The Decision to Repurchase Shares: A Cash Flow Story*

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Utilizing classification systems developed by Helfert (1982), and Gentry, Newbold, and Whitford (1985, 1990), this paper presents a summary of changes in the cash flow position of companies embarking on a share repurchase strategy. The results from the adoption of a repurchasing strategy show that subsequent to the repurchase, net working capital flow components and net operating flow get smaller while net investment flow increases. There also exists a clear cash flow effect leading up to the announcement period as well as reduced reliance on external funds. The findings are of interest to corporate executives, credit analysts, investors and other outside parties in evaluating the strategic and operational change occurring in firms who choose to repurchase shares. The results are also consistent with firms using share repurchase programs as a way of adjusting payouts.

INTRODUCTION

In recent years, the growth of share repurchase programs indicates they are an important tool in implementing a firm's overall business strategy. For example, in 1996, a record 1,475 American companies announced plans to buy back equity worth US$177 billion (*Fortune*, 1997, p. 24). Yet the link between share repurchase programs and corporate strategy remains a confounding issue for corporate management, boards of directors, investment bankers, financial analysts and investors. What should a company do with its surplus cash? Should it reduce debt levels, increase dividend payouts, make additional capital investments, or utilize the cash in buying back a percentage of the firm's stock. Because management cannot observe the future affect of share repurchase on its financial performance, the dilemma facing decision makers is choosing a course of action that will maximize future firm value. An objective of this study is to explore the relationships between strategic share repurchases and changes in cash flow components. Because share repurchases are connected to the availability of net cash flow (NCF), a further objective is to highlight the contribution of the three free cash flow (FCF) components—net operating flows (NOF), net investment flows (NIF) and net working capital flows (NWC).

The success of any business organization is dependent upon the ability of management to generate future cash flows from investing, financing and operating activities. Recently, it has been shown that the performance of cash flows can be directly linked to growth in firm value (Kaplan & Ruback, 1995).

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This paper adds to our understanding of the cash flow implications of share repurchases. The results show that subsequent to the repurchase, net working capital flow components get smaller, net operating flow components get smaller and investment flows component remain unchanged. There also exists a clear cash flow effect leading up to the announcement period.

Reasons for Initiating a Share Repurchase Program

A number of strategic reasons are cited in the financial literature as to why a company would repurchase its own stock. The survey work of Young (1969) and Wansley, Lane, and Sarkar (1989) identifies up to 29 different reasons for a company justifying the repurchase of its shares. Most however can be classified under the following headings:

A signal by management of future confidence. Management is constantly making observable information-revealing decisions or signals to corporate stakeholders. Share repurchase decisions may be an attempt to send a message to information users.

An increase in the firm's leverage. The leverage theory states that investors will respond positively to a share repurchase program due to the presence of tax savings associated with increased use of debt.

Excess cash. A company with excess cash available after funding all value creating investments will enhance value by paying out the excess cash to repurchase shares. The signal will be perceived positively since the release of free cash to stockholders eliminates the possibility of management investing those funds sub-optimally.

Provide shares for employee bonus/retirement plans. The reissue explanation states that share repurchases are undertaken to provide shares for retirement programs, exercise of stock options, bonuses, or other reissue uses.

A substitute for cash dividend. The dividend substitution explanation states that investors respond positively to cash distributions in the form of share repurchase because of historically favored tax treatment. Another reason is that since we are unable to observe future cash flows, companies with excess free cash are more likely to retire stock than increase dividends. It is well documented that companies face reputational penalties for reducing dividends and are therefore cautious about adjusting dividends.

Part of a defensive strategy to avoid a takeover. A company may use share repurchases as a takeover defense. In effect, share repurchases increase the cost that a potential acquirer pays to attain control by altering the distribution of shareholder reservation values.

Lack sufficient investment opportunities. A company lacks investment opportunities or is restricted by monopolistic regulations.

As stated above, excess cash is cited as a motivating factor behind the decision to repurchase shares. Stephens and Weisbach (1998) further conclude that repurchases are positively related

to levels of cash flow.[1] Since we are unable to observe future cash flows, companies with excess free cash are more likely to embark on repurchase programs than increase dividend payouts. This supports a positive relationship between cash and repurchase programs.

THE CASH FLOW STORY

One of the most useful financial tools for analyzing the performance of management is the statement of cash flows. The cash flow statement integrates accounting information from the balance sheet and income statement, and it provides a unique interpretation of the allocation of a firm's resources. It is widely recognized that the value of the firm is closely related to the performance of its future cash flows. Cash flow analysis reflects the subtleties and nuances of management trade-offs, and it provides chronological benchmarks for measuring and judging management effectiveness. In the business world and in the popular press, the concept of cash flow has many meanings and can be easily misinterpreted. This study uses a free cash flow (FCF) theory consistent with the work of Palepu (1985) and Lehn and Poulsen (1989).

The result of FCF approach is to provide a direct focus on the cash flow contribution of investing, financing and operating decisions that reflect management's success at creating economic value. Investing decisions determine where cash is invested in both current and future value generating assets. Through operating decisions, management implements, monitors and control the cash flows generated from its productive assets. Together these decisions drive the financial returns generated for stakeholders, namely, stockholders, suppliers and debt holders, employees and customers. Gentry (1996) comments that the performance of a firm's net cash flow over time provides powerful signals concerning its financial health; thus, the long-run patterns of a few key cash flow components can be used to assess a company's strategic performance. In his overall assessment, he maintains that the most important relationship among the cash flow components is the link between net investments and net operating flows, and that cash flow components are closely associated with the financial health and strategic performance of a firm. A key objective in this study is the assessment of the relationship of changes in a firm's cash flow components in firms pursuing a repurchasing strategy. The question of whether changes in cash flow components trigger action (or inaction) remains, at this point, an empirical question. There does exist, however, substantial empirical evidence documenting the strong influence of cash flow on some firms' investing decisions (Donaldson, 1961; Myers & Majluf, 1984; Jensen, 1986; Hackel & Livnat, 1992; Fazzari & Peterson, 1993). The study of share repurchases provides a stage from which to better integrate and understand the linkage between cash flow effects and the decision to repurchase.

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[1] In a related study by Evans and Gentry (2001) there was found to be significantly higher levels of mean and median FCF for repurchasing companies, relative to non-repurchasing companies, in the period preceding the repurchase announcement. The finding by Evans and Gentry strongly supports a free cash flow effect as a primary driver for repurchasing stock.

The centerpiece of the study is the link between a firm's decision to repurchase shares and the performance of its cash flow components. Of particular interest is how the cash flow performance differs over a number of intervals of time. As part of the process the components of free cash flow (FCF), net operating flow (NOF), net investment flow (NIF), net working capital flow (NWC), net cash flow (NCF) and net financing flow (NFF) are analyzed.

Estimates of intrinsic value are based on a company's future (discounted) cash flows. The future cash flow stream in question is a firm's FCF. The current study will be an indirect test of the FCF valuation theory. It seems reasonable that higher levels of a firm's FCF will eventually lead to higher firm valuation. This will be the case where the firm is funding profitable investments, including share repurchase programs. In addition to the rate of growth in FCF some recognition should be given to the stability or otherwise of both operating and free cash flows. The nature of these flows provides valuable insight into why companies choose to repurchase shares or not repurchase shares. If a company faces volatile operating flows and uncertain or even negative free cash flows reliance on debt capital would be minimal and the use of equity capital would be favoured. If, in any given year, substantial free cash was generated, these funds would be applied to reducing financial leverage through the repayment of debt rather than a return of surplus funds to shareholders. Alternatively, a company perceiving stability of operating and free cash without an increase in financial risk is able to sustain a higher level of financial leverage. Normally, these firms have a far greater degree of financial flexibility. For these companies a buyback strategy is enhancing wealth or at a minimum ensuring the normal growth of the firm.

Sample Description

The repurchase sample was formed by identifying all repurchase announcements reported in the *Wall Street Journal Index* from January 1, 1980 to December 31, 1997. Financial and market data have been collected for each of the sample companies throughout the period January 1978 to December 1999. The minimum post announcement period of study was two years while the maximum period of study was nineteen years. Two years of financial and market data immediately preceding the repurchase announcement was collected for each company. The sample consisted of those firms that announced open market transactions, fixed price self tender offers and dutch auction self tender offers. The final sample consisted of 381 companies announcing share repurchase programs. The sample included 293 companies listed on the New York Stock Exchange (NYSE), 57 listed on the American (AMEX), and the remaining 31 were listed on the Over-The-Counter (NASDAQ) markets.

METHODOLOGY

To examine the changes in cash flow components, the methodologies as applied by Gentry et al. (1985, 1990) were used in an attempt to couple value creation and cash flow performance.

The cash flow components in period t are defined as:

NOF = net operating cash flow
= Sales - (Cost of Goods Sold - Depreciation Expense) - Selling, General and Administrative Expenses - Taxes

NIF = net investment flow

	=	$-[(NFA_t - NFA_{t-1}) + \text{Depreciation Expense}_t]$
		(where NFA = Net Fixed Assets)
		(a minus (-) is an outflow of cash and a plus (+) is an inflow)
NWC	=	net working capital flow (where a - is an outflow, and a + is an inflow)
Change in AR	=	accounts receivable flow, where change means a change in value of a variable between two periods
	=	$AR_t - AR_{t-1}$
Change in INV	=	inventory flow
	=	$INV_t - INV_{t-1}$
Change in OCA	=	other current asset flow
	=	$OCA_t - OCA_{t-1}$
Change in AP	=	account payable flow
	=	$AP_t - AP_{t-1}$
Change in OCL	=	other current liabilities flow
	=	$OCL_t - OCL_{t-1}$
Change in NWC	=	± change in AR ± change in INV ± change in OCA ± change in AP ± change in OCL
DIV	=	dividend flow (-)
FCE	=	interest expense (-)
II	=	interest income (+)
DNFF	=	change in net financing flows (+ or -)
FCF	=	NOF + NIF + change in NWC
NCF	=	NOF + change in NWC + NIF + II + FCE + DIV

For comparative purposes relative cash flow measures have been computed. These measures are defined as:

NOF*	=	the mean percentage of the total net cash inflow generated by the Net Operating Cash Flows subsequent to the repurchase announcement.
NIF*	=	The mean percentage of the total cash outflow allocated to capital investment subsequent to the repurchase announcement.
Change in NWC*	=	The mean percentage of the total cash outflow (inflow) allocated (generated) to (from) net working capital subsequent to the repurchase announcement.
FCF*	=	$\frac{\text{NOF*} + \text{NIF*} + \text{Change in NWC*}}{\sum \text{Total Outflow or Total Inflow}}$

The data for calculating the relative cash flow measures, NOF*, NIF*, Change in NWC*, were found on the Compustat file.

Cash Flow Components and Hyphothesis

A company with excess cash available after funding all value creating investments will enhance value by paying out the excess cash to repurchase shares. The signal will be perceived positive since the release of free cash (free cash flow effect) to stockholders eliminates the possibility of management investing those funds sub-optimally. The announced repurchase program may also signal higher future cash flows than previously expected by the market

(cash flow signaling effect). The signal may, for example, be interpreted as a move by the firm to better and more productive future investments. The signal may simple be due to the fact that a repurchase program will reduce the number of outstanding shares. A reassessment by investors of the firm's future earnings per share and dividend per share will change their expectations about the future cash flows. As such, investors will revise their estimates (cash flow, earnings) upwards. In the Perfect, Peterson, and Peterson (1995) paper there is a predisposition of evidence supporting cash flow signaling.

Recent work on buybacks (Wansley, Lane, & Sarkar, 1989), together with qualitative evidence obtained from discussions with corporate executives, indicates that repurchases are financed from net cash flows rather than borrowings, while maintaining (and increasing) dividend flows. This finding is consistent with the Higgins (1972) theory on repurchases. The above assertion supports the argument that repurchasing firms will have higher levels of free cash flows and net cash flows.

Relative Free Cash Flow (FCF*)

Free cash flow is commonly defined as a company's true operating flow (Copeland, Koller, & Morrin, 1996, p.172). It is the total after-tax cash flow generated by the company and available to all providers of the company's capital. When a company is able to generate more cash from its operations than is needed for its long-run existence, the company has free cash flows. Relative free cash flow is the percentage contribution of free cash flow to the total cash flow and gives additional insight into the performance and behaviour of repurchasing companies. Repurchasing companies committing cash resources to fund the repurchase program are likely to have higher levels of FCF*.

Hence :

> ***H1:*** *Ceteris paribus, in the post repurchasing period, repurchasing firms will experience higher relative free cash flows.*

Relative Net Operating Cash Flows (NOF*)

A relative cash flow component represents the percentage contribution of each component to the total cash inflow or outflow. Net operating flow is, in most instances, the largest cash inflow component. It is reasonable to assume that repurchasing firms utilizing cash to repurchase stock will have a relatively higher proportion of their cash flows coming from operations than non-repurchasing firms. The higher cash flows from operations may be explained by a number of potential reasons; for example, many repurchasing firms have stronger competitive positions in the market they serve. Other reasons include repurchasing firms are recognized as the market leaders in their industry, have strong brand products and market niche and may be recognized as well managed companies.

In studies on corporate repurchase behavior, the notion that management teams embark on share repurchase programs to signal future confidence and higher levels of future value was directly identified by Vermaelen (1981) and Dann (1981). If true, higher levels of corporate value should be revealed in higher levels of operating flows.

Hence:

H2: Ceteris paribus, in the post repurchase announcement period, repurchasing firms will experience higher relative Net Operating Cash Flows.

Relative Net Investment Flow (NIF*)

If through the strategy of a share repurchase, favorable information is being signaled, it should reveal itself in the form of value, that is, the present value of all future net cash flows should increase. As such, higher levels of corporate value should be revealed in higher levels of operating flows, investment flows and free cash flows subsequent to the repurchase decision.

It is generally recognized that the larger the percentage of cash inflow from NOF* the larger the relative outflow for investments (NIF*). With reference to empirical findings (Nohel & Tarhan, 1998) that a repurchase decision is a bullish signal to the market of improved future operating, financial and market performance, one outcome would be the prediction of larger relative investment outflows subsequent to the repurchase decision.

Hence:

H3: Ceteris paribus, in the post repurchase announcement period, repurchasing firm will experience higher relative net investment outflows.

Relative Net Working Capital Flows (Change in NWC*)

It is difficult to hypothesize the direction of net working capital flows. A repurchase decision could be a signal of increased future business activity, generating higher levels of future sales. This may result in a company increasing inventory and receivable levels resulting in higher relative working capital outflows. Alternatively, cash generated for the repurchase decision may be funded in part from reduced inventories and account receivables and higher levels of accounts payable and other current liabilities. Another factor could be the use of debt around the time of the repurchase decision. One argument could be that as a result of increased debt, management is motivated to reduce working capital and be more efficient. Likewise if a repurchasing company is not successful in changing its future strategy, business could continue to deteriorate causing a decline in relative net working capital flows.

In the context of the current study, share repurchases are perceived to be a signal which generates positive change in a firm's strategic outlook and cash positions. As such the prediction is for higher relative net working capital outflows.

Hence:

H4: Ceteris paribus, in the post repurchase announcement period, repurchasing firms will experience higher relative net working capital cash flows.

Relative Net Cash Flows (NCF*)

The net cash flow (NCF) surplus or deficit reflects the primary cash flow position of the firm. NCF is commonly defined as the residual cash after funding operating, investment and financial commitments. The relative net cash flow (NCF*) is defined as the percentage contribution of the net cash flow surplus or deficit after major cash flows to the total cash flow. In general, NCF* performance and trends highlight the decisions that underpin the implementation of a company's strategies. The adoption of a share repurchase as a corporate strategy is interpreted as a move to better and more productive future investments.

Hence:

> ***H5:*** *Ceteris paribus, in the post repurchase announcement period, repurchasing firms will experience higher relative net cash flow.*

Relative Net Financing Flows (NFF*)

NFF is a measure of the proportion of cash inflows coming from external sources of financing. The percentage contribution of NFF to the total cash flow is represented by NFF*. It would be reasonable to argue that repurchasing companies will have little need of external financing to meet their operating needs. The rationale for such an argument is the large NOF* together with a repurchase decisions are both suggestive of excess cash.

As such it is reasonable to assert a negative relationship between NOF* and NFF*.

Hence:

> ***H6:*** *Ceteris paribus, in the post repurchase announcement period, repurchasing firms will experience lower NFF*.*

Empirical Results

As shown in Table 1, there is a significant reduction in FCF* in the period subsequent to the repurchase program. This is particularly evident in the period surrounding the repurchase program and is a finding which supports a free cash flow effect as a primary driver for repurchasing stock. Similar results are uncovered with an examination of median levels of FCF*.[2] The analysis in the next section shows the reduction in FCF* for repurchasing companies in the period surrounding the announced repurchase is an outcome driven by higher relative net investment outflows (supporting a cash flow signalling argument), lower relative net working capital outflows, lower relative net operating inflows and higher relative

[2] Skewness in the distribution of the mean and median values in growth rates and free cash flow prompted the use of tests not dependent on the assumption of normality. The Wilcoxon Signed Rank test is generally robust for departures from the assumption of identical distribution. In general, the advantage of non-parametric test is that they can be used without assuming that the sampled populations have any particular type of probability distributions. The disadvantage in applying a non-paramatic test is that the test is often less powerful that the analogous parametric test.

net financing flows. The main factor contributing to the sharp decline in FCF* in the year of repurchase strategy for repurchasing companies is the sharp reduction in NOF* during this period due in part to higher net financing flows (NFF).

When the sample groups are partitioned on the basis of size, a number of further insightful observations can be made. Appendix Table A1 contains summary data of the relative free cash performance of repurchasing companies. As shown, the largest repurchasing capitalized stocks (> $2.0b) show significantly higher long term FCF* vis-a-vis the pre repurchase period. The difference between pre-announcement FCF* and long-term FCF* for the median group of companies is not significantly different from zero. The smallest capitalized companies (< $300mm) show a significant reduction in FCF* which is particularly evident in the 3 year period subsequent to the repurchase program.

TABLE 1
Relative Free Cash Flows (FCF*) in %
Repurchasing Firms (n=381)

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Mean[a]	28.59	22.17**	24.68*	21.52**	19.98***
Median[b]	30.64	25.79	22.69*	24.66**	21.21***
Standard Deviation	23.91	22.84	17.71	23.90	27.01

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3) and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3) and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3) and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program. The mean and median results are pooled averages over all intervals of time.

To summarize, data partitions by size have revealed a strong size effect in the FCF* performance of repurchasing companies. The sharp decline in FCF* in the year of the share repurchase is mainly driven by small firms.

Evident in Table 2, is a decline in the relative net operating flows (NOF*) from operations in both the year of the repurchase strategy and in the subsequent post announcement period. The decline is most severe in the year of the announced strategy but is significant over all intervals. What is causing the decline in NOF*? It is apparent that additional relative inflows are growing at a faster rate than NOF*. The main contributors to this additional inflow are relative working capital flows (see Table 4) and net financing flows. Net financing flows, in particular, the additional usage of debt capital by repurchasing companies is a major contributor to the incremental higher flows.

TABLE 2
Relative Net Operating Flows (NOF*) in %
Repurchasing Firms (n=381)
1978 – 1999

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Mean[a]	62.99	57.28***	58.08**	56.81***	59.67***
Median[b]	66.57	61.51*	65.15**	58.34**	57.96***
Standard Deviation	19.21	24.42	17.86	20.01	24.97

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3) and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3) and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3) and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.

In Appendix Table A2, relative operating flows by size are tabulated. The results indicate that differences do exist across size groupings. For the smallest group of companies, repurchasing companies show a significant decline from the period preceding the announced program to all periods subsequent. In the one year following the announced program NOF* has declined from 57.86% to 43.36%. In the larger company groups the NOF* patterns are generally flat over the period of the study. No statistical NOF* significant differences exist within each of these groups or when compared to each other. Application of the Wilcoxon Rank-Sum test statistic indicates the median group of repurchasing companies do show lower absolute levels of NOF* across all time periods. Clearly a repurchasing program used by small companies as a vehicle to change future strategy has been unsuccessful in generating higher future NOF*.

In practice there exists a number of differing perspectives linking share repurchase activity to capital expenditure programs. Understanding the linkage and the direction of that linkage is central to the assessment of long-run firm value creation. For example, management teams may embark on share buyback programs to signal future confidence and higher levels of future cash flow. Alternatively, cash flowing to repurchase shares may result in less cash to invest in capital expenditure. Another interpretation of the signal by investors is the company lacks attractive investment opportunities.

An analysis of NIF* (Table 3) indicates general support for the intuitive argument of higher relative NIF* outflows following a repurchase announcement. In the one year post announcement period the level of repurchasing firm NIF* rises by 12.0% from the pre announcement period, giving some credibility to a cash flow signaling effect. Over the long-term the mean level of NIF* is statistically greater than that existing prior to the repurchase program.

TABLE 3
Relative Net Investment Flows (NIF*) in %
Repurchasing Firms (n=381)
1978 – 1999

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Mean[a]	-31.81	-31.83	-34.91	-32.49*	-35.66**
Median[b]	-32.02	-34.21**	-30.49	-31.81	-34.69**
Standard Deviation	21.12	24.02	17.60	19.63	23.01

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3) and post (1) within repurchasing firms.

[b] Wilcoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3) and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3) and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.

To gain an additional perspective on NIF*, relative flows were analyzed on the basis of size. Appendix Table A3 presents a number of descriptive and summary statistics. An examination of Table A3 reveals a number of interesting trends. Firstly, NIF* outflows are an increasing function of firm size. Secondly, over time the level of volatility in NIF* declines. Thirdly, the smallest group of repurchasing companies show significant increases in NIF* in post announcement periods relative to NIF* prior to repurchase activity. Significant differences between the pre announced period and subsequent periods are evident in the year of the announced repurchase as well as in the subsequent one and three year period. It is interesting to study the behavior of these small companies. They have significantly increased NIF* in the year of repurchase, yet their NOF* is falling. The level of NIF* outflows is sustained at a level higher than that existing prior to the repurchasing program. With a continued deterioration in NOF* this maybe suggestive of an agency problem. Small repurchasing firms are channeling resources into investment flows, but ex post, these investment flows are not generating significantly higher NOF*. Alternatively, management may be coupling the repurchase strategy with higher investment outflows to strengthen the costly signal received by the market. Again, this strategy appears to have limited success.

Drawing conclusions and inferences is difficult. It could be that large firms are using the repurchase mechanism as a means of distributing excess cash. Alternatively, small companies see share repurchasing and higher capital expenditure as a means of signaling higher future cash flow. There is however, no evidence to suggest higher sustainable future cash flows in small firms.

In the context of the current study, share repurchases are perceived to be a signal which generates positive change in a firm's strategic outlook. As such the prediction is for higher relative net working capital outflows.

Within the repurchasing companies the decline in NWC* from the pre announcement period is significant in the year of the announced program, for the three years subsequent to the repurchase announcement and for all years after the repurchase program till 1999, the final year of the analysis. Interpretation of these results needs to be in light of the large standard deviations in NWC* for both groups. The application of median tests (Table 4) uncovered significant post announcement differences in working capital commitments of repurchasing firms.

The repurchasing companies show a substantially lower level of NWC* outflows subsequent to the repurchase program. The decline in NWC* reaches a maximum for the period pre to post three years. Why is there such a dramatic difference? The answer could, for example, lie in a planned reduction in inventory levels, reduction in accounts receivable as a result of a general deterioration in sales or increased efficiencies in working capital management.

TABLE 4
Relative Net Working Capital Flows (NWC*) in %
Repurchasing Firms (n=381)
1978 – 1999

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Mean[a]	-6.60	-3.05**	-5.19***	-4.51***	-4.17
Median[b]	-5.60	-2.56**	-3.72**	-2.40**	-3.18*
Standard Deviation	14.15	20.40	12.71	12.84	17.80

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3) and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3) and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3) and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.

When NWC* is partitioned by size a number of additional insights are obtained. Appendix Table A4 clearly indicates that for all size groupings, NWC* outflows are smaller for all periods subsequent to repurchase announcement.

The most significant reduction in NWC* expenditures occurs in the smallest group of companies. In the spot year, year of announced program, NWC* outflows for repurchasing companies show highly significant declines from the pre announcement period to the year of the repurchase, for the three year period proceeding the announcement, and for all periods subsequent to the announcement. Differences in median performance reported in Appendix Table A4 ratify the above results. An indirect result may be that part of the strategy may be the use of working capital to help support funding for the repurchase program, thereby differentiating the styles of management controls in repurchasing and non-repurchasing firms. Similarly, for the largest firm value repurchasing companies the decline in NWC* outflows is most pronounced in the pre to announcement (spot) year.

There does exist a clear cash flow effect leading up to the announcement period. Excess cash in the pre-announcement period is one clear motivating factor for the repurchase decision. In the post-announcement period, NCF* (Appendix Table A5) for repurchasing companies has generally remained constant. There is decline in the year following the announcement possibly caused by a continuation of the funding needs for the previously announced programs.

Meaningful differences do become apparent when size differentials are considered. For the largest size group of repurchasing companies NCF* is substantially larger in all periods subsequent to the repurchase announcement. This indicates a strong cash flow effect as a motivator in the decision to repurchase shares.

The above result is in contrast to that found in the smallest group of companies. For the same repurchasing companies NCF* declines following the share repurchase strategy. Excess cash in the pre-announcement period appears to be effected by firm size. Small firms have the highest level of excess cash in the pre-announcement period.

The NCF findings across size differentials gives further support to a cash flow effect in the repurchase decision. Particularly evident is the significant differences in NCF in the large firm value companies.

As evidenced by Appendix Table A6, repurchase companies in the year of announcement show a significant increase in NFF*. Companies appear to be evidently increasing their reliance on financing flows to help fund the repurchase decision. Subsequent to the repurchase decision, NFF* declines in repurchasing companies which could be interpreted as a cash flow effect or a cash flow signaling effect. It is evident that the decision to repurchase has promulgated higher future cash flows reducing the reliance on external financing, a finding which gives strong support to a signaling hypothesis. Overall support for the findings can also be obtained in conjunction with an analysis of NOF as it is generally supported that NFF* is negatively related to NOF*.

The difference in NFF* between the sample groups is primarily due to size effect. When partitioning by size (Appendix Table A6), the greatest differences occurs when comparing the NFF* of small firm size repurchasing companies. Small repurchasing firms have started to place reliance on external financing from the year of the announced strategy and continuing into the long-term. For example: in the year of the repurchase, NFF* rose 9.96% from a pre-announcement NFF* mean of -1.09%. Small firms are either using all their operating funds or are using external funds as a way of funding the repurchase decision.

Summary Analysis

In summary form, Table 5 presents the percentage contributions each fund flow component makes to the total funds flow. The percentage contribution of each component is based on the concept that the sum of the inflows equals the sum of the outflows. The information not only provides management with better diagnostic capabilities but is a way of introducing an integrated financial statement useful for measuring the overall effectiveness of management.

TABLE 5
Mean Relative Contributions of Cash Flow Components
Repurchasing Firms

		Pre#	Spot	Post (1-t)	Post (3)	Post (1)
INFLOWS						
Net Operating	($mm)	317.26	362.81	470.42	398.51	409.73
	(%)	62.89	57.00	59.74	58.66	57.71
Payables	($mm)	49.47	69.81	68.72	62.48	57.56
	(%)	11.84	11.74	10.25	9.99	10.00
Other CL	($mm)	47.28	82.09	110.95	89.79	104.60
	(%)	9.46	12.46	15.12	12.77	13.69
Net Other A&L	($mm)	10.52	20.35	25.11	23.47	22.91
	(%)	1.39	5.02	3.88	3.66	3.21
Net Financial	($mm)	26.11	68.49	29.47	65.03	49.42
	(%)	5.26	10.13	4.08	9.28	5.96
Interest Income	($mm)	21.66	25.78	21.29	16.47	15.02
	(%)	4.35	4.87	12.74	2.31	2.13
Net Inflow	($mm)	503.12	678.11	787.45	707.32	717.28
	(%)	100	100	100	100	100

Table 5 continues on next page.

In evaluating the cash flow performance a hierachy of relationships emerge, namely:

- Repurchasing firms experience deteriorating relative net operating (NOF*) inflows.
- Repurchasing firm's relative net investment (NIF*) outflows increase subsequent to a repurchase strategy.
- Repurchasing firm's relative net working capital (NWC*) outflows decline post repurchase strategy.

The results also show a continuous deterioration in the free cash flows performance of repurchasing companies, an outcome driven by higher relative net investment flows. It would appear as if the process of repurchasing signals a healthy future investment opportunity set.

It is also clear that operating performance as measured by working capital, operating and financial flows differ pre and post repurchase strategy.

Impact of Offer Type

A company can repurchase its stock using a number of different mechanisms. Of importance in the current study is open market repurchases (OM), fixed price intrafirm tender offers (FP), and the dutch auction tender offer (DA) mechanisms.

TABLE 5 (continued)
Mean Relative Contributions of Cash Flow Components
Repurchasing Firms

		Pre#	Spot	Post (1-t)	Post (3)	Post (1)
OUTFLOWS						
Net Investment	($mm)	156.47	213.77	252.31	244.63	346.21
	(%)	31.31	31.72	31.88	34.64	31.69
Inventories	($mm)	65.90	54.40	82.49	72.30	76.79
	(%)	13.40	8.16	10.62	10.41	10.73
Other CA	($mm)	38.25	46.83	61.40	50.98	65.96
	(%)	7.67	6.93	8.31	6.70	9.28
Dividends	($mm)	42.62	50.58	63.42	55.11	51.80
	(%)	7.48	7.21	7.07	6.71	8.18
Interest Expense	($mm)	59.38	70.98	90.93	95.96	91.04
	(%)	11.89	11.579	11.566	13.572	12.762
Receivables	($mm)	36.71	33.49	61.33	26.85	34.79
	(%)	8.40	5.50	8.82	5.87	3.81
Change in Cash	($mm)	101.89	201.37	172.38	156.91	156.32
	(%)	20.12	29.79	21.95	20.20	24.82
Net Outflows	($mm)	503.14	678.11	787.45	707.36	717.22
	(%)	100	100	100	100	100

In theory the sum of the inflows should equal the sum of the outflows. The pragmatic impact of rounding and missing data items reduces the validity of the theoretical model. Adjustments were made in order to equate net inflows with net outflows. The balancing adjustments were made in the change in cash component.

A substantial body of literature is now centered on the valuation and strategic impact of these mechanisms. There also exists a general consensus that fixed price repurchases are the most effective signal of undervaluation and is motivated by the payment of a known repurchase premium. In order of magnitude the FP signal is followed by DA and OM repurchases (Persons, 1994; Comment & Jarrell, 1995; Kamma, Kanats, & Raymar, 1990). By partitioning the aggregate sample according to offer mechanisms an additional insight is gained into underlying differences in the cash flow components.

Findings in Table 6 indicate that companies embarking on tender offer buyback programs (FP, 19.5%, DA,17.8%) aim to repurchase larger numbers of shares outstanding than those companies using an open market mechanism (11.6%). Inferences about the differences between the mean repurchase quantities support the above assertion.

TABLE 6
Announced Stock Repurchases as Reported in the Wall Street Journal

PANEL A: by percentage repurchased		ALL	FP	DA	OM
Number of Offers	mean	381	81	49	251
Shares Sought[a]	median	14.4	19.6	17.7	11.2
	std dev	13.8	14.1	15.9	9.9

FP = Fixed price Self Tender Offer
DA = Dutch Auction Self Tender Offer
OM = Open Market Repurchase

Difference in Sample Means

t[b] Statistic		
DA, OM	3.729***	(p value = .001)
FP, DA	1.152	(p value = .880)
FP, OM	3.113***	(p value = .000)

[a] Announced percentage of stock to be repurchased by year and is ratio of the value of repurchase to the market value of firm's equity. The public announcement of a share repurchase program can take the form of the percentage of issued capital to be repurchased, the total cost of the repurchase, or the number of shares to be repurchased. Where the total cost was given, the end of year stock price and quantity of share outstanding was obtained from Standard and Poor's stock guides and the annual Compustat file and computed as announced number of shares outstanding at the beginning of the repurchase month. If a dollar value is given then the number of shares is computed using the stock price at the beginning of the repurchase month.

[b] Two-tailed test significance. ***denotes significance at the 1% level, **significance at the 5% level and *at the 10% level.

To better understand the cash flow story, cash flow component analysis was undertaken on the three sub-groups. With the exception of the Dutch Auction group of repurchasing companies, the findings were consistent with those of the total sample group. Contrary to the cash flow performance of FP and OM repurchasing companies, analysis of the sample of DA repurchasing companies revealed significant improvement in NOF* and NIF* flows.

There are numerous non-mutually exclusive interpretations that can be placed on the above findings. There may, for example, exist a size effect since companies using DA tend to be in the domain of only the largest capitalized companies. There may be a period effect as the use of DA as a repurchase mechanism reached a pinnacle in the 1984-1988 period. There may exist a corporate control factor, given that DA have been shown (see Persons, 1994) to be the most effective takeover deterrent. The threat of a possible takeover may, for example, give rise to a "kick in the pants" solution where managers under the threat of dismissal refocus their attention on the business. Why is the performance of OM and FP companies disappointing relative to DA companies following the repurchase event? It could be that the use of OM and FP repurchases may not be strategically aligned but simple, the action of a company with excess cash.

CONCLUSION

In a decision to repurchase shares management may wish to send a signal to the market that the company's shares are undervalued. In this case the company will aim to repurchase its shares when the value of that share is perceived by the management of the company to be trading below its true or intrinsic value. Alternatively, management may be motivated by one or more of a number of previously, defined reasons, for example, excess cash, dividend substitution, leverage adjustment, or initiating a repurchase program. Whatever the reason, the end result should be a course of action inspired by the premise of shareholder wealth maximization likely to improve a firm's FCF.

A key objective in this study is the assessment of the relationship between changes in firm's cash flow components prior to and following a decision to repurchase. The findings support free cash flow as a primary driver for repurchasing stock. On the contrary we found no evidence to support the hypothesis (H_1) that a repurchase strategy is a course of action designed to improve a firms FCF* postion subsquent to a repurchasing strategy. Likewise, the relative net operating flows (NOF*) in the repurchase sample declined in the post-announcement period. As such we are unable to support the hypothesis (H_2) of a higher NOF* performance in the post repurchase period. The decline in NOF* is due in large part to the performance of small firms together with the reliance of repurchasing companies on other inflows, for example, net financial (higher NFF* debt inflows) and a reduction in working capital. For the smallest group of repurchasing companies a significant decline in NOF* is evident from the period preceding the announced program to all subsequent periods.

Repurchasing companies, during the period of repurchase activity, expend greater resources on investment flows. Over the short to median terms subsquent to a repurchase strategy, NIF* is significantly higher and lends support to H_3. Over the long-term, the level of NIF* does however approximate that existing prior to the repurchase program. It is possible that repurchasing companies may be coupling higher investment outflows with the repurchaing strategy to strengthen the signal of higher potential future cash flows.

Within the repurchasing companies the most significant find was a sharp decline in NWC* in the year of the share repurchase program. The reduction in in NWC* could be due, for example, to a planned reduction in inventory levels, reduction in accounts receivable or increased efficiencies in working capital management. Alternatively, the strategy may be to reduce working capital in order to help fund the repurchase program. The reduction in NWC* was also evident in all periods subsequent to the repurchase leading to a rejection of H_4.

There exists a clear cash flow effect leading up to the announced repurchase strategy. In the post-repurchase period there is no evidence to suggest higher NCF* and as such we are unable to support H_4. There is however, continued evidence of a size effect in the NCF*. For the largest size group of repurchasing companies, NCF* is substantially larger than it is for the smallest group of repurcahing companies. For the smallest group of companies, NCF* significantly declines following the share repurchase strategy.

Contrary to the hypothesized relationship in H_5, the study indicates an increased reliance on external financing at the time of the repurchase strategy. This increased reliance on external funds does not significantly decline subsquent to the repurchase strategy.

In conclusion, when partitioning the sample on the basis of offer types, those companies using DA as an offer mechanism showed significant improvement in NOF* and NIF* performance subsquent to the repurchase strategy.

REFERENCES

Dann, L. (1981). Common stock repurchases. *Journal of Financial Economics, 9*, 113-138.

Donaldson, G. (1961). *Corporate debt capacity: A study of corporate debt policy and the determination of corporate debt capacity.* Working Paper, Harvard University.

Comment, R., & Jarrell, G. (1995). Corporate focus and stock returns. *Journal of Financial Economics, 37*, 67-87.

Copeland, T., Koller, T., & Murrin, J. (1996). *Valuation: Measuring and managing the value of companies* (2nd ed.). New York: John Wiley.

Evans, J. (1998). *Do strategic share repurchase programs create long run firm value?* Unpublished doctoral dissertation, University of Illinois, Urbana Champaign.

Evans, J., & Gentry, J. A. (2000). *Do strategic share repurchase programs create firm value?* Working Paper, Curtin University of Technology, Australia.

Evans, J., & Gentry J. A. (2001, March). The financial characteristics of share repurchase companies: A comparative analysis. *Finance India: The Quarterly Journal of Finance, 15* (1).

Fazzari, S., & Petersen, B. (1993). Investment smoothing with working capital: New evidence on the impact of financial constraints. *The Rand Journal of Economics, 24*, 328-342.

Gentry, J. (1996), Assessing strategic performance with cash flow components. *Global Finance 2000,* Published by The Conference Board Inc., 65-70.

Gentry, J. A., Newbold, P., & Whitford, D. T. (1985). Classifying bankrupt firms with funds flow components. *Journal of Accounting Research, 23*, 146-160.

Gentry, J. A., Newbold, P., & Whitford, D. T. (1990). Profiles of cash flow components. *Financial Analyst Journal, 46*(4), 41-48.

Hackel, K. S., & Livnat, J. (1992). *Cash flow and security analysis.* Homewood, IL.: Business One Irwin.

Helfert, E. A. (1982). *Techniques of financial analysis,* (5th ed.). Homewood, IL: R.D. Irwin.

Higgins, R. (1972, March). The corporate-dividend saving decision. *Journal of Financial and Quantitative Analysis*, 1527-1541.

Jensen, M. (1986). Agency costs of free cash flow corporate finance, and the market for takeovers. *American Economic Review, 76*, 323-328.

Kaplan, S. N., & Ruback, R. S. (1995). The valuation of cash flow forecasts: An empirical analysis. *Journal of Finance, 50*, 1059-1093.

Kamma, S., Kanatas, G., & Raymar, S. (1990). *Dutch auctions versus fixed price self tender offers for common stock: An empirical examination.* Working Paper, Indiana University.

Lehn, K., & Poulsen, A. (1989). Free cash flow and stockholder gains in going private transactions. *Journal of Finance, 44*(3), 771-787.

Myers, S. C., & Masluf, N. F. (1984). Corporate financing and investment decisions when firms have information that investors do not. *Journal of Financial Economics, 13*, 187-220.

Nohel, T., & Tarhan, V. (1998). Share repurchases and firm performance: New evidence on the agency costs of free cash flow. *Journal of Financial Economics, 49*, 187-222.

Palepu, K. (1985). Diversification strategy, profit performance and the entropy measure. *Strategic Management Journal, 6*, 239-255.

Persons, J. C. (1994, September). Signaling and takeover deterrence with stock repurchases: Dutch auctions versus fixed price tender offers. *The Journal of Finance, 4*, 1373-1402.

Perfect, S., Peterson, D., & Peterson, P. (1995). Self tender offers: The effects of free cash flow, cash flow signaling, and the measurement of Tobin's Q. *Journal of Banking and Finance, 19*, 1005-1023.

Stephens, C. P., & Weisbach, M .S. (1998). Actual share reacquisitions in open-market repurchase programs. *Journal of Finance, 53*(1), 313-333.

Vermaelen, T. (1981). Common stock repurchases and market signaling. *Journal of Financial Economics*, 139-183.

Wansley, J., Lane, W., & Sarkar, S. (1989). Management's view on share repurchase and tender offer premiums. *Financial Management*, 18(3), 97-109.

Young, A. (1969, July/August). Financial, operating and security market parameters of repurchasing. *Financial Analyst Journal*, 123-128.

APPENDIX

TABLE A1
Relative Free Cash Flow (FCF*)
Repurchasing Firms (Grouped by Size)

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Firm Size >$2.0[b]					
N=82					
Mean (%)	22.77	26.34	25.57*	24.41	23.32
Median (%)	22.29	29.26	25.40	23.14	27.63
Standard Deviation (%)	20.63	27.42	17.18	21.38	25.37
Firm Size $300mm to $2.0[b]					
N=195					
Mean (%)	27.77	18.77*[a]	26.52	25.88	20.67
Median (%)	24.40	17.01*[b]	25.94	24.20	23.89
Standard Deviation (%)	21.50	27.75	14.64	19.99	30.23
Firm Size <$300mm					
N=102					
Mean (%)	24.80	14.68***	17.79	14.67	10.51
Median (%)	22.91	10.25***	22.41	13.04*	11.50
Standard Deviation (%)	28.61	26.91	19.46	26.20	31.31

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3), and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3), and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3), and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.

TABLE A2
Relative Net Operating Flows (NOF*)
Repurchasing Firms (Grouped by Size)

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Firm Size >$2.0[b]					
N = 102					
Mean (%)	64.24	58.26	64.29	62.34	62.96
Median (%)	67.47	59.27	68.84	66.33	63.79
Standard Deviation (%)	17.91	23.49	15.49	17.53	22.58
Firm Size $300mm to $2.0[b]					
N = 198					
Mean (%)	62.29	53.37*[a]	61.39	57.66	56.43
Median (%)	68.39	54.42**[b]	66.19	63.23	64.42
Standard Deviation (%)	23.30	19.95	18.75	20.37	26.43
Firm Size <$300mm					
N = 102					
Mean (%)	57.86	43.18***	47.12	46.94	43.36*
Median (%)	61.83	41.96***	51.39	54.39	45.85**[b]
Standard Deviation (%)	28.93	22.91	25.38	26.09	25.95

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3), and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3), and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3), and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.

TABLE A3
Relative Net Investment Flows (NIF*)
Repurchasing Firms (Grouped by Size)

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Firm Size >$2.0[b]					
N = 82					
Mean (%)	-38.47	-33.26	-35.41	-37.20	-37.41
Median (%)	-36.71	-35.11	-35.93	-35.17	-39.19
Standard Deviation (%)	18.58	27.49	16.27	18.30	21.31
Firm Size $300mm to $2.0[b]					
N = 192					
Mean (%)	-30.40	-29.84	-31.21	-30.52	-34.70
Median (%)	-29.27	-32.51	-30.37	-28.94	-33.47
Standard deviation (%)	23.49	24.9	15.18	20.00	28.16
Firm Size <$300mm					
N = 102					
Mean (%)	-24.72	-31.11***[a]	-28.51	-29.53**	-29.61*
Median (%)	-21.41	-31.7**[b]	-28.27	-30.52*	-26.84
Standard deviation (%)	18.10	21.08	18.44	19.51	21.63

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3), and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3), and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3), and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.

TABLE A4
Relative Net Working Capital (NWC*)
Repurchasing Firms (Grouped by Size)

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Firm Size >$2.0[b]					
N = 82					
Mean (%)	-6.92	-2.72*[a]	-6.38	-4.41	-3.75*
Median (%)	-4.98	-1.91*[b]	-4.14	-2.02**	-4.10
Standard Deviation (%)	14.67	22.86	11.88	13.37	20.10
Firm Size $300mm to $2.0[b]					
N = 192					
Mean (%)	-7.81	-8.82	-6.72	-4.27	-3.18
Median (%)	-5.73	-3.61	-2.64	-2.09	-1.50
Standard Deviation (%)	14.47	23.49	11.91	17.38	27.12
Firm Size <$300mm					
N = 102					
Mean (%)	-11.26	-1.10*	-4.94***	-6.63**	-6.49
Median (%)	-8.69	0.3**	-3.18**	-4.47*	-3.42
Standard deviation (%)	17.41	22.41	15.96	20.98	26.51

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3), and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3), and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1995. Post (3), and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.

TABLE A5
Relative Net Cash Flow (NCF*)
N = 381
Repurchasing Firms

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Mean (%)	14.27	13.36	12.67	10.41	10.21
Median (%)	13.84	17.74	14.19	12.63	13.17
Standard Deviation (%)	22.59	32.81	15.82	21.17	29.39
Firm Size >$2.0[b]					
N = 82					
Mean (%)	11.89	19.52	16.11	13.74	15.72
Median (%)	10.47	24.91**[b]	16.22	15.56	17.40*
Standard Deviation (%)	19.99	25.30	18.28	21.11	30.21
Firm Size $300mm to $2.0[b]					
N = 192					
Mean (%)	16.12	12.96	15.27	14.91	12.73
Median (%)	18.49	17.121	17.6	19.17	13.36
Standard Deviation (%)	25.3	27.68	16.58	27.48	30.07
Firm Size <$300mm					
N = 102					
Mean (%)	14.10	12.01	12.51	8.50	6.21***[a]
Median (%)	14.57	18.11	12.87	11.87	9.63
Standard Deviation (%)	31.52	26.47	22.42	28.61	21.82

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3), and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3), and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3), and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.

TABLE A6
Relative Net Financing Flows (NFF*)
N = 381
Repurchasing Firms

	Pre[#]	Spot	Post (1-t)	Post (3)	Post (1)
Mean (%)	5.29	9.10*	4.80	5.92	9.26
Median (%)	2.21	5.90**[b]	5.57	5.81*	5.90**
Standard Deviation (%)	18.57	31.91	12.81	19.55	29.17
Firm Size >$2.0[b]					
N = 82					
Mean (%)	7.40	8.38	6.31	5.28	8.18
Median (%)	4.17	9.21	4.62	6.36	4.91
Standard Deviation (%)	15.71	29.37	11.27	17.96	26.51
Firm Size $300mm to $2.0[b]					
N = 192					
Mean (%)	3.21	3.70	3.72	4.36	6.21
Median (%)	2.28	2.74	2.47	2.04	4.86
Standard Deviation (%)	19.40	23.50	10.79	18.78	35.16
Firm Size <$300mm					
N = 102					
Mean (%)	-1.09	9.91***[a]	2.89	1.77	5.51
Median (%)	-1.29	5.11***[b]	2.52	0.86	5.01***
Standard Deviation (%)	24.13	20.74	14.75	22.18	27.74

[a] Two-tailed test significance to test the hypothesis of zero mean within group differences between pre performance and spot, post (1-t), post (3), and post (1) within repurchasing firms.

[b] Wicoxon Rank-Sum (Z) test statistic to test the hypothesis of median zero within group differences between pre performance and spot, post (1-t), post (3), and post (1). *** denotes significance at the 1% level, ** at the 5% level and * at the 10% level.

[#] Intervals of time relative to announced repurchase strategy. Pre is the average 3 year performance prior to announced repurchase. Spot is the performance in the year of the repurchase. Post (1-t) is the average performance from the year subsequent to repurchase program for all years to 1999. Post (3), and post (1) measure performance in the 3 and 1 year interval subsequent to repurchase program.