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On the Politics of Accounting Disclosure and Measurement: An Analysis of Economic Incentives

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1. Introduction

This paper examines the incentives faced by different groups of participants in the financial market to take opposing positions on various issues relating to accounting disclosure and measurement. The larger purpose of this undertaking is to begin the process of building a model that helps to explain (1) what many view as dismal progress, in relation to the resources expended, in our ability to reach "agreement" on a set of accounting principles and disclosure procedures, and (2) the increasing involvement of Congress and the SEC in the rule-making process. There is no pretense that a satisfactory result will be reached in one iteration. But as the Chinese proverb reminds us, every journey, no matter how long, has a first step.

The notion that self-interest often causes different parties to take different positions on a given accounting proposal, and to back that self-interest via political action, is of course not new. Instances of this type have been documented by a number of authors, including Zeff [1972], Gerboth [1973], Horngren [1973; 1977], Moonitz [1974], and Armstrong

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[1976]. Others have attempted to link some of the incentives to take particular stands on accounting matters to the relative importance of debt in the capital structure, perceived future changes in the tax law, the anticipated response of regulatory agencies, the likely effects on executive compensation, the impact on bookkeeping costs, and other matters (Watts [1977], Watts and Zimmerman [1978]). This paper differs from these studies primarily in its methodology: it focuses on the implications that can be obtained from a model of the financial market drawing on the economic theory of information and portfolio choice in a general equilibrium context.

The model used is designed to capture a number of basic observables in its assumptions, of which the following play a central role: (1) Risky assets are overwhelmingly viewed as normal goods (i.e., something one acquires more of as one's resources increase, ceteris paribus). (2) Individuals differ significantly in their personal resource levels and in the loci of their comparative advantage. (3) Subscriptions to investment information are available at fixed rates and tend, like newspapers, to be viewed as private goods due to their time value. (4) The information published in the financial reports of any given firm, by virtue of being presented in aggregated form, is coarser than that contained in the underlying accounting system. (5) Management has ready access to the books of account and is not precluded from transacting in the securities of its employer. (6) Large coalitions are costly to form and to operate. Toward the end of the paper, especially in Section 5, the following assumption is also brought into play: (7) The government is based on majority rule.

The central implication of the preceding assumptions, considering the simple setting in which the firm is not in need of new capital, is that the less well-to-do subscribing investors as well as the nonsubscribing investors (who tend to be "small" in terms of their resources) have clear incentives to demand more firm-specific disclosure and finer accounting measurements from management on a *timely* basis. On the other hand, there are strong incentives to resist such demands on the part of management, information searchers, and the more well-to-do among the subscribers to investment services. Only a "middle group" of subscribing investors appears to have reason to be relatively indifferent. Successful efforts by the "activists" in this ongoing conflict might show up in the form of special provisions dealing with accounting measurement and disclosure in the corporate bylaws; however, it is more likely that they will be reflected in regulatory requirements or the "statements" of private bodies.

It is noteworthy that the incentives of the "activist" groups attach no particular value to productive efficiency. Reductions in productive efficiency, however, are anathema to management and its investor allies, who have strong incentives to resist increased but untimely public disclosure. However, the same incentives which cause management and its allies to resist *timely* disclosure also cause these groups to resist *improve-*

ments in productive efficiency, at least from a short-run perspective. The incentive pressures on management, therefore, call for a vigorous defense of the status quo coupled with periodic assaults on unnecessary reporting requirements.

The net effect of the "activists'" incentives to be drawn to the political process, and the failure of these incentives to reflect productive efficiency concerns (at least in the short run), are likely to cause the prevailing set of operative accounting practices, and the institutional machinery that supports it, to give rise to productive inefficiencies. There are two forces behind this result. The more extensive the disclosure requirements, the greater the resources required for their implementation and execution. And the greater the frequency or extent of informative disclosure, given a nonnegligible window between the event and its publication, the greater the rewards to, and hence the (private) resources devoted to, prepublication "scooping," which in turn accentuates the extent of unequal information. Thus, the net result is a *two-fold negative* effect on productive efficiency. Consequently, while timely disclosure of significant accounting measures and events offers every assurance of improving productive efficiency (in the process making access to information more equal), the imposition of expanded disclosure requirements permitting even narrow windows has precisely the opposite effect.

Section 2 examines the economic consequences of changes in accounting methods and disclosure procedures and notes that price effects are essentially independent of welfare effects, so that one is not a predictor of the other. Section 3 specifies the basic model, which is illustrated via an example. The adversaries with respect to timely disclosure are identified in Section 4. Some of their available strategies are then analyzed in Section 5, which also identifies some alternative scenarios and makes comparisons of their economic efficiency. Section 6 examines the differences between firm-specific and macroeconomic information in the current context, and Section 7 contains some concluding remarks.

2. *Assessing the Economic Consequences of Accounting: The Near-Independence of Welfare Effects and Price Effects*

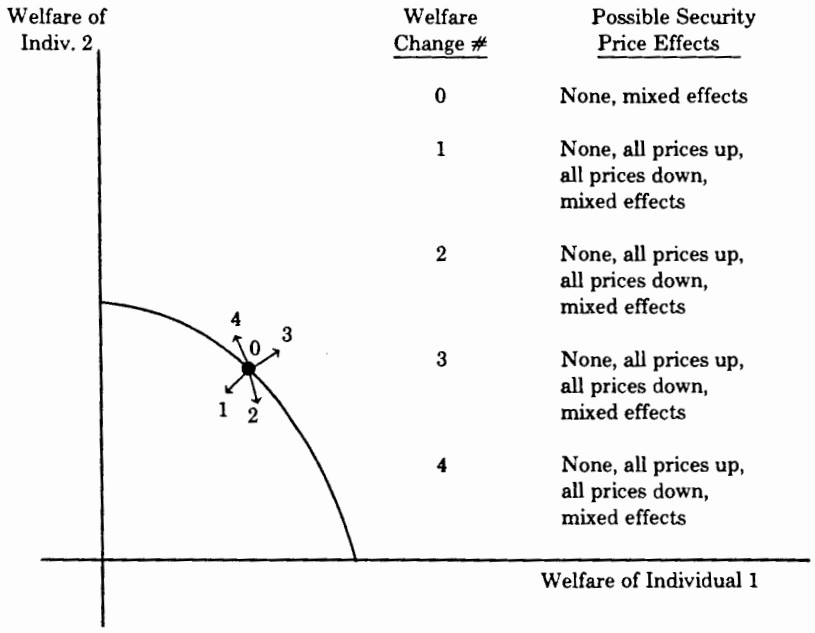
That decisions concerning the accounting rules to be followed have economic consequences now seems generally accepted. For example, the controversy surrounding *FASB No. 8* brought home the point that the method employed in foreign currency translation was capable of influencing at least some companies' transactions. Similarly, the use of *LIFO* instead of *FIFO* affects the amount of taxes collected by the government, which in turn affects government borrowing (or tax rates), which in turn affects security purchases by individuals, etc. One result is price effects in the financial markets. But these effects in turn affect individual's opportunities and hence their welfare. While price changes are directly

observable, welfare changes are not. However, welfare changes are indirectly observable. For example, in considering a change to inflation accounting, those who expect their welfare to be favorably affected (upon optimal adaptation to the change) will presumably support it. On the other hand, those who expect their welfare (upon optimal adaptation) to suffer would presumably oppose the change. Thus, opposing views on proposed accounting changes or rules can be attributed to differences in the anticipated effects on one's own welfare (everything, including one's caring about others, considered).

In order to measure welfare in a decision-oriented context, one is forced to rely on the concept of *expected utility* and to do so in a situation of postadjustment stability or *equilibrium*. Of course, once an equilibrium is constructed, one automatically has access to the equilibrium *prices* as well.

The tenuous nature of the relationship between equilibrium welfare and equilibrium prices is not widely appreciated. For example, consider a two-period consumption-investment model with first-period consumption serving as numeraire. For simplicity, assume there are only two (types of) individuals and that the efficient set of allocations, measured in welfare, falls along the curve in figure 1. Let point 0 be the current situation before the introduction of an accounting change (such as some form of inflation accounting). Points 0 through 4 now represent five conceivable *welfare* effects attributable to the accounting change.

Point 0 (no welfare effect) would result if the accounting change had



Welfare Change #	Possible Security Price Effects
0	None, mixed effects
1	None, all prices up, all prices down, mixed effects
2	None, all prices up, all prices down, mixed effects
3	None, all prices up, all prices down, mixed effects
4	None, all prices up, all prices down, mixed effects

FIG. 1

no resource implications and individuals' decisions were unaffected. The latter would, for example, be true if the accounting change had zero marginal cost and brought no new information to light (and did not remove previously available information). In that case, prices would also remain unchanged. But no trading can also occur when the new system yields new information, as long as the financial market is sufficiently rich for the securities to "absorb" all changes in assessments in its "bid-ask" price structure. Thus, an absence of welfare effects can be accompanied by either (1) no price changes or (2) a mixture of price increases and decreases.

Point 1 represents the case when both individuals would be worse off with the accounting change. This could, for example, be true if the new reporting system was fairly costly and added little new information. Certainly, all types of possible price effect combinations are possible. The same is true when everyone ends up better off (point 3) or when some end up better off and some end up worse off (points 2 and 4). In particular, there is no reason to associate security price increases with welfare improvements or security price decreases with welfare reductions—the opposite relationship is just as plausible. Thus, the great number of empirical studies that have been conducted to catalog security price changes in conjunction with various and sundry accounting questions generally permit no inferences concerning the welfare effects associated with the use of particular accounting methods, for example—and most authors have been fairly careful to state this. To consider welfare effects, which is what economic consequences are all about, one is forced to use models which permit welfare indices to be discerned. While such models generally are very complex, they need not be unmanageably so, as I trust the next section will demonstrate.

3. *A Disclosure Example*

In examining the disclosure question, it is helpful to be somewhat concrete. For this purpose, consider a taxicab company[1] that owns a fleet of 1,000 cars, each with an original cost of $6,000 and a service life of two years, at the end of which the salvage value is zero. Revenues and profits are affected by two things: whether the economy is strong or sluggish and whether the fleet of cars consists of an abnormal proportion of lemons or not. The probability that the economy is either strong or sluggish in any one year is 0.5. The probability that the company's fleet of cars will turn out to be high in lemons is also 0.5 (the lemon property is not observable prior to purchase). Both of these probabilities are known to all market participants. Whether a given cab is a lemon or not

[1] In May 1978, a conference organized by Robert Sterling and Arthur Thomas was held at Rice University to address various aspects of accounting measurement. To focus the discussion, a taxicab example was chosen as a means of stimulating convergence of various extant views (see Sterling and Thomas [1979]).

does not affect total revenues and operating expenses in the first year (this is because it is on average optimal to let needed repairs serve as a direct substitute for maintenance in the first year of a lemon's life),[2] but it does affect cash flows and profits in the second year.

THE COMPANY

The initial balance sheet of Green Taxicab Company is given in Appendix A. As that table shows, working capital was financed via bank loans while the physical capital was obtained through the sale of bonds and common stock, on the basis of a roughly five-to-one debt–equity ratio.

The results of the first year's operations of Green Taxicab Company (a year in which economy was strong)[3] are given in Appendix B. Appendix C contains the funds statement for the same period and Appendix D the balance sheet at the end of the first year. Note that the company uses the sum-of-the-years'-digits method of depreciation for both book and tax purposes.

THE ECONOMIC ENVIRONMENT

In order to keep the complexity of the analysis within bounds, the basic economic framework employed is of the single-good, two-period variety under standard assumptions. That is, at the end of period 1 the economy will be in some state s, where $s = 1, \cdots, n$. There are I consumer-investors indexed by i, whose probability beliefs over the states are given by the vectors $\pi_i = (\pi_{i1}, \cdots, \pi_{in})$, where $\pi_{is} = 0$ for all i and s; their preferences are represented by the additive utility functions $f_i(c_i) + u_i(w_{is})$, where c_i is the consumption level in period 1 and w_{is} is the consumption level in period 2 if the economy is in state s at the beginning of that period. Both f_i and u_i are assumed to be monotone increasing and strictly concave, that is, consumer-investors prefer more to less and are risk-averse. Investors are also assumed to view risky assets as normal goods (something they buy more of if their resources increase, ceteris paribus).[4] Individual i's income from employment is denoted $e_{is} \geq 0$; such income is payable at the end of period 1.

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[2] Whether a given cab is a lemon is assumed to be revealed early in the cab's life and would at that time be apparent to a potential buyer as well (the potential buyer's reasoning: why would a taxi company sell a nearly new cab unless it was a lemon?). Thus, I assume that it does not pay the Taxicab Company to sell a known lemon on the market, since its lemon quality would be reflected in the price that could be obtained. On the other hand, it would be rational for the company to reduce its periodic service program, since many of the parts benefiting from this service can, by the lemon assumption, be expected to need early replacement anyway.

[3] If the economy in the first year had been sluggish, Green Taxicab Company would have incurred a loss and paid no dividend. The company would also have had to take out a short-term loan in order to redeem its maturing bonds. For all essential purposes, however, the analysis to come would be unaffected had this event been assumed instead.

[4] This assumption is strongly supported by U.S. census data drawn from estate tax

After the market participants receive the first year's annual report just prior to the beginning of period 1 (time 0), the market opens[5] and the consumer-investors trade to a new allocation of their resources between current consumption and a portfolio chosen from J securities indexed by j. Security j pays $a_{js} \geq 0$ per share at the end of period 1 and the total number of outstanding shares is Z_j. Let z_{ij} denote the number of shares of security j purchased by investor i at time 0; his portfolio $z_i = (z_{i1}, \cdots, z_iJ)$ then yields the payoff:

$$x_{is} = \sum_j z_{ij} a_{js},$$

which, when combined with the employment income, gives:

$$w_{is} = x_{is} + e_{is}$$

available for consumption in period 2 if state s occurs at the end of period 1. Investor endowments of consumption goods and shares are denoted $(\bar{c}_i, \bar{z}_i)$ and markets, as is usual, are assumed to be competitive and perfect but not complete.[6]

It bears emphasizing that when trading takes place at time 0, financial reports have already (just) been published by the various firms; the contents of these reports therefore represent public information known to all market participants. The reports are based on generally accepted accounting principles, that is, they are based on the accrual method, on

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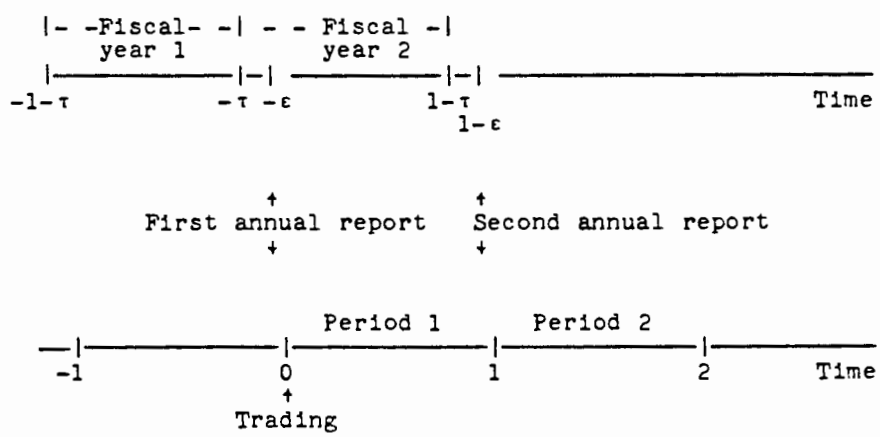
returns (*Fortune* reference unfortunately misplaced). This property is always implied when there is one risky and one riskless asset and the absolute risk aversion function $-u''(w_{is})/u'(w_{is})$ is everywhere decreasing (see Arrow [1971, essay 3]).

[5] Due to the observed lag in financial reports, fiscal years and consumption periods do not coincide. The following diagram may help:



[6] That is, consumer-investors perceive prices as beyond their influence, there are no transaction costs or personal taxes, securities are perfectly divisible, and the proceeds from short sales can be invested. A complete market is a market in which the number of linearly independent securities is the same as the number of states.

historical cost, and are highly aggregated in nature. All decisions by the firm are assumed to have been fixed (e.g., the level of investment, the capital structure, the dividend payouts, and various operating policies) with two exceptions: the firm's disclosure policy and the scale of certain labor-intensive activities are subject to change. Different disclosure policies may differ, for example, in the amount of detail provided in the annual report.

THE CAST

The following four subgroups of consumer-investors constitute the chief actors in this model:

(1) *Management.* The management of any given firm, by virtue of its unique position, is the first to know of specific developments affecting that firm. Managers may trade freely in the securities of their own firm, but "insider trading rules" require disclosure of sales and purchases within a certain time period after the transaction in question has been completed.[7]

(2) *Information searchers.* Searchers and analysts specialize in collecting information about the economy as a whole, about various industries, and about particular firms (which they frequently visit). Those with large resources of their own tend to apply this information to their own portfolios only (Group 1), while others (Group 2) sell the information to subscribers for a fixed fee and, in conformity with various self-imposed conflict of interest rules, invest their own funds in the total market portfolio.[8]

(3) *Subscribing investors.* This group consists of investors who tend to be relatively well-to-do and who are too busy with professional endeavors to find the time to keep up with developments affecting their investments on their own, or who find it uneconomical to do so.

(4) *Nonsubscribing investors.* This is the largest of the various categories of investors. The members of this group, who tend to be less well-to-do, recognize that the various subscription services available have value at some cost less than the subscription price, but not at the offered rates.[9] Some of these investors (Group 1) select individualized portfolios based on the information available to them, while others (Group 2) hold the market portfolio.[10]

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[7] Under current rules, insider transactions must be reported by the tenth of the month following the month of the transaction. Insiders are also precluded from taking short positions in their company's securities and must return to the company any profits realized from holding periods of less than six months.

[8] Most securities firms have rules that bar analysts and other employees from trading a security until at least 48 hours after clients have received new information (sent by the analyst) bearing on that security. Note that the term "market portfolio," as employed in this paper, includes all financial securities in positive net supply, not just stocks. As shown in Appendix F, the bonds are risk-free.

[9] Even when investment services are available in the library, there are often direct travel costs to be incurred (plus time costs) in getting there.

[10] The reasons for these two strategies are addressed toward the end of this section.

The reader will note that the foregoing leaves out such groups as accountants, attorneys, government employees, and others, whose welfare will also be affected by the issue at hand. A consideration of the fates of these groups, however, is postponed to a later analysis.

INFORMATION PROCESSING

Information is treated in the conventional manner. Thus, the information bearing on the state that will occur at time 1 that an investor obtains prior to time 0 will be referred to generically as a signal y from an information system $Y = (y_1, \cdots, y_m)$. A signal y causes consumer-investor i to update his prior beliefs π_i^0 to the posterior beliefs π_i^y via Bayes rule prior to trading. That is, if $p_i(y \mid s)$ denotes investor i's perceived probability that signal y will be emitted if s is about to occur, Bayes Theorem gives

$$\pi_{is}^y = \frac{p_i(y \mid s)\,\pi_{is}^0}{\sum_s p_i(y \mid s)\,\pi_{is}^0} = \frac{p_i(y \mid s)\,\pi_{is}^0}{p_i(y)}.$$

When $\pi_i^y \neq \pi_i^0$, the information system Y is said to be non-null for investor i. The $n \times m$ matrix of conditional probability numbers $p_i(y \mid s)$ for investor i will be called his *information structure.*

EQUILIBRIUM RELATIONSHIPS

The essential ingredients needed to spell out the key relationships that can be expected to hold in the postulated environment are now in place. It is most convenient to address the equilibrium relations in two stages.

Consider first the situation after the various information systems, including the private subscription arrangements, are in place. Under our assumptions, each consumer-investor i then solves, upon receipt of information (signal) y:

$$V_i^y \equiv \operatorname*{Max}_{c_i, z_i} \{ f_i(c_i) + \sum_s \pi_{is}^y u_i(\sum_j z_{ij} a_{js} + e_{is}) \}$$

subject to his budget constraint. The budget constraints are given by:

$$c_i P_0 + \sum_j z_{ij} P_j = \bar{c}_i P_0 + \sum_j \bar{z}_{ij} P_j + K_i(Y, k)$$

for the subscription-selling searchers, and by:

$$c_i P_0 + \sum_j z_{ij} P_j = \bar{c}_i P_0 + \sum_j \bar{z}_{ij} P_j - k_i(Y)$$

for all others, where P_0 is the price of a unit of period 1 consumption, and P_j is the price (at $t = 0$) of security j. $K_i(Y, k)$ is the revenue from the sale of information system Y when the subscription rate is k, and k_i is the subscription cost on the part of investor i. Since the subscription fee for information system Y is k, then k_i is, for subscribers, equal to $k(Y)$ for some Y; for all nonsubscribers, k_i is equal to zero. In addition, since the

subscription market must clear, we have:

$$\sum_i k_i = \sum_i K_i.$$

The subscription-selling searchers and the small investors in Group 2 (set $\hat{I}$) also face the (self-imposed) constraint:

$$z_i \in \{z_M\}, \qquad i \in \hat{I},$$

where $\{z_M\}$ is the set of total market portfolios. Finally, in equilibrium asset prices must be such that markets clear, that is, we must have:

$$\sum_i c_i = \sum_i \bar{c}_i, \qquad \sum_i z_{ij} = z_j, \quad \text{all } j.$$

The equilibrium conditions implied by the preceding equations are summarized in Appendix E.

Having described the equilibrium relationships conditional on information (signal) y, we must now address how the assumed information network arises in the first place. Unfortunately, no formal model of these phenomena is available, so it is necessary to be somewhat informal.

For every consumer-investor, the expected utility he attains based on his selected information system Y is given by:

$$V_i(Y) \equiv \sum_y p_i(y) V_i^y. \tag{1}$$

For the subscribing investors, Y is that subscription service (or combination of services) which maximizes the right side of (1) (net of the subscription fees that appear in his budget constraint). For the nonsubscribing investors, the optimal system is Y_0 (no information). As noted, this group includes those with small resources: when risky assets are normal goods (for which the empirical evidence is overwhelming), the amount an investor is willing to pay for (valuable) information is an increasing function of his resources. Thus, it would rarely pay for someone with \$1,000 to invest to acquire a \$100 subscription service.

For the searchers who use their discoveries only on their own account, the principal trade-off in evaluating equation (1) is between the value of discovered information (as reflected in the information structure) and the concomitant loss of employment income. For the subscription-selling searchers, the decision problem is somewhat more complex, since they must also set the subscription fee k. The smaller $k(Y)$ is, the larger the number of investors who attain a net benefit from subscribing, assuming only small price effects on securities. But the larger the number of subscribers, the larger the effect on security prices, which in turn reduces the value of the information and may even cause the information to become partially revealed. The pricing of subscription services is thus a somewhat delicate matter, for which no developed theory is available. What is clear, however, is that subscription revenues must be sufficiently high to yield higher welfare than both (1) the best alternative employment

opportunity, and (2) applying the information only to one's own portfolio. If not, there would of course be no reason to stay in the business. Recall, however, that the principle of comparative advantage has been assumed to be operative in the sense that everyone's marginal (and total) product would be distinctly different in the various occupations.

THE CONDITIONAL FORECASTS

As already noted, all of the information in Appendix A through Appendix D constitutes public information when trading begins at $t = 0$. In addition, the market participants presumably have in their possession certain projections about how Green Taxicab can be expected to do in its second (and final) year. We have already indicated that operating results are sensitive to two factors: the performance of the overall economy (sluggish or strong) and the kinds of cars the company has in its fleet (a normal composition or unusually many lemons). Since these two random variables are binary, statistically independent, and symmetric, there are four possible states, each with equal probability of occurrence in the absence of additional information. That is:

$$\pi_i^0 = (.25, .25, .25, .25), \qquad \text{all } i.$$

The numbering and labeling of the four possible states are given at the top of Appendix F.

For simplicity, and to abstract from matters beyond our immediate concern, assume that each market participant comes up with the same estimate of next year's net income per share as everyone else for each of the four possible states, namely, 3.90, 5.90, 11.40, and 13.40, respectively. Note that these forecasts are more sophisticated than those used in current practice, which typically are expressed as point estimates or as range estimates. The details behind these forecasts are shown in Appendix F. Note also that revenues are rather sensitive to the state of the economy (along with wages and fuel costs). A lemon fleet has two primary effects in the second year: $200,000 extra in repairs and maintenance and $500,000 in lost revenues from down time, with corresponding savings in wages, compared to a normal fleet.

THE BOOKS VERSUS THE ANNUAL REPORT

It has been popular, especially in recent years, to view financial reports as useful in predicting future cash flows (Financial Accounting Standards Board [1978, pp. 14–15]). It may be instructive to consider this question, in the current context, at two levels. First, it is no doubt true that published financial reports are helpful in identifying past gross margins, the sensitivity of revenues to economic conditions, "normal" profit margins, etc. This kind of information is clearly indispensable in constructing the four columns in Appendix F.

But what do the financial statements in Appendix A through Appendix D tell us about the probabilities of the four possible states at the top of

Appendix F? Such information is typically of considerable private value and sometimes of social value as well (see, e.g., Hakansson, Kunkel, and Ohlson [1980]). Since the probability that the economy will be sluggish in the second year of the company's operations was assumed to be 0.5, independent of what the economy did the first year (as well as in previous years), the fact that the financial statements in Appendix A through Appendix D reveal that the year in question was one in which the economy was strong is of no help to anyone. That particular fact is no doubt available from other public sources as well. (In fairness, of course, one does not tend to think of financial reports of individual companies as a source of macroeconomic information.) This is not to say that incentives and opportunities do not exist for both private and public agencies to collect macroeconomic information of predictive value based on the period $(-\tau, 1 - \tau)$—I return to this issue in Section 6.

This leaves the question of the state of the company's fleet. Unfortunately, the *first* year's financial statements (Appendix B through Appendix F) reveal nothing about this either since reported revenues, depreciation, and the total of repairs and maintenance in particular are unaffected by this state variable. The only recorded clue is in the books themselves, which would show the information given in table 1. In addition, the potential exists for providing a clue via the replacement cost of the company's fixed assets—I return to this point in Section 5.

What this boils down to, then, is that knowing whether repairs in the first year were \$1 million (message 1) or half a million (message 2) is an important piece of information. In the former case the probabilities of states 1 and 3 would be revised to 0.5 and those of states 2 and 4 to zero; in the latter case, the probabilities of states 2 and 4 would be revised to 0.5 and those of states 1 and 3 to zero. That is:

$$\pi_i^1 = (.5, 0, .5, 0) \qquad \text{all } i,$$

$$\pi_i^2 = (0, .5, 0\ .5) \qquad \text{all } i.$$

I now examine management's *incentives* to disclose voluntarily the details of repairs and maintenance or, equivalently, the state of Green Taxicab's fleet, prior to $t = 0$, and the economic consequences of various scenarios involving the availability and nonavailability of this piece of information prior to trading at $t = 0$. Note that there seems to be no

TABLE 1
Green Taxicab Company
Breakdown of Repairs and Maintenance, First Year
(Ended at $-\tau$)

Account No.		For Fleet High in Lemons	For Normal Fleet
1105	Repairs	1,000	500
1109	Maintenance	1,000	1,500
	Total	2,000	2,000

reason to view the disclosure of this item as "required" under present regulations. Green Taxicab's income statement is already more disaggregated than most extant statements of the results of operations. And a write-down of the company's fixed assets is clearly not an item of contention since a respectable profit is expected in year 2 in any case (see Appendix F).

ADDITIONAL ASSUMPTIONS

In order to assess the economic implications of alternative disclosure policies, it is necessary to compare the equilibria that these alternatives entail. This is a terribly complicated process even in the best of circumstances so that it is useful to simplify further—by exercising some care, no essential richness need be lost by doing so. Consequently, four additional assumptions are employed. First, I assume, with only a slight loss of generality, that Green Taxicab Company is the only firm in the economy. Second, I assume that all searchers concentrate on finding firm-specific information and that search involves only opportunity costs (i.e., out-of-pocket costs are ignored). The third simplification is to assume, as in the previous cases without loss of generality, that all employment income is independent of the state, that is, that such income is fixed and not used as a risk-sharing tool. Finally, I assume, for simplicity, that there is no price signaling, that is, that the security prices associated with the two signals convey no information to the nonsubscribers.

The first two columns of Appendix G show the *aggregate* endowments of the four major categories of investors, as well as for the subgroups of searchers and small investors discussed previously. Note that each group holds the total market portfolio in the aggregate; this supposition reflects an absence of information about whether any group is, on average, more or less risk-tolerant than any other and is not crucial to later arguments. The preceding in no way restricts consumer-investor diversity within the groups, of course.

ALTERNATIVE EQUILIBRIA—"LAISSEZ FAIRE"

Suppose first that trading at $t = 0$ takes place on the basis of the published financial statements in Appendix A through Appendix D and the (publicly known) earnings estimates in Appendix F. The following scenario, which I call the "laissez faire" scenario, then suggests itself: (1) The manager (management) will trade knowing what kind of fleet the company has. (2) The searchers will, before $t = 0$, discover the nature of the company's fleet by visiting the company's headquarters and/or its garages or by sampling the cabdrivers. (3) The information-selling searchers send their discovery to their subscribers, who receive it just prior to $t = 0$. Aggregate subscription fees are assumed to be \$22,000. (4) The nonsubscribing investors trade in ignorance of the state of the company's fleet.

To evaluate the plausibility of the preceding, it is necessary to be more specific. To this end, I shall show that the conditional allocations in the middle two columns of Appendix G, and the allocations in the final two columns of Appendix G and the respective prices in the middle of Appendix I do indeed represent the respective equilibria for the two messages in the "laissez faire" case.

Let the utility functions of the manager, of nonsubscriber #1, and of nonsubscriber #2 satisfy the partial specifications given in Appendix H. Note that nonsubscriber #1 is rather risk-tolerant, while nonsubscriber #2 is quite risk-averse.

Consider first the case when the fleet is one of high lemon content (message 1). Knowing this, the manager, faced with prices of \$94.50 for the bonds and \$17.228 for the stock, will increase his bond holdings from 500 to 1,229.21 and reduce his investment in stock from 5,000 to 1,000 shares, leaving first-period consumption unchanged (this is readily verified by reference to the optimality conditions (A1)-(A3)). On the other hand, nonsubscriber #1, faced with the same prices but not knowing the state of the fleet, will increase his short position in bonds from 10 to 17.29, using the proceeds to increase his share holdings from 100 to 140, leaving first-period consumption unchanged (Appendix I). Similarly, nonsubscriber #2 reduces his bond position from 10 to 8.18, at the same time boosting his equity position from 20 to 30 shares, also leaving first-period consumption unchanged. Again, these actions can be verified by reference to optimality conditions (A1)-(A3).

Faced with the price vector (94.5, 17.228), we can extrapolate from management's behavior that all others in the know and not faced with constraint (A5) (the searchers and the subscribing investors) will shift from stocks to bonds as well given message 1. Thus, the allocation given in the middle columns of Appendix G and the price vector (94.5, 17.228) indeed represent an equilibrium.[11] Analogously, the allocation in the last two columns of Appendix G and the price vector (93.2, 17.877) represent an equilibrium given message 2. Again, the portfolios chosen by management, by nonsubscriber #1, and by nonsubscriber #2 can be verified by use of conditions (A1)-(A3) and the preference and endowment information in Appendix H and Appendix I. The simultaneous verity of (A4) and (A5) can be checked by reference to Appendix G.

In scrutinizing the preceding "laissez faire equilibria," the following should be noted:

(1) The expected utility of nonsubscriber #1 is 612.8. The going subscription fee is too high to make it worthwhile for him to be a subscriber. For example, if it were \$108.82 and he subscribed, his expected utility would only be 551.0. Since investors were assumed to treat risky assets as normal goods, subscribing investors would tend to be wealthier than the nonsubscribers, ceteris paribus.

[11] The aggregate holdings of the nonsubscribers in Group 1 are consistent with the total holdings of 300 small investors #1 and 750 small investors #2.

(2) The uninformed investors can completely protect themselves against being taken advantage of by buying the total market portfolio. But this act usually involves a loss as well in that the resulting portfolio may not suit the investor's preferences. As noted, the portfolio chosen by nonsubscriber #1 using inferior information produces an actual expected utility of 612.8 (Appendix I), while the expected utility of the total market portfolio he can buy is only $610.1 + \epsilon_1$. That is, the gain from not having to hold the market portfolio (which in this case is too conservative for his tastes) outweighs the loss he suffers from having to rely on inferior information.[12] Similarly, nonsubscriber #2 also rejects the market portfolio as a solution; its expected utility of $224.3 + \epsilon_2$ is less than that of the (more conservative) portfolios his inferior information enables him to choose, which is 242.3 (see Appendix I).[13] On the other hand, there is clearly a category of uninformed investors for whom buying and holding the total market portfolio is optimal. This subset is labeled "Nonsubscribing Investors, Group 2" in Appendix G.

(3) Something called the "no-information reference equilibrium" has also been calculated (see Appendix I). The underlying scenario assumes that all investors trade on their prior beliefs but is otherwise identical to the "laissez faire" case. While unrealistic because investors would not ignore information in their possession and the searchers have not engaged in alternate employment, this case has been included to provide a basis for isolating the effects of the informational differences prevailing under "laissez faire." In my example, there would be no trading in the no-information case; prices would be 94 and 17.925. The expected utility of the manager would be 24,675 (vs. 26,640 under "laissez faire"—see Appendix I). For nonsubscriber #1, expected utility would be 638.3 (vs. 612.8 under "laissez faire") and for nonsubscriber #2 it would be 249.6 (vs. 242.3 under "laissez faire"). Thus, the effect of knowing more than others, ceteris paribus, in this case as well as in general, is to be able to improve upon one's welfare at the expense of those who know less.

(4) The nonsubscribing investors have been assumed not to be able to infer the message contained in the equilibrium prices. That is, they were assumed unable to see a difference between the price pair (94.5, 17.288) and the pair (93.2, 17.877). (Honestly now, would you, the reader, given only the information in Appendix A through Appendix F, be able to infer message 1 from prices (94.5, 17.228)?) However, this assumption is in no sense crucial to the model. The qualitative properties of the "laissez faire" equilibria just described hold as long as the nonsubscribers cannot make perfect inferences from the prevailing prices. These prices, of course, do reflect the fact that some market participants know the state of the fleet and some do not.

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[12] Similarly, refusing to trade is often a poor defensive strategy, as noted in Hakansson [1977, pp 414-15].

[13] ϵ_1, and ϵ_2, which can be made arbitrarily small, result from the fact that investor #1 will increase his total investment while investor #2 will (correspondingly) decrease his.

THE "TIMELY DISCLOSURE" EQUILIBRIA

Suppose now that management decides to disclose, via a note in the financial statements or otherwise, the state of Green Taxicab's fleet. I shall consider why management would, or would not, want to do such a thing, only after the ramifications of this act have been fully identified.

The implications of "full disclosure" prior to trading at $t = 0$ are far-reaching (recall the discussion and figure 1 in Section 2). First, nonsubscribers now know more than they did before. Second, subscribing investors will now refuse to renew their subscriptions, since the information they previously paid for is now publicly available. Third, searchers have no more reason to spend time and resources visiting Green Taxicab Company in search of information. So they offer their time and services in their next best area of employment; Green Taxicab Company seizes the opportunity to hire them—some assist in the disclosure area, while others are employed in a new, labor-intensive venture, Division *X*. Total compensation received is \$15,000, \$7,000 less than the income from subscriptions under "laissez faire" (which is consistent with the principle of comparative advantage). The anticipated results of operations of Division *X* are shown in Appendix J.

Let us now turn to what happens in the market when trading occurs at $t = 0$. There are two basic differences. First, everyone enters with the same information. Second, using the information in Appendix J, the stock of Green will have a higher payoff at the end of period 1, given that the economy is strong, by \$.40 per share (40,000/100,000); if the economy turns out to be sluggish, the final payoff will be unchanged from the previous case. The result is that investor welfare and prices are certain to be changed.

If the preceding is combined with the previous assumptions, it turns out (under the particular utility functions assumed) that there will be no trading at $t = 0$ under either message.[14] The equilibrium price vector is (95.5, 17.442) if the fleet happens to be high in lemons and (91.5, 18.534) if that is not the case. Management is worse off than before, with an expected utility of 25,559 versus 26,460 under "laissez faire." Not surprisingly, nonsubscriber #1 is better off (656.2 vs. 612.8), along with nonsubscriber #2 (253.2 vs. 242.3), in the timely disclosure scenario than under the "laissez faire" scenario.

What about the others? Those searchers who used to work on their own account and those subscribers who have particularly large resources will be worse off than before. This is because even though they have access to the same information as before, that information is now fully reflected in prices, whereas it was only partially reflected in prices under the "laissez faire" scenario. That is, the new income from employment or the saving from not having to pay a subscription fee is for these people

[14] The fact that there is no trading is in no way crucial to the results; its sole virtue is that the calculational burden was eased.

more than offset by the loss suffered from having to trade at less favorable prices, so to speak. The other former searchers are also worse off since their employment income has been cut (from $22,000 to $15,000). Those (less well-to-do) subscribing investors for whom the information they purchased was of somewhat marginal value under "laissez faire" would be better off under "timely disclosure," however, since the saving from not having to pay for the information is greater than the price advantage they had under the "laissez faire" price system. Finally, those small investors who used to buy the total market portfolio for defensive reasons now find that the payoff from the timely disclosure total market portfolio stochastically dominates that from the "laissez faire" market portfolio in a first-order sense.[15] This makes this group as well better off in the timely disclosure scenario than under "laissez faire."

4. *The Adversaries*

The two scenarios developed in Section 3, referred to as the "laissez faire" and the timely disclosure cases, have been summarized in the first two columns of table 2. The numbers represent welfare indices, with "laissez faire" used as a norm. Since these indices are based on expected utilities, they are not comparable across individuals. However, the numbers in any row may be thought of as representative of a typical individual in that category.

According to the table, those who are better off under the timely disclosure scenario are the less wealthy subscribers, the nonsubscribing investors in Group 2, and especially the nonsubscribing investors in Group 1. On the other side are management, the searchers, and the more well-to-do subscribers, whose welfare would be greater under "laissez faire."

It should be noted that *the preceding welfare effects are highly robust.* That is, they occur even if all of the simplifying assumptions used in connection with the example developed in Section 3 are relaxed. In other words, the numbers in the first two columns of table 2 would still be valid even if I had assumed that there are many firms instead of one, that searchers are only partially engaged in finding firm-specific information, that employment income is state-dependent (which would permit profit-sharing and bonus plans,[16] etc.), and that there is price signaling, as long as prices reveal information only imperfectly. Even the introduction of transaction costs and personal taxes would not change the picture. My simplified example, in other words, permits considerable generalization without altering the welfare effects summarized in the first two columns of table 2. The crucial assumptions behind that comparative result

[15] Distribution function $F(x)$ is said to first-order stochastically dominate distribution $G(x)$ if $F(x) \leq G(x)$ for all x and strict inequality holds for some x.

[16] It should be noted that managerial compensation schemes do play a significant role in this paper; they are examined in more detail in the next section.

TABLE 2
Welfare Implications of Alternative Scenarios

Investor Category	"Laissez Faire"	Timely Disclosure		Ineffective Mandatory Disclosure Requirements	Inefficient, Partially Effective Disclosure Requirements	
		Successfully Executed	With Idealized Side Payments		Case 1	Case 2
Column #	1	2	3	4	5	6
Management	0	−2	1	−1	−2	−3
Searchers	0	−2	1	−1	−2	−4
Subscribing investors:						
Group 1 (well-to-do)	0	−2	1	−1	−3	−4
Group 2 (middle group)	0	0	1	−1	−1	−1
Group 3 (less well-to-do)	0	3	1	−1	0	1
Nonsubscribing investors:						
Group 1	0	7	1	−1	2	5
Group 2	0	1	1	−1	−1	−1
Effect on aggregate consumption	0	Positive	Positive	Negative	Negative	Negative
Pareto-efficiency of attained allocation	Inefficient	Efficient	Efficient	Grossly Inefficient	Grossly Inefficient	Grossly Inefficient

(besides rational behavior and risk aversion) are the normal goods nature of risky assets, the disparity in personal resources, the fixed cost nature of subscription rates, the presence of comparative advantages in the employment market, the assumption that there is more aggregate output when fewer individuals are engaged in search for the (same) information, that is, that we have:

$$\begin{aligned} W_s^{TD} &\geq W_s^{LF}, \quad \text{all } s \\ W_s^{TD} &\cdot\cdot W_s^{LF}, \quad \text{some } s, \end{aligned} \tag{2}$$

where W_s^{TD} is aggregate consumption in state s under "timely disclosure" (and W_s^{LF} is defined analogously), and, finally, the assumption that large coalitions are costly (and/or unmanageable). Since each of these assumptions square with observed facts, the deduced welfare effects can be accepted with considerable confidence.

It should be noted that the last assumption is crucial to the stability of the "laissez faire" scenario. For example, there exists, under assumption (2), a redistribution which makes everyone better off under the timely disclosure scenario than under "laissez faire." The effect of this solution is shown in the third column of table 2. Its implementation would require (1) a wealth transfer from the Group 3 subscribers and the Group 1 nonsubscribing investors to management, to the searchers, and to the Group 1 and Group 2 subscribers plus (2) an enforceable guarantee of timely full disclosure by management. No small feat, in other words! The required scheme also has all the trappings of (as socially accepted redistributions go) a redistribution in reverse. One of the things that keeps column 3 from replacing column 1 of table 2 (and a number of other outcome patterns tied to timely disclosure as well), then, is the assumption that large coalitions are relatively costly (and/or unmanageable).

Using basic properties drawn from the theory of financial markets, the economics of information, the concept of comparative advantage, and various observables, my example in the previous section has set the stage for identifying where the various parties stand on certain disclosure issues, as well as other accounting issues, in an admittedly simplified context. In particular, management, the searchers, and the more well-to-do subscribers have strong incentives to oppose timely disclosure, while the less well-to-do subscribers and the nonsubscribers have strong incentives to favor timely disclosure, at least from a short-run perspective. In other words, there is a built-in conflict of interest between a subset of investors, on the one hand, and management and another subset of investors on the other. The first group has a strong self-interest in gaining access to privileged information, the other has strong incentives not to make that information public until its value has disappeared. The next section examines how various strategies available to the parties involved impinge on this conflict, and how the real issue—timely disclosure—

easily becomes convoluted in the ensuing contest and is capable, especially in the name of mandatory full disclosure, of rather adverse effects on productive efficiency.

5. *The Timely Disclosure Conflict: Strategies and Scenarios*

Let us consider management's incentives to make the additional disclosure from a different perspective. Appendix I shows that the value of the firm is greater under timely disclosure than under "laissez faire," independent of the state of the company's fleet. But in the present context, management does not have an incentive to maximize the value of the firm by signaling the state of the company's fleet. Quite the opposite. Management prefers to be able to act on information which is not publicly available. That is, it is in management's interest to oppose "full disclosure" of the state of the company's fleet and not to maximize the value of the firm.[17]

The preceding does not imply that management's attitude toward timely disclosure cannot be altered, of course. There are two broad avenues available to those who have something to gain by accomplishing this: the use of incentives and coercion. The carrot and the stick are considered in turn.

CARROTS

The simplest type of carrot would be for the nonsubscribers and the Group 3 subscribers to offer a side payment to management in exchange for a promise of timely disclosure. But the searchers and Group 1 subscribers could meet this challenge, at least in part, by offering their own side payments for a promise of nondisclosure. While the first group can in principle outbid the second under assumption (2), it may be difficult to raise such a side payment, since it is in each investor's own interest to contribute as little as possible. And even if the required sum were paid, it would not be a trivial matter to enforce management's promise.

A more promising possibility lies in the area of executive compensation. Here, it may be possible to design a profit-sharing arrangement for management that is sufficiently generous to overcome its recalcitrance. Such an arrangement would be supported by the Group 3 subscribers and by the nonsubscribing investors. But other stockholders, namely, the searchers and the Group 1 subscribers, would vigorously oppose it or try to water it down so it is insufficiently attractive. In other words, this resolution of the conflict is by no means a sure bet. In particular, top management compensation plans are usually approved by the board of

[17] Note that the breakdown of the market value maximization rule is not due to the market's incompleteness in this case; it is attributable to informational externalities.

directors, where "smaller" investors are likely to be less well represented. But there are other complications (and other issues to consider in this context) as well.

First, it should be noted that executive compensation under "laissez faire" comes in two parts: direct payments by the company (salary, bonus, stock options, etc.) and security market profits resulting from being on the inside of the company, which routinely provides access to information that is finer than the information that is made public.[18] The latter portion clearly depends on the size of the manager's personal wealth. Under a multitude of assumptions concerning the market for managers, one would expect their direct compensation to be higher under timely disclosure, but not sufficiently so to offset their poorer results in the financial market. Such a situation is perfectly consistent with the first two columns in table 2.[19]

Second, even if management were paid all of the incremental profits generated by the firm under timely disclosures, those profits might not be sufficient to induce them to prefer the timely disclosure scenario; this would be the case whenever management's personal resources are particularly large.

Third, when there are many firms in the economy, it is difficult for any particular firm, and therefore its management via profit sharing, to

[18] Recall that we are not concerned here with major events (such as the well-known Texas Gulf Sulphur case) but with routine developments and such banal differences as those which exist between the books and the published financial reports. For example, in the September 1979–January 1980 period, which was followed by a significant drop in the price of GM stock, 25 of the top 58 executives of General Motors made 38 open-market transactions, of which 37 were sales (Associated Press [1980]). Another story by Dan Dorfman, *San Francisco Chronicle* (exact 1980 date unknown) reports that the top three executives of McDonnell-Douglas sold 336,228 shares somewhere in the range 36¼–52⅛ prior to the April 21, 1980 disclosure of a 40-percent decline (apparently unexpected) in first-quarter earnings. On the date of disclosure, the stock dropped 2½, closing at 31. So far as I know, none of these transactions ran afoul of insider-trading rules.

For empirical evidence reflecting the existence of opportunities for abnormal profits by insiders, see Jaffee [1974]. Indirect evidence about such opportunities, based on accounting information, is suggested by the studies of, e.g., Collins [1975] and Ro [1978]. Finally, the persistence of numerous investment services which base their recommendations on insider transactions is not inconsistent with the view that insiders have access to better information.

[19] Suppose, for example, that all managers have equal ability, have a comparative advantage in management, and receive a salary equal to their expected marginal product, but that their investable capital ranges from near zero to large. For those with something to invest, all security market profits attributable to having access to more detailed information than that which is made public then constitute pure rents under the "laissez faire" scenario; and even if salaries remained unchanged under timely disclosure, there would be no incentive to move to a new type of employment despite the loss of the preceding profits. Only if managerial salaries were less than managers' expected marginal product, and this was not the case in other labor markets, would there be an incentive for some managers to switch jobs, in the absence of a small salary increase, in connection with a switch to the timely disclosure scenario. Thus, in this case, only a small increase in managerial salaries would be required to induce all managers to remain in their managerial posts; an increase that might be virtually automatic in the presence of a bonus plan.

capture the benefits from timely disclosures by acting on its own. This is because even though a single firm's action can cut into the welfare of the searchers, it may not, under the principle of comparative advantage, cause a single former searcher to move out of search and into some other (nondisclosure) employment. In other words, firms can effectively remove the incentives for search via timely disclosure, thereby forcing the searchers into other forms of employment, only by acting in concert.

In sum, then, the success of the incentive approach depends crucially on the ability of smaller shareholders to cause the board of directors to enter into managerial employment contracts in which the profit-sharing component is of major significance—and to do so on an essentially nationwide basis. Since the interests of the larger shareholders are directly opposed to such contracts, the prospects that the incentive approach will cause management to engage in timely disclosure are not bright.

STICKS

There are at least two avenues of coercion open to those (especially the nonsubscribers in Group 1) who prefer the timely disclosure scenario to "laissez faire." One is to fight for having specific disclosure provisions included in the corporate bylaws. The other is lobbying in favor of specific disclosure requirements (which is costly to them) or just being sympathetic to legislative initiatives along such lines (which is not). Both of these efforts, of course, would be resisted by management, the searchers, and the subscribers in Group 1.

The first of the above alternatives does not appear to have been actively pursued, since small investors are not noted for their presence at corporate organizational meetings—or, if present, for their weight there. Nor do extant corporate bylaws pay much attention, if any, to relevant aspects of timely disclosure. I shall therefore focus on the mandatory disclosure alternative. For simplicity, the emphasis will be on requirements imposed by the public sector (SEC and others) rather than the private sector (FASB).

Before examining the coercion alternative directed at "mandatory disclosure," two things should be noted by way of background. First, the very existence of majority rule government, including all of its operational appurtenances, represents a partial challenge to my assumption that coalitions are costly. This institution makes it possible for large coalitions to exercise power at relatively low cost, albeit with numerous administrative shortcomings, to be sure. Note in particular that lobbying may not be required: merely being sympathetic to legislative proposals prepared at public expense may be sufficient to affect legislation. Second, observe that the redistribution in the third column of table 2, even though it makes everyone better off than they would be under "laissez faire," is not very appealing to the nonsubscribing investors in Group 1. They would much prefer the straight timely disclosure scenario minus the redistri-

bution (i.e., the second column in table 2). The incentives on the part of the nonsubscribing investors especially to flirt with the regulatory approach are therefore considerable.

It may be useful to consider briefly some of the possible outcomes of this regulatory conflict. An extreme possibility is that the activist group is successful—timely disclosure is achieved at relatively low cost so that it would be accompanied by an improvement in productive efficiency; this case is, of course, represented by the second column in table 2. At the other extreme, however, is the outcome in which new and costly disclosure requirements are indeed imposed, but they are completely ineffective in that the information is either null or arrives too late (i.e., after $t = 0$) or both. An example of this type would be the current insider-trading disclosure requirements.[20] Similarly, a requirement to disclose the replacement cost of fixed assets that merely takes the age and use of the assets into account in some average sense would not be of value in my example anyway.[21] The outcome would then be as in the fourth column of table 2; the informational discrepancies would persist, with resources being wasted on disclosure from which no one learns anything new, causing a lowering of both productive efficiency and welfare compared to what they would be under "laissez faire."

A third possible outcome is one in which some new information does become publicly disclosed on a timely basis, but only in conjunction with a number of other requirements which turn out to be ineffective. The numbers in columns 5 and 6 of table 2 are representative of this possibility. Note that the nonsubscribing investors in Group 1 are better off in both of these cases, even though they involve an inefficient use of resources. The incentives of the activist group, in other words, do not necessarily result in actions which lead to a productively efficient solution. As long as the nonsubscribing investors in Group 1 perceive a reasonable chance of attaining increased public disclosure on a timely basis, it is in their self-interest to fight for this goal with little regard for the attendant social costs.

As already noted, management in contrast has strong incentives to resist all attempts to achieve increased disclosure. In so doing, it is also unequivocally opposed to all costs associated with such disclosure, both when such disclosure is on balance productively efficient and when it is

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[20] See n. 9.

[21] To return to my example, suppose the "blue book" value of the average one-year-old taxicab is $2,400, with the average lemon being sold for $2,350 and the average nonlemon for $2,450. Reporting the replacement cost of the company's fleet at $2.4 million would then convey no information at all, whereas the numbers $2.35 million and $2.45 million (correctly applied) would provide full disclosure if included in a note to the financial statements—and the statements were not thereby delayed. Note also that the market value of a lemon fleet in our "going concern" setting is $2.69 million under "laissez faire" and $2.70 under timely disclosure (see Appendix I). The corresponding market values of a nonlemon fleet are $2.72 million and $2.77 million, respectively.

not. The oft-heard managerial phrase to the effect that various disclosure requirements are not worth their cost can thus be traced to motives which range anywhere from a complete smokescreen to a genuine desire to avoid productive inefficiencies. Note also that when the possibilities of the outcomes in the last two columns are taken into account, both the subscribers in Groups 2 and 3 and the nonsubscribing investors in Group 2 are likely to move to the sidelines or to change sides.

The conflict between the "activist" investors and management and its investor allies, which is a fundamental implication of the current model, is not new, of course; it presumably has been going on since the early days of the corporation. Hard evidence on who has won what is rather difficult to come by. But the adoption of accrual accounting for reporting purposes may be viewed as a victory for the activists in that accrual accounting contains less noise than cash basis accounting—accrual accounting would also appear to be productively efficient as long as it is not pushed too far. The same can probably be said for various moves toward uniformity and for at least some of the requirements to provide more disaggregated data (gross margins in the thirties, segmented reporting in the late sixties would be examples).[22] The audit requirement no doubt reduces the noise in preliminary reports as well, although I am not aware of any evidence that it has, due to its lateness, significantly reduced the profit opportunities available to analysts.

But management and its investor allies are not without victories either. Most important, management does not need to (and does not) report its "insider" transactions until well after the fact. Historical accounting, with all the noise it contains, is still well entrenched. And accounting reports are still in every sense highly aggregated, again causing them to be relatively noisy. Finally, they are late, at least too late to pose a threat to the ability to act on nonpublic information. What this state of affairs probably reflects is the fact that management has two rather effective weapons in its hands: it can put the burden of formulating precisely what is wanted on the opposition, and it can, by judicious but very slight delay, render potentially valuable information untimely and therefore essentially worthless.

Searchers also have strong incentives to resist timely disclosure. However, many searchers are also analysts and analysts have generally not resisted proposed disclosure requirements. The explanation for this apparent discrepancy is simple: my conclusions apply only to *timely* disclosure. Disclosure rules which are not expected to result in timely disclosure would typically be favored by searchers/analysts. The reason is simply

[22] Recall that the "events approach" to financial reporting is based on the notion that aggregation results in a loss of information (Sorter [1969]). My example shows that this loss is often absorbed in a magnified fashion by a subset of investors, with other subsets, typically including management, actually gaining from aggregately reported numbers, as shown in the first two columns of Appendix I.

(as a more elaborate model would show) that noise-reducing but untimely disclosures increase the opportunities available from search activities. This is because profitable searches depend on both (1) finding information and (2) having it publicly and credibly disseminated at a later date. The more accurate or frequent the (untimely) disseminations, the greater the rewards from predisclosure discoveries.

6. *Macroeconomic Information*

My analysis in Section 3 was concerned with what might be called firm-specific information, since it was of a type that can be uniquely associated with the firm in question. However, it is immediately clear that information about how the economy will do can be equally valuable to those who possess it, since such information would lead to a revision of the probabilities of states 1 through 4 as well. But there is a major difference between the firm-specific and macroeconomic cases, since there is, in the latter case, no "management group" that gains automatic access to such information by virtue of its job. Macroeconomic information has to be collected rather than simply discovered.

It may be noted that the collection and public dissemination of macroeconomic information is in many cases a worthwhile activity. As a case in point, consider the example in Section 3 in which the utility functions are time-additive. Suppose in addition that (1) consumer-investors' information structures concerning such information are essentially homogeneous,[23] (2) signal beliefs are essentially homogeneous, and (3) production realignments can no longer be made. Then, since markets are incomplete and (I have assumed that) endowments represent an equilibrium without the information, everyone would be better off with costless public macroeconomic information than without it (Hakansson, Kunkel, and Ohlson [1980, theorem 1]). The same is true when the information is costly as long as the cost is in some sense small. Removing the homogeneity of the information structure and the additive utility assumptions only strengthens the preceding statement. The collection and dissemination of public macroeconomic information by such agencies as the Department of Commerce, the President's Council of Economic Advisors, and the Department of Agriculture (which goes to painstaking lengths to

[23] When:

$$p_i(y \mid s) = p_1(y \mid s) \quad \text{for all } i \geq 2, y, \text{ and } s, \tag{3}$$

the information structures are said to be homogeneous; if (3) does not hold, they are called nonhomogeneous. Finally, when there exist numbers $k_{i(y)}$ such that:

$$p_i(y \mid s) = k_i(y)p_1(y \mid s) \quad \text{for all } i \geq 2, \text{ all } s \text{ and } y,$$

the information structures are said to be essentially homogeneous. Similarly, signal beliefs are said to be essentially homogeneous when:

$$p_i(y) = k_i(y)p_1(y) \quad \text{for all } i \geq 2, \text{ all } y.$$

prevent leaks in its monthly crop forecasts) thus tend to have positive welfare effects, as long as they do not use too many resources and endowments are close to what the optimal holdings would be without the information.

Private surveyors of information have of course also evolved in the macroeconomic area, as well as with respect to particular industries (Data Resources, Inc., Chase Econometric Associates, and Wharton Econometric Forecasting Associates are examples). Their presence can give rise to redistributions similar to those analyzed in Section 3. But there is also a major difference. What they report tends to be news to the managers of firms and thus is of value in deciding on the appropriate production realignments. Firm-specific news sold or used by searchers, on the other hand, represents information that is presumably already known by the firm's management.

7. *Concluding Remarks*

This paper has attempted to identify the incentives facing various participants in the financial market with respect to taking positions for or against various alternatives concerned with disclosure and the selection of accounting methods. The context was one in which the firm is already a going concern not in need of new capital. The case in which the firm is floating new loans or bonds or issuing additional stock remains to be addressed. Two other limitations should be noted. First, the analysis was constrained to comparisons in which one information system is more informative than the other in the Blackwell [1953] sense; the results would of course not be valid for other comparisons. Second, the analysis in Section 4 is contingent on assumption (2), without which there exist preferences under which other types of redistributive effects may occur (with management possibly gaining under the timely disclosure scenario, for example). This is not to say that assumption (2) is in any way implausible; it is difficult to imagine how it might not be valid. Similarly, since some measurement methods are more informative than others, the analysis also applies directly to choices among accounting measurement rules as well. In particular, if a noisy measurement rule is used, more resources will be devoted to "unscrambling" than if a more informative method were in place.

With the preceding limitations in mind, however, the findings in Section 4 appear quite robust. It is perhaps surprising that (1) the everyday observation that risky assets are overwhelmingly treated as normal goods, (2) the real-world prevalence of investment subscriptions among a subset of investors, and (3) the wide range of empirically observed asset levels among investors together imply that there is in effect a built-in, continual conflict between well-defined subgroups of investors with respect to substantive accounting disclosure and measurement questions. Nonsubscribers and less well-to-do subscribers have

reasons to favor greater disclosure even when such disclosure is excessively costly; their chief hope of achieving this is to lobby for, and/or be sympathetic to, legislative and private sector (FASB) proposals that promise timely disclosure. At the same time, management, with the express but perhaps tacit support of wealthier subscribers and searchers, has strong incentives to oppose additional disclosure on a timely basis even when such disclosure is essentially costless. Thus, the kind of managerial recalcitrance that Moonitz [1974] and others have documented in the disclosure area can be attributed to a relatively small but significant set of economic observables. It is important to note, however, that management also has strong incentives to oppose accounting requirements that have a negative effect on productive efficiency (such as untimely and/or excessively costly reporting). Thus, it would be incorrect to conclude that observed managerial recalcitrance on accounting issues is "bad." Whether it is "good," "bad," or redistributive depends largely on how it affects the productivity of the financial reporting process.

APPENDIX A

Green Taxicab Company
Balance Sheet
at Time $-1-\tau$
(in $1,000s)

Assets		Claims	
Cash	200	Notes payable	200
Automobiles, at cost	6,000	Bonds payable, 6½%, due at $t=-\tau$	4,056
Total	6,200	Bonds payable, noninterest bearing, face value $1,000 due at $t=1$, net	884
		Common stock, outstanding 100,000 shares	1,060
		Total	6,200

APPENDIX B

Green Taxicab Company
Income Statement
Year Ended at Time $-\tau$
(in $1,000s)

Revenues		25,000
Cost and expenses:		
Salaries and wages	15,000	
Fuel	2,500	

Depreciation*	4,000	
Repairs and maintenance	2,000	
Other expenses	980	24,480
Income from operations		520
Interest expense		320
Income before taxes		200
Income taxes		100
Net income		100

* Depreciation is calculated on the basis of the sum-of-the-years' digits for both book and tax purposes.

APPENDIX C

Green Taxicab Company
Statement of Changes in Financial Position
Year Ended at Time − τ
(in $1,000s)

Sources of funds:		
Operations:		
Net Income	100	
Depreciation	4,000	
Amortization of bond discount	56	4,156
Uses of funds:		
Dividends	100	
Redemption of bonds	4,056	4,156
Increase in working capital		0

APPENDIX D

Green Taxicab Company
Balance Sheet
at Time − τ
(in $1,000s)

Assets		Claims	
Cash	200	Accounts payable	200
Automobiles, at cost less accumulated depreciation	2,000	Bonds payable, noninterest bearing, face value $1,000 due at $t = 1$, net	940
Total	2,200	Common stock, outstanding 100,000 shares	1,060
		Total	2,200

APPENDIX E

Equilibrium Conditions

Assuming interior solutions (with respect to the nonnegativity constraint on consumption, $(c_i, w_i) \geq 0$), the equilibrium conditions for any given system of information flow such that:

$$k_i K_i = 0, \text{ all } i, \qquad \sum_i k_i = \sum_i K_i,$$

and given any information signal y, may be written:

$$f_i'(c_i) = \lambda_i \qquad \text{all} \quad i, \tag{A1}$$

$$\sum_s \pi_{is}^y u_i'(x_{is} + e_{is}) a_{js} = \lambda_i P_j \qquad \text{all} \quad i, j, \tag{A2}$$

$$c_i + z_i P = \bar{c}_i + \bar{z}_i P + K_i - k_i \qquad \text{all} \quad i, \tag{A3}$$

$$\sum_i c_i = \sum \bar{c}_i, \sum_i z_{ij} = Z_j, \qquad \text{all} \quad j, \tag{A4}$$

$$z_i \in \{z_M\}, \qquad i \in \hat{I}, \tag{A5}$$

where the λ_i are the Lagrange multipliers, (A4) represents the market clearing equations, and $P_0 \equiv 1$ has been chosen as numeraire.

Note that an allocation (c^*, z^*) which constitutes a solution to system (A1)–(A5) (along with a price vector $\mathbf{P}$ and a vector λ) is Pareto-efficient with respect to the given market structure and (A5); no other allocation (c, z) obtainable within that market structure plus (A5) can make some consumer-investors better off, given the subscription structure, without making others worse off.

APPENDIX F

Green Taxicab Company
Pro Forma Statement of Income, Cash Flows, and Terminal Values
Period Ending at $t = 1 - \tau$
(in $1,000s)

	State			
	1 Economy Sluggish, Lemon Fleet	2 Economy Sluggish, Normal Fleet	3 Economy Strong, Lemon Fleet	4 Economy Strong, Normal Fleet
Revenues	$19,500	$20,000	$24,500	$25,000
Cost and expenses:				
Wages	11,700	12,000	14,700	15,000
Fuel	2,000	2,000	2,500	2,500
Depreciation	2,000	2,000	2,000	2,000
Repairs and maintenance	2,200	2,000	2,200	2,000
Other expenses	760	760	760	760
Interest expense	60	60	60	60
Income taxes	390	590	1,140	1,340
Total	19,110	19,410	23,360	23,660
Net income	390	590	1,140	1,340
Per share	3.90	5.90	11.40	13.40
Depreciation	2,000	2,000	2,000	2,000
Amortization of bond discount	60	60	60	60
Cash flow	2,450	2,650	3,200	3,400
Terminal value at time 1:				
Bonds	$ 1,000	$ 1,000	$ 1,000	$ 1,000
Common stock	1,450	1,650	2,200	2,400
Total	2,450	2,650	3,200	3,400
Each bond	100	100	100	100
Each share	14.50	16.50	22.00	24.00

APPENDIX G

Pre- and Post-Trading Asset Holdings of Major Investor Categories

	Pre-Trading Endowment		Post-Trading Holdings, Laissez Faire Case			
			Message 1		Message 2	
	Bonds	Shares	Bonds	Shares	Bonds	Shares
Management	500	5,000	1,229.2	1,000	−267.2	9,000
Searchers:						
Investors	1,000	10,000	2,458.4	2,000	−534.4	18,000
Subscription sellers	500	5,000	580	5,800	570	5,700
Subscribing investors	2,500	25,000	3,784.4	16,700	1,425.6	29,550
Nonsubscribing investors:						
Group 1	4,500	45,000	948	64,500	7,806	27,750
Group 2	1,000	10,000	1,000	10,000	1,000	10,000
Total	10,000	100,000	10,000	100,000	10,000	100,000

APPENDIX H

Partial Specifications of Selected Second-Period Utility of Consumption Functions

Manager			Nonsubscriber #1			Nonsubscriber #2		
x_i	$u_i(x_i + e_i)$	$u_i'(x_i + e_i)$	x_i	$u_i(x_i + e_i)$	$u_i'(x_i + e_i)$	x_i	$u_i(x_i + e_i)$	$u_i'(x_i + e_i)$
121,777	1,350	1.1978	301	24	1.3348	1,183.35	0	2.00
122,500	2,100	1.00	346	80	1.1918	1,253	110	1.3348
132,500	12,000	.96	450	190	1.00	1,256.1	114.1	1.30
137,421	16,700	.95	581	320	.98	1,290	160.5	1.00
144,921	23,790	.94	637	374.5	.964	1,313	183	.98
160,000	37,800	.92	650	387	.96	1,322.5	192.19	.964
162,000	38,716	.91	700.4	434.89	.95	1,330	199.4	.96
170,000	46,800	.88	715.4	449	.94	1,348.5	216.8	.928
172,000	49,420	.87	757	488	.928	1,420	282.9	.924
189,277	64,000	.6662	834.75	560.1	.927	1,440	301.32	.92
			934.4	652.41	.926	1,446	306.82	.912
			1,071	778.83	.925	1,448	308.642	.91
			1,087	793.62	.924	1,478	335.6	.89
			1,200	897.8	.92	1,480	337.37	.88
			1,207	904.2	.912	1,488	344.37	.87
			1,240	934.26	.91	1,538	374	.5752
			1,351	1,035	.89	1,545.6	378	.50
			1,400	1,078.4	.88	1,611.6	405	.40
			1,440	1,113.4	.87			
			1,621	1,240	.6662			
			1,631	1,246	.5752			

APPENDIX I

Comparison of Equilibria, Selected Items

APPENDIX I

Comparison of Equilibria, Selected Items

	Manager	Nonsubscriber		Equilibrium Prices	Value of Firm	Aggregate Consumption in Period 2 from Invested Funds			
		#1	#2			State 1	State 2	State 3	State 4
Endowment	(500, 5,000)	(−10, 100)	(10, 20)						
No information reference case:									
Optimal portfolio	(500, 5,000)	(−10, 100)	(10, 20)						
Expected utility	24,675	638.3	249.6	(94, 17.925)	2.7325M	2.45M	2.65M	3.20M	3.40M
Laissez faire case:									
Message 1:									
Optimal portfolio	(1,229.21, 1,000)	(−17.29, 140)	(8.18, 30)						
Conditional expected utility	20,245	529.5	222.8	(94.5, 17.228)	2.6678M	2.45M		3.20M	
Message 2:									
Optimal portfolio	(−267.23, 9,000)	(−2.33, 60)	(11.34, 13)						
Conditional expected utility	32,675	696.1	261.8	(93.2, 17.877)	2.7197M		2.65M		3.40M
Expected utility	26,460	612.8	242.3						
Expected utility of market portfolio		$610.1 + \epsilon_1$	$224.3 + \epsilon_2$						
Timely disclosure case:									
Message 1:									
Optimal portfolio	(500, 5,000)	(−10, 100)	(10, 20)						
Conditional expected utility	20,408	562.1	234.6	(95.5, 17.442)	2.6992M	2.45M		3.24M	
Message 2:									
Optimal portfolio	(500, 5,000)	(−10, 100)	(10, 20)						
Conditional expected utility	30,710	750.2	271.9	(91.5, 18.534)	2.7684M		2.65M		3.44M
Expected utility	25,559	656.2	253.2						

APPENDIX J

Green Taxicab Company
Division X
Pro Forma Results of Operations, Year 2
(in $1,000s)

		Economy Sluggish		Economy Strong
Revenues		15		95
Wages:				
Direct	10		10	
Disclosure	5	15	5	15
Taxes		0		40
Net income		0		40

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