protecting a supplying division which might be a high-cost producer, I recommend a number of steps involving analysis of the operation and comparison with outside competitive production where possible [Sloan, 1963, pp. 49–50].

While Sloan does not relate what transfer price practice he implemented upon becoming chief executive at General Motors, Donaldson Brown provided a forceful description of GM's policy:

The question of pricing product from one division to another is of great importance. Unless a true competitive situation is preserved, as to prices, there is no basis upon which the performance of the divisions can be measured. No division is required absolutely to purchase products from another division. In their interrelation they are encouraged to deal just as they would with outsiders. The independent purchaser buying products from any of our divisions is assured that prices to it are exactly in line with prices charged our own car divisions. Where there are no substantial sales outside, such as would establish a competitive picture—at times partial requirements are actually purchased from outside sources so as to perfect the competitive situation [Brown, 1927, p. 8].

In summary, by 1925 DuPont and General Motors had developed many of today's managerial control practices: decentralization via a functional or

multi-divisional organization, the ROI performance measure, formal capital appropriation procedures, budgeting and planning cycles, flexible budgets, target ROI pricing based on standard volume, incentive and profit-sharing plans, and a market-based transfer price policy.

3. DEVELOPMENTS SINCE 1925 IN COST ACCOUNTING AND MANAGERIAL CONTROL

The preceding sections document that the growth of the modern corporation, between 1880 and 1925, provided the stimulus for the development of innovative management accounting practices. These practices were devised by engineers and industrialists, working in actual organizations, rather than by academic researchers. This probably explains the rapid adoption of these innovative practices by other organizations.

The period since 1925 has not been devoid of interesting developments in cost accounting and management. For example, many aspects of cost behavior have been developed, embellished, and imbedded in the literature.¹⁰ But these developments have been primarily by academics and, with few exceptions, have had relatively little impact on practice. Unlike the situation described in the preceding two sections, there have been virtually no major innovations by practicing managers or management accountants during the most recent 60 years to affect contemporary management accounting thought.¹¹

¹⁰ Economists and accountants at the London School of Economics wrote extensively on the nature of costs and the importance of opportunity costs in economic decisions (see Buchanan and Thirby [1973]). Today's cost accounting texts contain extensive discussions on various cost behavior concepts such as fixed vs. variable, incremental, escapable, opportunity, traceable, controllable, relevant, etc. These concepts are generally illustrated in simplified production settings.

¹¹ Kaplan [1981] describes a rather depressing exer-

One innovation has been the emergence, in the past 30 years, of the modern treatment of capital budgeting.¹² Shillinglaw [1980, p. 6] reports:

When I started my professional career in the early 1950s, the consulting firm I worked with played a missionary role in the introduction of discounted cash-flow analysis in industry . . . the older systems, based on pay back period or on some undiscounted form of the return-on-investment ratio, were designed by financial managers, most of them accountants. The engineers had been tinkering with cash-flow discounting for years, but they were not very influential.

Joel Dean is often acknowledged for introducing modern capital budgeting procedures to firms. His book [Dean, 1951] is an excellent summary of the practices of leading corporations in the post-World War II era but, surprisingly, does not advocate the discounting of future cash flows. He describes the discounting of the stream of earnings, not the cash flows, from a project and concludes that for many investments, discounting "frequently may not be worth the cost." By the mid-1950s, however, Dean was advocating the discounted cash flow (DCF) approach [Dean, 1954] over the previously used payback and ROI methods, and this recommendation also appeared in the accounting literature [Christenson, 1955]. The publication of the first edition of Bierman and Smidt in 1960 provides additional support for the acceptance of DCF analysis (at least among academic scholars), and numerous surveys during the past 20 years have indicated the widespread adoption of this analytic technique by U.S. firms. Whether the procedure is being used wisely is currently being questioned (see, for example, Pinches [1982] and Myers [1984]), but the criticisms are about how DCF is implemented in firms rather than

about the merits of discounting cash flows versus the previously used, nondiscounted measures such as ROI or payback.

The Residual Income (RI) extension to the Return on Investment criteria also emerged in the post-World War II period. It is generally attributed to the General Electric Corporation, though its antecedents can be traced to writings earlier in this century (see Scovell [1924], Church [1917, pp. 393–394] and Clark [1923]). The earliest references to residual income in the management accounting literature are quite recent [Solomons, 1965 and Anthony, 1965]. The Residual Income concept overcame one of the dysfunctional aspects of the ROI measure in which managers had an incentive to decline investments that yielded returns in excess of the firm's (or division's) cost of capital, but below the average ROI for their division. The RI approach has not been widely adopted (see Reece and Cool [1978]). Even General Electric has apparently discarded RI and returned to ROI as its basic financial measure for investment center performance (see General Electric [1981]).

The transfer price problem remained a thorny issue for vertically integrated or multi-divisional firms, though there are very few references to this subject until the most recent 30 years. In the mid-1950s, three articles [Cook, 1955, Dean, 1955, and Stone, 1956] were published on transfer pricing that described the full range of available practices (full cost, standard cost, market price, and negoti-

cise, attempting to glean innovative management accounting practices from reading through recent volumes of a practitioner-oriented journal.

¹² Parker [1968] summarizes the pre-1950 development of discounted cash flow in the actuarial, engineering economy, and political economy literature. He notes that there is little evidence that firms used this technique before the 1950s.

ated or bargained price) and advocated one or the other as being preferable. Not a single reference was made in these three articles to any prior literature on the subject. Hirschleifer [1956, 1957], in two classic articles, developed the micro-economic foundations of the transfer pricing problem and demonstrated, in a limited setting, the optimality of using the opportunity cost of the selling division as the appropriate transfer price. This rule includes the market price as a special case when the intermediate product is sold in a perfectly competitive market, but the rule reverts to the selling division's marginal cost when there is no market or an imperfectly competitive market for the intermediate product.

Examples of firms using the marginal cost rule in practice are quite rare (see Umaphy [1978]), suggesting that the deterministic, cooperative, full-information setting assumed in the Hirschleifer analysis is not realized very often. In fact, the existence of private information by division managers, and the gains from strategic behavior within the firm (see Williamson [1975] and Waterhouse and Tiessen [1978]), require that the transfer pricing problem be solved in an environment that clearly permits noncooperative bargaining in an uncertain environment with informational asymmetries among division managers and central management.¹³ Thus, the transfer price issue remains an open problem to this day, though researchers are much more aware of the analytic complexity of this problem than they were thirty years ago. In the meantime, it is probable that the distribution of transfer-pricing practices among firms in 1983 would be indistinguishable from that of thirty years ago, when the transfer pricing problem first attracted the attention of academics.

About 1960 a major stream of management accounting literature started on

the application of quantitative models to a variety of planning and control problems. This literature, stimulated by the development of operations research as an academic discipline in the post-World War II era, described how analytic techniques, including regression analysis, linear and nonlinear programming, probability theory, hypothesis testing, and decision theory, could be applied to cost accounting problems (see Kaplan [1977 and 1982]).

The introduction of quantitative analysis has not extended the domain of management accounting. It simply provides analytic tools for aiding the planning and control decisions that firms have been making for the past century, e.g., determining fixed and variable costs, assessing product profitability and determining improved product mixes, aiding the make vs. buy decision, deciding whether to discontinue an existing product or launch a new one, allocating costs to products, and analyzing the sources of deviation between actual and budgeted performance. Quantitative analysis therefore appears to be a descendant of the scientific management era of cost accounting (1895–1915), with the renewed interest in this approach occurring, after a half-century gap, because of newly developed techniques. Had these techniques been available to the engineers who developed the scientific management approach, it seems likely that many of the recommendations of the past two decades would have been considered and tested for their usefulness in the 1895–1925 era.

The most recent 15-year period has been characterized by the application of information economics and agency theory to management accounting problems. The first phase of this research, the

¹³ The discussion in Dearden [1964] provides a vivid illustration of the difficulties in implementing transfer pricing schemes in actual organizations.

information economics approach, viewed the management accountant as choosing an information system in an uncertain environment to aid decision-making in the firm. The information system was useful if it provided signals about an unknown, random state of nature that could influence the actions of an optimizing decision-maker with a known preference (or utility) function for monetary rewards. In theory, the values of alternative information (management accounting) systems could be measured by their effects on the decision-maker's expected utility. The academic literature of this genre had a relatively brief duration, starting with an introduction to the problem in 1968 [Feltham, 1968] and basically culminating, less than a decade later, with a monograph [Demski and Feltham, 1976]. The approach is also well summarized in Demski [1980].

The single-person information economics approach was supplanted by principal/agent, or agency theory, research. In this model, accounting information is viewed as the basis of contracting between economic agents who have different ownership rights, different information, perhaps different prior beliefs, and different preferences for outcomes. Thus, rather than viewing the firm as a single organizational entity, agency theory models the diverse interests, information, and beliefs of economic agents contracting with the firm. The information, or management accounting, system serves to inform the principal (owner, shareholder, central manager) and agent (management, division, or department head) about the actual outcome, to supply signals to the agent and, in some cases, to inform the principal about the likelihood of various state occurrences. It can also provide information to the principal about the agent's effort and actions. The sharing of the outcome

between the principal and agent depends critically on the particular information available to both parties (see, for example, Demski and Feltham [1978] as an example of agency theory applied to a budgeting problem). Baiman [1982] provides an excellent survey of the rapidly developing research that has occurred in this field since 1975.

Information economics and agency theory research offers the potential for a rigorous, analytic theory of management accounting, rooted in the utility and profit-maximizing behavior of neo-classical economics, as well as in the more recent analytic tools of statistical decision theory and noncooperative multiperson game theory. But this potential, if ever realized, will be many years in the future. Despite the technical virtuosity of the agency theory researchers, the complexity and difficulty of computing equilibrium solutions in multiperson non-cooperative game settings with private information has limited the analysis to only extremely simple organizational settings. In fact, none of the models considers an organization any more complex than the Lyman Mills Textile Co., in which the owners hired workers and needed to devise employment contracts, performance monitors, and incentive payments for the workers.

Basically, agency theory is a theory of contracting with production workers, not with managers. A critical assumption is that agents need to be motivated to take actions or exert effort for which they have disutility. In other words, the theory assumes that agents prefer not to exert effort or take desired actions and, as a consequence, need to be compensated financially to induce them to take actions that will benefit the firm. This assumption may be useful for modeling the behavior of agricultural and production workers, but its extension to a theory of

managerial behavior is rather strained. In practice, managers do not seem to have much effort aversion; frequently the problem is the reverse—they work too long and too hard at their jobs, not too little. Also, the decisions or actions required to benefit the overall firm do not seem to be obviously more distasteful or more arduous to these managers than making decisions that are harmful to the firm.

About the only “managerial” story that gets told via agency theory requires a liberal interpretation of effort aversion as a surrogate for conflicts of interest between managers (the agents) and shareholders (the principals). With this interpretation, contracting is required to insure that managers do not consume too many nonpecuniary benefits from which managers receive utility but that reduce the principals’ wealth (and utility). The overconsumption of nonpecuniary benefits may be an interesting topic for a few researchers to explore. But certainly, developing a theory of the firm, or a theory of managerial behavior, that focuses on limiting expensive carpeting and art objects in executives’ offices is not likely to address central managerial issues.

Omitted from agency theory/contracting models is the role of knowledge and innovation to create value in the firm.¹⁴ Agency theory assumes a static technology. It misses the options for entrepreneurial managers to make major changes in their environment through product and process improvements. Also missing is the role for managers to increase value through enhanced marketing activities, training and motivating their employees, and improved quality and maintenance policies. Management accounting procedures are means by which senior managers communicate the goals and strategies of the firm to their

division and local managers and thereby guide the managers in their day-to-day operating and resource allocation decisions. Focusing entirely on an effort-aversion or conflict of interest story will be overly restrictive as we study the role of management accounting practices in actual organizations.

Agency theory should be viewed as a very exploratory investigation to develop a formal theory of the demand for information within the firm. But its limitations should be well recognized and should not supplant other efforts to improve management accounting systems in contemporary managerial and production settings.

Related to agency theory, and developing in parallel with it, is a theory of the firm based on transaction costs.¹⁵ Transaction cost economics comes from the same intellectual roots as agency theory research, emphasizing the limits of market transactions due to private information among economic agents, and the nature of opportunistic, individual maximizing behavior by these agents. It differs from agency theory research by not attempting to analyze all transactions via formal contracts. The transactions cost model attempts to explain why bounded rationality in the presence of environmental complexity, uncertainty, and opportunistic behavior limits market-based behavior. According to this theory, firms arise and organize hierarchically to form a cooperative organization that can adapt sequentially to cope with a complex, uncertain environment. Transac-

¹⁴ Similar criticisms of the “received wisdom” from contemporary economic theory appear in Teece and Winter [1984].

¹⁵ This literature has been explicated by Williamson [1975 and 1981], building on the seminal work of Coase [1937]. The transaction cost model has been introduced into the accounting literature by Waterhouse and Tiessen [1978], Johnson [1980 and 1983], Spicer and Ballew [1983], and Tiessen and Waterhouse [1983].

tions that might otherwise be handled in the market at considerable cost or loss of efficiency are performed internally and governed by administrative processes.

While many authors have written about the transactions cost model, little progress has been made in analyzing actual organizations and gaining insight about which "administrative processes" would be most effective and efficient in organizing the firm's internal transactions. In part, this stems from a lack of precise definition of the transactions cost environment.¹⁶

A second reason for the lack of impact of this literature is that it has been tested in only a limited way on actual organizations. Armour and Teece [1978], in a study of 28 petroleum firms during 1955–1973, found a positive relationship between profitability (measured by the accounting rate of return on stockholders' equity) and the adoption by a firm of a divisionalized structure from a functionally organized one. Steer and Cable [1978] detected higher returns on sales and equity, among 82 large British companies, for "optimally organized" firms. The multidivisional form was considered "optimal" for large firms with diversified activities, whereas the traditional functional organization was considered appropriate for smaller firms or for firms in process-oriented (single product) industries such as steel. No study, however, has yet to address the central managerial accounting issue of the properties of alternative performance measures for decentralized operating units. Armour and Teece acknowledge in a footnote:

First, there must be an explicit definition of an objective function, usually in terms of a profit or rate of return measure. Second, there must exist machinery within the firm that induces division managers to maximize with respect to the specified objective func-

tion. . . . The existence of these control systems serves the purpose of attenuating the internal control loss encountered by the management of a functionally organized firm as it expands [Armour and Teece, 1978, fn. 4, p. 107].

We still have no systematic evidence on the efficacy or dysfunctionality of alternative objective functions, or even whether a single objective function is sufficient to minimize the control loss in decentralized organizations.

Thus, the transaction cost literature has given us a vocabulary, some intuition, and a conceptual framework for understanding the development of a firm's organizational structure. But its implications for devising administrative processes or performance and control measures in firms have not been developed.

In thinking about the lack of innovation in contemporary firms' management accounting systems, I am impressed by the difference between innovations that occur in businesses and innovations that occur in academic institutions. The developments in cost accumulation and cost control in the railroads, in the steel industry, and later in vertically integrated and multidivisional firms, such as DuPont and General Motors, spread rapidly to other organizations. Managers in these innovating organizations could see how well the new procedures worked in practice and this likely provided a credible basis for disseminating the successful innovations to other organizations. Individuals such as Frederick Taylor, Pierre du Pont, and Donaldson Brown were able to apply techniques that worked well in one organization to other organizations that subsequently employed them. Wells [1977], in a review of early

¹⁶ Baiman [1982, p. 155] acknowledges agency theory's debt to the transactions cost literature but criticizes the approach because "most of its results are based on casual, rather than rigorous, analysis."

cost accounting developments, notes the extensive communication among the U.S. mechanical engineers who were developing the new managerial technology:

A shop culture developed which had all the hallmarks of a "gentlemen's club." Within the club, information was freely shared. The result was "a vast, mutually owned store of knowledge and experience closely akin to a body of

4. NEW CHALLENGES FOR COST AND MANAGERIAL ACCOUNTING RESEARCH

There are some obvious new directions to extend cost accounting research. First, the traditional cost accounting model, developed for the mass production of a few standardized products, can be updated to accommodate the realities of the manufacturing environment of the 1980s

turing facilities, permitting efficient production of small batches of customized products, introduces a new setting for cost estimation, planning, and control.

Investigating the cost accounting implications of the major changes in the organization and technology of manufacturing operations represents a new path for management accounting research. In retrospect, the field in 1970 could have gone in either of two directions. At the time, accounting researchers were being trained in quantitative techniques from operations research, probability and statistics, and economic theory. This provided researchers with a broad array of analytic tools to investigate an expanded role for management accounting information in complex settings. As described previously, the path actually followed froze the production setting (in fact, for many cases, it simplified the production setting back to the primitive production processes of the mid-nineteenth century) in order to investigate complex information production, risk-sharing, incentive, and contracting issues. This agency theory research stream has now attracted the attention of virtually all analytic management accounting researchers. The alternative (not mutually exclusive) path, of investigating the role of accounting information in the more complex production and assembly operations of contemporary manufacturing settings, has hardly been pursued by any researcher. Certainly there should be a place both for researchers investigating complex information and contracting problems in simplified production settings and for researchers dealing with the managerial demand for information in realistic and rich production settings. I am not able to conclude that our present allocation of effort between these two alternative research directions is desirable.

5. NEW DIRECTIONS FOR MANAGEMENT CONTROL RESEARCH

Research to remedy current problems with the traditional profit center form of organization provides an opportunity for new thought in management control systems. As described earlier, the profit center concept evolved in the DuPont and General Motors Corporations. It has been viewed as the key step in permitting the efficient and effective administration of large, multidivisional enterprises.

By an ingenious use of return on investment, the DuPont organization used conventional measures of financial performance corresponding to each of the company's separate activities, and yet avoided the narrow "shop floor" view of top management's role that often pervaded single-activity enterprises before 1900.

In their internal accounting systems, multidivisional companies such as DuPont and General Motors especially emphasized return on investment. This emphasis suggests that the founders of those organizations attached great importance to how their new hierarchical structure might achieve economies by overcoming imperfections in existing capital markets.

The firm's executives believed that the primary responsibility of top management was to insure that the company earned the required market return on invested capital [Johnson, 1980].

While ROI control and the profit center organization have contributed greatly to the success of large corporations during the past 60 years, problems have begun to emerge with the excessive focus on short-term financial performance.¹⁹ These problems arise because

¹⁹ Many articles have accused U.S. executives of focusing too narrowly on short-term performance at the

managers, being clever, resourceful people, have learned that there are a variety of ways to meet profit and ROI goals. Initially, and perhaps for many years after profit centers and ROI centers were introduced, managers attempted to achieve good performance by making operating and investment decisions to develop new and better products, to increase sales, and to reduce operating costs. Over time, however, it probably occurred to some managers that during difficult times, when sales were decreasing and operating costs were increasing, profits could be “earned” not just by selling more or producing for less, but by engaging in a variety of nonproductive and typically nonvalue-creating activities. We will briefly summarize three types of short-run behavior: exploiting accounting conventions, engaging in financial entrepreneurship, and reducing discretionary expenditures.

Accounting Conventions

The historical cost accounting model and generally accepted accounting principles (GAAP) provide ample opportunities for firms to manage their income measurement. For example, managers can time the recognition of some income and expense items so as to exhibit steady earnings growth or to meet budgeted goals for the current period.²⁰ Managers can also choose among accounting methods permitted by GAAP.

A more subtle effect of the overemphasis on achieving current earnings goals has occurred because the internal management accounting function has now become subservient to the external financial reporting function in U.S. firms. Recall that the cost accounting and management control practices that developed in U.S. corporations between 1850 and 1925 evolved from the demands of senior

executives to help them understand their internal operations, to make new product and investment decisions, and to motivate and evaluate the performance of their employees. Contemporary U.S. practice, in contrast, is characterized by the internal use of accounting conventions that have been developed and mandated by external reporting authorities. Thus if the Financial Accounting Standards Board (FASB) says that, for external financial statements, all R&D expenditures must be expensed, then these expenditures are generally expensed

expense of long-term profitability. Perhaps the most convincing of these criticisms comes from the executives themselves:

Dun's Business Month queried the 230 chief executives who are members of its President's Panel. . . . A thumping majority of the panelists agrees that management in the U.S., unlike its counterpart in Japan, is excessively concerned with the short-term, at the expense of longer-range considerations that may be far more important. . . . Most of the executives differ among themselves only on how much the shortcoming results from outside pressure for quarter-to-quarter performance, particularly from Wall Street.

Among the comments of these most senior U.S. executives are:

It behooves U.S. management to look beyond the immediate future. The Japanese, West Germany, and Switzerland have taught us the need to address long-term results.

The current trend towards high compensation rewards based on the immediate year's performance rather than long-range growth is a serious disincentive to management objectivity.

Amid today's takeover scramble, short-term performance is needed for survival.

The financial community's stress on very, very short range performance often can be ignored only at a company's peril, especially if it is contemplating equity or debt financing.

It would be a very healthy change if quarterly reports were no longer required.

[“What's Wrong with Management,” 1982.]

I am grateful to Kenneth Merchant for this reference.

²⁰ Occasionally, managers meet budgeted earnings goals by extending the conventions of the historic cost accounting model; see the recent examples described in “Cooking the Books” [1983].

on the internal books too. If the FASB requires that certain types of leases must be capitalized for external reporting, then these same leases, and only these leases, are generally capitalized for internal evaluation too. An extreme version of this dominance of the external reporting mentality has companies using a modified form of residual income but charging divisions not a risk-adjusted cost of capital on all assets under the control of a division manager, but rather a pro-rata share of the company's actual interest expense for the year. Thus, the capital charge could be as low as two to three percent annually, if the company has a low debt-equity ratio, even though the opportunity cost of additional funds tied up in working capital could be ten percentage points higher.

The profit center concept has seemingly become distorted into treating each division as a mini-company, attempting to allocate all corporate expenses, common and traceable, to divisions (frequently on an arbitrary basis that confuses the underlying microeconomics and cost structure of the divisions).²¹ Firms use accounting conventions for internal planning and control, not because they support the corporate strategy, but because they have been chosen via an external political process by regulators at the FASB and the Securities and Exchange Commission (SEC). With management accounting practices now driven by an external reporting mentality, we can start to understand why there has been so little innovation recently in management accounting thought and practice.²²

Financial Entrepreneurship

The second area for misleading profit center measurements arises from the financial entrepreneurship of senior managers. Instead of attempting to generate

earnings in the factory, in the product laboratory, and in the sales offices, many U.S. executives have attempted to generate earnings by financial transactions. These actions, such as mergers and acquisitions, divestitures and spinoffs, leveraged buy-outs, debt swaps and debt repurchases, and periodic sales of assets can increase short-term earnings without necessarily creating long-term value to the firm. These actions are more available to senior managers than to division managers, but opportunities for financial gamesmanship are still available to profit center managers. These opportunities include the sale of low book-value assets and off-balance-sheet leasing.

Short-run Opportunistic Behavior

Perhaps the most damaging dysfunctional behavior induced by a preoccupation with short-term profit center performance is the incentive created for division managers to reduce expenditures on discretionary and intangible investments. When profit targets become hard to achieve because sales are not increasing as fast as expected, or variable and operating costs are rising faster than expected, managers may try to minimize the adverse impact on short-term earnings by reducing expenditures on product and process development, promotion, distribution, quality improvement, applica-

²¹ Again, contemporary managers could benefit from the wisdom of Donaldson Brown:

I may state that we do not distribute against the production of the individual divisions any of the expense of the General Motors central office. This is considered a charge against the operating earnings of the divisions. . . . All net earnings of the divisions are brought together on a statement total, from which is taken the expense of the General Motors Corporation [Brown, 1927, p. 21].

²² Two decades ago, Davidson [1963] also urged that the internal informational needs for managing the organization not be made subservient to the external reporting system. I appreciate Roman Weil's suggestion for this reference.

tions engineering, human resources, customer relations, and other such intangibles. The immediate effect of such expenditure reductions is to improve the reported profitability of the division, but this is achieved by risking the long-term competitive position of the enterprise.

The ability of the firm and the division to increase reported profits while sacrificing the long-term economic health of the firm is a fundamental weakness in the accounting model. At one level, we can criticize the firm for following, for internal purposes, the same accounting practices used for the external reporting of expenditures on intangibles; that is, immediate expensing of all these expenditures. A few firms, such as General Electric, do segregate these discretionary, programmatic expenses on the divisional income statement so that it becomes apparent which divisions are achieving their profit goals by risking their future competitive positions.

But at a deeper level, the opportunity to increase reported income by foregoing both tangible and intangible investments, yielding long-term economic benefits to the division, illustrates a flaw in the basic goal of using short-term profit as an indicator of improvement in the economic wealth of the firm. Beaver and Demski [1979] demonstrate that when some of the assets of the firm cannot be traded in organized markets, it may be impossible to agree on an income measure for the firm. While they developed this impossibility result with financial reporting in mind, it is equally compelling for demonstrating the great difficulty of measuring periodic income for profit centers within the firm. Certainly, if we had market prices for the stock of new products and improved processes from R&D expenditures, for the level of employee talents and morale, for flexible and high-quality manufacturing opera-

tions, for customer loyalty and product awareness, for reliable and high-quality suppliers, and for an efficient distribution network, then we could achieve a more valid and reliable periodic divisional income measure. But the failure to have market prices for the outcomes of investments in intangibles makes the short-term divisional income measure highly manipulatable and reduces the correlation between this measure and the increases in the economic value of the division.

One might reasonably ask: Why did these problems with profit center measures not emerge earlier? Why do we not read about Alfred Sloan or Pierre du Pont being concerned with their divisional managers foregoing profitable tangible and intangible investments in order to increase their annual divisional profit or ROI measure? At this time, I can only speculate on possible reasons for the relatively recent decline in the ability of profit center measures to motivate behavior to increase the economic value of the firm. This issue can and should be studied more systematically.

Nevertheless, casual empiricism suggests that the following menu of explanations be considered. *First*, there was apparently less pressure for short-term financial performance in the 1920s and 1930s than exists in the 1970s and 1980s. For example, we can read in Sloan [1963] and in the description of Donaldson Brown's GM pricing formula that General Motors' goal was not to show steady year-to-year earnings increases. Rather, it was recognized that, for a cyclical business, an appropriate goal needed to be defined as an average over the entire business cycle. Years of slack demand were recognized as "normal" and not the signal to contract expenditures on new product development, marketing, or other intangibles.

A *second* factor to investigate would be the mean time between managers' promotions in 1924 vs. 1984. Many of the difficulties in profit center evaluations arise from attempting to measure performance over a brief period, when the long-term adverse consequences from short-term optimizing actions have not yet become apparent. If division managers expected to remain in their jobs for at least five to seven years, there would be less incentive to curtail beneficial investments with potential long-term payoffs.

Third, the difference in size of organizations between 1924 and 1984 may play an important role. Perhaps the smaller organizations that existed earlier in this century would have made decisions by division managers to sacrifice long-term competitive position for short-term profits more obvious to the senior and central management. Today's much larger organizations, especially those that take pride in running their company "by the numbers," are more vulnerable to short-term optimizing actions by profit center managers. In transactions cost terms, the increased size of organizations, without corresponding changes in the control system or objective function, provided increased latitude for managers' opportunistic behavior.

Fourth, there may have been a shift in hiring practices during the past 60 years. Formerly, employees, especially those destined to become divisional and senior managers, tended to spend their entire careers with the same firm. Thus there would be less incentive for them to take actions that would not be in the best long-run interests of the firm. As a professional managerial class developed in the U.S. during the middle part of the 20th century, certainly abetted by the rapid increase of MBAs whose managerial skills were more transferable across

different firms, turnover probably increased, thereby reducing the incentives for these managers to avoid actions that would compromise the long-term viability of their current firm.

An often made (though still unsubstantiated) criticism of MBAs in significant managerial positions in U.S. corporations is that in contrast to the situation 50 and more years ago, firms today are being run by managers who are untrained in, and unfamiliar with, the technology of the firm's products and processes. As a consequence, they are less knowledgeable about how to create value through improved products and processes and therefore rely more on attempting to create value through finance and accounting activities labeled "paper entrepreneurship" by critics such as Reich [1983].

A *fifth* reason for the decline in usefulness of divisional profit measures may be attributed to the widespread use of executive bonus plans based on accounting measures. While we saw that GM had an accounting-based bonus more than 60 years ago, it has only been recently that accounting-based performance plans became prevalent in U.S. corporations. Problems with these plans are well documented (see Rappaport [1978 and 1981] and Meadows [1981]), but the plans are still used extensively. Senior executives whose annual and deferred compensation are strongly influenced by reported annual income are surely able to communicate the importance they place on achieving annual profit goals to divisional managers. Once alerted to senior managers' interest in achieving certain income targets, resourceful division managers will find many ways to meet their obligations to contribute to overall corporate profits (see fn. 20).

Sixth, the environment of the 1980s is probably sufficiently different from that

of the 1920s so that any management control system that served well in earlier times is likely to be inadequate today. Contemporary factors that differ from the circumstances earlier in this century are much more vigorous global competition, the rapid worldwide movement of technology and capital, an increased pace of technological change, more intervention in the private marketplace by governments through higher taxes and increased regulation, and generally higher inflation rates. Whatever the differences, it would indeed be surprising if the managerial control systems devised for the environment of 60 years ago would still be useful and relevant in the very different circumstances of the 1980s. How then can we embark on a research path in management control to develop improved performance measures for decentralized operating units?

Financial measures, such as operating cash flows, will undoubtedly continue to be among the measures used to evaluate the performance of decentralized units. But we should acknowledge the difficulties associated with attempting to measure economic profits in periods as short as a year. Even granting that the objective of a division should be to maximize long-term profits, this does not imply that an annual profit is the best short-term indicator of how well the division is proceeding along a long-term profit-maximizing path. Other measures, such as product innovation, product leadership, employee skills and morale, or customer loyalty, may be much better indicators of future profitability than annual profits. It is unlikely (I would say impossible) that any single measure can both summarize the economic events affecting a firm or division during a period and serve as a basis for motivating and evaluating managers. Therefore, multiple performance indicators may improve the moti-

vation and evaluation of divisional performance.²³ Some of these indicators will be financial; others will not be. There seems no particular reason why financial measures should be primary in determining short-term divisional goals, even if the long-term goal is to maximize the long-term cash flow of the firm. Peters and Waterman [1982] provide a highly provocative conjecture on the importance of nonfinancial goals (what they call “basic beliefs” or “overriding values”) and the limited value of focusing on financial goals.

Virtually all of the better performing companies we looked at . . . had a well-defined set of guiding beliefs. The less well-performing institutions, on the other hand, were marked by one of two characteristics. Many had no set of coherent beliefs. The others had distinctive and widely discussed objectives, but the only ones that they got animated about were the ones that could be quantified—the financial objectives, such as earnings per share and growth measures. Ironically, the companies that seemed the most focused—those with the most quantified statements of mission, with the most precise financial targets—had done *less* well financially than those with broader, less precise, more qualitative statements of corporate purpose [Peters and Waterman, 1982, p. 281].

Also,

We find among the excellent companies a few common attributes that unify them despite their very different values. First . . . these values are almost always stated in qualitative, rather than quantitative, terms. When financial objectives are mentioned, they are almost always ambitious but never precise. Furthermore, financial and strategic ob-

²³ Ridgway [1956] described the limitations of single measures of performance, indeed of any system relying solely on quantitative measures.

jectives are never stated alone. They are always discussed in the context of the other things the company expects to do well. The idea that profit is a natural by-product of doing something well, not an end in itself, is also almost universal [Peters and Waterman, 1982, p. 284].

Management accounting must serve the strategic objectives of the firm. It cannot exist as a separate discipline, developing its own set of procedures and measurement systems and applying these universally to all firms without regard to the underlying values, goals, and strategies of particular firms. For example, some firms, such as Andrew Carnegie's steel company, will have cost control and cost reduction as their primary strategic goal. For these firms, the management accounting system will then need to collect elaborate information on relevant costs to support the corporate goal. For other firms, product innovation, service, quality, or employee morale may be the most important goal. If a management accounting system is to serve division and senior managers, it must support these overriding corporate goals and not focus narrowly on an earnings measure because that measure was helpful to DuPont, General Motors, and General Electric when these companies formed earlier in this century.

The inertia from 60 years of concentration on financial performance measures will not be easy to overcome. The Management Accounting Practices Committee of the National Association of Accountants restricts the domain of management accounting to:

the process of identification, measurement, accumulation, analysis, preparation, interpretation, and communication of *financial* information used by management to plan, evaluate, and control within an organization. . . . [Statement on Management Accounting No. 1A,

"Definition of Management Accounting," 1981 (emphasis added)].

Presumably, if a firm's managers felt that measurements of product quality, productivity, product innovation, employee morale, or customer satisfaction were relevant for their planning and control decisions, then these measurements would need to be supplied by persons other than management accountants. Thus, a fundamental choice does need to be made. Management accountants may feel that their own area of comparative advantage is to measure, collect, aggregate, and communicate *financial* information. This will remain a valuable mission. But it is not likely a goal that will be decisive to the success of their own organizations, and if senior managers place too much emphasis on managing by the financial numbers, the organization's long-term viability may become threatened.

The option to include nonfinancial measures in the firm's planning and control system will be more unfamiliar, more uncertain, and, consequently, less comfortable for managerial accountants. It will require them to understand those factors that are most critical to the company's long-term success. Financial goals will be among these but they will not be the only critical success factors, and probably will not be the most important short-term indicators of long-term success. It will not be easy to develop nonfinancial performance measures to support long-term corporate objectives. After research and experimentation, we may discover that the benefits of producing nonfinancial measures are too low, relative to the costs. Perhaps division and senior managers will rely on informal communication, including MBWA (Management By Walking About; see Peters and Waterman [1982, pp. 288-

291]) to determine whether local managers' actions are consistent with long-term corporate goals. Financial measures would continue to be collected and reported, but would not necessarily be the primary measure by which managers and divisions are evaluated.

In summary, financial performance measures, such as divisional profit, give an illusion of objectivity and precision. But these measures are relatively easy to manipulate in ways that do not enhance the long-term competitive position of the firm, and they become the focus of opportunistic behavior by divisional managers. By de-emphasizing financial performance measures and relying more on multiple measures of performance, including subjective evaluation based on personal communication and observation by superiors, division managers will not have as clear a target for short-run optimizing behavior. Thus, there is probably a need for more ambiguous, less precise performance evaluation systems. It is not that nonfinancial performance measures are any less vulnerable to this opportunistic behavior; but by adopting a system of multiple measures, subjectively aggregated, the gains a manager sees from short-run opportunistic behavior become more uncertain and hence, such behavior may be inhibited. In any case, this does provide an opportunity for new research.

My final comments relate to how this research can be performed. I suspect that researchers will not learn about the production and organization problems of contemporary industrial corporations by reading economics and management science journals. Researchers will need to leave their offices and study the practices of innovating organizations. Companies are responding to changes in their environment by introducing new organizational arrangements and new technology for producing their outputs. They may

even be introducing new measurement systems in their organization. The challenge for academic researchers is to discover the Pierre du Ponts, Donaldson Browns, Alfred Sloans, and Frederick Taylors of the 1980s; to describe and document the innovative practices that seem to work for successful companies. The research will be more inductive than deductive, but likely productive, both for the individual researcher and for the management accounting discipline.

One of the leading academic practitioners of field-based, inductive research has been Henry Mintzberg, who has produced influential studies on managerial behavior and organizational design (see Mintzberg [1973, 1981, and 1983]). Mintzberg [1979] has described his philosophy and strategy of small-sample, field-based research. Seven themes in his research are noted, but I would like to close by quoting from just one of them. It captures the fun and excitement that have been missing from our managerial accounting research because of our reluctance to get involved in actual organizations and to muck around with messy data and relationships.

The research, in its intensive nature, has ensured that systematic data are supported by anecdotal data. More and more we feel the need to be on site, and to be there long enough to be able to understand what is going on. (We began with a week and are now spending months and even years.) For while systematic data create the foundation for our theories, it is the anecdotal data that enable us to do the building. Theory building seems to require rich description, the richness that comes from anecdote. We uncover all kinds of relationships in our "hard" data, but it is only through the use of this "soft" data that we are able to "explain" them, and explanation is, of course, the purpose of research. I believe that the re-

searcher who never goes near the water, who collects quantitative data from a distance, without anecdote to support them, will always have difficulty explaining interesting relationships (although he may uncover them). Those creative leaps seem to come from our subconscious mental processes, our intuition. And intuition apparently requires the "sense" of things—how they feel, smell, "seem." We need to be "in touch." Increasingly in our research, we are impressed by the importance of phenomena that cannot be measured—by the impact of an

organization's history and its ideology on its current strategy, by the role that personality and intuition play in decision-making. To miss this in research is to miss the very lifeblood of the organization. And missed it is in research that, by its very design, precludes the collection of anecdotal information [Mintzberg, 1979, pp. 587–588].

If managerial accounting research is to progress, we will need to start collecting our anecdotes from 1980s corporations.

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