FACULTY WORKING PAPER 92-0163

An Empirical Study of the Corporate Choice Among Equity, Convertible Bonds and Straight Debt: A Cash Flow Interpretation

Hei-Wai Lee
Department of Finance
University of South Florida

James A. Gentry
Department of Finance
University of Illinois

Bureau of Economic and Business Research
College of Commerce and Business Administration
University of Illinois at Urbana-Champaign

BEBR

FACULTY WORKING PAPER NO. 92-0163

College of Commerce and Business Administration

University of Illinois at Urbana-Champaign

September 1992

An Empirical Study of the Corporate Choice Among Equity, Convertible Bonds and Straight Debt: A Cash Flow Interpretation

Hei-Wai Lee
Department of Finance
University of South Florida

James A. Gentry
Department of Finance
University of Illinois

An Empirical Study of the Corporate Choice Among Equity, Convertible Bonds and Straight Debt: A Cash Flow Interpretation

by

Hei-Wai Lee

Assistant Professor of Finance
University of South Florida

and

James A. Gentry

IBE Distinguished Professor of Finance
University of Illinois at Urbana-Champaign

An Empirical Study of the Corporate Choice Among Equity, Convertible Bonds and Straight Debt: A Cash Flow Interpretation

Abstract

This study links the overall financial health of a company to the decision of what type of security should be offered to raise long term capital. We use cash flow information to examine the choice of the external financing instrument and the information conveyed through offering announcements. We find that the relative cash flow components add value in explaining the choices between debt and equity securities. The results in this study support the financial health/informational signaling hypothesis that debt (equity) securities are used by financially healthier (weaker) companies. In addition, the changes in cash flow performance of companies prior to and subsequent to their offerings are consistent with the valuation effect of security choice on stock price.

I. Introduction

Once a company has decided to seek external financing, its managers face the decision of what securities to offer. This decision has two interesting and important aspects, namely, the determinants of the security choice and its effect on the valuation of the common stock. Numerous empirical studies have examined the latter and, in general, found that there were significant negative stock price reactions to common stock and convertible bonds offerings, but not to straight debt offerings.[1] The findings are consistent with the general implication of the informational signaling hypothesis that more negative information is conveyed when junior securities are offered.[2]

On the other hand, there are only a few studies that investigated the determinants of the security choice. The early works of Baxter and Cragg (1970), Martin and Scott (1974) and Taub (1975) focused on the managers' choice of equity and debt in their security offering decisions. In general, they found that companies offering equities had relatively higher leverage, were smaller in size, and had higher P/E ratios than companies that offered debt securities. Marsh (1982) extended earlier studies by using logit analysis to examine the equity and debt offering choice of U.K. companies. He observed that capital market conditions also had a significant impact on the security choice decision. Additionally, Marsh concluded that companies behaved as if they had a preconceived target capital structure. Recently,

---

[1]See Dann and Mikkelson (1984), Asquith and Mullins (1986), Eckbo (1986), Masulis and Korwar (1986), Mikkelson and Partch (1986, 1988).

[2]See Ross (1977), Heinkel (1982), Myers and Majluf (1984), Krasker (1986), Blazenko (1987) and Narayanan (1988).

Billingsley, Lamy and Thompson (BLT) (1988) extended Marsh's study with U.S. data to examine the security choice among debt, equity and convertible bonds. They obtained results similar to other studies.

Although empirical studies on the determinants of security choice identified various internal and external factors that influenced the choice of security, these studies did not examine the overall performance effect of the offering companies. Furthermore, their findings did not relate to the valuation effects of security choice on the content of information conveyed in the offering announcements.

This study links the fundamentals of the offering companies to their security choice and the associated information content. In this study, cash flow components are used to measure the overall financial health of a company. The objectives of this study are twofold. First, we examine the usefulness of cash flow components to explain the security choice decision. Second, by examining the changes in cash flow performance of companies prior to and subsequent to the offerings, we provide further insight into the content of information conveyed through the security offering announcements.

In this study, we discovered that the financial health of the offering companies had a significant effect on the choice of security offered. Consistent with the informational signaling hypothesis, the findings suggest that straight debt was offered by financially healthier companies, and vice versa. In particular, we found that companies offering straight debt had more cash inflows generated from operations and more cash outflows going to dividends than companies that offered equity. Additionally, companies that offered equity securities

experienced deteriorations in the financial health prior to the offering. That is, cash inflows generated from operations were lower and cash outflows going to dividends were also lower over time. Furthermore, although all three types of companies offering securities acquired comparable proportions of external financing prior to the offering, their sources of financing were different. We found that companies that offered straight debt relied mainly on long term debt financing and increasingly so over time. However, companies that offered common stock relied mainly on equity financing and also increasingly so over time. Subsequent to the security offerings, all three types of companies experienced deteriorations in their overall financial health. They all had less cash inflows generated from operations and less cash outflows going to dividends and investment expenditures. However, the magnitude of deterioration was larger for companies that offered equity. This observation is consistent with the general findings in the valuation effects of security choice. The next section of the paper presents the cash flow model and Section III discusses the financial health hypothesis and its empirical hypotheses to cash flow components. The data and methodologies are discussed in Section IV and the empirical results are presented in Section V. The summary and conclusions are in Section VI.

II. The Cash Flow Model

The cash flow model in this study is a modification of Helfert's (1982) cash-based funds flow model by Gentry, Newbold and Whitford (GNW) (1985a, 1985b). The model built upon the FASB Exposure Draft (1981)

which was the blue print of the FASB No. 95 Statement of Cash Flow (1987). This model emphasizes the cash flow information of three major areas, namely, the operating, financing and investing activities, of a company. Livnat and Zarowin (1990) found that cash flow components of these three areas were significantly related to the stock price performance of the company, as predicted by various theoretical models in finance. They concluded that there exists incremental information content in these cash flow components that is beyond the earnings information. In addition, Gentry, Newbold and Whitford (1985b, 1988) found that the cash flow model was successful in classifying and predicting bankruptcy and bond ratings.

The GNW cash flow model has eight major components.[3] They are net operating flow (NOF), change in net working capital flow (NWC), change in net financing flow (NFF), fixed coverage expenditures (FCE), net investment flow (NIF), dividend payment (DIV), change in net other asset and liability flow (NOA&L) and the change in cash and marketable securities (CASH). A cash inflow has a positive sign and a payment has a negative sign. The following equation presents a formulation of the GNW cash flow model.

$$NOF + NWC + NFF + FCE + NIF + DIV + NOA\&L - CASH = 0. \quad (1)$$

The accounting convention underlying the cash flow statement results in total net cash inflow (TCI) being equal to the absolute value

---

[3]A detailed definition of the cash flow components is presented in the appendix.

of total net cash outflow (TCO). The notation is simplified by substituting the expression total net cash flow (TCF) for TCI and TCO, i.e., TCF = TCI = |TCO|. In the following illustration, each cash flow component is divided by TCF to remove the scale effect and obtain a relative cash flow component (CFC). The CFC represents the percentage each component contributes to the firm's total net cash inflow or outflow. By establishing a hierarchy of the CFCs, the availability of net surplus or deficit cash flow (NCF) can be used to assess the trend of a firm's financial health.

In Table 1, the CFC are arranged in a hierarchical order that reflects their economic importance in evaluating the financial health of a firm. Generally, financial and credit analysts use the proposed cash flow hierarchy to evaluate a firm's financial strengths and weaknesses. The hierarchical structure of the CFC highlights the contribution of each component and the net cash flow available after major inflows and outflows are taken into account. An example of the CFC hierarchy and the relative net cash flow (NCF), i.e., the net surplus or deficit cash flow position, is presented in Table 1. This example is based on research findings of Gentry, Newbold and Whitford (1990).

Table 1 shows 92% of Company A's cash inflows originate from operations (NOF). After deducting from NOF the major outflows for investment--NIF (-45%), and changes in net working capital (-13%), the remaining cash flow surplus represents 34% of the total. The two major outflows associated with the costs of external financial capital are interest expense, (fixed coverage expenditures (FCE)) and dividends (DIV). After deducting the FCE, the surplus cash flow available for

dividends (DIV) is 32%. DIV consume 12% of total outflows, which leaves a net cash flow surplus of 20%. The surplus cash is used to retire debt (-10%) and invest in marketable securities (-10%). In contrast Company D, an example of a distressed company, has 15% of its cash inflow coming from operations. After deducting cash outflows of 18% for total investment (NIF + NWC = total investment or -15% + -3% = -18%), Company D has a deficit cash flow equal to -3% of the total cash flow. The FCE represents 16% of the total outflow, which leaves a -19% to pay DIV. DIV adds an additional 1% to total outflow. The -20% represents a net cash flow deficit and shows that Company D has used all of its operating and working capital cash inflows plus an additional 20% to cover the outflows for investment, dividends and fixed coverage expenditures. Table 1 also shows the deficit was offset by an increase in financing and a decrease in net other assets and liabilities.

Table 1 illustrates several basic concepts that exist between the net cash flow surplus/deficit and levels of risk. First, as the percentage of cash inflows from net operations declines, the net cash flow surplus becomes smaller or the deficit becomes larger. Second, as the net cash flow surplus declines or the net cash flow deficit increases, a firm's financial risk increases. For example, Company A has the highest net cash flow surplus and it has the lowest financial risk. In contrast, Company D has the largest net cash flow deficit and it has the highest financial risk. Third, as the relative cash inflow from operations decreases, the relative cash outflow to capital investment decreases. The pattern of the interrelationships among the

key cash flow components is closely associated with the financial health of a firm.

The GNW cash flow model is modified in this study to examine the implications of the financial health hypothesis. The modification relates to the net financing flow (NFF) component, where the NFF is subdivided into three parts: net short term borrowing flow (STB), net debt financing flow (FIND) and net equity financing flow (FINE) components.

III. Hypotheses

This section develops the financial health hypotheses. They are based on the literature related to the informational signaling hypothesis and the pecking order hypothesis. We also relate the financial health hypothesis to a modified cash flow model and develop empirical hypotheses on the relative cash flow components.

In an informational asymmetric framework, Myers and Majluf (1984) showed that firms using internal financing for growth are preferred to firms that use external financing. According to their model, the market interprets the not-to-issue decision as a positive signal about the company and the security offering decision as a negative signal. Furthermore, when there is a need for external financing, companies offering debt securities are interpreted by the market as being better than those offering equity securities. Given this kind of market perception, a financially healthy company, which has a larger share of its cash inflows coming from operations, would distinguish itself from the less healthy firms by offering debt securities when external

financing is needed. Besides, financially healthier firms are more likely to offer debt securities because they can fulfill the obligations associated with a higher debt level. Alternatively, debt securities are unaffordable to financially weaker firms because of the legally binding constraint placed on the future cash flows of the company, which would increase bankruptcy risk, Ross (1977). Thus,

Hypothesis 1: Companies offering more junior securities have a smaller and decreasing fraction of their total cash inflows coming form operations (NOF).

In turn, a relatively small percentage of total cash inflow coming from operations (NOF) results in a reduction in the availability of internally generated cash for investment expenditures (NIF) and dividends (DIV). As shown in Table 1, relatively low NOF, NIF and DIV results in greater financial risk.

Companies that have more value creating investment opportunities are generally more profitable and financially healthier. These investments generate more future cash flows which can sustain the obligation of a higher debt level. Hence, financially stronger companies, which have a larger share of their cash outflows going to investment expenditures (NIF), can afford debt financing when they seek external financing. Thus,

Hypothesis 2: Companies offering more junior securities have a smaller and decreasing proportion of their total cash outflows going to net investments (NIF).

Because the market interprets the reduction or omission of dividends as a negative signal about the value and future earnings prospect of a company, it reacts negatively to these decisions. In general, companies tend to avoid cutting or omitting their dividends. As a result, only financially healthy companies which can sustain a higher level of dividends would increase their dividends. Bhattacharya (1979), John and Williams (1985) and Miller and Rock (1985) showed that dividend increases are used as a signaling device by better quality firms to distinguish themselves from their weaker counterparts. Thus,

Hypothesis 3: Companies offering more junior securities have a smaller and decreasing proportion of their total cash outflows going to dividends (DIV).

When a company's net operating flow (NOF) is low or has been declining, a larger and increasing fraction of its cash inflow comes from external financing (NFF). Another set of hypotheses follow from the preceding discussion. That is

Hypothesis 4: Companies that offer more junior securities have a larger and increasing fraction of their cash inflows coming from external financing (NFF).

It is not only important to determine that the net financing flow (NFF) is relatively larger for companies offering junior securities, but it is crucial to show that the external capital raised is in the form of common stock. As discussed in the previous section, the general implication of the signaling model is that the market interprets

riskless debt borrowing as the least negative signal, while common stock offering as the most negative signal of the company. Given this interpretation, when companies have to seek external financing, the healthier ones prefer debt to equity financing. Within the debt offering, they prefer short term riskless borrowing to long term risky debt offering. The signaling literature indicates that companies do not issue equity securities unless there are no other choices or their common stock is overpriced in the market. Thus, it is expected that healthier companies that offer debt securities will have a larger proportion of short-term borrowing (STB) or long-term debt (FIND), and a smaller share in equity (FINE). Thus

Hypothesis 5: Companies that offer more junior securities have a larger proportion of their external financing (NFF) coming from equity securities (FINE) and a smaller proportion coming from short-term borrowing (STB) and long-term debt (FIND).

The financial health hypothesis does not have direct unambiguous implications on the remaining relative cash flow components.[4] The predicted signs of the coefficients for the tests of the financial

---

[4]For example, in general, the smaller the proportion of cash outflows going to fixed coverage expenditures, the less financial risk the company has and hence the healthier the company. However, among companies which need external financing, the healthier ones prefer debt financing because they can afford the larger obligation, which is in the fixed coverage expenditure associated with it. Thus, in this study, higher fixed coverage expenditures may imply financially healthier companies.

health hypothesis are presented in Table 2.[5] In the analysis, the magnitude of the dividend payment and the net investment expenditures are used to compute the corresponding relative cash flow variables, i.e., DIV and NIF.

By examining the cash flow characteristics of companies of various sizes, Gentry, Newbold and Whitford (1990) observed significant differences in the relative cash flow components according to firm size. Their findings suggest the need of controlling for a firm size effect on the relative cash flow components in this study. Thus, a firm size variable, SIZE, which is defined as the market value of equity at the beginning of the offering year, is included in the analysis.

IV. Data and Methodologies

Common stocks, convertible bonds and straight debt offerings by industrial companies over the ten years period from 1977 to 1986 were identified from the Investment Dealers' Digest and the Wall Street Journal Index. The offerings were included in the study if they met the following requirements:

1. The companies were listed on the AMEX or NYSE at the time of the offerings.
2. The offerings are publicly underwritten and registered with the Securities Exchange Commission (SEC) under the traditional method.

---

[5]Since the financial health hypothesis has a predicted direction on the relationships between the relative cash flow components and the security choice, a one-tail test will be applied to these variables in the analysis.

3. The offerings are not for swapping other securities nor for the explicit purposes of acquisitions and restructuring.
4. The offerings are primary or combinations of primary and secondary offerings.
5. The companies have only one class of voting common stocks.
6. The offering announcements are reported in the Wall Street Journal (WSJ).
7. The offering announcements are not contaminated by other company specific announcements such as mergers, takeovers or organizational changes within a calendar week of the announcement date.

Based on the above criteria, we identified 540 companies which offered securities over the ten year horizon. Since the study period is prior to the introduction and implementation of the FASB No. 95, we estimated the cash flow components with information from the balance sheet, the income statement and the statement of changes in financial position of the company. Following Livnat and Zarowin (1990), we excluded the change in cash and market securities (CASH) component to reduce the multicollinearity problem among the cash flow components. For the same reason, we redefine the relative cash flow component by using the market value of equity at the beginning of the calendar year to remove the scale effect in the cash flow components.[6] Complete financial information is available on the COMPUSTAT Industrial Annual

---

[6]We have also used the total assets at the beginning of the calendar year and the sales level, respectively, to normalize the cash flow components. The results of using these two alternative variables are immaterially different from those presented in this paper.

tape for 288 companies during the study period. Among them, 88 offered straight debt, 60 offered convertible bonds and 140 offered common stocks. The time period used in this study started three years prior to the offering year and ended two years after the offering year. Table 3 presents the distribution of the offering companies by calendar year for each of the three types of security offered.

A three part study is used to examine the validity of the financial health hypothesis in security offering decisions. Additionally, the effectiveness of cash flow components in predicting the type of security offered is examined. The first part of the study is to examine the difference in each relative cash flow component of offering companies across security type. The Duncan's Multiple Range test and the analysis of variance test are used in this univariate analysis of relative cash flow components.

The second part of the study is to utilize the polychotomous multivariate probit model developed by McKelvey and Zavonis (1975) to examine the classification and predictive ability of the relative cash flow components in security offering decisions. In order to test the predictive ability of the model, the master sample in this study is subdivided into an original sample and a holdout sample. The original sample is composed of offerings during 1977 to 1984, and the holdout sample consists of offerings in the years of 1985 and 1986. As a result, the original sample has 63 straight debt offerings, 41 convertible bonds offerings and 108 common stock offerings. The holdout sample has 25 straight debt offerings, 19 convertible bonds offerings and 32 common stock offerings. In the probit analysis, the dependent

variable is the dummy variable for the security type in the offerings. The dummy variable takes the value of 1 for straight debt offerings, and the values of 2 and 3 for convertible bond and common stock offerings, respectively.

The final test is to examine the changes in the performance of individual relative cash flow components prior to and subsequent to the offerings. Student t tests are used to determine if there is a change in the mean of each relative cash flow component over various time horizons. Prior to the offerings, the time horizons are, respectively, from the third and second fiscal years before the offerings (years -3 and -2) to the fiscal year preceding the offering year (year -1). Subsequent to the offerings, the comparisons are between the cash flow performance during the first two fiscal years after the offerings (years +1 and +2) and during the fiscal year preceding the offering year (year -1). The offering year is excluded from the analysis because the cash flow performance during this year are biased by the offerings as well as the security choice.

V. Empirical Results

The empirical results are presented in three sections. The first section comprises the findings on the univariate analysis of individual relative cash flow components based on the analysis of variance test and the Duncan's multiple range test. The second section presents the findings of the polychotomous multivariate probit analysis. The third section presents the changes in cash flow performance of security offering companies prior to and subsequent to the offerings.

A. Univariate Analysis

Table 4 presents the results of the analysis of variance tests. The null hypothesis that companies offering different types of securities have the same cash flow performance are rejected at (at least) the 10% level of significance for five variables. These five variables are NOF, DIV, NWC, NOA&L and SIZE.

Because the analysis of variance test does not give the direction nor the details of the differences among the various groups, the Duncan's Multiple Range test results are also presented in Table 4. Consistent with the findings in the analysis of variance test, the means of seven variables are significantly different from one another across security groups at the 5% level for a one-tail test. They are the net operating flow (NOF), the net debt financing flow (FIND), the net equity financing flow (FINE), the dividend payment (DIV), the net working capital flow (NWC), the net other asset and liability flow (NOA&L) and the firm size (SIZE) variables. For the six cash flow components, the findings are, in general, consistent with the implications of the financial health hypothesis. In particular, companies that offered equity securities had a smaller proportion of their cash inflows coming from operations (NOF) and net debt financing (FIND), but a larger proportion coming from net equity financing (FINE). Companies that offered equity securities had a smaller percentage of the total outflows going to dividends (DIV). These are signs of financially weak companies. Similar to the findings of Billingsley, Lamy and Thompson (BLT) (1988), convertible bond offering companies shared more common

characteristics with common stock offering companies than straight debt offering companies.

B. Polychotomous Multivariate Probit Analysis

The probit analysis is composed of a combined test including all three security groups and a series of three pair-wise comparisons. The model is constructed such that the more junior security group takes on a larger value for the dependent variable. Each analysis estimates the probability that the more junior security will occur.

1. Combined Test

The findings presented in the first column of Table 5 provide support for the financial health hypothesis. After controlling for the firm size effect, there are three significant cash flow variables, namely, the net operating flow (NOF) and the dividend payment (DIV) variables at the 5% level and the net equity financing flow (FINE) variable at the 10% level. The results indicate that companies offering more junior securities had less internally generated cash flow, relied more on external equity financing, and committed less to dividend payments. These are signs of less healthy companies. The cash flow model is moderately accurate in classifying and predicting the corporate choice of straight debt and common stock offerings. The model correctly classified 56% of straight debt offerings and 87% common stock offerings as shown in Table 5. None of the 41 convertible bond offerings are properly classified, but 34 of them are misclassified as common stock offerings. For the holdout sample, the prediction accuracies for straight debt offerings and common stock offerings are 52% and 78%,

respectively. Similarly, no convertible bond offerings are correctly predicted, but two-thirds of them are incorrectly predicted as common stock offerings. The poor performance of the cash flow model in classifying and predicting convertible bond offerings are not surprising given the results from the univariate analysis. The similarity between companies offering convertible bonds and common stock explains the substantial misclassification of convertible bond offerings as common stock offerings.

2. Pair-Wise Tests

The findings of the pair-wise comparisons that involve straight debt offerings are similar to those in the combined test. In a pair-wise comparison of straight debt to common stock offerings, the second column of Table 5 shows the same set of three variables (SIZE, NOF and DIV) are significant at the 5% level and with the same signs as those in the combined test. The classification and prediction accuracies of the cash flow model in this comparison are 78% and 75%, respectively. The results are compatible to the performance of the Marsh (1982) and Billingsley, Lamy and Thompson (BLT) (1988) models. Between the two security groups, the cash flow model is more successful with common stock offerings. The classification and prediction accuracies for common stock offerings are 91% and 94%, respectively. The corresponding figures for straight debt offerings are 57% and 52%, respectively.

The results of the pair-wise comparison of straight debt to convertible bond offerings are presented in the third column of Table 5. The significant cash flow variables are the dividend payment (DIV) and

the net investment flow (NIF) variables at the 5% level and the net operating flow (NOF) variable at the 10% level. While NOF and DIV have the correct signs for their coefficients, the coefficient for NIF has a sign which is inconsistent with the financial health hypothesis. The positive coefficient suggests that companies that offered convertible bonds had more cash outflows going to investment expenditures, which is a sign of a healthy company. The classification and prediction accuracies of the cash flow model are 73% and 77%, respectively. For individual security groups, the classification and prediction accuracies for straight debt offerings are 83% and 84%, respectively. For convertible bond offerings, the corresponding figures are 59% and 68%, respectively. The results of the probit analysis are better than the BLT model.

The findings in the convertible bonds to common stock offerings comparison are markedly different from the preceding pair-wise comparisons. There are four significant variables according to the fourth column of Table 5. The net equity financing flow (FINE) and the net short term borrowing flow (STB) variables are significant at the 1% level, and the dividend payment (DIV) and the net other asset and liability flow (NOA&L) variables are significant at the 10% and 5% levels, respectively. FINE and STB have the same signs as the other analyses, but DIV has the opposite sign. The results indicate that companies offering common stock had a larger proportion of their cash inflows coming from short term borrowing and external equity financing, and more cash outflows going to dividends, than companies that offered convertible bonds. The classification and prediction performance of the

cash flow model in this analysis are disappointing, but they reflect the hybrid nature of convertible bonds. Similar to the results in the combined test, the cash flow model fails to classify and predict companies offering convertible bonds correctly.

In addition, except the pair-wise probit analysis on the convertible bonds to common stock offerings, the Chi-Square test statistics of the probit analysis are significant at the 5% level. Overall, the multivariate analysis provides supportive findings for the financial health hypothesis and the usefulness of cash flow components in explaining managers' security choice in their external financing decision. After controlling for the firm size effect, companies which offered straight debt had a larger proportion of their cash inflows generated internally and a larger proportion of their cash outflows going to dividend payments. Similar to other studies, we also find that companies that offered straight debt were in general larger than those that offered convertible bonds or common stock.

C. Changes in Cash Flow Performance Analysis

A difference in the means test is used to show the results of changes in cash flow performance of security offering companies for various time horizons prior to and subsequent to the offerings. Prior to the offerings, companies which offered common stock experienced deteriorations in their financial health, as shown in the first two columns of Panel C. Over time, they relied more on external financing (NFF), in the forms of both equity (FINE) and short term borrowing (STB), to supplement the declining internally generated cash flow (NOF). In addition, there is a significant decrease in the fraction of cash

outflows going to dividend payments (DIV). It implies that companies offering common stock either stopped increasing their dividends or at least did not increase them at the prior pace. On the other hand, as shown in the first two columns of Panel A, straight debt offering companies did not show many changes in their cash flow performance prior to the offerings. Though these companies also increased their reliance on external financing (NFF), the source was mainly in the form of debt financing (FIND) and was different from that of common stock offering companies. Although not significant, straight debt offering companies experienced increasing cash inflows from operations (NOF) and cash outflows to dividends (DIV) and interest expenses (FCE). Similar to earlier findings in this study, the cash flow performance of companies offering convertible bonds lay between the other two groups, but they had greater similarity to the common stock offering companies. However, it is interesting to note that there were significant declines in both net financing flow (NFF) and net investing flow (NIF).

As shown in the last two columns of Table 6, all companies offering securities experienced deteriorations in their cash flow performance subsequent to the offerings. However, the degree of deteriorations was more significant for companies offering convertible bonds and common stock. These two groups of companies experienced significant decreases in cash inflows generated from operations (NOF), as well as significant decreases in cash outflows going to dividend payments (DIV) and investment expenditures (NIF). These three cash flow variables have the same signs and are not statistically significant for straight debt offering companies. The significant changes in fixed

coverage expenditures (FCE) are significant for the debt and equity offerings. The significant decrease in FCE for companies offering common stock occurs because their debt ratios decrease due to the offerings, and vice versa for straight debt offering companies.

Overall, the findings on changes in cash flow performance of security offering companies prior to and subsequent to the offerings further support the results of the univariate and multivariate analyses discussed earlier. Companies which offered senior securities are financially healthier that those offering junior securities. In addition, companies offering common stock experienced financial deteriorations prior to the offerings and the deteriorations continue after the offerings. On the other hand, subsequent to the offerings, convertible bond and straight debt offering companies experienced financial deteriorations, but to a lesser extent than common stock offering companies. These observations are consistent with the financial health hypothesis and the valuation impacts of security choice on stock price upon the offering announcements.

VI. Summary and Conclusions

This study links the overall financial health of a company to the decision of what security should be offered to raise long term capital. Cash flow information is used to examine the security choice in external financing decisions and the information conveyed through the offering announcements. We find that the relative cash flow components, which are a measure of the overall financial health of a company, add value in explaining the choices between debt and equity securities. Consistent

with the financial health/informational signaling hypothesis, the findings suggest that straight debt are offered by financially healthier companies, and equity securities are offered by financially weaker companies. In particular, companies which offer straight debt have more cash inflows generated from operations and more cash outflows going to dividends than companies which offer equity. Besides, prior to the offering, companies that offer equity experience a deterioration in their financial health. They have less cash inflows generated from operations and less cash outflows going to dividends over time. More interestingly, although all companies offering securities are involved in external financing prior to the offering, their sources are different. We find companies that offer straight debt relied mainly on long term debt financing and increasingly so over time, but companies that offer common stock relied mainly on equity financing and also increasingly so over time. Subsequent to the security offerings, all three types of companies experienced a deterioration in their overall health. They all have less cash inflows generated from operations and less cash outflows going to both dividends and investment expenditures. However, the magnitude of deterioration is stronger for companies which offer equity. This observation is consistent with the general findings on the valuation effects of security choice on stock prices.

Bibliography

Asquith, P. and D. Mullins. "Equity Issues and Offering Dilution." Journal of Financial Economics 15 (January/February 1986), 61-89.

Barclay, M. and R. Litzenberger. "Announcement Effects of New Equity Issues and The Use of Intraday Price Data." Journal of Financial Economics 21 (May 1988), 71-99.

Baxter, N. and J. Cragg. "Corporate Choice Among Long-Term Financing Instruments." Review of Economics and Statistics 52 (August 1970), 225-235.

Bhattacharya, S. "Imperfect Information, Dividend Policy, and 'The Bird in the Hand Fallacy'." Bell Journal of Economics 10 (1979), 259-270.

Billingsley, R., R. Lamy and G. Thompson. "The Choice Among Debt, Equity, and Convertible Bonds." Journal of Financial Research 11 (Spring 1988), 43-55.

Blazenko, G. "Managerial Preference, Asymmetric Information, and Financial Structure." Journal of Finance 42 (September 1987), 839-862.

Dann, L. and W. Mikkelson. "Convertible Debt Issuance, Capital Structure and Financing--Related Information: Some New Evidence." Journal of Financial Economics 13 (June 1984), 157-186.

Eckbo, B. "Valuation Effects of Corporate Debt Offerings." Journal of Financial Economics 15 (January/February 1986), 119-152.

FASB, "Exposure Draft: Reporting Income, Cash Flows and Financial Position of Business Enterprises." Stamford, Conn.: FASB, 1981.

FASB, Statement of Financial Accounting Standards No. 95, 1987.

Gentry, J., P. Newbold and D. Whitford. "Classifying Bankrupt Firms with Funds Flow Components." Journal of Accounting Research 23 (Spring 1985a), 146-160.

_____. "Predicting Bankruptcy: If Cash Flow's Not the Bottom Line, What Is?" Financial Analysts Journal 41 (September/October 1985b), 47-58.

_____. "Predicting Industrial Bond Ratings with a Probit Model and Funds Flow Components." The Financial Review 23 (August 1988), 269-286.

_____. "Profiles of Cash Flow Components." Financial Analysts Journal 46 (July/August 1990), 41-48.

Heinkel, R. "A Theory of Capital Structure Relevance Under Imperfect Information." Journal of Finance 39 (December 1982), 1141-1150.

Helfert, E. Techniques in Financial Analysis. 5th ed. Homewood, Ill.: Richard D. Irwin, 1982.

Krasker, W. "Stock Price Movements in Response to Stock Issues Under Asymmetric Information." Journal of Finance 41 (March 1986), 93-105.

Livnat, L. and P. Zarowin. "The Incremental Information Content of Cash-Flow Components." Journal of Accounting and Economics 13 (1990), 25-46.

Marsh, P. "The Choice Between Equity and Debt: An Empirical Study." Journal of Finance 37 (March 1982), 121-144.

Martin, J. and D. Scott. "Industry Influence On Financial Structure." Financial Management 4 (Spring 1974), 67-73.

Masulis, R. and A. Korwar. "Seasoned Equity Offerings: An Empirical Investigation." Journal of Financial Economics 15 (January/February 1986), 91-118.

McKelvey, R. and W. Zavonis. "A Statistical Model for the Analysis of Ordinal Level Development Variables." Journal of Mathematical Sociology 4 (1975), 103-120.

Mikkelson, W. and M. Partch. "Valuation Effects of Security Offerings and the Issuance Process." Journal of Financial Economics 15 (January/February 1986), 31-60.

_____. "Withdrawn Security Offerings." Journal of Financial and Quantitative Analysis 23 (June 1988), 119-133.

Myers, S. and N. Majluf. "Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have." Journal of Financial Economics 13 (June 1984), 187-221.

Narayanan, M. "Debt versus Equity Under Asymmetric Information." Journal of Financial and Quantitative Analysis 23 (March 1988), 39-51.

Ross, S. "The Determination of Financial Structure: The Incentive Signalling Approach." Bell Journal of Economics 8 (Spring 1977), 23-40.

Taub, A. "The Determinants of the Firm's Capital Structure." Review of Economics and Statistics (November 1975), 410-416.

Appendix: Estimation of Cash Flow Components

We estimate the cash flow components of the offering companies with information from the income statement, changes in balance sheet items from the beginning to the end of the fiscal year, and from the statement of changes in financial position. The data are obtained from the 1991 version of the COMPUSTAT Industrial and Research files. The cash flow components are estimated as follows:

(1) Net Operating Flow (NOF) = Net income + Interest expense + Depreciation and amortization.

(2) Net Financing Flow (NFF) = Net short term borrowing flow (STB) + Net debt financing flow (FIND) + Net equity financing flow (FINE).

where net short term borrowing flow (STB) = Change in current maturities of long-term debt.

net debt financing flow (FIND) = Change in long-term debt.

net equity financing flow (FINE) = Change in total stockholders' equity + Change in the carrying value of preferred stock - Net income + Common dividends + Preferred dividends.

(3) Dividend Payment (DIV) = Common dividends + Preferred dividends.

(4) Net Investment Flow (NIF) = Change in Net fixed assets + Depreciation expense.

(5) Fixed Coverage Expenditures (FCE) = Interest expense - Interest income.

(6) Net Working Capital Flow (NWC) = Change in accounts payable + Change in other current liabilities + Change in income taxes payable - Change in accounts receivable - Change in inventory - Change in other current assets.

(7) Net Other Asset and Liability (NOA&L) = Change in other liabilities - Change in other assets + Change in deferred taxes + Change in minority interests - Change in investments and advances to unconsolidated subsidiaries (equity and other methods) - Change in intangibles.

(8) Change in Cash and Marketable Securities (CASH).

According to the GNW cash flow equation in the paper,

$$(1) + (2) - (3) - (4) - (5) + (6) + (7) = (8)$$

We use this relationship to check our estimates of the cash flow components for each company and for each year. We delete any observation with a discrepancy in this relationship of more than one million dollars from our analyses.

TABLE 1

AN EXAMPLE OF THE HIERARCHY OF RELATIVE CASH FLOW COMPONENTS (CFC) UNDER VARIOUS RISK CONDITIONS

	Company			
	Lowest Credit Risk			Highest Credit Risk
Relative Cash Flow Components (CFC)	A	B	C	D
Net Operating (NOF)	92%	70%	57%	15%
Net Working Capital (NWC)	-13	-12	-12	-3
Net Accounts Receivables (AR)	-9	-15	-22	30
Net Inventories (INV)	-11	-17	-18	25
Net Other Current Assets (OCA)	-1	-3	2	10
Net Accounts Payables (AP)	7	15	17	-43
Net Other Current Liabilities (OCL)	1	8	9	-25
Net Investment (NIF)	-45	-38	-30	-15
Surplus or Deficit after Investment Expenditures	34	20	15	-3
Fixed Coverage Expenditures (FCE)	-2	-6	-9	-16
Surplus or Deficit available for dividends	32	14	6	-19
Dividends (DIV)	-12	-14	-15	-1
Net Cash Flow Surplus or Deficit (NCF)	20%	0%	-9%	-20%
Net Financing (NFF)	-10	7	10	19
Net Other A & L (NOA&L)	0	0	-6	1
Cash & M.S. (CASH)	-10	-7	5	0
CFC After All Cash Flows	0	0	0	0

TABLE 2

PREDICTED SIGNS OF COEFFICIENT ESTIMATES OF RELATIVE CASH FLOW COMPONENTS ACCORDING TO THE FINANCIAL HEALTH HYPOTHESIS

Relative Cash Flow Components	Financial Health Hypothesis
Net Operating Flow (NOF)	-
Net Short Term Borrowing Flow (STB)	-
Net Debt Financing Flow (FIND)	-
Net Equity Financing Flow (FINE)	+
Dividend Payment (DIV)	-
Net Investment Flow (NIF)	-
Fixed Coverage Expenditure (FCE)	0*
Net Working Capital (NWC)	0
Net Other Asset & Liability (NOA&L)	0

*The sign can be either + or -.

TABLE 3

DISTRIBUTION OF SECURITY OFFERINGS BY SECURITY TYPE BETWEEN 1977 AND 1986

Year	Straight Debt	Convertible Bonds	Common Stocks	Total
1977	8	1	3	12
1978	1	1	1	3
1979	13	1	5	19
1980	21	15	20	56
1981	6	4	9	19
1982	11	9	13	33
1983	3	8	49	60
1984	0	2	8	10
1985	10	4	15	29
1986	15	15	17	47
NT	88	60	140	288
NI	58	55	102	153

where NT: total number of offerings.
NI: total number of industries represented.

TABLE 4

RESULTS OF THE ANALYSIS OF VARIANCE (ANOVA) TEST AND THE DUNCAN'S MULTIPLE RANGE TEST ON THE MEANS OF THE RELATIVE CASH FLOW COMPONENTS AND THE FIRM SIZE VARIABLE DURING THE FISCAL YEAR PRECEDING THE OFFERING

Variables	ANOVA F Statistics	Duncan's Multiple Range Test SD (N=88)		CB (N=60)		CS (N=140)
Market Value of Equity (SIZE)	4.10[b]	2046.2	>[b]	418.5	=	402.6
Net Operating Flow (NOF)	2.42[c]	0.3530	=	0.3404	>[b]	0.2747
Net Financing Flow (NFF)	0.18	0.1965	=	0.1617	=	0.1604
Net Short Term Borrowing Flow (STB)	0.44	0.0075	=	0.0032	=	0.0200
Net Debt Financing Flow (FIND)[1]	1.73	0.1610	=	0.1309	=	0.0736
Net Equity Financing Flow (FINE)	1.98	0.0281	=	0.0276	<[b]	0.0669
Dividend Payment (DIV)	9.46[a]	0.0432	>[a]	0.0268	=	0.0315
Net Investment Flow (NIF)	0.84	0.2175	=	0.2897	=	0.2490
Fixed Coverage Expenditure (FCE)	1.99	0.0693	=	0.1042	=	0.0706
Net Working Capital Flow (NWC)	2.49[c]	-0.1132	<[b]	-0.0419	=	-0.0443
Net Other Asset & Liability (NOA&L)[1]	2.33[c]	-0.0797	=	-0.0160	=	0.0089
Change in Cash (CASH)	0.75	0.0179	=	0.0128	=	0.0380

where a,b,c denote significance at the 1%, 5% and 10% levels, respectively.
1 denotes that the means of FIND and NOA&L variables for the straight debt sample are significantly different from those for the common stock sample at the 5% level.

TABLE 5

PROBIT COEFFICIENT ESTIMATES FOR COMBINED TEST AND PAIRWISE TESTS USING RELATIVE CASH FLOW COMPONENTS AND THE FIRM SIZE VARIABLE

Variables	Combined Coeff.	Combined t	SD & CS Coeff.	SD & CS t	SD & CB Coeff.	SD & CB t	CB & CS Coeff.	CB & CS t
Intercept	1.470	7.42[a]	1.526	5.79[a]	0.683	2.09[b]	0.817	3.00[a]
Market Value of Equity (SIZE)	-0.001	-5.11[a]	-0.001	-4.82[a]	-0.001	-2.98[a]	-0.000	-1.48
Net Operating Flow (NOF)	-1.547	-1.74[b]	-2.483	-1.89[b]	-2.496	-1.46[c]	0.238	0.18
Net Short Term Borrowing Flow (STB)	0.236	0.23	0.486	0.34	-1.650	-0.94	4.279	2.03[b]
Net Debt Financing Flow (FIND)	-0.817	-1.04	-0.980	-0.89	-1.479	-1.17	0.275	0.22
Net Equity Financing Flow (FINE)	0.947	1.40[c]	0.485	0.61	-0.538	-0.47	2.931	2.18[b]
Dividend Payment (DIV)	-5.850	-1.67[b]	-9.303	-1.85[b]	-13.03	-2.09[b]	7.257	1.38[c]
Net Investment Flow (NIF)	0.629	0.81	1.376	1.25	2.399	1.76[b]	-1.208	-0.96
Fixed Coverage Expenditure (FCE)	1.308	0.98	2.797	1.11	3.651	1.23	-1.989	-1.09
Net Working Capital Flow (NWC)	0.542	0.72	1.307	1.24	-0.776	-0.57	1.939	1.54
Net Other Asset & Liab. Flow (NOA&L)	1.297	1.13	0.192	0.13	-0.439	-0.21	3.340	1.99[b]
Chi-squared	56.81[a]		56.17[a]		28.37[b]		17.52	
R-squared	0.6196		0.7006		0.6448		0.2389	

Classification and Prediction Accuracy

Classification

Security Type	Sample Size (n)	Combined n	Combined (%)	SD & CS n	SD & CS (%)	SD & CB n	SD & CB (%)	CB & CS n	CB & CS (%)
SD	63	35	56	36	57	52	83	--	--
CB	41	0	0	--	--	24	59	6	15
CS	108	94	87	98	91	--	--	102	94
Total	212	129	61	134	78	76	73	108	73

Prediction

Security Type	Sample Size (n)	Combined n	Combined (%)	SD & CS n	SD & CS (%)	SD & CB n	SD & CB (%)	CB & CS n	CB & CS (%)
SD	25	13	52	13	52	21	84	--	--
CB	19	0	0	--	--	13	68	3	16
CS	32	25	78	30	94	--	--	30	94
Total	76	38	50	43	75	34	77	33	65

were a,b,c denote significance at the 1%, 5% nd 10% levels, respectively.

TABLE 6

MEAN CHANGES IN RELATIVE CASH FLOW COMPONENTS OVER VARIOUS TIME HORIZONS PRIOR TO AND SUBSEQUENT TO THE OFFERINGS. YEAR -1 IS THE FISCAL YEAR ENDING PRIOR TO THE OFFERING AND YEAR +1 IS THE FIRST FISCAL YEAR SUBSEQUENT TO THE OFFERING YEAR.

	From Year i to Year j							
	-3 to -1		-2 to -1		-1 to +1		-1 to +2	
Relative Cash Flow Components	Mean	t	Mean	t	Mean	t	Mean	t
A. Straight Debt Offering Companies								
Net Operating Flow (NOF)	0.036	0.68	0.049	1.02	-0.080	-1.40	0.071	-1.31
Net Financing Flow (NFF)	0.124	1.73c	0.098	1.55	-0.129	-1.66[c]	-0.166	-2.27[b]
Net Short Term Borrowing Flow (STB)	0.017	0.45	0.013	0.94	-0.030	-0.54	0.024	0.46
Net Debt Financing Flow (FIND)	0.083	1.66[c]	0.116	2.37[b]	-0.124	-2.09[b]	-0.177	-2.33[b]
Net Equity Financing Flow (FINE)	0.024	0.87	-0.031	-0.97	0.025	0.65	-0.013	-0.50
Dividend Payment (DIV)	0.001	0.58	0.002	1.61	-0.003	-1.07	-0.002	-0.97
Net Investment Flow (NIF)	0.014	0.40	0.004	0.17	-0.041	-1.33	-0.046	-1.34
Fixed Coverage Expenditure (FCE)	0.005	0.78	0.009	2.29[b]	0.016	2.06[b]	0.026	2.45[b]
Net Working Capital Flow (NWC)	-0.093	-2.48[b]	-0.071	-2.17[b]	0.094	2.34[b]	0.118	2.77[a]
Net Other Asset & Liab. Flow (NOA&L)	-0.126	-1.62	0.069	0.53	0.085	1.45	0.071	1.28
B. Convertible Bond Offering Companies								
Net Operating Flow (NOF)	-0.017	-0.40	0.021	0.83	-0.117	-3.09[a]	-0.127	-2.08[b]
Net Financing Flow (NFF)	-0.017	-0.28	-0.200	-1.28	-0.095	-2.18[b]	-0.139	-2.27[b]
Net Short Term Borrowing Flow (STB)	0.040	0.85	-0.006	-0.19	0.007	0.56	0.144	1.14
Net Debt Financing Flow (FIND)	-0.009	-0.14	-0.118	-1.04	-0.106	-3.06[a]	-0.252	-1.74[c]
Net Equity Financing Flow (FINE)	-0.048	-2.42[b]	-0.076	-1.98[b]	0.003	0.16	-0.030	-1.46
Dividend Payment (DIV)	-0.001	-0.52	-0.001	-0.46	-0.006	-2.78[a]	-0.005	-1.97[b]
Net Investment Flow (NIF)	-0.042	-0.79	-0.126	-1.21	-0.105	-2.93[a]	-0.154	-2.85[a]
Fixed Coverage Expenditure (FCE)	0.009	0.53	0.010	0.98	-0.026	-1.37	0.003	0.10
Net Working Capital Flow (NWC)	-0.029	-0.87	0.089	1.08	0.030	1.03	0.069	2.04[b]
Net Other Asset & Liab. Flow (NOA&L)	0.003	0.14	-0.052	-1.03	0.020	1.11	0.046	1.64
C. Common Stock Offering Companies								
Net Operating Flow (NOF)	-0.052	-2.38[a]	-0.032	-2.43[b]	-0.074	-5.28[a]	-0.062	-2.58[a]
Net Financing Flow (NFF)	0.082	1.72[c]	-0.019	-0.42	-0.067	-1.75[c]	-0.122	-2.52[a]
Net Short Term Borrowing Flow (STB)	0.028	2.00[b]	-0.000	-0.00	-0.013	-.130	-0.022	-1.58
Net Debt Financing Flow (FIND)	0.017	0.45	-0.037	-1.08	-0.029	-0.96	-0.054	-1.29
Net Equity Financing Flow (FINE)	0.037	1.96[b]	0.019	1.05	-0.026	-1.36	-0.045	-2.51[a]
Dividend Payment (DIV)	-0.004	-2.73[a]	-0.002	-1.35	-0.006	-3.89[a]	-0.006	-4.11[a]
Net Investment Flow (NIF)	0.006	0.17	-0.005	-0.13	-0.091	-2.94[a]	-0.117	-3.49[a]
Fixed Coverage Expenditure (FCE)	-0.005	-0.82	-0.001	-0.32	-.022	-3.53[a]	-0.012	-1.66[c]
Net Working Capital Flow (NWC)	-0.033	-1.36	0.024	1.12	0.023	1.09	0.027	1.29
Net Other Asset & Liab. Flow (NOA&L)	0.002	0.18	0.024	1.97[b]	-0.021	-1.71[c]	-0.006	-0.16

where a,b,c denote significance at the 1%, 5% and 10% levels, respectively.