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Proceedings of the Academy of Accounting and Financial Studies

Table of Contents

HOW DEBT AND OTHER FIXED EXPENSES AFFECT ROE

Ravinder K. Bhardwaj, Winthrop University
David E. Letourneau, Winthrop University

ABSTRACT

Debt, as recognized on the corporate balance sheet, generates financial leverage. The Du Pont Equation and the Extended Du Pont equation, as commonly used, apply a leverage factor to the return on assets (ROA) to calculate the return on equity (ROE). The Extended Du Pont equation is a useful set of ratios for explaining the relationship between cost control, asset utilization, and debt management. The authors add elements to the elementary cost of debt to modify the results of the Extended Du Pont Equation. Typically, only long-term debt and equity are used to determine the financial leverage of a firm. The authors contend that including preferred stock as part of the firm's debt, and recognizing how the dividends paid on that preferred stock affect ROE may give a manager or a student a more relevant measure the effects of debt on ROE. In addition, one could also include other fixed costs, such as lease payments, and further extend the insights available through the more commonly employed Extended Du Pont Equation.

The benefits of augmenting the Du Pont Equation can be appreciated by considering the following: The standard Du Pont Equation, ROE = ROA x EM, implies that doubling the equity multiplier (EM), while keeping the return on assets (ROA) unchanged, doubles the return on equity (ROE). However, because of the effects leverage has on interest expense and taxes, increasing financial leverage will not affect ROE proportionally. More debt, or more leverage, increases interest expense, which reduces taxable income, reduces taxes, and reduces ROA, assuming that the firm earns more than the cost of capital on its debt.

In addition, preferred stock has several of the characteristics of debt. The inclusion of preferred stock and its associated cost of dividends in the calculation of ROE can be considered as resulting in a more comprehensive consideration of total debt. Similarly, including other fixed expenses such as lease payments can provide the firm with another view of its financial leverage position. Together, considering these several factors may lead students and practitioners towards broader appreciation of the power of the DU Pont Equation.

The authors develop an equation, based on the Extended Du Pont Equation, but which takes into consideration not only the effects of debt and preferred stock on the capital structure and the effect of interest expense on earnings, but also the effects of preferred stock on the return on equity.

USE OF FUNDS BY INTERNATIONAL QUASI-GOVERNMENTAL ORGANIZATIONS– A REVIEW OF FINANCIAL REPORTING BY UNITED NATIONS RELATED ORGANIZATIONS

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ABSTRACT

This study examines the types of funds and fund categories used by UN-related organizations in their financial reports. The subject is timely, given that the UN General Assembly approved revised accounting standards for its agencies in October 1996. Requests for financial reports were sent to fifteen major UN agencies. Seven financial reports were received and analyzed for this study, including some well-known agencies such as the World Health Organization and UNESCO.

Analysis of the seven reports received revealed a wide variety of fund types in use. The range was from no grouping of funds to seven groups in one report, along with a number of differences in fund names and types. UN accounting standards do not spell out fund types required, so the variety we encountered is not surprising. Comparability would be enhanced if future UN standards can provide more guidance in fund reporting.

INTRODUCTION

Fund accounting is used by many different governmental and nonprofit organizations to promote accountability and to meet legal requirements. A fund is defined by the Governmental Accounting Standards Board (GASB) as "...a fiscal and accounting entity with a self-balancing set of accounts...which are segregated for the purpose of carrying on specific activities or attaining certain objectives in accordance with special regulations, restrictions, or limitations."

Governmental and nonprofit organizations (G&NP) usually have as an operating objective providing some type of service, whereas for business organizations, the primary purpose is to make a profit. Business organizations rely on net income as a key measure of their operating success. GN&P must look to other reporting measures to demonstrate their successful operations. Fund accounting is one reporting tool that helps demonstrate accountability and legal compliance.

In the United States, GASB sets accounting standards for state and local governments and the Financial Accounting Standards Board (FASB) is responsible for nonprofit organizations. GASB has issued standards related to fund types used by state and local governments. Although FASB's standards do not address fund accounting, fund accounting is used by many nonprofit organizations. The American Institute of Certified Public Accountants (AICPA) has addressed the types and nature of such funds in their Industry Audit Guides.

The United Nations System contains a wide range of separate but related and affiliated organizations. These separate organizations issue financial statements based on their own organization's financial policies and regulations. In an effort to harmonize financial reporting by these organizations, a common set of accounting standards was adopted in 1996. These United Nations (UN) accounting standards are broadly based on International Accounting Standards (IAS). However, the UN standards contain several departures from the IAS. In addition, the UN standards do not address several accounting areas. For example, fund definition and fund types are not addressed by the standards.

The purpose of this study is to determine the types of funds used by UN related organizations and how funds are grouped together for financial reporting purposes. The findings of this study may be useful in providing a foundation to further explore harmonization of financial reporting for international governmental and nonprofit organizations.

UN RELATED ORGANIZATIONS

The UN and its related organizations are international nonprofit organizations. However, these organizations have many similar characteristics with governmental organizations. Chase (1998) explored the similarities in financial reporting between UN organizations and nonprofit and local government in the United States. For the most part, UN organizations have member states (nations) that govern the organizations. Most UN organizations receive their operating support through an assessment process of member states and use an appropriation process to allocate funds. This is very similar to the flow of resources for governments. Governments impose taxes to raise resources and appropriate those resources for specific purposes.

Most UN organizations also receive substantial funds from other sources. One source of additional resources is voluntary contributions made by member states. These contributions are usually restricted for specific activities or programs. Another source of funds can come from other UN organizations. These inter-organizational transfers are used to have one organization assist in carrying out the programs of another organization. Some of the UN organizations also charge fees for some of their services and, in some cases, these fees are intended to cover the costs of providing these services.

UN organizations may also hold resources for others. For example, some of the organizations are accumulating resources for post-employment benefits for employees, such as health care costs and termination benefits. The organizations may also hold resources for groups outside the organization.

As stated earlier, in October 1996, the UN General Assembly issued accounting standards for the UN system of organizations. The new standards' primary objective "...is to provide a framework for accounting and financial reporting in the United Nations system which reflects generally accepted accounting principles, while taking account of the specific characteristics and needs of the system. A further objective is to promote consistent accounting and financial reporting practice between organizations."

The UN standards do not specifically define the fund types to be used in the financial statements. However, the standards do make several mentions about funds. The appendices provide illustrations of acceptable formats for the financial statements. The illustrations provide for a

columnar format suitable for displaying information by fund or fund type. These sample financial statements also indicate that the first column should be used for the General Fund and related funds. The standard also states that the columnar format should be used to distinguish the different types of funds managed by the organization. There should be a separation of funds at the disposal of member states (regular budget and working capital funds are given as an example) and those that are not (funds received by donors to finance projects).

The UN standards also provide guidance on the display of fund balances and reserves. Included in the list of items to include in the display of fund balances are: operating reserves, balances related to projects funded by donors, working capital funds, and capital funds related to land and buildings.

RESEARCH METHOD

Most of the UN organizations produce financial statements for a two-year period. For the most part, the new standards were followed for the first time in the preparation of the 1998 financial statements. There are many organizations affiliated with the UN. From discussions with UN officials, fifteen major organizations were identified as suitable for this study. These organizations have their own member states and produce separate audited financial statements.

Requests for financial statements were sent to these fifteen organizations. As of the time of this study, seven sets of financial statements were received and included in the findings. Another four organizations responded by indicating that their financial statements were not yet finalized. Appendix A lists the organizations included in the study.

Each set of financial statements was reviewed to determine the types of funds reported. Notes to the financial statements and supporting schedules were also reviewed to gather additional information related to funds and fund groupings.

FINDINGS

All seven organizations use a variety of funds to report financial activity. As discussed earlier, the use of funds is reflective of the way organizations receive their resources. All seven organizations have an operating fund that primarily reflects the assessed contributions received from member states (one organization received no assessed contributions). Most of the organizations also receive a significant amount of resources from voluntary contributions, contributions intended for specific purposes, and support from other UN organizations. Some of the organizations also have significant revenue generating activities and hold funds for others.

In the financial statements, the organizations grouped similar funds and reported these groups as separate columns. This presentations allowed the organizations to report activity for the entire organization in one combined statement (i.e .balance sheet and statement of income and expenditure and changes in fund balance) with separate columns for each major fund group.

The number and types of fund groups reported by the organizations varied. Table 1 reports the number of fund groups used by the seven organizations. The one organization that is listed as not using a grouping, did combine trust funds into one column, but reported an additional twenty-five funds in separate columns.

TABLE 1
NUMBER OF FUND GROUPINGS

	No groupings	Two Groups	Three Groups	Five Groups	Six Groups	Seven Groups
Number of Organizations	one	one	one	two	one	one

TABLE 2: FUND GROUPS

FUND GROUP	NUMBER OF TIMES LISTED
Operating Fund :	
Regular Budget	three
General Fund	four
UNDP	three
Other Operating Funds	three
Voluntary Funds	two
Technical Co-operations	two
Employee Benefit Fund	two
Special Trust Accounts	two
Extrabudgetary Fund	one
Equity in Capital Assets	one

The organizations grouped funds differently. Table 2 reports a general description of the fund groups reported and the number of organizations that reported a similar fund group in their financial statements. The fund groups listed in Table 2 are a general description of the fund groups and may not be the exact titles used by the organizations. For example, one organization used a fund group labeled “other headquarters funds” which is reported in the table as other operating funds. Five of the seven organizations included working capital funds as part of their operating fund group heading (one organization that did not group funds reported working capital as a separate column). The other organization did not appear to have a working capital fund.

Only three organizations used a fund group for other operating funds. This fund group included activities such as publication sales, interest earnings, revenue generating activities, and exchange rate changes. Most of the other organizations included this type of activity as part of their operating fund.

All seven of the organizations reported trust funds, however, only four organizations reported separate columns for this fund group. Three of the organizations combined trust and other special funds. The special funds included funds provided by other UN organizations and voluntary contributions. The difference between trust funds, voluntary funds, special funds, extrabudgetary and technical co-operations fund groupings is not very clear. It appears that these funds are used to record resources received outside the normal assessed contributions of member states. In some cases, the fund groupings are used by organizations to further specify the type of support and possible restrictions on these resources. For example, three organizations reported funds received from UNDP (United Nations Development Program) as a separate fund group. The other organizations included resources received from UNDP as part of some other fund group. This may explain why the number of fund groups used varied significantly from one UN organization to the other.

As indicated earlier, the fund groups are listed as separate columns in the financial statements. Six of the organizations provided a total of all fund groups. Of these six, three organizations provided a separate column to eliminate inter-organizational activity. For the six organizations that reported a total column, comparative data for the previous accounting period was provided. Four organizations also reported comparative data for each fund group.

CONCLUSION

The UN standards approved in 1996 represent a positive step in promoting comparability among the financial statements of UN organizations. However, one area not included in the UN standards is a definition of funds and what fund types should be used in financial reporting. This study finds that there are significant differences among the fund groupings reported by UN organizations.

Although there are several differences in grouping of funds, it appears that there are similarities in the types of funds used by the organizations. These similarities are based on the source of funds and the restrictions placed on these funds. As the UN organizations work on refining their accounting standards, it would be helpful to address how funds should be grouped for financial reporting purposes. This would enhance comparability among UN organization financial statements, and may provide a foundation that would be helpful to other international nonprofit organizations.

APPENDIX A
List of Organizations

International Atomic Energy Agency

International Telecommunication Union

United Nations Educational, Scientific and Cultural Organization

United Nations Industrial Development Organization

United Nations Population Fund

World Health Organization

World Meteorological Organization

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INTERNATIONAL PORTFOLIO DIVERSIFICATION IN THE ASEAN STOCK MARKETS: A COINTEGRATION ANALYSIS

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INTRODUCTION

Detailed studies have been done to investigate the long-term interrelationship among developed countries' stock markets. Eun and Resnik (1984), Meric and Meric (1989), Philippatos, Cristofi, and Cristofi (1983), and Wheatly (1988) observed that the longer the time period, the greater the degree of stability among the international stock markets. In recent studies on emerging stock markets, Chan, Gup, and Pan (1992), Arshanapalli and Doukas (1993), and DeFusco, Geppert, and Tsetsekos (1996) observed the absence of a long-term equilibrium relationship (cointegration) among them. This suggests the apparent independence of the sampled emerging stock markets and the possibility of profitable international portfolio diversification.

This study investigates the diversification possibility in the selected ASEAN (Indonesia, Malaysia, Philippines, Singapore, and Thailand) stock markets. ASEAN is the Association of South East Asian Nations which was established in Bangkok in 1967 by the five nations mentioned above. Brunei Darussalam joined the association in 1984 and Vietnam became a member in July 1995. Vietnam is not included in the study since it was not a member of ASEAN during the period under observation and it does not have a fully functional stock market. Brunei is not included because of the same reason. The portfolio diversification possibility in ASEAN market is of special interest because of the tremendous growth of their respective economies and the surge in their market capitalization. This study investigates the long-term interrelationships among these five country's stock markets. An absence of cointegration among them will indicate the possibility of a long-run and profitable portfolio diversification in the ASEAN market.

DATA

Daily market indices from five ASEAN markets will be used for the analysis. For each country, the index data for four and a half years from October 1, 1990 to May 31, 1994 have been collected from the Bloomberg financial Markets, Commodities, and News Services[1]. The daily

[1]In the ASEAN market, the daily indices used in the study are Jakarta Composite index of Indonesia, Kuala Lumpur Composite index of Malaysia, Philippine Composite index of Philippines, Strait Times Industrial index of Singapore, and Thai Stock Exchange index of

market indices from these countries were used, since the use of index data reveal the overall movement of these markets. The use of daily indices also eliminate any seasonal effect on these markets.

METHODOLOGY

The rates of return of the stock indices are calculated by taking the difference between the index price and it's first difference in logarithmic form. The return can be calculated as:

$$R_{it} = lnI_{it} - lnI_{i(t-1)} \quad \textbf{(1)}$$

Where, I_{it} is the current stock price index of the i-th country and R_{it} is the rate of return on index at time *t*. The logarithmic form is used as most economic and financial time series follow curvilinear trends.

The cointegrating regression equation between any two stock market index returns with reverse specifications can be described as follows:

$$R_{it} = \alpha_0 + \alpha_1 R_{2t} + e_t \quad \textbf{(2)}$$

$$R_{2t} = \beta_0 + \beta_1 R_{1t} + v_t \quad \textbf{(3)}$$

Where R_{1t} is the daily index return of market 1, R_{2t} is the return from stock market 2, and e_t , v_t are the stochastic error terms. The cointegrating equations are estimated by ordinary least squares (OLS) to investigate whether these two returns are cointegrated. The cointegrating residuals $\hat{e}_t (= R_{1t} - \hat{\alpha}_0 - \hat{\alpha}_1 R_{2t})$ and $\hat{v}_t (= R_{2t} - \hat{\beta}_0 - \hat{\beta}_1 R_{1t})$ are used to test whether the R_{1t} and R_{2t} are cointegrated of order *d (i.e., I(d))*, in which case the data on R_{1t} and R_{2t} have to be differenced *d* times to restore stationarity. For *d = 0*, R_{1t} and R_{2t} are stationary in levels and for *d = 1*, first differencing is needed to obtain stationarity. It is important to convert non-stationary variables into stationary processes. Otherwise, they do not drift towards a long-term equilibrium situation (cointegrated).

One of the most commonly used methodology for stationarity is Augmented Dickey and Fuller (ADF) test, proposed by Dickey and Fuller (1981). The ADF test corrects for any serial correlation that might exist in the series by including lagged changes of the residual in the regression. The test procedure can be expressed by the following expressions:

$$(1-L)e_t = \gamma_0 e_{t-1} + \sum_{i=1}^{m} \gamma_{1i}(1-L)e_{t-i} + \mu_t \quad \textbf{(4)}$$

Thailand.

Where, L is the lag operator, $(1 - L) = d$ represents the difference operator, and m is the number of lags necessary to ensure that m_t and l_t are empirically white noises. For *I(1)* processes, $(1 - L)e_t = e_t - e_{t-1}$, and $(1 - L)v_t = v_t - v_{t-1}$. The null hypotheses of no-cointegration (H_0: $g_0 = 0$ *or* $t_0 = 0$) is rejected if the calculated pseudo-t values (ADF statistic) associated with g_0

$$(1-L)v_t = \tau_0 v_{t-1} + \sum_{i=1}^{m} \tau_{1i}(1-L)v_{t-i} + \lambda_t \qquad \textbf{(5)}$$

and t_0 are greater than the critical value in Mackinnon (1991), also reported in Engle and Yoo (1987).

If R_{1t} and R_{2t} are cointegrated (H_0 rejected), the long-term movements of these two series are related to each other. Consequently, the opportunity for international portfolio diversification will be non-existent. Engle and Granger (1987) suggested that there must exist an associated error correction model (ECM) for the two cointegrated series. The error correction models can be expressed as follows:

$$(1-L)R_{1t} = \theta_1 e_{t-1} + \sum_{i=1}^{m} \theta_{2i}(1-L)R_{1(t-i)} + \sum_{i=1}^{m} \theta_{3i}(1-L)R_{2(t-i)} \qquad \textbf{(6)}$$

$$(1-L)R_{2t} = \psi_1 v_{t-1} + \sum_{i=1}^{m} \psi_{2i}(1-L)R_{2(t-i)} + \sum_{i=1}^{m} \psi_{3i}(1-L)R_{1(t-i)} \qquad \textbf{(7)}$$

Here, e_{t-1} and v_{t-1} represent the error correction terms, representing the extent to which any temporary disequilibrium in the short-run is corrected. If two series are cointegrated, the ECM specification shows that the changes in R_{1t} and R_{2t} depend on the changes in themselves as well as on the lagged values of each other. It partially corrects the disequilibrium from the cointegrating relationship between the two variables.

Furthermore, if $[|\theta_1| + |\psi_1|] \neq 0$, the two series will move toward a long-term equilibrium relationship (cointegrated). On the other hand, if R_{1t} and R_{2t} are not cointegrated (i.e., $\gamma_0 = 0 / \tau_0 = 0$) with stationarity achieved for each index return, the possibility remains for profitable international portfolio diversification.

EXPECTED RESULTS

In line with previous findings on the emerging markets, East European stock markets are expected to be independent of each other. Consequently, diversification provides a profitable opportunity.

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FASB NO. 123's EFFECTS ON MANAGEMENT DECISIONS TO GRANT STOCK OPTIONS

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ABSTRACT

Although SFAS No. 123 was designed to solve inconsistencies in current accounting practice for stock options, the long-term effects of SFAS No. 123 could change the way companies compensate their employees. The FASB added the stock compensation project to its agenda in March 1984 after much criticism and debate. The debate stemmed from two main criticisms of APB 'SOpinion No. 25, Accounting for Stock Issued to Employees (APB No. 25). First, the inconsistent accounting treatment of various stock compensation arrangements and secondly that this inconsistency had come about because companies had developed various new types of stock compensation arrangement that were not fully addressed by APB No. 25.

Under SFAS No. 123, companies have two alternatives for accounting for their stock compensation. A company may elect to adopt the new "fair value" method to both measure and recognize compensation cost for its stock options; or, it may continue to account for its stock based compensation using the "intrinsic value" method set forth in APB No. 25. If companies elect the latter they are required to disclose in a footnote the pro forrna effect that the stock options would have had on net income if the new "fair value" method had been adopted. The purpose of this paper is to gain an understanding of why SFAS No. 123 was issued, how companies currently view the established reporting requirement, which method companies have adopted and whether the requirement has affected management decision making in regards to stock based compensations.

We designed a survey to ascertain if SFAS No. 123 was attaining its intended goals. We also wanted to see if the information provided was perceived to be more reliable and relevant and to determine if there were any unintended consequences of the pronouncement. Specifically, has 123 caused firms to reduce or change their use of options as part of their compensation packages. Results of the survey indicated that stock options are very important to most companies and that they are used to recruit and retain highly qualified employees. Most companies said that they are continuing to use the intrinsic method for accounting for stock options. The overall survey results also indicated companies had not reduced the use of stock options; however, most companies stated that they would have had the "fair value" method been required. Lastly we found that companies do not think that SFAS No. 123 has provided more relevant or reliable information and that the pronouncement has been costly to implement.

AN ANALYSIS OF THE IMPACT OF ALTERNATIVE FINANCIAL STATEMENT PRESENTATIONS OF COMPREHENSIVE INCOME

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ABSTRACT

This paper reports the results of a study of the reactions of financial statement preparers and financial statement users to Statement of Financial Accounting Standards No. 130 (SFAS No. 130), Reporting Comprehensive Income. This standard requires companies to report a new measure of income called Comprehensive Income, which includes net income plus several additional items that previously were carried directly to stockholders' equity without being reported in income. These additional items now included in comprehensive income are, in total, labeled Other Comprehensive Income.

Comprehensive Income is defined as:

> *... the change in equity of a business enterprise during a period from transactions and other events and circumstances form nonowner sources. It includes all changes in equity except those resulting from investments by owners and distributions to owners (FASB 1985, para. 70)*

In discussing the concepts of earnings and comprehensive income, the Financial Accounting Standards Board (FASB), in Statement of Financial Accounting Concepts (SFAC) No.5, declared:

> *Earnings and comprehensive income have the same broad components -- revenues, expenses, gains, and losses -- but are not the same because certain classes of gains and losses are included in comprehensive income but are excluded from earnings (FASB 1984, para. 42).*

Although the specific elements of other comprehensive income are not identified by SFAS No. 130 because they may change over time, the major items currently included are (1) unrealized gains and losses on available-for-sale securities, (2) foreign currency translation adjustments, and (3) minimum pension liability adjustments.

SFAS No. 130 provides illustrations of three alternative formats for reporting comprehensive income:

> *... [I] the components of other comprehensive income and total comprehensive income being reported below the total for net income in a statement that reports results of operations, [ii] in a*

> *separate statement of comprehensive income that begins with net income, and [iii] in a statement of changes in equity (FASB 1997, para. 22).*

While SFAS No. 130 does not specify a single financial statement presentation, it does encourage the use of either the first or second alternative and thereby assigns a lesser level of acceptability to the third alternative (para. 23).

SFAS No. 130 does not result in new information being reported; all of the information required was previously reported in the financial statements. The primary effect of the new standard is that previously reported information is now reported with greater prominence. Further, the specific financial statement elements affected are now included in a new measure of performance, comprehensive income. Because SFAS No. 130 introduces this new perfon-nance measure, and also permits three alternative presentations within the financial statements, an opportunity is provided to evaluate both statement preparers' and users' reactions to the new reporting requirement.

THE ALL-INCLUSIVE INCOME CONCEPT

For the most part, the issue of which specific items to include in the computation of an enterprise's net income is well established. However, the question of how to report unusual or nonrecurring items has been controversial for many decades. In general, the authoritative bodies have resolved such issues by adopting an all-inclusive approach. Thus, authoritative standards have been issued over the years requiring such items as extraordinary gains and losses, other types of unusual or infrequently occurring gains and losses, gains and losses from disposals of segments, and adjustments related to changes in accounting principles all to be included in net income. However, several other items have been treated differently. For example, prior period adjustments are excluded from income and reported as adjustments of retained earnings. Several other items have been carried directly to special stockholders' equity accounts, bypassing income.

Numerous individuals and groups, such as the Association for Investment Management and Research (AIMR), have long argued that allowing companies to bypass income and report some items directly in stockholders' equity permits these items to escape notice by financial statement users and is inconsistent with the all-inclusive approach generally adopted by the authoritative bodies. Consistent with the Statements of Financial Accounting Concepts, SFAS No. 130 attempts to remedy this discrepancy by including in comprehensive income those items previously reported only in equity. Of course, the approach taken by SFAS No. 130 is only partially inclusive in that the items previously reported only in equity are now included in comprehensive income, but still not in net income. These other comprehensive income items, together with net income, make up the total of comprehensive income. Further, the pronouncement, while requiring these items to be included in comprehensive income, permits them to be reported in the statement of changes in equity, rather than requiring that they be reported in a more prominent location.

CONCLUSIONS

This paper examines issues surrounding the reporting of comprehensive income for two separate groups. First, CFOs were asked which of three acceptable reporting formats they would use to report comprehensive income. The results show that a majority of CFOs plan to report comprehensive income in the statement of stockholders' equity. CFOs as a group do not think that the comprehensive income information conveyed to financial statement users is useful.

The second group studied is the users of financial statements represented by members of AIMR. The users of financial statements thought that comprehensive income conveyed additional useftil information but was not one of the most important financial statement items for assessing firm performance. The format of the presentation of comprehensive income appears to impact the probability that users of the financial statements use comprehensive income in computing traditional firm performance measures. However, the small number of responses to the user survey leave this issue open to question.

Editors' Note: The full version of the paper is available from the authors.

A REAL OPTIONS APPROACH TO VENTURE FUNDING

Larry L. Lawson, Missouri Western State College

ABSTRACT

For the past decade there has been an increasing interest in new ventures due to their involvement with promising new technologies and their impacts on national and regional economic growth (Meyer, Radosevich, Carayannis, David & Butler, 1995). This has led to an increased flow of funds into the venture capital market from both individual investors and governments (Venture...;1997). One outcome of these changes is that the process of deciding which ventures to fund and which not to fund has come under increasing scrutiny.

Financial analysis traditionally has relied on discounted cash flow (DCF) models of asset valuation. In its simplest form, DCF has used a relatively certain set of cash flows and discounted them over a known time period at a risk-appropriate interest rate. Important questions as to the applicability of this approach have been raised for a variety of investments when the riskiness of the investment and its timing both are subject to considerable uncertainty. Option pricing theory provides an alternative pricing basis that explicitly focuses on timing and risk and, in doing so, has produced some insights into securities pricing that DCF did not (Hull, 1997). Recently, options theory has been extended from its beginnings in options on financial assets to operations on real (tangible) assets (Dixit & Pindyck, 1994).

This paper examines the suitability of extending real options analysis to the new venture funding process. Several current aspects of the venture funding process are suggestive of its compatibility with the real options approach such as the trend of major venture capital funds to choose larger investment targets and the trend to prefer later stage ventures over research and see stage investments. The ways in which these and other trends are consistent with the real options literature will be explored in the paper along with some indications of the general usefulness of real options models in understanding the venture analysis process.

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THE IMPACT OF THE REPEAL OF THE SHORT RULE ON MUTUAL FUNDS

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ABSTRACT

Until recently, mutual fund managers were limited in their ability to protect stockholders against falling prices. This was in large part due to a sixty one year old provision in the tax code known as the "short-short rule, or the '30%'rule'". This law, which was contained in Section 851 of the tax code, disqualified a mutual fund from income passthrough treatment if more than 30 percent of its gross income was derived from the sale or disposition of certain securities which were held less than 3 months. The purpose of this rule was to discourage active short-term trading by mutual funds. The Internal Revenue Service stated that the rule's purpose was to "ensure that regulated investment companies engage primarily in safeguarding investments and securing investment returns consistent with safety of principal." This paper summarizes the change in the law and its potential impact on mutual funds.

AN EMPIRICAL ANALYSIS OF THE VALUE OF CORPORATE REPUTATION IN EXPLAINING VARIATIONS IN PRICE EARNINGS RATIOS

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ABSTRACT

The price earnings ratio has long been used as an investment analyst's tool to assess earnings growth potential and investment risks. Studies by Beaver and Morse (1978) and Zarowin (1990) confirm the long-held belief that variations in the price earnings ratio values are primarily influenced by expected earnings growth potential and perceived investment risk. However, both studies conclude that these factors do not explain all of the variation and suggest that further research be conducted to identify other important factors. In this study, we hypothesize that corporate reputation is an important factor along with projected earnings per share growth, investment risk and accounting method choice in explaining variations in price earnings ratios. The finding of this research indicates that positive corporate reputation ratings will lead to higher price earning ratios. This finding suggest that companies that work to improve their reputation will reap the benefits of a "reputation stock price premium" that will, in turn, help to achieve the goal of maximizing shareholder wealth.

INTRODUCTION

The price earnings ratio has long been used as an investment analyst's tool to assess earnings growth potential and investment risk. Studies by Beaver and Morse (1978) and Zarowin (1990) confirm the long-held belief that variations in the price earnings ratio values are primarily influenced by expected earnings growth potential and perceived investment risk. However, both studies conclude that these factors do not explain all of the variation and suggest that further research be conducted to identify other important factors.

One such factor hypothesized by the aforementioned research is the effect of accounting method choice on variations in price earnings ratios. If two companies with equal economic circumstances choose different accounting methods to account for similar transactions, the price earnings ratios for the two companies will vary simply because their earnings per share differ. Given equal economic circumstances, the stock prices should be nearly the same. A study by Little (1998) concluded that a "quality of earnings" variable used as a surrogate measure for the effects of accounting method choices was significant in explaining some of the additional variance in price earnings ratios. However, the study suggested that significant unexplained variance remains and that other factors should be explored.

In this study, we hypothesize that another important factor may be a corporation's reputation. Reputation can be viewed as capturing a combination of a firm's social and economic contributions. Previous research suggests that positive reputations allow firms to mitigate drops in stock prices in bear markets, charge premium prices, attract better applicants for its work force, attract investors, lower costs of capital, and enhance competitive status. (See, for example Beatty and Ritter, 1986; Caminiti, 1992; Milgram and Roberts, 1986; Fombrun and Stanley, 1990; Vergin and Qoronpleh, 1998; and Little, Jones, and Jones, 1999). If these assertions are true, then a measure of corporate reputation should contribute to the explanation of variance in price earnings ratios beyond traditional measures of risk, growth potential, and quality of earnings. This research tests the significance of *Fortune's* reputation ratings in explaining variance in price earnings ratios in addition to the variables capturing expected earnings growth, investment risk, and quality of earnings.

BACKGROUND STUDIES

Previous studies by Beaver and Morse (1978) and Zarowin (1990) conclude that indeed there are variables other than earnings growth potential and investment risk that explain differences in price earnings ratios. Beaver and Morse (1978), for example, found that earnings growth potential and risks on average explain approximately 50 percent of the variation in price earning ratios. Accordingly, they concluded that other factors are important in explaining price earnings variation, such as the effects of accounting method choices.

Little (1998) examined the accounting method choice hypothesis for companies in the oil and gas industry. A variable named "quality of earnings" (cash flow from operations divided by net income) was used to capture the accounting method choice phenomenon. The study concluded that "quality of earnings" did significantly explain an incremental portion of the unexplained variance in price earnings ratios after considering the effects of the traditional variables, protected EPS growth and investment risk. However, a significant portion of variance in price earnings ratio remained unexplained, suggesting that other variables might be explored.

A number of studies have suggested that a company's reputation has a significant impact on stock prices. For example, Little, Jones, and Jones (1999) examined the relationship of a company's *Fortune* Magazine Reputation Rating to the size of stock price drops in stock market crashes of varying severity. They found that reputation can mitigate the downward movement of stock prices especially when program trading is limited.

In another study, Vergin and Qoronpleh (1998) concluded that future stock market performance is directly related to reputation. They compared the 13-year stock price performance of firms in the upper tier of the reputation ratings with firms in the lower tier and the S&P 500 index. The upper tier firms showed an average increase of 20.1 percent in stock price over that period as compared to 1.9 percent for lower tier firms and 13.1 percent for the S&P index.

MEASURES

Financial Variables

The values for the financial variables for 1992 were obtained from Value Line. The dependent variable is the 1992 price earnings ratio. The independent variables are five-year projected earnings per share growth, investment risk (beta) and quality of earnings (cash flow from operations--. net income). These data were available from Value Line for 141 of the firms in the 1992 *Fortune* Magazine Annual Reputation Rating for which data were available.

Corporate Reputation

The most widely-recognized measure of corporate reputation is the annual survey conducted by *Fortune* Magazine. For this measure, over 800 senior executives, directors, and financial analysts are asked to rate firms in their industry on a scale of zero (poor) to ten (excellent) on each of eight attributes:

quality of management,
quality of good or services,
innovativeness
long-term investment value,
financial soundness,
ability to attract, develop, and keep talented people,
wise use of corporate assets, and
community and environmental responsibility.

This measure has been widely used. The concept is that reputation is multi-faceted construct, reflecting several stockholder groups, not just financial. While this measure purports to capture reputation as multidimensional, there is evidence that the mean value across the eight dimensions represents a unidimensional construct. Fombrun and Stanley (1990) demonstrate that not only are the scores on the dimensions highly inter correlated with each other, but also that the scores on dimensions load on one factor. Accordingly, we use the overall reputation rating for our measure of corporate reputation.

RESEARCH METHOD

The 141 firms included in the 1992 Fortune Reputation Index for which, Value Line data were available, formed the basis of the sample. The regression model used to test our hypothesis that corporate reputation is a significant variable in explaining variation in price earning ratios is expressed, as follows:

PE = Yo + Y1 EEG + Y2 B + Y3 QE + Y4 REP + e

Where:

PE	=	*price earnings ratio*
EEG	=	*projected five year earnings per share growth*
B	=	*beta*
QE	=	*quality of earnings*
		Cash Flow from Operations/Net Income
REP	=	*overall reputation rating*

RESULTS

Table One displays the descriptive statistics for the variables used in the regression model for the 141 sample firms. As can be seen, the sample firms had price earnings ratios with a mean of about 18 and a standard deviation of about 8 and corporate reputation ratings with a mean of 6.61 with a standard deviation of .70. The corporate reputation mean is slightly higher than an "average" rating of 5.0 out of a possible 10.0.

Table One: Descriptive Statistics

Variable	N	Mean	Standard Deviation
PE	141	18.44	7.93
EPSGR	141	2.47	1.11
BETA	141	1.10	0.18
QE	141	2.41	1.55
REP	141	6.61	0.70

Where: PE = Price Earnings Ratios
EPSGR = Projected Five Year Earnings Per Share Growth Rate
BETA = Financial Risk
QE = Cash Flow from Operations/Net Income
REP = Overall Fortune 500 Corporate Reputation Rating

Table Two displays the results of the regression model. As expected, the projected earnings per share growth variable is significant at the .0001 level. This result is consistent with past research as well as conventional financial wisdom. Future earnings per share growth has always been considered the key factor in price earnings variation. Also, as expected, the beta (financial risk) variable is highly significant at the .0027 level. This result is also consistent with past research and conventional financial wisdom. The quality of earnings variable is significant at the .01 level, confirming the finding of Little (1998) that accounting method choices do explain some of the variation in price earnings ratios. Finally, as hypothesized in this research, the corporate reputation rating is highly significant at the .0036 level. This result indicates that a positive corporate reputation rating can lead to higher price earnings ratios even after controlling for future earnings per share

growth, Beta, and accounting method choices. Thus, in addition to other benefits, a positive corporate reputation seems to aid in the goal of maximizing shareholder wealth.

Table Two: Regression Model Results

Variable	Predicted Sign	Model Coefficient	Prob > F
Intercept	?	-0.0436	0.993
EPSGR	+	4.989	0.0001
BETA	-	7.308	0.0027
QE	+	0.988	0.0132
REP	+	1.791	0.0036

Where: EPSGR = Projected Five Year Earnings Per Share Growth Rate
BETA = Financial Risk
QE = Cash Flow from Operations/Net Income
REP = Overall Fortune 500 Corporate Reputation Rating

Collinearity tests using the Belsley, Kuh, and Welch (1980) technique reveal that the regression model is well-conditioned. Additionally, regression coefficient signs are as anticipated. All the variables, except Beta, were expected to have a positive relationship to price earnings ratios. For example, a higher corporate reputation rating leads to higher price earnings ratios with the other factors held constant.

CONCLUSIONS

The finding of this research indicates that positive corporate reputation ratings will lead to higher price earning ratios. This finding suggests that companies that work to improve their reputation will reap the benefits of a "reputation stock price premium" that will, in turn, help to achieve the goal of maximizing shareholder wealth.

Future research is important to determine if there are individual components of a corporation's reputation rating that is particularly important in explaining variation in price earning ratios. If so, companies could refine the process of improving their reputation by focusing on the individual components as opposed to the subjective whole.

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THE EFFECTS OF TAX REFORM ON THE DISTRIBUTION OF CORPORATE EFFECTIVE TAX RATES: A MICROECONOMIC ANALYSIS OF THE ARMEY AND NUNN-DOMENICI PROPOSALS

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ABSTRACT

There has been considerable discussion in recent years about replacing the current system of progressive income taxation with an alternative system. Two alternatives, the Armey "Flat Tax" Plan and the Nunn-Domenici USA Plan, have received considerable public attention and Congressional support. Prior analyses (e.g. AICPA and Sullivan, 1996) employed aggregate data to study the impact of these proposals on "typical" corporations within various industries. Their results were mixed-some industries appeared to be winners under the new proposals, whereas other industries appeared to be losers. We extracted microeconomic data from a sample of corporations with publicly available financial statements. We then compared the sample corporations' tax burdens, measured by average effective tax rates, under each of the proposals to their tax burden under the current tax system. The results suggest that on average the tax burdens of corporations will be larger under either of the new proposals when compared to the tax burdens of corporations under the current system.

CHAOTIC DYNAMICS IN PACIFIC RIM CAPITAL MARKETS

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ABSTRACT

Do stock returns follow a random walk or a martingale process? Or is it possible, that on the aggregate level, capital markets are driven by a collective "image of the future"that societies are driven by? When economies are viewed as an evolutionary processes, it is just possible that on the aggregate, but a subconscious level, competitive forces in capital markets become endogenous in a system that drives exchange rates towards a collective futuristic image. Moreover, such a system could be deterministic. Theories involving evolutionary dynamics lend credence to the hypothesis that chaotic dynamics may be present in aggregate financial markets. The scope of random walk tests employed as a measure of market efficiency has recently been extended by the introduction of research into chaos theory. This paper employs statistical tools specifically designed to detect low dimensional deterministic chaos in the stock markets of four major Pacific Rim countries and the U.S. Country indexes exhibiting low-dimensional deterministic chaos may contain some informational inefficiency; thus, it may be possible to use nonlinear dynamics to predict future stock returns. The results provide some evidence of the existence of low-dimensional chaotic systems in two of the examined indexes and may give investors renewed incentive to attempt to identify specific return patterns.

The informational efficiency of financial markets has been an age old, yet intriguing topic of debate among finance theorists and practitioners. Random-walk tests employed in the past have established the weak-form efficiency of financial markets in most major industrialized nations. However, recent advances in the study of nonlinear deterministic systems have uncovered chaotic processes that can generate data series that may appear random to linear science. These discoveries have sparked a renewed rigor in the examination of capital market efficiency. Moreover, recent deliberations about viewing economies as evolutionary dynamical processes lend credence to the hypothesis that aggregate stock market behavior may be driven by a "vision of the future" [Grabbe 1996] and hence may embody an underlying deterministic mechanism. In light of these recent developments, investigations of underlying chaotic deterministic mechanisms in stock market aggregates has taken on an increased significance.

Grabbe [1996] presents the possibility of self-organization of human societies, and thus by implication of the economy, with a shared image or a vision of the future. At the singular level, this vision might be subconscious or nonexistent, but at the aggregate level such a vision might be discernible. In international stock markets, a large volume of the trading occurs while traders are speculating. They may not afford the luxury of acting late on any relevant news. Very often, the trader must anticipate other traders' moves and try to preempt such moves. As such, each trader

must not just act on his or her expectations but rather act on anticipation of other traders' moves who themselves are trying to anticipate the first's and everyone else's moves and so on. Evolutionary dynamics provide a solution in the form of spontaneous order involving dynamic feedback at a higher, or aggregate, level. In the international stock markets context, what appears to be competition amongst traders and institutions at the lower level, where expectations are generated, functions as co-ordination at the higher (global) level. Hence it is likely that even in face of rational expectations, stock market aggregates, such as country market indexes used in this study, may be generated by some form of complex deterministic mechanism. As such market aggregates may not be priced efficiently in the traditional sense.

The subject of informational efficiency of U.S. financial markets continues to receive much attention in the literature (for examples, see Atkins and Dyl [1990]; Ball and Kothari [1989]). More recent studies have begun the task of employing chaos theory in testing the efficiency of financial markets (e.g., Brock et al. [1987, 1991]; Scheinkman and LeBaron [1989]; Hsieh [1989, 1991, 1993, 1995]; Kohers et al. [1997]; Pandey et al. [1998] and Willey [1992]).

On the international level, several significant developments have created an increased interest in the efficiency of international markets. For example, relatively recent developments in financial market deregulation, the gradual lifting of restrictions on capital movements, the relaxation of exchange controls, major progress in computer technology and telecommunications, as well as a significant increase in the cross-listings of multinational company stocks have all led to a substantial rise in global stock market activities. Furthermore, the improvements in communication and computer technology not only have made the flow of international information cheaper and more reliable, but also have lowered the cost of international financial transactions. In addition, greater coordination in trade and capital flows policies among the industrialized nations may have contributed to more similar economic conditions and developments in these countries, which would be reflected in their respective stock markets. Largely as a result of these developments, many experts suggest that, especially in recent years, stock markets have moved toward a far greater degree of global integration, which has led to a renewed interest in the efficiency of foreign financial markets.

In examining the pricing efficiency of stock markets, the vast majority of research has relied on linear modeling techniques which have serious limitations in detecting multi-dimensional patterns. Using recently developed methodology, this study intends to broaden the limited scope of previous research on the subject. This approach employs powerful statistical tools to detect low dimensional deterministic chaos in the stock markets of the U.S. and four major Pacific Rim countries. More specifically, in testing the efficiency of the national stock indexes representing the United States, Australia, Hong Kong, Japan, and Singapore, this paper employs tests for nonlinear dynamics, a process which, in comparison to traditional linear models, is capable of detecting more complex patterns that otherwise appear to be random. Each country's stock market index is examined individually to determine if the time series is generated by some form of deterministic chaos. Country indexes exhibiting low-dimensional deterministic chaos may contain some informational inefficiency (in the weak form sense); thus, it may be possible to use nonlinear dynamics to predict future stock returns.

LITERATURE REVIEW

Most research on global market efficiency has dealt with the systematic movements of stock prices, the lead-lag relationship among market indexes, and the benefits of diversification (e.g., Cochran *et al.* [1993], Maldonado and Saunders [1981] and Panton *et al.* [1976]).

Studies employing tests based on nonlinear dynamics have just begun to surface in the literature. Brock *et al.* [1987, 1991], Hsieh [1989, 1991, 1993, 1995], Kohers *et al.* [1997], Pandey *et al.* [1998], Scheinkman and LeBaron [1989] and Willey [1992], have found a preponderance of evidence that residuals of whitened stock index returns are not IID (independently and identically distributed). The evidence is mixed as to whether this rejection of IID results from nonlinear dependencies or nonstationarity of data series.

Very few studies have examined international stock markets for the existence of chaotic dynamics. Frank *et al.* [1988], found some evidence of chaotic determinism in international markets. Mercado-Mendez and Willey [1992] generated evidence of chaotic processes in the Japanese Nikkei index. However, they did not find evidence of chaos in the Financial Times of London Industrial Index and the Dow Jones Industrial Average returns. Sewell *et al.* [1993] document nonlinear dependencies in the stock markets of Hong Kong, Korea, Japan, Singapore, and Taiwan, while Errunza *et al.* [1994] identify similar nonlinear dependencies in the markets of Germany, Japan, and the emerging markets of Argentina, Brazil, Chile, India, and Mexico. Omran [1997] reports finding strong evidence of the existence of nonlinear dependancy in the U.K. stock markets. Pandey *et al.* [1998] find preponderance of evidence of nonlinear dynamics in the aggregate stock market indexes of U.K., Switzerland, France, Italy and the U.S. However, they were unable to conclude that low-dimensional deterministic systems were the driving mechanism behind any of the examined indexes. In summary, the existing evidence on the presence of chaotic processes in international stock markets is highly sketchy and inconclusive.

Previous studies have provided useful information on various aspects of efficiency of financial markets and their respective degrees of linkage to each other. However, very little evidence exists on the nonlinear dynamics of the major global stock markets. Tests for chaotic determinism, in contrast to most traditional linear-form tests, are capable of detecting more complex patterns which otherwise appear to be random. Thus, by utilizing a statistical methodology specifically designed to detect low-dimensional deterministic chaos in the major Pacific Rim stock markets, this study fills an important void in the existing literature.

DATA AND METHODOLOGY

This study examines the stock markets of four major Pacific Rim countries along with the U.S. equity market. Specifically, the sample used in this research consists of the weekly national stock indexes of the following countries: Australia, Hong Kong, Japan, Singapore, and the United States. These indexes, representing market-weighted price averages, were retrieved from *Morgan Stanley Capital International Perspective* (MSCI) of Geneva, Switzerland. The indexes represent stock markets worldwide for which data was available on a consistent and reliable basis. The combined market capitalization of the companies that comprise the indexes represents approximately 60 percent of the aggregate market value of the various national stock exchanges. Since these

national indexes are constructed on the basis of the same design principles and are adjusted by the same formulas, they are fully comparable with one another. The Morgan Stanley Capital International indexes are considered performance measurement benchmarks for global stock markets and are accepted benchmarks used by global portfolio managers as well as researchers (e.g., Cochran *et al.* [1993]). Each one of the country indexes is composed of stocks that broadly represent the stock compositions in the different countries.

Attempting to detect systematic patterns in the movements of the various global stock market indexes by using a common currency would introduce a serious bias. Specifically, any pattern detected using a common currency could be attributable to: (a) movements in the stock market, (b) movements in foreign exchange rates, and (c) any combination of the two. To avoid the possibility that any detected systematic pattern is due to foreign exchange rate developments, the various national stock markets are measured in terms of their respective local currencies.

The period examined in this study extends from February 23, 1978 through March 27, 1997. To avoid biases arising from possible structural shifts from regime changes and other shifts in market dynamics, the overall time frame is also subdivided into two subperiods of approximately equal length, that is February 23, 1978 – September 10, 1987, and September 17 – March 27, 1997.

Prior to proceeding with their examination for nonlinear determinism, each index returns series is filtered for linear correlations using autoregressive models. The lags used in the autoregressions for the appropriate model are determined via the Akaike Information Criterion (AIC) (see Akaike (1974)).

In examining the efficiency of financial markets, the first step lies in testing for the randomness of security or portfolio returns. Such an approach was adopted in earlier studies of market efficiency using linear statistical theory and very general nonparametric procedures. Examinations of chaotic dynamics have revealed that deterministic processes of a nonlinear nature can generate variates that appear random and remain undetected by linear statistics. Hence, this study employs tests that have recently evolved from statistical advances in chaotic dynamics. One of the more popular statistical procedures that has evolved from recent progress in nonlinear dynamics is the BDS statistic, developed by Brock *et al.* [1987], which tests whether a data series is independently and identically distributed (IID). Simulations in Brock *et al.* demonstrate that the BDS statistic has a limiting normal distribution under the null hypothesis of independent and identical distribution (IID) when the data series consists of more than five hundred observations. The use of the BDS statistic to test for independent and identical distribution of pre-whitened data has become a widely used and recognized process (e.g., Brorsen and Yang (1994), Hsieh (1991, 1993), Kohers *et al.* (1997), Pandey *et al.* (1998), *Sewell et al.* (1992), Willie (1992)). After data has been pre-whitened and nonstationarity is ruled out, the rejection of the null of IID by the BDS statistic points towards the existence of some form of nonlinear dynamics.

Rejection of the null hypothesis of IID by the BDS is not conclusive evidence of the presence of chaotic dynamics. Structural shifts in the data series can be a significant contributor to the rejection of the null. To avoid biases arising from structural shifts from regime changes and other shifts in market dynamics, the sample period of February 1978 - December 1996 is subdivided into two subperiods (i.e., February 23, 1978 – September 10, 1987 and September 17, 1987 – March 27, 1997) which are examined individually for the violation of the IID assumption.

Furthermore, in order to ascertain whether the data series are, indeed, a result of chaotic processes, two other tests are performed. The Modified Rescaled Range (R/S) analysis is a powerful indicator of long-term persistence of a series where the influence of a set of past returns on a set of future returns is effectively captured. In addition, the *three moments test* effectively distinguishes deterministic (mean) nonlinearities from nonlinearities of variance, the latter which could result from a stochastic rather than deterministic influence.

The R/S statistic, which was developed by Hurst (1951), has been used in several studies for the purpose of detecting long term dependencies in time series data. Over the years, a number of modifications and refinements have been made to the classical R/S statistic (e.g., see Lo (1991)). According to Lo (1991), one of the drawbacks of the classical R/S statistic is that it detects short-term as well as long-term dependency, but does so without distinguishing between them. Thus, if a time series were to have strong short-term dependencies, the R/S statistic may be biased towards an indication that long-range dependence also exists.

The Rescaled Range analysis is based on the simple hypothesis that any IID data would show an increase in standardized ranges which are proportional to increase in sample sizes as samples of increasing subperiod lengths are considered. If increases in standardized ranges are less than (more than) proportional to increasing sample sizes, then the data is persistent (antipersistent) and not IID. Both the R/S statistic and the Modified R/S statistic have been utilized by researchers as a measurement for detecting long range dependencies in time series data.

RESULTS

Aside from its ability to detect nonlinear relationships, the BDS statistic, by its very design, is also sensitive to linear processes. Since this study concerns itself with the detection of nonlinear dynamics in stock return series, autocorrelations were filtered out using autoregressive models, then BDS statistics for each data series were calculated. An examination of the results in reveals that most BDS statistics are significantly positive.

The full version of this paper provides more detailed results and demonstrates that some form of nonlinear influence abounds in the index returns of Australia, Japan, Hong Kong, and Singapore. Although nonstationarity of data precluded the investigators from drawing conclusions about nonlinear influence in the index returns of the U.S., it is probable that during stable periods, the U.S. index may also be influenced by a nonlinear process. The Japanese index returns do appear to be afflicted by a low-dimensional chaotic process. In contrast, the Singapore index returns seem to be affected by a more complex, higher-dimensional chaotic form.

Editors' Note: References, tables and complete findings are available from the authors.

QUALITY OF GROWTH: DIVIDENDS AND VALUATION

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ABSTRACT

Theory suggests that a rapidly growing company will tend to finance its growth through retention of earnings, thus paying a relatively lower dividend than a company that has a lower growth rate. This study will focus on the stocks that make up the S&P 400 industrial companies and cover a period of the last fifteen years. The objective will be to focus on the dividend policy of a company especially as it relates to the quality of growth. Growth will be defined in a variety of ways: growth in total assets, growth in sales and growth in net income. The quality of growth will be defined as growth in total assets or sales compared to growth in net income. The lower this ratio, the higher the growth quality. Theory suggests that companies that have a higher quality of growth should have a higher dividend retention ratio.

RELATIONSHIP BETWEEN POST MERGER CHANGE IN CAPITAL STRUCTURE AND MARKET REACTION TO THE STOCK PRICE OF THE BIDDING FIRM AT THE ANNOUNCEMENT OF MERGER : A STUDY OF MERGER SYNERGISM

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ABSTRACT

This paper examines the effect of post merger capital structure change on the stock price of bidding firms at the announcement of merger. Wealth distribution hypothesis states that if leverage of a company increases, stockholders gain at the expense of the bondholders. In this study we found supports for wealth distribution hypothesis and also found that in the event of post merger increase in leverage, stock holders of the cash rich bidders experience higher return than the stock holders of the cash poor bidders. Also, when the merger is financed by stock, announcement day return of leverage increasing merger is less negative than that of leverage decreasing merger and their difference is significant. These findings support the postulates of free cash flow hypothesis.

INTRODUCTION

In studying the effects of merger on stock price or resulting synergy, researchers attempt to understand and identify the underlying variables responsible for the observed market reaction. One of the factors that did not receive much attention is the expected capital structure change of the merged company. Jensen (1986) suggested that excess cash held by the bidding firms plays an important role in acquisitions. Whenever a company produces substantial cash, because of the principal agent conflict, managers may not want to pay out this excess cash to shareholders. If the cash is paid out it will reduce the resources under managers' control and will subject the firm to the scrutiny of the capital markets. Mergers and acquisitions provide the managers with an avenue to spend cash instead of paying it out to the shareholders. So, firms with large amount of 'free cash' are more likely to be less selective in their investment decisions and may get involved in low benefit mergers. According to the free cash flow theory debt can reduce the agency cost of free cash flow by reducing the cash available at the discretion of the managers. Debt has a controlling influence and helps prevent firms from wasting resources on low return projects. If merger is expected to increase the debt ratio of the merged company, risk of bankruptcy in the event of failure to service the debt will motivate the managers to select their merger partners more carefully and make the organization more efficient. Proponents of wealth distribution theory states that merger do not create value. Gain from one group of security holders come at the expense of other groups. However, Asquith and Kim

(1982), Dennis and McConnel (1986), and Cornett and Travlos (1989) did not find any evidence that gains or loss in a merger is due to the redistribution of wealth among securities.

The purpose of this study is to study the effect of post merger change in leverage on the stock price reaction of the bidding firms around merger announcement date. We will look at the pre merger cash flow level of the acquiring firms and examine if the effect of leverage change is function of the excess cash available to the bidder.

HYPOTHESIS

According to the wealth redistribution hypothesis, leverage increasing transactions are expected to raise the value of the stock and leverage decreasing mergers are expected to reduce the value of equity due to the redistribution of wealth between bondholders to equity holders. Free cash flow theory looks at the same situation from a different angle. It predicts that leverage increasing transactions will generate higher returns for the stock holders if the acquirer is cash rich because debt creation will force the managers to commit future cash flows to debt payments. So, the management of the bidding firm will be more selective in their choice of merger partner. However, the effect of leverage change will be less if the bidder is cash poor. Based on the predictions of free cash flow theory, the following hypotheses have been formulated:

H1: If merger results in an increase in leverage, stock price of the bidder will react positively at the announcement of merger.

H2: If merger results in a decrease in leverage, stock price of the bidder will suffer a loss at the announcement of merger.

H3: In leverage increasing mergers, market reaction to stock price of the cash rich bidder will be positive.

H4: In leverage increasing mergers, market reaction to stock price of cash poor bidder will be negative.

As evidenced from previous studies stock price reaction to bidding firms is always negative in stock financed mergers [Wansley, Lane, Yang (1983), Travlos (1987)]. Even in stock financed mergers, if the leverage ratio increases, it is expected to have a 'disciplinary effect' on the management. So:

H5: If the merger is financed by stock and if the post-merger leverage of the merged company goes up, share holders of the bidding firm will experience positive market response.

H6: If the merger is financed by stock and if the post merger leverage of the merged company decreases, share holders of the bidding firms will experience significant negative returns.

DATA AND METHODOLOGY

Mergers included in the study occurred between 1978-1990. The sample was selected from Mergers and Acquisition magazine where effective dates of merger and method of payments are given. Mergers financed by combinations of cash, stock, and/or debt were not included in the sample. Data from the Merger and Acquisition magazine were cross-checked with the information available in the Wall Street Journal Index(WSJI). Announcement dates of mergers were obtained from WSJI. Acquiring and acquired firms had to be listed on the NYSE, AMEX, or OTC. Their returns from -136 to +136 trading days relative to merger announcement date available on CRSP tapes. Firms engaged in any kind of restructuring(e.g., other merger activities, new offerings of securities, repurchases etc.) within six months of the announcement date, were excluded from the sample.

The relative sizes of the targets were also considered in selecting the sample. Relative size is defined as the ratio of the book value of the assets of the target to the book value of the assets of the bidder [Lev and Mandelker(1972)]. If a target firm is too small compared to acquiring firm, it is not expected to have impact on the performance of the merged company. For our study, following Choi and Philippatos(1983), if the relative size of the target was less than ten percent, it was excluded from the sample. The final sample contained 265 mergers.

The bidding firms were grouped according to their change in leverage in the post merger period. In terms of the direction of the change in leverage, a merger may result in an increase or decrease in the leverage of the merged company. Leverage was measured by the ratio of the book value of total debt to book value of total assets [Choi and Philippatos (1983)]. Pre-merger leverage was calculated as the ratio of the sums of the debt to the sums of total assets of the merging companies for two years prior to the merger announcement date. Post merger leverage is the average of the debt ratio of the first and second year after the merger completion date. Changes in the financial ratios are detected by comparing the ratios of the pre- and post merger period. A firm will be in 'increase' group if the change in leverage is non-negative and will be in the 'decrease' group if the change is negative. Seventy-three of the merged firms experienced a decrease in their leverage and the leverage ratio of 138 firms increased over their pre-merger ratio.

We grouped the mergers according to the level of free cash flow(high free cash vs. low free cash). In the absence of any direct measure of free cash flow, we used financial "slack" as its proxy. Financial slack, defined by Myers and Majluf (1984) and previously used by Asquith and Mullins(1986) and Bruner(1988), is inverse of the net debt ratio which is computed as follows:

$$Net\ Debt\ Ratio = \frac{Net\ Debt}{Common\ Equity + Preferred\ Stock + Net\ Debt}$$

where, net debt = total debt - (cash + cash equivalents). The net debt ratio for each firm was divided by the industry average to get the "normalized" slack ratio. If the ratio is greater than one, the firm is slack poor, and if it is less than one it is slack rich. These ratios were calculated one year before the merger announcement dates. In all cases, book value of the assets were used.

The mean adjusted model was employed in the analysis of the security returns. Using a procedure similar to Jayaraman and Shastri(1988), abnormal returns and standardized abnormal

returns were calculated. The estimation period was -136 to -16 days relative to the date of announcement date. The daily and cumulative excess returns during the test period, t=-15 to +15, was tested for statistical significance. The null hypothesis is that the mean excess return on the event day, which is the first public announcement day of merger, is zero. Abnormal returns were defined as:

$$A_{i,t}=R_{i,t}-\overline{R_i}$$

where $A_{i,t}$ = abnormal return on security I on day t
$R_{i,t}$ = return on security I on day t
R_i = mean return for security I

$$\overline{R_i}=\frac{1}{T}\sum_{t=1}^{T} R_{i,t}$$

T = number days in the estimation period
Standardized abnormal return for a security I on day t, $SA_{i,t}$, is calculated as:

$$SA_{i,t}=A_{i,t}/S_i$$

S_i = standard deviation of security I's return during the estimation period.
The test statistic Z_t is calculated as:

$$Z_t=\overline{SA}_t\sqrt{N}$$

$$\overline{SA}_t=\frac{1}{N}\sum_{i=1}^{N} SA_{i,t}$$

N = number of firms in the sample
The cumulative abnormal return(CAR) was computed over a period of t_1 to t_2, which is any interval of time during the test period. The CAR for a security I between two dates is given by:

$$CAR_i = \sum_{t_1}^{t_2} A_{i,t}$$

For a sample of N securities the mean CAR is:

$$CAR_{t_1,t_2} = \frac{1}{N} \sum_{i=1}^{N} CAR_i$$

The standardized CAR(SCAR) was calculated as:

$$SCAR_i = \frac{\sum_{t_1}^{t_2} SA_{i,t}}{\sqrt{t_2 - t_1 - 1}}$$

For N number of securities, the test statistic Z for the given period was determined as:

$$Z_{t_1,t_2} = \overline{SCAR}\sqrt{N}$$

$$\overline{SCAR} = \frac{1}{N} \sum_{i=1}^{N} SCAR_i$$

EMPIRICAL RESULTS

Table 1 report the abnormal returns earned by stockholders of the bidding firms, whose leverage ratios increased in the post-merger period, around the merger announcement date. Table 2 reports the same for mergers where post-merger leverage ratio is less than the pre-merger ratio. For leverage decreasing sample abnormal rate of return on days -1 and 0 (event date) are significantly negative at .01 level [t=-6.49 and -4.48 respectively], but for the leverage increasing sample returns are negative but not significant. These results support hypotheses 1 and 2.

Results for samples grouped by the cash level , whose post-merger leverage ratio increased, are given in tables 3 and 4. For high cash bidders event day abnormal return is not significant (t=-0.41), but for low cash bidders whose leverage increased, abnormal returns on days -1 and 0 are significantly negative at .01 level [t=-3.63 and -4.84 respectively]. These results are interesting. Because if leverage change causes redistribution of wealth, effects in both cases would have been similar. So, differential gain by one type of security holder over the other may not only due to the redistribution, the cash flow available to the bidder may be an important explanatory variable. These findings support the free cash flow hypothesis and hypotheses 3 and 4.

Stock financed mergers always result in negative return for bidding firms. We compared stock financed mergers with decreasing and increasing post-merger leverage ratio. In both cases event day abnormal returns are significantly negative, but for the leverage decreasing sample it is more negative and the difference in abnormal returns between two groups is statistically significant. We also compared the abnormal returns for days t=-1 and t=0 for different sub-samples (Table 7). Abnormal return earned by the leverage increasing sample is significantly higher than the leverage decreasing sample for both days -1 and 0. The t-statistics of the difference is -4.98 for t=-1 (significant at .01 level) and -2.42 for t=0 (significant at .02 level). For high cash flow sample whose leverage went up, the abnormal return for both days are significantly higher than the sample whose leveraged decreased (t=-3.08, significant at .01 level). Leverage increasing, high free cash flow sample experienced significantly higher return than leverage increasing low free cash group on day 0 (t=2.30, significant at .05 level). On day t=-1 difference is positive but not significant. For stock financed mergers, leverage decreasing sample earned significantly lower return than leverage increasing sample on day t=-1 (t=-4.50, significant at .01 level) and also on day t=0 (t=-2.16, significant at .05 level).

CONCLUSION

This study examines the effect of post-merger capital structure change on the stock price of the bidding firms on the merger announcement day. According to the wealth redistribution hypothesis, if capital structure changes, gain by a security comes at the expenses of another security. For example, if leverage increases, stockholders gain at the expenses of the bondholders. Free cash flow theory examines the effect of leverage change from a different angle. Free cash flow theory proposes that when a firm has higher level of cash, it will be less selective in choosing their investments, e.g., their merger partners. But if such merger results in increase in leverage of the merged company, because of the risk of bankruptcy, management of the acquiring firms will be more careful in selecting their targets. In our study we found supports for both wealth redistribution hypothesis and free cash flow theory.

We grouped the mergers into ‘leverage increasing’ and ‘leverage decreasing’ samples according to their post-merger change in leverage. Leverage increasing group earned significantly higher return than leverage decreasing group on day t=-1 (significant at .01 level) and day t=0 (significant at .02 level). When samples are grouped by their level of free cash, it has been observed that high free cash, leverage increasing group earned significantly higher return than the low free cash leverage increasing group. If wealth redistribution was the cause of differential return among stock

and bondholders, the difference in abnormal return between these two sub-samples should not have been significant.

Stock financing does not reduce the cash at the hands of the bidding firms. At the announcement of stock financed mergers, stock holders of the bidding firms invariably experience significantly negative returns. We grouped the stock financed mergers into 'leverage increasing' and 'leverage decreasing' samples. The leverage increasing group earned significantly higher return than the leverage decreasing group both on day t=-1 (significant at .01 level) and day t=0 (significant at .05 level).

These findings shed new light on stock price reaction at merger announcement and support the arguments of wealth redistribution theory. But the findings also suggest that the wealth redistribution is a function of the excess cash held by the acquiring firm.

Editors' Note: Tables are available from the authors.

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BOND DOWNGRADES AND INTRA-INDUSTRY CONTAGION AND COMPETITIVE EFFECTS: THE CASE OF INDUSTRIALS

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ABSTRACT

A review of recent research indicates substantial interest among academicians in the possibility of industry-wide information transfers from a variety of corporate events. A major contribution of such an intra-industry approach to the study of information effects is that it fosters an understanding of how the capital market utilizes competing sources of information to price financial assets. The present paper adopts this intra-industry approach to broaden the inquiry into the role played by bond rating agencies. Specifically, the study examines whether bond downgrades — which have been observed typically to cause a downward revision in the market value of a firm's equity — have any implications for the value of the re-rated firm's industry rivals. Apart from shedding light on the process of price formation in capital markets, such an inquiry can be provide valuable information for the current debate on the need to regulate rating agencies.

In addition to measuring the stock price changes for the re-rated firms and their competitors, this study analyzes the effect of several firm- and industry-specific characteristics on the nature of those price adjustments. An assessment is also made of the extent to which stock price responses to bond downgrades are conditioned by the state of the economy and the announced reasons for the rating action.

Two possible intra-industry effects of bond rating changes can be identified: the "contagion effect" and the "competitive effect". In the context of bond downgrades, the contagion effect would reveal itself in a negative stock price response for industry rivals, while a competitive effect would be indicated by a positive valuation effect on industry rivals. This study will, on the basis of existing literature on corporate finance, industrial organization, and information economics, formulate and test hypotheses regarding the role of specific firm and industry characteristics in determining the dominant effect of bond downgrades on industry rivals.

LITERATURE REVIEW

The influence of bond rating changes on the prices of debt and equity issued by the re-rated firms has been the subject of several studies over the last two decades (see, for example, Katz [1], Weinstein [2], Pinches and Singleton [3], Holthausen and Leftwich [4], Zaima and McCarthy [5], Hand *et al*. [6], Hsueh and Liu [7], and Schweitzer *et al*. [8]). In addition to revealing the role of bond rating agencies in the production of information, these efforts have shed light on such issues as the informational efficiency of capital markets and the agency relationship between classes of security-holders.

A review of these studies reveals a marked shift over time in the perception of the function performed by rating agencies. The earlier studies such as those by Katz [1], Weinstein [2], and Pinches and Singleton [3], did not provide any evidence of a significant informational impact of bond rating changes. These authors were led to conclude that rating changes merely reflected information already available to the public. In sharp contrast, the results of the more recent research have lent support to the hypothesis that bond rating downgrades bring new information relevant to the pricing of the re-rated firm's equity. Hsueh and Liu [7] have suggested that more accurate data, in the form of daily returns, and superior methodology may be responsible for the significant rating change effects found by recent studies.

It is also apparent from yet more recent studies that the understanding of the role played by rating agencies continues to evolve. The work by Crabbe and Post [9] and Nayar and Rozeff [10] demonstrated for the first time the significant impact of re-rating activity in the short-term debt market. The results of the first study are consistent with a rating downgrade being a proxy for the erosion in issuer reputation in the presence of asymmetric information with regard to the issuer's investment opportunities. The second study in its turn revealed that rating agencies both certified the future prospects of new entrants to the short-term debt market, and, via rating changes, influenced investors' assessments of existing issuers' future cash flows. Most recently, Matolcsy and Lianto [11] provided evidence of the value added by bond rating agencies in the Australian capital market. They found that bond downgrades conveyed incremental information after explicitly controlling for the possibility that an "earnings drift" effect due to earnings announcements may cause abnormal returns to be associated with rating revisions.

The present work extends the scope of inquiry into the nature of information conveyed by bond rating changes by contending that such re-ratings are capable of conveying information not only about the re-rated firm, but also other firms in the same industry. In the process, it attempts to shed new light on the manner in which rating agencies contribute to the imposition of capital market discipline.

Schweitzer *et al.* [12] recently conducted an investigation of the industry-wide information effects of bond rating changes in the banking industry. The current study will consider instead the intra-industry effects of bond rating changes in several non-banking industries. An examination of industrials, rather than just banks, will obviously afford a richer canvas against which to study the nature of information conveyed by bond rating changes. In particular, it will allow an analysis of how and to what extent industry-related factors condition the repricing of equity precipitated by bond rating changes in an environment free of the regulatory conditions peculiar to banks.

Most recently, Akhigbe *et al.* [13] have similarly analyzed the industry-wide effects of bond rating changes for a sample of firms that includes non-financial industries. The present study, while checking the robustness of their results to a change in the time period under consideration, will add to the existing body of knowledge by analyzing the effect of several additional factors that might condition the intra-industry effect of bond rating downgrades.

METHODOLOGY AND DATA

The present study seeks to ascertain whether or not the news of a bond downgrade has an impact on the equity value of the re-rated firm and its industry rivals. One of the most critical tasks

demanded by such an inquiry is the measurement of changes in stock price attributable to the announcement of the downgrade. This section discusses the calculation of stock price reactions to information releases, and provides a detailed description of the sample. The discussion also develops the hypotheses pertaining to the impact of bond downgrades, and describes the variables employed in the study.

SAMPLE SELECTION AND DATA SOURCES

The analysis in this study covers the period of six years from 1990 to 1995, and considers bond downgrades announced by the two major rating agencies, Moody's Investor Services and Standard and Poor's Corporation. In order to be included in the study, these announcements had to have appeared in the *Wall Street Journal* (*WSJ*).

There are three broad categories of information required for the present study. First, the date on which the announcement of the downgrade appeared in the *Wall Street Journal* is determined from the *WSJ Index*. This *Index* also serves as the source of information on any confounding events during the three days surrounding the event date. Second, the abnormal return calculation requires daily returns on the equity of each security (downgraded and rival firm) in the sample. These returns, along with the daily returns on the market index proxy, are retrieved from the CRSP Daily Returns and Calendar/ Index Files. Third, measures of firm- and industry-specific characteristics are based on data provided by Compustat. The dates identifying periods of economic expansion and contraction are provided by the *Survey of Current Business* published by the U.S. Department of Commerce. The analysis of the reasons for the bond downgrades is based on reports in the financial news media, which includes the *Wall Street Journal*.

HYPOTHESES

In addition to measuring the stock price reactions of these two categories of firms to announcements of bond downgrades, the study will employ regression analysis to evaluate the significance of certain firm-and industry-specific characteristics in explaining cross-sectional differences in those reactions.

Before the intra-industry effect of downgrades can be investigated, it is necessary to assess the impact of these rating changes on the downgraded firms themselves. Consistent with the findings of recent studies, it is expected that on average significantly negative abnormal returns will be observed for the current sample of downgraded firms within the three day period centered on the event day. Therefore the first hypothesis to be tested is as follows:

H_0: Bond downgrades convey no information relevant to the equity value of the re-rated firms.

H_1: Bond downgrades convey information relevant to the equity value of the re-rated firms.

A case can also be made for industry-wide repercussions of bond downgrades. The argument for a possible effect of a bond rating change on the stock prices of industry rivals primarily rests on: (1) an issue's rating being a measure of its default risk relative to all other issues (those within and outside its industry); (2) the inability of a scheme of discrete rating classes to reflect the precise

differences in the probability of default between issues; (3) the notion that even if a rating change is prompted by firm-specific factors, it may signify a change in the competitive position of industry rivals; and (4) the assumption that investors may perceive the re-rating to stem from altered industry prospects.

These considerations suggest the following set of hypotheses:

H_0: Investors do not use bond downgrades to glean information about the re-rated firms' rivals.

H_1: Investors use bond downgrades to glean information about the re-rated firms' rivals.

Past research indicates that the informational effect of an event may not be identical for all firms, and that certain characteristics underlying the firm may condition the company's stock price response to the arrival of new information (see, for example, Barry and Brown [18], Cornell *et al.* [19], Holthausen and Leftwich [4], and Hsueh and Liu [7]).

THE ROLE OF INDUSTRY CHARACTERISTICS

It may be useful to segregate rival firms by industry and analyze the effect of certain industry-level characteristics on the nature of industry-wide information conveyed by bond downgrades. Previous studies on intra-industry effects suggest, for instance, that the degree of leverage and competition within an industry may be important factors in explaining the stock price reactions of rival firms (Lang and Stulz [20]). To explore this possibility, the present paper models the average abnormal returns to all rival firms within an industry.

SUMMARY

In summary, the present study investigates whether: (1) the average abnormal returns to downgraded firms and their industry rivals are significantly different from zero at the time of the rating change; (2) certain characteristics underlying the two groups of firms can explain the cross-sectional variation in the abnormal returns to those firms; (3) specific industry attributes condition the stock price response on the part of groups of rival firms; and (4) the motivation for the downgrade offered by the rating agency influences the effect of the rating change on industry rivals. While the abnormal returns are calculated and tested for significance using standard event study methodology, regression analysis is employed to estimate the relationships between abnormal returns and the various attributes of the firm, industry, and economy. A similar cross-sectional analysis is applied to estimate the effect of reasons for downgrades on the average abnormal returns to groups of industry rivals.

The study seeks to add to the existing literature (a) by testing the robustness of the results obtained by Akhigbe *et al.* [13] to a change in the sample period, and (b) by investigating the role of several additional firm- and industry-level characteristics in conditioning the intra-industry impact of bond downgrades.

Editors' Note: References, tables and a full version of this paper are available from the authors.

THE MARKET'S VALUATION OF AN AUDITOR'S ABILITY TO REDUCE AGENCY COSTS

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ABSTRACT

Prior research has provided some evidence that a company's demand for audit quality is a function of the company's agency costs. This line of research has examined auditor switches and looked for an association between changes in a company's agency costs and changes in auditor quality (auditor switches). The implication is that high quality auditors are able to reduce agency costs more than low quality auditors, and therefore, companies with high levels of agency costs demand a higher quality auditor because these companies have more to gain by reducing agency costs. However, there is little evidence that the stock market values an auditor's ability to reduce a company's agency costs.

To evaluate the market's valuation of an auditor's ability to reduce agency costs, the stock price reaction of clients of Laventhol and Horwath (LH) at the time LH declared bankruptcy are examined. This paper hypothesizes that companies with high levels of agency costs suffered a larger reduction in market value as a result of this announcement relative to companies that have low levels of agency costs. This hypothesis is supported by the results. Additionally, this paper hypothesizes that companies with high levels of agency costs that appoint a high quality auditor as a successor to LH would experience positive abnormal returns relative to companies who have high levels of agency costs and appoint a low quality auditor. The findings do not support this hypothesis. This may result from the information about a successor auditor becoming public information prior to the formal announcement.

INTRODUCTION

Prior research has provided some evidence that a company's demand for audit quality is a function of the company's agency costs (DeFond 1992; Francis and Wilson 1988). This line of research has examined auditor switches and looked for an association between changes in a company's agency costs and changes in auditor quality (e.g., auditor changes). The implication of this line of research is that high quality auditors are able to reduce agency costs more than low quality auditors and therefore companies with high levels of agency costs demand a higher quality auditor because these companies have more to gain by reducing agency costs. However, there is little evidence that the stock market values an auditor's ability to reduce a company's agency costs.' The auditor provides value-added services by providing a level of audit quality. Agency theory posits that a company will enter into contracts to control agency costs. If an auditor is viewed as providing a certain quality level, the other contracts will be written accordingly. Simultaneously, a company will

enlist an auditor with the necessary quality given the level of monitoring required by these contracts. Therefore, when uncertainty is introduced regarding the quality of the auditor, firms with high agency costs are no longer at equilibrium. Accordingly, it is hypothesized that the higher the agency costs of the firm, the more negative the market reaction to changes and uncertainties regarding future audit quality.

A recent article by Menon and Williams (MW) (1994) discussed these issues as they relate to the clients of the bankrupt public accounting firm, Laventhol and Horwath (LH). While MW discussed the agency arguments, they examined the LH bankruptcy in the context of the insurance hypothesis. In this study, we test the agency arguments directly. Variables that have been used to proxy for agency costs are regressed against the cumulative market return around the announcement of the LH bankruptcy. As hypothesized, companies with high levels of agency costs suffered a larger reduction in market value relative to companies that have low levels of agency costs.

POSSIBLE MARKET REACTIONS TO THE LH BANKRUPTCY ANNOUNCEMENT

There are several arguments to explain the market reaction to an auditor bankruptcy. The first is the insurance hypothesis which states that when the auditor declares bankruptcy, the stockholders no longer have the litigation avenue available. This hypothesis was investigated by Menon and Williams (1994) who supported their hypothesis by finding that firms sustaining losses prior to the LH bankruptcy experience a larger negative reaction to the announcement than firms that did not.

There are, however, other factors that the market may have considered when this announcement was made. These factors do not exclude the insurance hypothesis, but provide additional variables that may have impacted the market reaction. The primary alternative explanations, which are introduced by MW, relate to agency theory arguments and uncertainties introduced by the bankruptcy announcement.

Auditing results, in part, from the need to monitor activities given the information asymmetries present in corporations. When LH declared bankruptcy, this affected the stockholders' reliance on this monitoring. Uncertainty was introduced by the bankruptcy announcement with respect to future audits. For fin--ns with year-ends between August 31 and November 30, uncertainty resulted regarding the timeliness of their financial statements. Because LH declared bankruptcy in mid-November, the SEC (1991) allowed these firms to issue unaudited statements until the successor auditor could complete the audit. For all firms, there was uncertainty as to who would be appointed the successor auditor. Uncertainty regarding the future auditor led to uncertainty concerning the level of future monitoring quality to be employed by the firm. Firms dependent on the contracts written based on a level of audit quality can be expected to suffer more from uncertainty regarding future audit quality than fin-ns who are not reliant on such monitoring services. If the stock market values an auditor's ability to reduce agency costs, then the companies that had high levels of agency costs should suffer a larger reduction in market value due to the uncertainty regarding the future level of audit quality than the companies that have low levels of agency costs.

Therefore, the purpose of this study is to examine if investors value the auditor as a mechanism for reducing agency costs. If they do, then investors in firms with high agency costs should react more negatively to the uncertainties regarding the quality of the future audits.

HYPOTHESES DEVELOPMENT

The bankruptcy announcement of LH led to uncertainty on the part of the market regarding the identification of the subsequent auditor which led to uncertainty concerning the level of future monitoring quality to be employed by the firm. Firms who had written contracts based on their financial statements assuming a certain level of audit quality and whose stockholders had relied on the audit to constrain managerial opportunistic behavior, can be expected to suffer more from this uncertainty than firms who are not reliant on such monitoring services. This leads to the following hypothesis:

> Hl: A firm's demand for audit quality measured by the level of agency costs is inversely related to the firm's stock price reaction to the bankruptcy announcement of LH.

A similar prediction can be made regarding the stock price reaction surrounding the appointment of a successor auditor. When the former client of LH disclosed the identity of the successor auditor, uncertainty regarding future monitoring quality was reduced. This allowed the market to deten-nine if the level of audit quality selected was appropriate given the level of reliance on the audit.

Even though all the firms originally engaged LH, they may still differ as to the level of reliance placed on the audit because of differing agency costs. Therefore, if the firm relying on its financial statements as part of its contracting technology appoints a lower quality auditor, the value of that firm should decrease relative to a firm who has relied on its financial statements as part of its contracting technology and appoints an equal or higher quality auditor to replace LH. Thus hypothesis number two:

> H2: Firms that appoint an auditor whose quality is not consistent with the firm's agency costs experience more negative abnormal returns when the successor auditor is announced.

MEASURES OF AGENCY COSTS

In prior research, agency costs have been proxied using ratios dealing with contracting issues and the organizational environment (DeFond 1992; Francis and Wilson 1988). Contracting variables include management ownership, bonus plans, and debt/equity ratios. Organizational environment variables include company size and new security issues.

The higher the percent of outstanding shares held by the firm's directors and officers, the more aligned are the interests of management and shareholders, therefore the monitoring needs of the company are reduced. Higher management ownership results in less reliance on the audit, so the uncertainties resulting from the bankruptcy announcement should be less relevant to investors.

A bonus plan that is based on earnings provides management with incentives to manipulate earnings. Therefore, the investors in companies that offer these types of bonus plans to management are more reliant on the audit, and the uncertainties caused by the bankruptcy should be more important.

The higher the debt level of the firm, the more likely there are debt covenants to monitor the activities of the firm (Begley 1990). The agency costs of debt referred to by Smith and Warner (1979) result from the problems of under-investment and asset-substitution. To protect themselves against these problems, bondholders demand higher interest payments and shorter maturities, imposing costs on the debt issuer. To reduce these agency costs of debt, issuing firms arrange to include covenants in their loan agreements with creditors. Many of these debt covenants are based on information contained in the client's financial statements. For example, clients may commit to maintenance of minimum levels of ratios measuring liquidity, profitability, and financial condition. Lenders may prefer higher quality auditors who are less likely to permit client manipulation of accounting numbers.

Uncertainty regarding future audit quality increases the probability of higher agency costs of debt. This increase in agency costs will be related to a firm's need for debt financing as reflected by the firm's debt/equity ratio.

Of particular importance is the existence of public debt. Private debt often contains provisions for the bank or financial institution providing credit to monitor the company's compliance with the debt covenants (Duke and Hunt 1990). However, such an arrangement is not economically feasible to the holders of public debt. Therefore, companies with public debt are particularly reliant on an external auditor to reduce the agency costs of debt.

ORGANIZATIONAL ENVIRONMENT VARIABLES

The first of the organizational environment variables is the size of the firm. Larger firms need more monitoring because as fin-ns become larger, cognitive limitations force managers to delegate more decision making authority. The managers are also less able to observe the actions of their subordinates as firm size increases. The combination of delegated authority and reduced observability gives rise to the risk of moral hazard and opportunism (Abdel-Khalik 1993).

The need for more credible auditors has been shown to be crucial when new stock or debt is issued (Beatty, 1989). Therefore, the uncertainties concerning the audit would adversely impact firms planning to issue new securities in the near future. Also, as a firm issues more securities, potential agency conflicts between the firm's managers and the owners and creditors increase, resulting in more reliance on audit quality.

SAMPLE AND METHODOLOGY

The sample to be used in this study is comprised of those firms identified from the 1993 Compustat database as LH clients before LH's bankruptcy announcement in 1990. Data for the independent variables were obtained form Compustat, proxy statements, 8-K reports, I O-K reports, and Moody's Industrial Manual. Sufficient CRSP data were necessary to compute beta and cumulative abnormal returns. The final sample, then, is 83 firms.

MODEL

To test both hypotheses, the cumulative abnormal return (CAR) is regressed on the agency cost variables. The CAR was estimated by replicating MW's procedures. The decision to file for bankruptcy was reported by most newspapers on Monday, November 19 and the formal announcement occurred on Tuesday, November 20. Therefore, the cumulative abnormal market returns were determined over the period of November 19-20. CARs were computed using the market model to generate expected stock returns for each day in the event window. Betas were estimated using a 1 00-day estimation period that ended November 5, 1990. In computing market returns, the equal weighted NYSE/AMEX or NASDAQ index was used, depending on the listing of the firm.

CONCLUSION

The tests of a firm's stock price reaction to the bankruptcy announcement of LH and the finns' stock price reaction to the appointment of a successor auditor provide mixed results regarding the market's perception of audit quality on firm value. CARs surrounding the bankruptcy announcement are associated with variables that are influential in determining a firm's level of agency costs. These results are consistent with the hypothesis that firms with a high demand for audit quality (high agency costs) suffer more of a decline in firm value due to uncertainty regarding future monitoring quality than do firms with a low demand for audit quality.

Stock price reactions to the appointment of the successor auditor, however, provide no support for the hypothesis of an interaction between a firm's agency costs and the successor auditor's level of quality. This may be due to the fact that by the time the successor auditor was officially announced, the market was already aware of the quality of the potential replacements. This, however, is an area for future research.

Editors' Note: Tables, full results and references are available from the authors.

AN INVESTIGATION OF CASH FLOW PROXIES IN ACCOUNTING RESEARCH

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ABSTRACT

In the past fifteen years, the quantity of research concerning the implications of cash flow has greatly increased. Research concerning the relationship of cash flows to earnings and stock prices, as well as the information content of cash flow can be found in most current accounting research periodicals. Many of the seminal investigations of cash flow used proxies and estimations for the cash flow component of financial statements. These studies utilized the best available information to further the extent of accounting knowledge. Currently, the information available to accounting researchers has improved, therefore, it is now pertinent to question whether these proxies and estimations were adequate measures of cash flow, or, -iven the improved accounting information, these studies should be reviewed and the conclusions reexamined.

This paper compares cash flow proxies and estimates used in prior research to the actual cash flow numbers reported by the entity. If these proxies and estimates provide appropriate indicators of cash flow then the results of these studies will be reinforced. However, if results obtained using proxies and estimates differ significantly from the results obtained using actual cash flow numbers reported by the companies, these studies may need to be corroborated using the actual cash flow data currently available.

CONCLUSIONS

This study compares prior cash flow studies, which utilize cash flow proxies, to our study, which employs actual cash flow amounts. The intent of the study is to compare the composite studies over the same time periods using the same firms. We find that when this is done, cash flows have a significantly higher associational quality with security returns when actual cash flow amounts are used. This study verifies what Lev (1989) asserts when he states that informational properties may be enhanced through increasing the quality of information available. When the quality of cash flow information in increased by reflecting actual cash flows, the associational properties are not only strengthened but application with current theory (SFAS 995) is assured.

The implication of this study on future cash flow research should be quite clear. Only actual cash flow amounts should be used for the purposes of conveying high quality and more realistic associations to investors and managers.

Editors' Note: The full version of the paper is available from the authors.

FUND ADVISOR COMPENSATION: AN APPLICATION OF AGENCY THEORY

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ABSTRACT

Compensation and the form in which it is paid are topics of seemingly endless interest, if not rancor, among the public, governments, academicians, and, not least of all, executives. Some believe that compensation is too high, some that it is improperly structured, others that it is inequitable or unethical, and still others that it provides the wrong incentives. And these by no means exhaust the issues raised by the various interested parties.

Examining compensation in an agency framework allows insight into the incentives provided through compensation. However, while the agency framework allows insight, sufficiently refined and detailed data are rarely available to allow empirical examination of the model. In the case of investment companies, these data are available.

The agency framework is applied to the situation of investment companies and specific, testable hypotheses are drawn. These hypotheses imply that compensation should be a function of the Net Asset Value and income of the fund, of the stated purpose and composition of the fund, and of the size of the fund. The next logical step in this research will be to gather the data and test the hypotheses generated herein.

INTRODUCTION

Compensation is a topic of controversy among investors, governments, and academicians. Public interest is indicated in articles such as "Why the CEO May Be Worth $100 Million," "The Good, the Bad, the Ugly of CEO Salaries," "Can Even Heroes Get Paid Too Much?" "American Pay Rattles Foreign Partners," "Shares Fall; Chief's Pay May Not," and "A CEO Cuts His Own Pay" which have recently appeared in the popular press. Legislated interventions in the structure of compensation and in the required reporting of the magnitude and, sometimes, the reporting of the actual compensation contract, indicate the governmental interest generated by compensation[2]. Articles by authors such as Aggarwal & Samwick (1999), Bhagat, Brickley, & Lease (1985), Brickley, Bhagat, & Lease (1985), Callahan & Rutledge (1995), Campbell & Kracaw (1987), Golec (1988), Grinblatt & Titman (1989), Hall & Liebman (1998), Hallock (1998), Harris & Raviv (1979), Jensen

[2] Legislation affecting the compensation of investment advisors has been particularly prevalent in recent years.

& Meckling (1976), Jensen & Murphy (1990), Mirrlees (1976), Murphy (1986a, 1986b), Ross (1973), Schaefer (1998), Starks (1987), Stiglitz (1974), and Tehranian & Waegelien (1985) are a sampling of the articles that demonstrate a long and enduring history of academic interest in compensation in its various forms.

Some investors, government officials, and academicians believe compensation is too high, some that it is improperly structured, others that it is inequitable and/or unethical, and still others that it provides the wrong incentives. In short, compensation is an issue of controversy. Understanding the role of compensation in the business framework is the key to the controversy.

THE PRINCIPAL-AGENT MODEL

Agency models generally address the problem of moral hazard. This problem occurs when a decision made by one individual, striving to satisfy personal desires, affects the welfare of others. Furthermore, those so affected cannot observe or directly control the choice made by the individual.

In an agency model, the principal is the owner of a business who, for some reason,[3] chooses not to be directly involved in the management of the firm; instead, the principal hires an agent and delegates decision-making authority for the enterprise to that agent. The owner of the firm might choose not to be involved in the operation of the business because of a desire not to expend effort or because the agent has a comparative advantage (either in resources or ability) in the management of the firm or because of a desire to diversify personal and capital resources. If the principal and agent have different goals, if it is too costly to monitor the behavior of the agent, and if both of the parties seek to meet their own goals, the agent won't act in the best interests of the principal. If the agent has decision-making authority and the agent's choices are not easily observed and controlled, the choices he/she makes are unlikely to be consistent with the objectives of the principal.

Suppose the agent expends effort to improve the outcome of the business. The principal receives the net profit of the operation of the business less the fee paid to the agent.[4] Thus, the principal may receive the benefit of the agent's expenditure of effort through the increase in the profitability of the enterprise. However, the agent is assumed to have some, as yet unspecified, level of disutility associated with the expenditure of effort. Because the agent may or may not, depending on the compensation scheme, receive the full benefit of any increase in effort, the agent may choose a level of effort less than the principal would like. The problem of the principal is to motivate the agent to act in a manner that will be mutually satisfying.

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[3] The owner of the firm might choose not to be involved in the operation of the business because of his/her own desire not to expend effort or because the agent has a comparative advantage, either in resources or ability, in the management of the firm or because of a desire to diversify his/her personal and capital resources.

[4] Because the principal is concerned with his/her own wealth, the principal's problem is to maximize the difference between the net profit of the business less the agent's fee, thus increasing his/her income.

The contract that leads to the highest level of expected utility[5] for the principal may be relatively simple or may be quite complex. If the actions of the agent are perfectly and costlessly observable, the principal can merely reward the agent for the "correct" action and punish the agent for the “incorrect” action. However, it is usually the case that the actions or effort of the agent are not perfectly and costlessly observable. In this case, the incentives for the agent must be aligned in such a way that the agent works in a manner desired by the principal.

Problems arise when the effort or actions of the agent are not perfectly and costlessly observable and the incentives of the agent do not lead to behavior that is consistent with the desires of the principal. This is the case which is typically modeled in the principal-agent literature. Moral hazard problems may be characterized by a divergence of incentives between the two parties and asymmetric information.

One possible solution for this problem is to make compensation contingent on the variable of concern for the principle, which in this case is the outcome of the business venture. The agent will expend effort just as if he/she were the principal if the fee paid to the agent is a residual claim on the performance of the company.[6] Such a contract aligns the incentives of the agent with those of the principal by having the agent bear the consequences of his/her choice of effort. However, if the risk tolerance of the principal differs from that of the agent, this contract may not be efficient; it may result in the relatively risk-averse party to the contract bearing all of the risk of the enterprise.

Both effort and risk bearing are important in the design of compensation contracts. Paying the agent a residual claim induces effort, but allocates risk to the party for whom the assumption of risk may be most costly. Compensating the agent with a fixed fee will provide improved risk sharing if the agent has lower risk tolerance than the principal. It does not, however, provide the agent with incentive to expend effort.

The optimal scheme would be expected to balance these two forces by compensating the agent through the use of both a fixed fee payment and a partial claim on the outcome of the enterprise. The exact form of an optimal contract would, therefore, depend on the relative degrees of risk aversion of the parties to the contract,[7] on the relation between the outcome of the business venture and the effort of the agent,[8] and on the degree to which the actual effort of the agent may be observed.[9]

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[5] In finance, we commonly use an observable variable, wealth, as a proxy for utility. Use of this proxy assumes, among other things, that the individual is risk neutral.

[6] In essence, the agent becomes the principal since the original principal now receives a fixed fee and the agent now holds the residual claim. The agent will now work in the way which maximizes his/her own utility.

[7] The level of risk imposed upon a mildly risk averse agent to provide an incentive to expend effort might not be the same as the level of risk needed to induce a strongly risk averse agent to expend effort.

[8] That is, the dependence of the compensation of the agent on the outcome of the enterprise might depend on the ability of the agent to influence the outcome.

[9] Although an assumption that the effort of the agent is not perfectly observable is generally included in principal-agent models, several authors have demonstrated that <u>any</u> information, even

INVESTMENT COMPANIES

An investment company is a business enterprise which pools the funds garnered from the sale of ownership shares and invests those funds in marketable securities. Generally, an investment advisor is retained to invest the funds in a manner consistent with the requirements and objectives of the fund.

Two forms of investment companies exist: open end and closed end. In each case, shares are initially sold in the market and the funds collected from the initial sale of shares are invested in a portfolio or marketable securities. The fundamental difference between the two forms of investment company is the manner in which shares are liquidated by investors. An open-end fund's investor redeems his/her shares directly from the company. The company, which receives the shares, pays the proportion of Net Asset Value (NAV)[10] represented by the shareholder's holdings to the liquidating investor. In contrast, the ownership of a closed end fund is similar to that of other publicly traded corporations. An investor liquidates holdings by selling his/her shares in a secondary market.

The quoted price of a share of an open-end investment company is the NAV of the proportion of the fund represented by that share. As such, it reflects the current market value of the underlying portfolio of securities. In contrast, a share of a closed end investment company trades in a secondary market. The price of the share reflects the supply and demand for the shares of the investment company, rather than of the asset portfolio, and so may deviate from the NAV of the fund. Typically, shares of a closed end investment company sell at a discount from the NAV of the fund.

Another important difference between open end and closed end funds involves the manner in which the value of the portfolios may increase. The value of either portfolio may increase by virtue of good performance, but the total value of the open end fund may also rise or fall by the amount of any purchase or redemption of shares by the investors in the investment company.

In this context, the incentives and consequently the managerial compensation scheme of the investment advisor are of great interest to both shareholders and to regulators. However, to date little is known about incentive plans for investment advisors, though managerial compensation has attracted a good deal of academic attention.

While compensation has been a topic of interest to many parties, much of the empirical work on managerial compensation[11] is, in a sense, circumstantial because of a lack of data. For example,

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a noisy proxy, about the effort of the agent is valuable. For a more complete explanation, see Holmström (1979).

[10] NAV is the market value of the portfolio of securities less the liabilities of the firm. This value represents the NAV of the entire firm. The NAV may also be divided by the number of shares outstanding to allow a representation of the NAV per share. In practice, the two are differentiated casually by the magnitude of the numbers being discussed.

[11] Theoretical models of managerial compensation include articles by Grossman & Hart (1983), Holmström (1979), Modigliani & Pogue (1975), Shavell (1979), and Starks (1987) all of which model the tension between the incentives to perform and optimal risk bearing in a variety of situations. Empirical work in the area of managerial compensation includes Murphy (1985, 1986a, 1986b), Bhagat, Brickley, & Lease (1985), and Tehranian & Waegelien (1985).

event studies[12] examine the stock market reaction to an event such as the introduction or revision of managerial compensation schemes. Although the event itself is identifiable, the information being relayed by the event is not obvious. Further, in these studies the difference between the old compensation schedule and the new compensation schedule is not specified and no expectation is formed with respect to which compensation plan would, a priori, induce managers to improve performance.

As another example, other authors[13] regress compensation on observed performance measures to estimate sensitivity of compensation to performance. However, while this method examines broad categories of compensation, it does not always differentiate compensation plans within these broad categories.[14] The evidence which results is circumstantial.

The use of such methods for empirical research may be due, in part, to a lack of detailed data sufficient to allow for a more direct examination of managerial compensation. Researchers have had little access to the exact form of the compensation packages of managers. Such a lack of information is understandable; short of regulation, a company appears to have little incentive to reveal the compensation contracts of its managers and significant incentives, in competitive managerial talent markets, not to reveal the compensation contract.[15] In addition, compensation plans may be stated implicitly rather than explicitly.

Although compensation contracts are not typically observable, in certain circumstances such data are obtainable. If an investment company is managed by an outside entity,[16] the Securities and Exchange Commission (SEC) requires that the contract between the investment advisor and the investment company be approved annually by the shareholders. To obtain this approval, management must publish a summary of the exact form of compensation; this compensation is usually stated in terms of observable variables.

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[12] See Bhagat, Brickley, & Lease (1985) and Tehranian & Waegelien (1985).

[13] See Murphy (1985, 1986a) and Jensen & Murphy (1990) for example.

[14] For example, such a study might include a dummy variable of 1 if the company compensates by a stock option plan and of 0 otherwise, but does not attempt to differentiate the magnitude or expected effect of the stock option plan. The coefficient in a regression model would indicate the effect of the existence of a stock option plan but does not differentiate among the size of plans. Jensen and Murphy (1990) is an exception; they estimate the sensitivity of various components of CEO wealth to the performance of the firm.

[15] There is also a moral hazard problem in asking the manager to reveal the compensation contract himself or herself. The manager may have an incentive to misrepresent the contract, depending on the circumstances.

[16] Such an entity is called an investment advisor.

HYPOTHESES

The models presented above contribute to our understanding of the agency relationship and of the role of compensation in resolving the agency conflict. The agency model has been applied in a wide variety of situations and to investigate a variety of issues, demonstrating the flexibility of the framework. However, although the agency framework is flexible, it does not usually generate sharp, refutable predictions for empirical testing. Empiricists impose additional structure on the theoretical models, particularly on the specific effect which the agent may exert on the distribution of outcomes. This additional structure leads not only to a better intuitive understanding of the agency relationship but also allows predictions which are refutable.

The opportunity for a conflict of interest and the potential of the compensation contract to minimize the effects of such a conflict is recognized by the regulators of the investment company industry. SEC documentation of abuses by the advisors in the investment advisor-investment company relationship led to the adoption, by Congress, of the Investment Company Act of 1940 (the 1940 Act).[17] The 1940 Act went beyond the Securities Exchange Act of 1933 and the Securities Exchange Act of 1934 in providing, specifically, for regulation of investment companies. Though these acts were designed to alleviate the agency problem, this conflict of interests continued to be a concern for legislators. This continued concern resulted in the 1970 Amendments to the 1940 Act. A special study of securities markets by the SEC in 1963 and a 1966 SEC report entitled *Public Policy Implications of Investment Company Growth* contributed to the passage, by Congress, of the 1970 Amendments. Since the passage of the 1970 Amendments, the SEC has continued to suggest modifications of the 1940 Act.

Starks & Golec (1986) demonstrated shareholder concern about this conflict of interest by documenting shareholder response to changes in the existing contracts of investment advisors, where the government mandated changes.[18] As indicated earlier, articles in the popular press also demonstrate shareholder concern.

Within an agency framework, compensation might reasonably be expected to affect the incentives of the agent. For instance, rewarding the agent for actions consistent with the desires of the principal and penalizing him/her for actions inconsistent with the desires of the principal should yield well-aligned incentives. However, if the actions of the agent are unobservable or if such observation is prohibitively costly, this simple compensation scheme is infeasible.

One obvious "solution" to the agency problem is to implement a contract in which compensation is contingent on the variable of concern for the principal. This variable is generally considered to be wealth, or, more specifically, the outcome of the enterprise. Such a contract will induce effort expenditure but may also impose an inefficient risk burden on the agent, if the risk tolerance of the agent differs from that of the principal. The compensation contract might be expected

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[17] The Investment Company Act of 1940 was intended to minimize the opportunity for the advisor to benefit at the expense of the investors in the fund.

[18] Starks & Golec (1986) found that firms, which were affected by the governmental mandate and that subsequently changed their contracts, lost both shareholders and assets around the effective date of the edict.

to offset the costs of non-optimal risk bearing against the benefits of providing incentives to expend effort.

Compensation as a Function of Net Asset Value and of Income

If the compensation contract is used to align the incentives of the agent with the desires of the principal, compensation might be contingent on the variable of concern for the principal. Increased wealth is an often-cited objective of the principal. Because Net Asset Value (NAV) is a measure of the value of the investment of the shareholders in the company, the variable of concern might be the NAV of the investment company. If the agent is able to affect the return on the portfolio, the compensation of the agent might appropriately be contingent on some measure of return (e.g., either NAV or income).

Furthermore, several arguments suggest that the compensation contract of the agent should be (weakly) concave in NAV or in income. These explanations are not mutually exclusive. That is, if compensation is concave in either of these variables, any one of these explanations might be indicated. Indeed, these explanations may be reinforcing, and hence any subset of these explanations might be correct.

First, consider a market that is generally semi-strong form efficient, but in which there is also some friction present. This friction might be a function of transactions costs or collecting and processing information or of some other barrier that interferes with perfect efficiency. Under these circumstances, the excess returns that may be gained are limited to this margin of friction. Although incurring the costs to overcome the efficiency barriers might be infeasible for the holders of small portfolios, such costs might reasonably be incurred when the benefits are applied to a large portfolio.

In this scenario, the efforts of the manager may have a positive effect on the return of the portfolio. On the other hand, effort has disutility for the agent; the agent bears the entire cost of effort expended in exploiting the friction. To induce the agent to expend effort, the compensation contract might be made contingent on the performance of the portfolio. However, this contingency imposes risk on the agent, who is less likely to be risk tolerant than are the well-diversified principals.[19]

This compensation contract should offset the benefits of increased effort against the costs of inefficient risk bearing. Because the benefits of increased effort are reduced, as the margin of inefficiency is exploited, and since the costs of inefficient risk bearing are increased as more risk is imposed on the agent, compensation contracts which are concave in outcome might be expected.

Second, Grinblatt & Titman's (1986) model provides an alternative argument for the concavity of compensation contracts. They consider compensation contracts as options on the difference between the value of the portfolio and the value of a benchmark portfolio.[20] Grinblatt & Titman conclude that compensation contracts, which are based on this type of difference, may induce

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[19] The compensation package typically represents a large portion of the wealth of the manager. The size of this compensation may prevent the manager from diversifying his own portfolio. Thus the risk tolerance of the manager is likely to be less than the risk tolerance of the well-diversified investor.

[20] In the majority of investment advisor compensation contracts, the investment advisor's compensation is a function of NAV. This is the same as comparing the investment portfolio to a benchmark portfolio with no assets.

alterations of the level of the portfolio risk and conclude that a (weakly) concave compensation contract is indicated.[21]

A third scenario that might indicate concave compensation schedules results from the U.S. tax code. Investors face convex tax schedules, and therefore concave after tax returns. In order to induce the agent to smooth returns through time, the principals might want the agent to face a concave compensation schedule, in order to better align the incentives of the principals with the cash flows of the agent.

Any of these models (or any subset of them, since the explanations are certainly not mutually exclusive) imply compensation contracts that are concave in outcome. Thus, to support the model presented here, compensation should be contingent on some measure of the performance of the portfolio. Further, compensation should be concave in the measures of performance.

Compensation Differs by Purpose and by Composition

Shareholders seem to indicate their degree of risk aversion, or alternatively, their desired level of risk, to the fund manager, through the statement of purpose.[22] The compensation contract of the advisor might reasonably be designed to reinforce the stated objective of the mutual fund. The fund's objective is popularly considered to reflect the desires of the shareholders.

Additionally, the stated composition of the fund might be expected to reflect the desires of the shareholders. In this statement the documentation of the fund indicates the proportion of the fund which may be invested in particular instruments (e.g., common stocks, preferred stocks, and bonds), the extent to which the fund may be leveraged, and the allowed risk level of the constituent investments (e.g., no more than 50 percent of the fund invested in securities rated lower than "A" by a particular rating service).

Given the statements of purpose and composition, risk and return do appear to be concerns of investors. Additionally, the form of the increase in wealth also appears to concern the investor. One characteristic of the form of income emphasized in the objective's statement is often current income. Another characteristic of the form of increases in wealth often emphasized in the objective's statement is growth. A third characteristic in some objective statements is a tax-free realization of returns. The last stated objective commonly observed for investment companies is security, cited jointly with either income or income and growth.

Given this range of stated objectives of the various investment companies, risk level, increases in wealth, and the form of increase all appear to be issues of concern to the investors in investment companies. The problem of the principal appears to be determining how to motivate the manager to act in a manner which would be mutually satisfying to both the agent and the principal. Recall that the agency literature indicates that to provide incentives for the agent to expend effort, the principal

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[21] Concave compensation contracts result from the same factors that yield concavity in option prices, which are particularly evident in "in the money" and "deep in the money" options' prices.

[22] This objective would be expected to indicate the desires of the shareholders whether the shareholders sorted themselves to funds on the choice of objective available to them or whether they chose an objective in the process of designing the fund.

may need to impose non-optimal risk bearing. A contract that provides such incentives ties the compensation of the agent to the "outcome" of the period.

Compensation Differs by Size

Recall that we appealed to a narrow margin of friction in the trading markets as a possible motivation for concave compensation schedules. Compensation contracts might be expected to differ by the size of the portfolio; while such frictions might be exploitable by any investor, the cost of exploiting frictions might be *proportionally* smaller for large funds. To the extent that large portfolios may benefit from market inefficiencies, the agents and the principals would share in the benefits. Thus, large firms would be expected to pay higher levels of compensation to their agents.[23] Large firms' returns should also be higher than the corresponding return on smaller portfolios. Further, a large portfolio may allow the agent to diversify his/her personal portfolio more fully. In order to induce expenditure of effort, larger firms may need to impose more risk on the agent than would small firms. This implies compensation schedules that are steeper in outcome than are the compensation schedules of smaller firms.

Alternatively, the managers of smaller portfolios can concentrate on a smaller pool of securities and hence may be more likely to find some relatively hidden "bargains." To induce the advisors to expend effort in searching for these "bargains," the fund may need relatively increased performance contingent compensation.

On the other hand, if large firms are concentrated in specified security types or in securities with specific income or growth characteristics, the agent's ability to diversify his/her personal risk may be severely limited. This limitation implies a compensation schedule that is less contingent on outcome the smaller the portfolio or the more the portfolio is limited to specialized investments.

Summary of Hypotheses

Compensation contracts might potentially be designed to alleviate, at least partially, the agency problem. Features of these compensation contracts might include a portion of compensation, which is a function of the objective of the individual fund, as well as of the restrictions placed on the constituent assets of the fund.

In general, compensation should be a positive function of the outcomes of NAV and of income. However, the sensitivity to outcome might be expected to be lower if the portfolio is more risky, given the likely relative risk aversions of the parties to the contract. Thus, compensation should be less sensitive to outcome for investment companies with a purpose of growth or for investment companies whose portfolio compositions reduce the agent's ability to diversify the portfolio.

Further, compensation should be concave in the outcome, whether that outcome is a function of wealth or of income. This concavity might be due to transactions costs and a margin of inefficiency in the market, or of the Grinblatt & Titman argument, or of the provisions of the U.S. tax code.

The effect of size on compensation is ambiguous. As the size of the fund increases, and therefore the ability of the manager to exploit the margin of inefficiency in the market improves, the

[23] This would not, however, imply that the compensation would be higher as a *proportion* of NAV. It could, indeed, be proportionally lower.

sensitivity of the compensation of the agent should increase, reflecting the greater benefit to be shared. Conversely, if the diversification of the portfolio is more limited or if the form of investment is more limited, compensation may be less sensitive to outcome in larger funds.

CONCLUSIONS AND EXTENSIONS

The principal-agent can be readily adapted to the situation of the owners and the advisors of investment companies. Because of a unique requirement of regulators, the compensation packages of investment advisors may be observed and perhaps quantified. Thus, and perhaps for the first time, we may explore the empirical form of compensation which is apparently designed to provide incentives for agents to act in a manner consistent with the desires of the principals.

The next step is to collect the available data and to empirically examine the relationships between compensation package and increases in wealth (in the form of changes in NAV and of income), the statements of purposes and compositions, and the size of the portfolio, as well as interrelationships between these variables.

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