FCF AGENCY COSTS, EARNINGS MANAGEMENT, AND INVESTOR MONITORING

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Abstract

Free cash flow has been identified as having the potential to be a major agency cost where managers make expenditures that have negative NPVs. This agency problem reduces profitability and lowers stock market valuations. We argue that firms with high free cash flow and poor growth opportunities will suffer from the free cash flow agency problem. Our results are consistent with expectations and show that firms with high free cash flow and low growth are associated with low long term profitability. We also find that managers use income-decreasing accruals when a firm has high free cash flow agency costs. This earnings management is motivated by managers' desire to shift profits to future years when the full impact of the sub-optimum investments hits earnings. The evidence supports Fudenberg and Tirole's (1995) managerial self interest hypothesis. Consistent with the institutional investor monitoring hypothesis, we show that institutional shareholders act to deter managers from using negative discretionary accruals when free cash flow agency costs are potentially high.

Keywords: free cash flow, profitability, earnings management, institutional shareholders.

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Introduction

Free cash flow (FCF) has been identified as a potentially major agency problem where managers make expenditures that reduce shareholders' wealth. One implication of the free cash flow agency problem is that a firm's financial performance will be poor. This will manifest itself in poor stock market valuations. In order to obfuscate or camouflage the effects of non-wealth maximising investments, managers may use accounting practices that manipulate, massage, or smooth reported earnings. Managers engage in earnings management in the belief that the manipulated or smoothed earnings are more palatable to investors who, they think, are unable to fully unravel the impact of the discretionary accounting choices made by the firm.

The paper has three objectives. First, we investigate the relationship between FCF agency problems and measures of a firm's current and future performance. We argue that FCF agency problems will result in poor long term profitability. Second, we examine the discretionary accounting choices made by firms with FCF agency costs. We argue that managers of firms with high FCF agency costs use accounting accruals to smooth earnings over time. Managers engage in this type of earnings management so as to improve the long term security of their jobs. Third, we investigate whether external monitoring by institutional investors is effective in deterring opportunistic earnings management. If external monitoring is effective, managers' abilities to use discretionary accounting choices will be more constrained than otherwise. Using a large sample of 6,374 firm-year observations for the period 1988-1999, we find that firms with higher FCF agency problems have higher operating cash flows, similar earnings performance, but lower industry-adjusted Tobin's Q ratios. Thus, firms with higher FCF agency problems have lower

stock market valuations and this is consistent with FCF being invested in negative NPV projects.

We show that FCF agency costs are positively associated with operating cash flows, our measure of short term profitability, and negatively related to Tobin's Q, our measure of long term profitability. We find that firms with FCF agency problems use negative accruals to reduce reported earnings. This action moves profits from the current year to future years and helps smooth earnings when the effect of the negative NPV investment manifests itself. The results also show that firms with substantial institutional investors are associated with lower levels of earnings management when there are FCF agency problems. We ascribe this association to institutional investors exerting direct or indirect pressure on managers to desist from using income-decreasing discretionary accruals so as to smooth earnings.

This paper adds to the existing literature in the following ways: First, we develop a new measure of FCF agency cost that is based on a combination of industry-adjusted retained cash flow and industry-adjusted corporate growth opportunities. We believe that our measure better captures the theoretical construct of Jensen's (1986) free cash flow than the conventional measure of free cash flow that is based solely on retained cash flow. Second, we provide empirical evidence that managers of firms with a high FCF agency problem are more aggressively involved in intertemporal earnings management through opportunistic accrual choices than those with a low FCF agency problem. In particular, we find managers of firms with high FCF agency costs prefer income-decreasing accruals in the current period so as to shift earnings to future periods when the (negative) impact on reported earnings of investments in unprofitable projects is realized. This result is consistent with Fudenberg and Tirole's (1995) theory of income smoothing.

Finally, previous research has paid relatively little attention to the role of institutional investors in deterring opportunistic earnings management through discretionary accrual choices. Our results show that institutional investors are engaged more aggressively in monitoring opportunistic earnings management by firms with high FCF agency costs. Given the lack of empirical evidence on the issue, our results provide useful insights into the relations among FCF agency costs, opportunistic earnings management, and external monitoring by institutional investors. In other words, our results suggest the FCF agency cost should be considered as an important moderating variable when examining the effectiveness of institutional monitoring on a firm's performance and/or opportunistic earnings management.

The next section sets up our hypotheses on the relationship between FCF agency problems and profitability and earnings management. Section III describes the data sources and research method, while section IV presents and discusses the results. Finally, section V provides a summary and conclusion.

Background and Hypotheses

Jensen (1986) defines free cash flow (FCF) as cash flows that are in excess of investments in positive NPV projects. These cash flows are most likely invested in negative NPV projects. This is also known as the overinvestment problem. Of course FCF ought to be returned to shareholders rather than frittered away on frivolous projects. Absent effective monitoring, some managers may choose to invest in marginal or negative NPV projects and activities. These projects and activities may be self-gratifying to the managers and may bring them pecuniary benefits or other personal rewards (see endnote 1). Managers give little disclosure to these activities as they believe such investments will not withstand scrutiny by investors. Identifying FCF agency costs (investments in negative NPV projects) is very difficult. Managers do not disclose an investment's cash flow projections, and the assumptions behind them, to investors. Appealing to commercial secrecy provides a cloak for bad investment decisions. Poor investments, however, will reveal themselves in the profits of the company. Non-value maximizing investments eventually reduce earnings and will result in lower stock prices. This leads to our first hypothesis:

H1: Firms with high free cash flow agency problems have low future profitability.

A. Income Smoothing

Because negative NPV projects will eventually result in poor profitability, managers, who knowingly or wilfully invest in these projects, will attempt to disguise the impact on earnings. To do this they can use accounting accruals to shift earnings from one year to another. Managers of firms with high FCF agency costs want to deflate earnings in the current year so as to transfer profits to a future year when earnings start to reflect the poor investment of FCF. The incentives for income smoothing have been examined by Fudenberg and Tirole (1995), among others. Their two-period model predicts that managers whose tenures are subject to performance review have an incentive to save earnings in good times for use in bad times (see endnote 2). This transfer of profits takes place because current good performance does not necessarily compensate for future bad performance due to the so-called 'information decay' phenomenon. The transferring of accounting profits from one year to another is accomplished by discretionary accruals (earnings management). Our second hypothesis is:

H2: Firms with high free cash flow agency problems will use income-decreasing discretionary accruals or

discretionary working capital accruals to boost earnings in the future.

B. The Role of Institutional Shareholders

Institutional shareholders have the opportunity, resources, and expertise to analyze company performance and management actions. Whether institutions use these latent powers is largely a function of the size of their individual or collective shareholdings. When institutional investors have substantial shareholdings, it becomes difficult to sell the shares immediately at the prevailing market price. This lack of marketability implies investment institutions become long term investors and thus they have incentives to closely monitor companies (Maug, 1998), especially those with potentially costly agency problems. When institutions have large investment stakes in a firm, they will be concerned about the underlying profitability of that firm. They will be wary of managers' use of discretionary accruals to manipulate earnings and camouflage non-optimal investment decisions. Institutional investors want a firm's managers to concentrate on long term profitability rather than pre-occupy themselves with manipulating earnings on a year by year basis. In the presence of potentially high agency costs such as those associated with high free cash flow, institutional investors will be extra vigilant in monitoring the accounting choices of corporate managers.

Although there is a substantial literature investigating the association between institutional shareholdings and corporate performance (see, for example, McConnell and Servaes, 1990; Smith, 1996; Del Guercio and Hawkins, 1999; Agrawal and Knoeber, 1996; Karpoff, Malatesta, and Walkling, 1996; Wahal, 1996; Faccio and Lasfer, 2000), there are very few studies that have examined how institutions monitor and influence the actions of management. Bushee (1998) and Bange and De Bondt (1998) represent two studies in this area. Both papers found that research and development expenditures were positively related to the size of institutional shareholdings and this is consistent with the institutions being concerned about long term profitability even at the expense of short term income. Our study aims to test whether large institutional shareholdings inhibit short term earnings management via discretionary accruals when FCF agency costs are high.

We hypothesize that the monitoring activities of institutional shareholders will inhibit management from opportunistically using discretionary accruals. One way of inhibiting the actions of management is the threat of litigation action against managers taken by institutional investors. Institutional investors also have the wherewithal to remove managers if they believe the managers are using discretionary accruals to camouflage the earnings impact of their opportunistic actions. We argue that institutional shareholders will more closely monitor management and management's accounting choices if FCF agency costs are high. Because we believe management will want to take income-decreasing accruals when there is a high FCF agency cost, we argue institutional investors will try to prevent this. This leads to our third hypothesis:

H3: Large institutional shareholders will reduce income-decreasing accounting accruals used by managers to camouflage FCF agency costs.

Research Method

Identification of Free Cash Flow Agency Problems

While the concept of free cash flow is straightforward, its estimation is problematic. A survey of the literature yields a number of ways to calculate FCF (see endnote 3) but none of these involves identifying negative NPV projects. Two conventional methods of estimating FCF are as follows:

FCF1 = net operating cash flow – cash dividends – capital expenditures (1)

and

FCF2 = net operating cash flow – cash dividends – taxes paid (2)

Equation (1) deducts capital expenditures from operating cash flow and it assumes these investments have positive NPVs; this, of course, may not be true. To operationalize FCF for our regression models, we calculate relative (industry-adjusted) measures of free cash flow denoted IFCF1 and IFCF2. Here, FCF1 and FCF2 are scaled by total assets (at t – 1) and compared to the industry median. Thus:

IFCF1 = [((net operating cash flow (OANCF) (see endnote 4) – cash dividends (DV) – capital expenditure (CAPX)) / total assets at t-1 (AT_{-1})) – Industry Median FCF1] (3)

IFCF2 = [((net operating cash flow (OANCF) – cash dividends (DV) – taxes paid (TXPD)) / total assets at t-1 (AT_{-1})) – Industry median FCF2] (4)

Industry is defined at the two-digit SIC level.

In spite of their frequent use as such, we believe FCF1 and FCF2 do not approximate free cash flow in Jensen's (1986) sense of the term. FCF1 and FCF2 are strongly correlated with operating cash flows (OANCF) and accounting profit, and firms attempt to maximise these performance measures. We argue that firms which have both high FCF and low growth opportunities are much more likely to invest in negative NPV projects; a similar approach to measuring agency problems is used by Doukas, Kim, and Pantzalis (2000).

In our study, growth opportunities are proxied by the price to book value ratio (PB) (Harford, 1999; Holthausen and Larcker, 1992; Skinner, 1993; Smith and Watts, 1992) and those firms with a PB ratio below the industry median are regarded as low growth (see endnote 5). The level of FCF agency

cost, denoted by AGENCY, is the decile rank of the IFCF of firms with below-median PB ratios. AGENCY is equal to zero for firms with above-median PB ratios.

B. Free Cash Flow, Agency Cost, and Profitability

To examine the relationship between free cash flow agency costs (AGENCY) and firm performance, we estimate cross-sectional regression models. Three dependent variables are used which reflect short term (accounting) performance and the stock market's assessment of long term profitability. These dependent variables are: (1) industry-adjusted net operating cash flow divided by lagged total assets; (2) industry-adjusted income before extraordinary items divided by lagged total assets; (3) industry-adjusted Tobin's Q ratio. Tobin's Q is our measure of relative firm value and it reflects the stock market's assessment of the long term profitability of the firm (Lang, Stulz, and Walkling, 1991). Because we do not know the number of years it takes before negative NPV projects start to affect earnings, we use Tobin's Q as our measure of long term profitability. Stock market valuation, and hence Tobin's Q, reflects the market's perceptions of the agency costs of the firm (of which the free cash flow agency cost is one component) and the market's perceptions of managers' abilities. The use of industry-adjusted variables for free cash flow, profitability, and firm value yields relative measures which are useful in cross-sectional models. Industry-adjusted variables also reduce the impact of different accounting practices that vary across industries but are generally homogenous within an industry. The models include controls for share ownership and external monitoring as well as controls for size and dividend payout policies. The basic model with firm and time subscripts suppressed, is:

$$IQ \text{ (or ICF, IROA)} = \beta_0 + \beta_1 RIFCF(1, 2) + \beta_2 PB + \beta_3 AGENCY(1, 2) + \beta 4 RIIS + \beta_5 RIMO + \beta_6 RILEV + \beta_7 B6 + \beta_8 RIIS \cdot AGENCY(1, 2) + \beta_9 RIMO \cdot AGENCY(1, 2) + \beta_{10} RILEV \cdot AGENCY(1, 2) + \beta_{11} B6 \cdot AGENCY(1, 2) + \beta_{12} RISIZE + \beta_{13} RIPAY \quad (5)$$

Variable definitions are given in Table I.

TABLE I HERE

RIFCF, RIIS, RIMO, RILEV, RISIZE, and RIPAY are expressed as scaled decile ranks. Rank transformations of the variables are used so as to reduce the effect of outliers (Bhushan, 1994). We adopt a procedure similar to Bartov, Radhakrishnan, and Krinsky (2000). The variables are classified into deciles, with zero representing the smallest decile and nine representing the largest; the numbers are then divided by nine so that the range is zero to one.

The method of computing Tobin's Q is similar to that advocated by Chung and Pruitt (1994). Chung and Pruitt find that this relatively simple calculation compares very well with the more complex procedures used by Lindenberg and Ross (1981).

The main variables of interest are free cash flow, RIFCF(1, 2), and agency cost, AGENCY (1, 2). We predict positive coefficients for RIFCF1 and RIFCF2 in regression equation (5) as they are measures of firm's operating performance. In contrast, managers of high free cash flow and low growth opportunity firms (high AGENCY cost) may make sub-optimum investment decisions. Low growth prospects suggest few profitable investment projects for the retained cash flow. A negative coefficient is therefore predicted for AGENCY (1, 2) in regression equation (5).

Other variables are added as control factors. PB is expected to have a negative coefficient as low growth often implies a moderate or low level of current and future profitability. From a theoretical standpoint, ownership variables, RIIS and RIMO, should have a positive influence on corporate profitability although prior empirical evidence is inconclusive. B6 is included to examine if the monitoring role of a high quality auditor has an impact on profitability and Tobin's Q. Interaction variables RIIS·AGENCY,RIMO·AGENCY,RILEV·AGENCY and B6·AGENCY are included in the model as ownership and governance variables may moderate the effect of agency costs on firm profitability. For example, Shleifer and Vishny (1986) and Pound (1988) argue that institutional investors will help control or reduce agency problems such as overinvestment. Jensen and Meckling (1976), among others, state that high management shareholdings will lead to a greater alignment with shareholder interests and so agency conflicts will be reduced. Increased leverage can restrain managers' tendencies to invest in unprofitable projects and thus agency problems are alleviated (Jensen, 1986; Stulz, 1990).

C. Free Cash Flow and Earning Management

Firms with FCF agency problems may use accounting procedures to move reported earnings toward some desired level. This earnings management may help camouflage or hide the consequences of unprofitable investment decisions inherent in high levels of FCF. We hypothesize that managers of firms with FCF agency problems will use negative discretionary accruals to transfer current year profits to future years. Two dependent variables are used to measure earnings management. First, we use discretionary accounting accruals (DAC). Second, we use discretionary working capital accruals (WCA). The basic model, with firm and time subscripts suppressed, is:

$$DAC \text{ (or WCA)} = \beta_0 + \beta_1 RIFCF(1, 2) + \beta_2 PB + \beta_3 AGENCY(1, 2) + \beta_4 RIIS + \beta_5 RIMO + \beta_6 RILEV + \beta_7 B6 + \beta_8 RIIS \cdot AGENCY(1, 2) + \beta_9 RIMO \cdot AGENCY(1, 2) +$$

β_{10}RILEV·AGENCY(1, 2) + β_{11}B6·AGENCY (1, 2) + β_{12}RISIZE + β_{13}RIPAY + β_{14}CHCF (6)

See Table I for the definitions of variables.

Discretionary accruals (DAC) are estimated cross-sectionally for each year using the modified Jones model (Dechow, Sloan, and Sweeney, 1995). Discretionary accounting accrual models are widely used to estimate earnings management in the accounting and finance literature (Rangan 1998; Teoh, Welch, and Wong, 1997, 1998). The model, with firm and time subscripts, is

$$TAC_{it}(TWCA_{it}) = \alpha_0(1/AT_{t-1}) + \alpha_1\left((\Delta SALE_{it} - \Delta RECCH_{it})/AT_{t-1}\right) + \alpha_2(PPE_{it}/AT_{t-1}) + \varepsilon_{it} \quad (7)$$

Variable definitions are given in Table I.

The model is estimated for each year and for each industry (based on 2 digit SIC codes) using cross-sectional observations. Non-discretionary accruals (NDAC) are defined as the fitted values from equation (7) while discretionary accruals (DAC) are defined as the residual, ε_{it}, from equation (7). The residual term (difference between TAC and the fitted value, NDAC) is used as the dependent variable in equation (6). Consistent with other studies, DAC is assumed to be the outcome of managers' opportunistic earnings management.

Free cash flow variables, RIFCF(1, 2), FCF agency cost variables, AGENCY (1, 2), and institutional stock ownership, RIIS, are included in the model and are the prime variables of interest. Rajgopal, Venkatachalam, and Jiambalvo (2002) report low absolute DAC when institutional shareholdings are high. Other variables are included as control variables. RIMO, RILEV, and B6 represent ownership or monitoring factors and these may have an impact on managers' use of DAC. Firms with high leverage face increased monitoring by banks and creditors and this inhibits the use of positive DAC (Becker, DeFond, Jiambalvo, and Subramanyam, 1998). For very high levels of debt, companies may wish to increase write-offs to the income statement (DeAngelo, DeAngelo, and Skinner, 1994) and this 'Big Bath' will reduce positive discretionary accounting accruals. Becker, DeFond, Jiambalvo, and Subramanyam (1998) find that Big Six auditors are associated with lower levels of DAC. Becker, DeFond, Jiambalvo, and Subramanyam (1998) report a negative relationship between cash flow and discretionary accruals. In our study, we use change in cash flow (CHCF) to control for the income smoothing incentive. The more positive the change in cash flow is, the more likely discretionary accruals will be negative. We also include industry-adjusted payout ratio to control for dividend policy in the regression.

As an alternative to using discretionary accounting accruals (DAC) in equation (6), we also use discretionary working capital accruals (WCA). To calculate WCA, we use total working capital accruals TWCA in place of TAC in equation (7) but without the PPE term. Total working capital accruals is calculated as (change in non-cash current assets – change in current liabilities – change in long term debt included in current liabilities – change in tax payables) divided by lagged total assets. The error term from equation (7), when TWCA is the dependent variable, is our proxy for discretionary working capital accruals.

Data

The sample is drawn from all companies included in the 1999 COMPUSTAT PC-Plus Active and Research files and for which institutional shareholder data are available on the 1999 COMPACT D/SEC Disclosure database. The COMPACT D/SEC database has observations beginning in 1988. Firm-year observations are omitted if there is a change in fiscal year end, if total assets are less than $1 million, and if the SIC of the firm is 4000–4999 (transportation and utilities), 6000-7000 (financial), or 9999 (unclassified). We winsorize observations that fall in the top one percent and bottom one percent for each variable. Winsorization reduces the impact of outlier observations on the results. In order to operationalize the Jones model we require there to be at least twenty companies per 2-digit industry code, per year. After applying these selection criteria, we obtain the final sample of 6,374 firm-year observations. Summary statistics for the sample are reported in Table II. As expected, the industry-adjusted variables have medians close to zero. The mean IQ statistic, 0.223, indicates the distribution of the relative Tobin's Q ratios is positively skewed. The mean and median discretionary accruals (DAC) and working capital accruals (WCA) are close to zero.

TABLE II HERE

Results

Free Cash Flow and Profitability

The regression results for various specifications of equation (5) are shown in Table III. Panel A uses RIFCF1 as the basic measure of free cash flow while panel B uses RIFCF2; the results are broadly similar across both RIFCF measures. IQ is used as our measure of the stock market's assessment of a firm's long term profitability while ICF and IROA reflect short term operating cash flow and current year profitability.

TABLE III HERE

Results for both pooled time-series, cross-sectional regressions and Fama-MacBeth (1973) regressions (see endnote 6) are qualitatively similar. Hence we report only the Fama-MacBeth regression results. As shown in Table III, RIFCF1 and RIFCF2 are positively associated with industry-adjusted Q ratios, operating cash flows, and return on assets. This finding is consistent with our assertion that free cash flow is a measure of a firm's operating performance. PB is negatively associated with profitability although the effect is weak for operating cash flows in panel A; elsewhere PB is significantly negative.

The coefficient on our free cash flow agency cost variable, AGENCY, is not statistically significant in explaining short term profitability (industry-adjusted return on assets) but is positive and significant for industry-adjusted cash flow from operations. Firms with free cash flow agency problems have large industry-adjusted cash flows from operations. The fact that the AGENCY variable is not significant for earnings (IROA) implies that firms have been taking negative discretionary accruals (see endnote 7). There is a negative significant coefficient for AGENCY in the Tobin's Q regression. Tobin's Q represents the stock market's assessment of the future prospects of the firm. Firms with high free cash flow agency problems suffer poor stock market valuations (and hence lower Q ratios) as investors recognise these firms may invest in negative NPV projects. The evidence from Table III (for Tobin's Q ratio) is consistent with our first hypothesis.

Institutional share ownership is positively associated with short term performance (ICF and IROA) although the significance is weak for IROA. Institutional investors prefer investments in firms with above average operating cash flows. There is no association between RIIS and the long term performance measure represented by Tobin's Q. Industry-adjusted managerial share ownership is positively and significantly related to industry-adjusted short term profitability. Managerial share ownership is not significantly related to long term performance. High levels of debt are associated with poor short term and long term performance measures. This association may be due to the increased risk of firms with substantial debt in their capital structure. B6 is not statistically significant except in one regression. Firms with free cash flow agency problems and that have substantial institutional shareholdings are associated with poor short term performance. We have no ready explanation for this association; the negative significant signs on RIIS·AGENCY for the ICF and IROA regressions are puzzling. Our prior expectation is that large institutional shareholdings will ameliorate the agency problem; instead the reverse happens. Highly levered firms with free cash flow agency problems (RILEV·AGENCY) have better long-term profitability as measured by IQ. This is consistent with Jensen (1986) who argues that monitoring by debt holders and the discipline imposed by having to make regular fixed payments of interest reduces the ability of managers to fritter away free cash flows even for low growth firms. The Big 6 and free cash flow agency cost interaction (B6·AGENCY) is not significant. Large companies have higher short term profits but there is weak evidence of a negative relation with IQ. High dividend payout ratios are associated with high industry-adjusted earnings and operating cash flows.

B. Free Cash Flow Agency Costs and Earnings Management

Regression results for equation (6) are shown in Table IV; panel A uses RIFCF1 and panel B uses RIFCF2. Two dependent variables are used, namely discretionary accounting accruals (DAC) and working capital accruals (WCA). The results across the four columns are broadly consistent with one another. Both discretionary accruals and working capital accruals are inversely related to industry-adjusted free cash flows (RIFCF). This inverse relation is consistent with the argument that firms with high operating cash flows tend to save current earnings for use in the future. Managers of firms with high FCF agency costs (AGENCY) have greater negative accruals. The negative coefficients for AGENCY support the argument that managers will defer some current profits to later years when earnings fall because of the impact of negative NPV projects undertaken with the free cash flow. The result for AGENCY is consistent with hypothesis 2.

TABLE IV HERE

RIIS, RIMO, and RILEV are generally not significant in explaining DAC and WCA. Consistent with Becker, DeFond, Jiambalvo, and Subramanyam (1998), Big 6 auditors are associated with negative discretionary accounting accruals. The conservative nature of auditors makes them influence clients to reduce reported profits by use of discretionary accruals. There is no extra or moderating effect when firms have high free cash flow agency problems as the interaction term, B6·AGENCY, is not significant.

Although institutional shareholders have no association with DAC and WCA, they do have an impact when FCF agency costs are high. The positive and significant signs on RIIS·AGENCY indicate that institutional investors deter managers from decreasing earnings in the current year so as to transfer profits to some later period. When FCF agency costs are potentially high, institutional investors are extra vigilant in monitoring the financial statements and accounting choices of the firm. The evidence from Table IV supports hypothesis 3.

RIMO·AGENCY and RILEV·AGENCY are generally not significant. RISIZE is weakly posi-

tively related to discretionary working capital accruals. Change in cash flow is negatively related to discretionary accruals (DAC) and discretionary working capital accruals (WCA). When there is a large increase in net operating cash flow, managers decrease both discretionary accounting accruals (DAC) and working capital accruals (WCA).

Summary

Jensen (1986) defines free cash flow as cash flow in excess of that required funding all projects that have positive NPVs. These free cash flows are invested in sub-optimal projects and will be associated with poor future profitability. One problem in obtaining empirical confirmation of this relationship is identifying free cash flow. Typically, researchers have used cash flow from operations minus dividends and minus tax (or capital expenditures) to estimate FCF. This measure, however, is an indicator of firm performance and we contend it does not correlate with the free cash flow agency problem. In this study we argue that only firms with low growth opportunities have free cash flow agency problems. We find that low growth, high free cash flow firms are associated with low future profitability as measured by Tobin's Q ratio. In order to camouflage the poor investments made by firms with high free cash flow and low growth, managers may resort to discretionary accruals to manipulate current and future reported earnings. Using the cross-sectional model, we find that firms with free cash flow agency problems tend to take negative discretionary accounting accruals and working capital accruals in the current year. This result is consistent with our *ex ante* expectation that managers want to shift profits to later years to offset the impact of negative NPV projects when they flow through to the Income Statement. These negative discretionary accruals are reduced if there is substantial institutional investment in the firm. Institutional investors restrict managers from opportunistic earnings management when free cash flow agency problems are present.

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Appendices

Table I. Definitions of variables used in this paper. COMPUSTAT codes are given in parentheses.

IQ	= industry-adjusted Tobin's Q ratio. Tobin's Q is calculated as ((Total assets (AT) – book value of equity (CEQ) + market value of equity (PRCC*CSHO))/Total assets (AT)) – industry median of Tobin's Q.
ICF	= industry-adjusted operating cash flow. ICF is net operating cash flow (OANCF) divided by lagged total assets (AT_{-1}) minus the industry median.
IROA	= industry-adjusted profitability for the year. IROA is income before extraordinary items (IB) divided by lagged total assets (AT_{-1}) minus the industry average.
RIFCF(1, 2)	= decile rank of free cash flow calculated from equation (3) or equation (4).
PB	= a dummy variable taking the value one (1) if the price to book ratio (PRCCF*CSHO/CEQ) is below the industry median and zero (0) otherwise.
AGENCY(1, 2)	= free cash flow (RIFCF1, RIFCF2) for firms with below median growth opportunities. It is the interaction of IFCF1 (IFCF2) and PB.
RIIS	= decile rank of percentage of shares owned by institutional investors minus the industry median.
RIMO	= decile rank of percentage of shares owned by managers minus the industry median.
RILEV	= decile rank of long term debt (DLTT) divided by total assets (AT) minus the industry median.
B6	= a dummy variable coded one (1) if the auditor is a Big Six firm, otherwise coded zero (0).
RIIS·AGENCY, RIMO·AGENCY, RILEV·AGENCY, B6·AGENCY are interaction variables.	
RISIZE	= decile rank of log of total assets (AT) minus the industry median.
RIPAY	= decile rank of (cash dividend (DVC) divided by income before extraordinary items (IB)) minus the industry median.

DAC = discretionary accounting accruals derived from the Jones (1991) model (see equation (7)).
WCA = discretionary working capital accruals (see equation (7)).
CHCF = change in net operating cash flow ($OANCF_t$ – $OANCF_{t-1}$) divided by lagged total assets (AT_{-1}).
TAC_{it}/TA_{t-1} = total accruals divided by lagged total assets. Total accruals (TAC) are calculated as: TAC = (income before extraordinary items (IB) – net operating cash flow (OANCH))/lag. TA (AT_{-1}).
$TA_{i, t-1}$ = lagged total assets (AT_{-1}), $\Delta SALE_{it}$= change in sales revenues, ΔRECCH=change in accounts receivables, PPE_{it}= property, plant, and equipment, ε_{it}= unspecified random factors.

Table II. Descriptive statistics

This table presents summary statistics (mean, standard deviation (Std Dev), median, minimum, and maximum) of the variables. The specific definitions of the variables are given in Table I.

Variable	Mean	Std Dev	Median	Minimum	Maximum
IQ	0.223	0.993	-0.003	-1.999	6.794
ICF	0.000	0.108	0.003	-0.476	0.367
IROA	-0.009	0.082	0.002	-0.353	0.207
IFCF1	-0.008	0.105	0	-0.454	0.356
IFCF2	-0.012	0.132	0.002	-0.728	0.574
PB	2.367	3.463	1.623	0.092	130.888
IIS	0.049	0.224	0.001	-0.631	0.786
IMO	0.056	0.214	0.000	-0.521	0.957
ILEV	0.033	0.149	0.000	-0.459	0.676
B6	0.871	0.336	1.000	0	1
ISIZE	0.039	1.209	0.014	-3.642	3.397
IPAY	0.090	0.332	0.000	-0.720	2.529
DAC	-0.004	0.107	-0.004	-0.788	0.601
WCA	0.014	0.118	0.008	-0.973	4.871
CHCF	0.008	0.112	0.010	-0.365	0.373

Table III. Fama-MacBeth Regression estimates

Free cash flows are measured by IFCF1 or IFCF2. Dependent variables: Industry-adjusted Q ratios (IQ), Industry-adjusted Operating Cash Flow (ICF) and Industry-adjusted Earnings (IROA). Definitions of the independent variables are given in Table I. t-statistics are in parentheses. Two tail tests of significance are reported.

	Panel A: RIFCF and AGENCY use IFCF1			Panel B: RIFCF and AGENCY use IFCF2		
	Dependent Variable			Dependent Variable		
	IQ	ICF	IROA	IQ	ICF	IROA
INTERCEPT	0.510	-0.150	-0.051	0.596	-0.143	-0.052
	(2.29)	(-11.30)	(-9.41)	(3.07)	(-10.31)	(-6.42)
RIFCF	0.418	0.270	0.072	0.382	0.221	0.075
	(2.81)***	(20.92)***	(6.58)***	(3.81)***	(12.46)***	(8.83)***
PB	-0.137	-0.009	-0.017	-0.138	-0.020	-0.021
	(-5.55)***	(-1.49)	(-5.44)***	(-5.66)***	(-3.56)***	(-7.15)***
AGENCY	-1.436	0.042	0.023	-1.511	0.068	0.017
	(-2.74)***	(2.57)***	(0.53)	(-4.11)***	(2.15)**	(0.55)
RIIS	0.040	0.039	0.018	0.072	0.050	0.020
	(0.40)	(2.23)**	(1.59)	(0.55)	(3.47)***	(1.79)*
RIMO	0.033	-0.004	0.022	0.007	-0.003	0.021
	(0.24)	(-0.29)	(2.26)**	(0.06)	(-0.24)	(2.73)***
RILEV	-0.394	-0.011	-0.030	-0.414	0.007	-0.026
	(-3.05)***	(-3.59)***	(-4.73)***	(-4.15)***	(1.37)	(-3.11)***
B6	0.079	0.004	-0.008	0.067	0.011	-0.006
	(1.02)	(1.35)	(-1.41)	(0.93)	(2.93)***	(-1.22)
RIIS·AGENCY	0.136	-0.071	-0.049	0.240	-0.083	-0.042
	(0.53)	(-2.35)**	(-3.05)***	(1.63)	(-2.23)**	(-2.66)***
RIMO·AGENCY	-0.051	0.011	-0.014	-0.015	0.022	-0.016
	(-0.27)	(0.46)	(-1.04)	(-0.10)	(0.55)	(-1.20)
RILEV·AGENCY	0.417	0.008	-0.006	0.521	-0.033	-0.003
	(2.05)**	(0.33)	(-0.33)	(9.31)***	(-3.35)***	(-0.45)
B6·AGENCY	-0.142	-0.031	-0.033	-0.118	-0.049	-0.031
	(-0.78)	(-1.37)	(-1.00)	(-0.73)	(-1.53)	(-1.21)
RISIZE	-0.064	-0.012	0.032	-0.136	-0.007	0.028
	(-1.20)	(-0.55)	(2.24)**	(-1.99)**	(-0.43)	(2.35)**
RIPAY	-0.052	0.046	0.044	-0.062	0.041	0.041
	(-0.93)	(4.10)***	(21.43)***	(-1.30)	(2.78)***	(19.46)***

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Table IV. Fama-MacBeth Type Average Regression Estimates

Free Cash Flows are Measured by IFCF1 or IFCF2. Dependent Variables: Discretionary Accruals (DAC) and Discretionary Working Capital Accruals (WCA). Definitions of the independent variables are given in Table I. t-statistics are in parentheses. Two tail tests of significance are reported.

	Panel A: RIFCF and AGENCY use IFCF1		Panel B: RIFCF and AGENCY use IFCF2	
	Dependent Variable		Dependent Variable	
	DAC	WCA	DAC	WCA
INTERCEPT	0.115 (11.39)	0.121 (12.97)	0.120 (10.02)	0.122 (10.60)
RIFCF	-0.135 (-11.47)***	-0.103 (-10.00)***	-0.115 (-9.27)***	-0.084 (-8.07)***
PB	-0.008 (-1.74)*	-0.005 (-2.08)**	-0.003 (-0.59)	-0.001 (-0.46)
AGENCY	-0.043 (-2.60)***	-0.054 (-3.96)***	-0.042 (-3.42)***	-0.051 (-3.81)***
RIIS	-0.014 (-1.01)	-0.013 (-0.91)	-0.021 (-1.48)	-0.019 (-1.26)
RIMO	0.015 (0.95)	0.008 (0.66)	0.016 (0.99)	0.011 (0.75)
RILEV	0.001 (0.15)	-0.010 (-1.60)	-0.006 (-1.00)	-0.016 (-2.67)***
B6	-0.018 (-3.57)***	-0.009 (-1.18)	-0.021 (-3.88)***	-0.010 (-1.22)
RIIS·AGENCY	0.027 (2.46)**	0.058 (2.67)***	0.024 (2.19)**	0.050 (2.80)***
RIMO·AGENCY	-0.011 (-0.41)	-0.008 (-0.31)	-0.019 (-0.64)	-0.019 (-0.61)
RILEV·AGENCY	0.007 (0.34)	-0.007 (-0.24)	0.012 (1.22)	0.003 (0.17)
B6·AGENCY	0.008 (0.85)	0.008 (0.62)	0.018 (1.63)	0.014 (0.88)
RISIZE	0.025 (1.40)	0.033 (1.95)*	0.026 (1.36)	0.036 (1.80)*
RIPAY	0.006 (0.66)	-0.015 (-1.23)	0.009 (0.91)	-0.013 (-0.95)
CHCF	-0.082 (-5.73)***	-0.090 (-14.20)***	-0.103 (-7.50)***	-0.109 (16.42)***

*** significant at the 0.01 level
** significant at the 0.05 level
* significant at the 0.10 level

Endnotes

1. For example, managers of firms with substantial cash flows and few profitable investment opportunities, may choose to invest in wasteful projects (rather than return cash to shareholders) because senior executives are rewarded for increasing company size.
2. Similarly, if current earnings are poor and future earnings are expected to be good, managers have incentives to transfer profits from the future to the present.
3. See, for example, Lang and Litzenberger (1989), Lehn and Poulsen (1989), and White, Sondhi, and Fried (1998).
4. COMPUSTAT PC-Plus variable codes given in parentheses.
5. Growth can also be measured by historical sales or profit growth and by the price earnings (PE) ratio. These alternatives often lead to similar conclusions as those obtained from using PB (Moon, 2001) and so they are not used in the analyses reported in this paper.
6. The Fama-MacBeth procedure reduces the problems of heteroskedasticity.
7. A major reason for differences between cash flow from operations and reported earnings is accounting accruals.