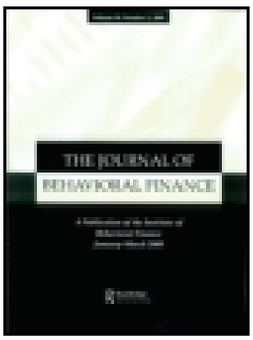

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Visibility, Institutional Preferences and Agency Considerations

Lucy F. Ackert and George Athanassakos

We show that market frictions and agency considerations are important concerns when institutional investors make portfolio allocation decisions. For a sample of widely followed firms, institutional holdings increase with increases in visibility as measured by the number of analysts following the firm. We also report a significant seasonal pattern in institutional holdings consistent with the gamesmanship hypothesis, which asserts that institutions rebalance their portfolios in response to agency considerations. Finally, we find that excess returns are highly seasonal with performance, deteriorating when the following by financial analysts increases. "Followed" firms actually exhibit inferior market performance over the 1981–1996 sample period.

Financial analysts produce a substantial amount of information on a large number of companies, although the intensity of their attention varies considerably. Some companies receive very intense coverage, with as many as fifty analysts reporting earnings estimates. But even some very large companies included in the S&P 500 were covered by only a few analysts in the 1980s (Arbel and Strebel, 1983).

Because security analysts promote firm visibility in their role as information intermediaries (Chung and Jo, 1996), we use analyst following to measure firm visibility. The significance of visibility cannot be understated, because investors are more likely to trade securities with which they are familiar (Kang and Stulz, 1997). Visibility is particularly critical for institutional investors whose portfolio decisions are commonly evaluated ex post and provide the basis for compensation (Haugen and Lakonishok, 1988).

But we still do not have a full understanding of how visibility affects institutional investors' portfolio allocation decisions and, in turn, equity market valuations. The purpose of this paper is threefold. We first examine how institutional investment varies across firm characteristics, including visibility. We then examine whether visibility impacts institutional managers' portfolio rebalancing strategies over the year, while recognizing that portfolio rebalancing may be driven by agency considerations. Institutional investors are self-interested economic agents, and agency considerations may significantly impact their behavior (Jensen and Meckling, 1976). Finally, we investigate how visibility affects the market's valuation of firms.

We begin by examining the pattern of institutional investment for a sample of widely followed firms. Falkenstein [1996] examines mutual fund preferences for selected stock characteristics and argues that market frictions influence portfolio decisions. One potential friction is information where information availability can drive the demand for a stock. Falkenstein shows that mutual fund equity holdings reveal a strong preference for highly visible stocks, where visibility is measured by media coverage.

Along with mutual funds, our study includes other financial institutions such as pension funds, endowments, and insurance companies. We measure visibility using analyst following because it proxies for the number of individuals who produce information about a firm (Bhushan, 1989). Brennan, Jegadeesh, and Swaminathan [1993] find that stock prices more quickly impound information for highly followed firms. Furthermore, because trading by better-informed investors imposes costs on less-informed market participants, higher analyst following is associated with reduced adverse selection costs (Brennan and Subrahmanyam, 1995). We find that institutional holdings increase as visibility increases, which provides more evidence that market frictions such as firm information impact portfolio decisions. We also find that institutional investment increases with firm size and decreases with increases in the price-to-earnings ratio.

We also investigate whether there is a seasonal pattern in institutional holdings driven by agency considerations. The agency cost model of managerial behavior provides a basis for the gamesmanship hypothesis, which suggests that institutional investors rebalance portfolio holdings over the year in order to

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influence their remuneration (Haugen and Lakonishok, 1988, Lakonishok et al., 1991, and Lee, Porter, and Powell, 1998).[1]

If institutional investors engage in performance hedging, they are more likely to take risks at the beginning of the year by moving funds into higher-risk securities in order to generate greater returns and outperform the benchmark against which their performance is judged. Because the performance of portfolio managers is generally evaluated (and bonuses paid) based on calendar year-ends, institutional investors have plenty of time to correct mistakes prior to year-end without jeopardizing their ranking.[2] As year-end approaches, portfolio managers can move from risky securities into those with lower risk if satisfactory returns are locked in. The lower-risk stocks are generally those of larger, highly visible firms.

Empirical support for gamesmanship on the part of institutional investors is provided by Ackert and Athanassakos [2000], who report strong seasonality in excess returns for a sample of widely followed firms. Their results indicate that institutions buy less visible stocks at the beginning of the year and rebalance their portfolios to include more visible firms near year-end. The Ackert and Athanassakos test, however, is an indirect test of the gamesmanship hypothesis. In our direct test of seasonality in institutional holdings we also find support for the gamesmanship hypothesis and the importance of agency considerations. The number of institutional investors in highly visible firms declines over the first part of the year and increases as year-end approaches.

Finally, we examine whether widely followed firms underperform relative to the market. Arbel, Carvell, and Strebel [1983] argue that less widely followed firms receive a return premium because financial institutions avoid holding their stocks. We examine the relationship between excess returns, institutional holdings, and analyst following and conclude that excess return decreases as visibility increases. Consistent with Merton's [1987] model of capital market equilibrium with incomplete information, excess return decreases with investor recognition. Because institutional investors demand the stock of highly visible firms, the equilibrium price is raised and, in turn, the return is lowered.

In the following section we discuss the importance of visibility to institutional ownership. In the third section, we review the sample selection methods and provide sample statistics. The fourth section reports the empirical evidence on institutional holdings. We discuss the results and directions for future research in the final section.

Institutional Investment and Visibility

We investigate the relationship between institutional investment and analyst following, our measure of firm visibility. A firm that is followed by many professional financial analysts is likely to be highly visible to investors. Because financial analysts produce information about the firms they follow, higher analyst following results in greater information availability. Thus, in acting as information intermediaries, security analysts directly affect firm visibility (Bhushan, 1989, Brennan, 1995, Chung and Jo, 1996). Furthermore, higher analyst following results in lower adverse selection costs (Brennan and Subrahmanyam, 1995). Because analysts monitor manager decisions, mismanagement is likely to be less prevalent in highly followed firms.

We first document the characteristics of a sample of widely followed firms, including variables that we expect to be associated with institutional ownership. Following Bhushan [1989] and O'Brien and Bhushan [1990], we measure institutional investment using the number of institutions holding a firm's stock. As Falkenstein [1996] documents for a sample of mutual funds, we expect to find that the level of institutional investment is related to security characteristics. We include firm size as measured by both the market value of equity and stock price, visibility as measured by the number of analysts providing earnings estimates, and risk and growth opportunities as measured by the price-to-earnings (P/E) ratio.

Previous research has found that institutional ownership increases with information generated about a firm and decreases with risk (O'Brien and Bhushan, 1990 and Falkenstein, 1996). Because greater information availability is associated with large, highly followed firms, we expect to find that more institutions invest in large firms that have high stock prices and greater analyst following.

Finally, we examine the relationship between institutional holdings and the P/E ratio. This ratio reflects two opposing forces: risk and growth opportunities. We expect institutional investment to decrease (increase) with increases in the P/E ratio if the effect of risk (growth potential) dominates.

In addition to firm characteristics, institutional behavior is related to agency considerations. Ackert and Athanassakos [2000] argue that managers rebalance their portfolios away from stock in highly visible firms at the beginning of the year and toward it at year-end in order to affect performance-based remuneration schemes.[3] Because selling pressure at the beginning of the year turns to buying pressure at year-end, seasonality in the returns of highly followed firms is expected. Ackert and Athanassakos find that the average return is lower in January than in other months of the year for their sample of highly visible firms, a seasonal pattern opposite in direction to that reported for small, low-stock price firms (Haugen and Lakonishok, 1988).

We further examine the role played by agency considerations in determining the behavior of institutional investors. If their behavior can be explained by the

gamesmanship hypothesis, institutional investors should rebalance their portfolios away from (toward) highly visible stock at the beginning (end) of the calendar year.[4] For a sample of visible firms, we examine the seasonal pattern in the number of institutional investors.

Finally, we examine whether visibility and agency-induced behavior by institutional investors impact expected returns. Merton [1987] posits a model in which expected return decreases as investor recognition increases. With higher recognition, demand increases, raising the price and lowering the expected return.

Arbel, Carvell, and Strebel [1983] find a strong "neglected-firm" effect, even after controlling for firm size. They report a negative relationship between excess return and the number of institutional investors. Similarly, Arbel and Strebel [1983] find that highly followed firms underperform after controlling for differences in risk using the capital asset pricing model (CAPM). We argue that the behavior of institutional investors is the driving force behind the underperformance of highly visible firms. Agency considerations heighten institutional investors' demand for stock in highly visible firms, which decreases expected returns at the end of the year. To provide insight into this issue, we examine the relationship between excess return and visibility after controlling for the seasonal pattern in returns.

Sample Selection

Analyst following, forecasts, and earnings data are obtained from the Institutional Brokers Estimate System (IBES) for each year of the 1981–1996 sample period. The firms included in the final sample passed through a set of filters, as follows:

1. The IBES database includes consensus forecasts for at least twelve consecutive months starting in January of the forecast year.
2. At least three individual forecasts determine the consensus forecast of earnings per share.
3. The company's fiscal year ends in December.
4. The Standard & Poor's Stock Guide contains information on institutional holdings, price per share, price-to-earnings ratio, and shares outstanding.
5. The CRSP NYSE/AMEX database includes returns data.

Conditions (1) and (2) ensure that the sample includes highly visible firms that are followed by analysts consistently over time. In imposing condition (3), we follow Givoly [1985] and exclude firms with non-December year-ends to ensure convenient and appropriate intertemporal comparisons over the cross-section and to impose the same forecast horizon for all firms. Conditions (4) and (5) give the firm characteristics and returns of interest. The final sample contains 72,141 observations for 455 firms. We compute monthly returns by compounding the daily returns for each firm using holding-period returns and excess return series. We obtain daily raw and beta excess returns from the CRSP database.[5]

In Table 1 we provide sample firm information for the overall sample, as well as for the first and last years of the sample. Sample statistics for 1981 and 1996 are reported for comparative purposes, and provide insight into how firm characteristics have evolved over time. Firm characteristics include the market value of equity, stock price, number of analysts providing earnings estimates, and P/E ratio.

The table first reports the mean market value and price, both of which increase over the sample period. Given that these firms are visible and followed by at least three analysts each month, many are large.[6] Note, however, that a significant number of sample firms are of small to moderate capitalization. We get some perspective on size by considering the size of firms included in small-cap indexes.

For example, the Wilshire Small Cap Index as of June 30, 1993, included 250 firms with a mean market value of $511 million.[7] The smallest firm in the Wilshire index had a market capitalization of $89 million and the largest had a capitalization of $1,461 million, suggesting that many of our sample firms can be classified as small. In fact, 38.87% of our sample firms had market capitalizations of less than $1,461 million in 1993. Analyst following varies considerably, with three to fifty-two analysts reporting earnings estimates each month. The average following for the overall sample and each sample year is substantial and is relatively constant across sample years.[8]

The table next reports summary statistics for the P/E ratio. Sample firms display divergent market valuations relative to current earnings and growth opportunities as measured by the P/E ratio, which varies from a minimum of 1 to a maximum of 134.[9] The observed P/E ratio is higher in 1996 than in 1981, and appears to trend upward over our sample period.

Table 1 also reports summary information on the institutional holdings in sample firms. The number of institutions over the full sample varies from 1 to 1,786, with a mean of 306. The average and median institutional holdings are substantial, although many sample firms are held by few institutional investors.

Patterns in Institutional Ownership and Visibility

We examine how institutional holdings vary across firm characteristics in Table 2. The number of institu-

Table 1. *Summary Statistics on Sample Firms*

	1981	1996	1981–1996
Number of firms	238	385	455
Market Value ($ millions)			
Mean	246.94	7,479.38	4,325.25
Median	250.26	2,693.25	1,690.72
Minimum	212.877	85.293	9.5121
Maximum	268.68	129,636.52	129,636.52
Std. Deviation	16.63	14,332.14	8,734.43
Stock Price ($)			
Mean	18.7293	34.8159	25.0684
Median	11.25	30.88	20.25
Minimum	0.72	1.3	0.72
Maximum	804.22	341	2,637.5
Std. Deviation	49.6084	22.474	49.0956
# earnings estimates			
Mean	14.7579	16.3675	17.5467
Median	14	15	16
Minimum	3	3	3
Maximum	31	43	52
Std. Deviation	5.3187	7.82437	7.85186
P/E ratio			
Mean	9.4583	18.0552	15.0079
Median	8	16	13
Minimum	3	3	1
Maximum	73	96	134
Std. Deviation	5.4886	10.5729	9.73982
# of institutions holding firm stock			
Mean	234.969	437.358	306.003
Median	170	340	233
Minimum	11	4	1
Maximum	1,532	1,640	1,786
Std. Deviation	213.303	310.99	246.558

Note: This table reports the number of firms included in the sample, as well as their characteristics. The full sample includes data from January 1981 through December 1996. For comparative purposes, the table reports summary information for 1981, 1996, and the full sample. Firm characteristics include market value of equity, stock price, the number of analysts providing earnings estimates, price-to-earnings ratio, and number of institutions holding the stock of sample firms.

tions holding a firm's stock is reported for quartiles sorted by firm characteristics including market value of equity, stock price, number of analysts providing earnings estimates, and P/E ratio. The table reports the average characteristic value for each quartile in the second column.

As expected, institutional holdings increase with market value, stock price, and analyst following quartiles. Larger firms, which tend to have higher stock prices, and highly followed firms have a richer information environment that draws institutional investors. Finally, because of the opposing forces of risk and growth opportunities, the relationship between institutional holdings and the P/E ratio could be positive or negative. The reported quartile averages suggest that growth is the countervailing force because institutional holdings increase with the P/E ratio.

To provide more insight into the pattern of institutional holdings across firm characteristics, we examine characteristics for quartiles sorted by the number of institutions holding a firm's stock. Table 3 reports the average value of each firm characteristic by institutional holding quartile. We find that when institutional holding is high, firms tend to be large, with high stock prices, many analysts producing earnings forecasts, and high P/E ratios.

Before formally testing the relationship between institutional holdings and firm characteristics in a multivariate regression, we examine appropriate transformations of the variables and their correlation structure. These transformations follow from Falkenstein [1996].

Table 4 reports the correlation matrix for the transformed variables, which include natural logarithms of the following firm characteristics: market value (MV), stock price (Pr), number of analysts providing earnings estimates (#Est), and P/E ratio. Market value is highly correlated with price and the number of earnings estimates. Because market value and price both measure firm size, regressions reported subsequently include only market value although inferences are similar if price (or the reciprocal of price) is included instead.

Table 2. *Institutional Holdings Sorted by Firm Characteristics: 1981–1996*

	Average Characteristic Value	# Institutions Holding
Market Value ($ millions)		
Q1 (low)	2,465.94	237.72
Q2	3,589.55	301.04
Q3	4,747.99	346.08
Q4 (high)	6,551.99	408.88
Stock Price ($)		
Q1	12.76	218.90
Q2	20.15	277.79
Q3	27.79	331.63
Q4	39.93	399.00
# earnings estimates		
Q1	13.36	259.08
Q2	17.29	309.17
Q3	19.53	328.29
Q4	22.49	352.41
P/E ratio		
Q1	9.04	257.23
Q2	12.64	326.82
Q3	15.92	335.16
Q4	25.22	336.28

Note: The number of institutions holding a firm's stock is reported for quartiles sorted by firm characteristics, including the market value of equity, stock price, number of analysts providing earnings estimates, and price-to-earnings ratio. In addition to average holdings, the table reports the average characteristic value for each quartile in the second column.

Table 3. *Firm Characteristics Sorted by Institutional Holdings: 1981–1996*

	Quartiles by the Number of Institutions Holding				
	Q1 (low)	Q2	Q3	Q4 (high)	t-statistic (Q4 – Q1)
# institutions holding	202.06	270.14	334.38	422.55	27.73**
Market Value ($ mil.)	2,624.58	3,764.07	4,893.89	6,746.58	31.71**
Stock Price ($)	18.83	21.87	28.34	37.77	34.63**
# earnings estimates	15.24	18.48	19.54	19.31	43.86**
P/E ratio	13.28	15.09	15.56	16.03	17.87**

Note: The table reports the average values of firm characteristics for quartiles sorted by the number of institutions holding a firm's stock. The first row of each panel reports the average quartile value of institutional holdings. The table also reports the average values of several firm characteristics including the market value of equity, stock price, number of analysts providing earnings estimates, and price-to-earnings ratio for each institutional holdings quartile. The final column reports a t-test of the null hypothesis that the difference between the first (Q1) and fourth (Q4) quartiles are equal.
**Indicates statistical significance at the 1% level.

Table 4. *Correlation Matrix for Institutional Holdings and Firm Characteristics*

	#Inst	MV	Pr	#Est	P/E
#Inst	1	0.90366 (0.0001)	0.39916 (0.0001)	0.68763 (0.0001)	0.10767 (0.0001)
MV	0.90366 (0.0001)	1	0.46995 (0.0001)	0.66964 (0.0001)	0.06879 (0.0001)
Pr	0.39916 (0.0001)	0.46995 (0.0001)	1	0.24148 (0.0001)	0.19535 (0.0001)
#Est	0.68763 (0.0001)	0.66964 (0.0001)	0.24148 (0.0001)	1	0.03257 (0.0001)
P/E	0.10767 (0.0001)	0.06879 (0.0001)	0.19535 (0.0001)	0.03257 (0.0001)	1

Note: The variables include the natural logarithm of the number of institutional investors (#Inst), as well as natural logarithms of the following firm characteristics: market value (MV), stock price (Pr), number of analysts providing earnings estimates (#Est), and price-to-earnings ratio (P/E). The table reports p-values below each estimated correlation.

The first estimated regression model examines the seasonal pattern in institutional holdings and the relationship between institutional holdings and various firm characteristics.[10] If institutional behavior is affected by agency considerations, managers rebalance their portfolios toward highly visible stocks at year-end and away from these stocks at the beginning of the year.

$$Y_{it} = \alpha_1 + \sum_{j=2}^{12} \alpha_j D_{j,t} + \sum_{k=1}^{k} B_k X_{k,i,t} + e_{i,t} \qquad (1)$$

We estimate the pooled cross-sectional, time series model, where $Y_{i,t}$ is the value of the dependent variable at time t for firm i, $D_{j,t}$ is a dummy variable taking the value of one for month j and zero otherwise, and $X_{k,i,t}$ is the value of the k-th independent variable at time t for firm i.[11] The intercept, α_1, reflects the sample average in January, and the coefficients of the dummy variables, α_j, measure monthly differences from the January base after taking into account the effects of the remaining independent variables.

In our first regression analysis, the dependent variable is the natural logarithm of the number of institutional investors (#Inst). The independent variables include seasonal dummy variables taking the value of one for each month from February through December, a dummy variable taking the value of one during the market crash months of September and October 1987 (SepOct87),[12] and the natural logarithms of firm characteristics including market value (MV), number of analysts providing earnings estimates (#Est), and P/E ratio. The model is estimated with the 57,865 observations for which we have complete data.

We use a single equation maximum likelihood procedure to correct for autocorrelation (Judge et al., 1985), as diagnostic tests indicated the presence of significant autocorrelation in the uncorrected residuals.[13] Additional diagnostic tests indicated that the maximum likelihood procedure adequately corrected for autocorrelation and that multicollinearity was not a problem.[14]

Table 5 reports the regression results for our model of institutional holdings, with t-statistics below each coefficient estimate and, in the final two rows, the regression R^2 and an F-test of the null hypothesis that all coefficients equal zero. The coefficient estimates provide support for our directional expectations concerning the effects of firm characteristics on institutional holdings. Institutional holdings are positively related to the market value of the firm and the degree of analyst following and negatively correlated with the P/E ratio. Once we control for the effects of other variables, the impact of risk dominates the relationship between institutional holdings and the P/E ratio.

The estimates reported in Table 5 also document strong seasonality in institutional investing after controlling for the remaining independent variables. January holdings are greater than holdings in February through May and lower than holdings in other months. The coefficient estimates indicate that institutional investors move away from our sample stocks at the beginning of the year. In the last months of the year this pattern reverses, as institutional investors add highly visible stocks back to their portfolios. In fact, when we compare the market value of stock in highly visible firms held by institutional investors in our sample, we find that these investors hold 13.8% more of the visible stock in December than in January of a given year. These results are consistent with the gamesmanship hypothesis and indicate that agency considerations play an important role in portfolio formation.

Lastly, we examine the seasonal pattern in excess returns and the relationship between excess returns and visibility. To examine the effect of agency considerations on expected returns, we estimate Equation (1), where the dependent variable is the firm's excess return calculated using portfolio rankings determined by beta. The independent variables include seasonal dummy variables taking the value of one for each month, a dummy variable taking the value of one during the market crash months of September and October 1987

Table 5. *Regression of Institutional Holdings on Seasonal Dummies and Firm Characteristics*

Intercept	3.3254	(80.64)**
February	–0.0168	(–10.70)**
March	–0.0050	(–2.41)*
April	–0.0135	(–5.61)**
May	–0.0044	(–1.70)
June	0.0041	(1.53)
July	0.0112	(4.16)**
August	0.0049	(1.87)
September	0.0001	(0.03)
October	0.0032	(1.34)
November	0.0079	(3.84)**
December	0.0063	(4.02)**
SeptOct87	–0.0255	(–11.17)**
MV	0.2443	(53.07)**
#Est	0.1369	(18.74)**
P/E	–0.0234	(–9.58)**
R^2	0.0959	
F-statistic	287.66**	

Note: The dependent variable is the natural logarithm of the number of institutional investors (#Inst). The independent variables include seasonal dummy variables taking the value of one for each month from February through December, a dummy variable taking the value of one during the market crash months of September and October 1987 (SepOct87), and the natural logarithms of firm characteristics including market value (MV), number of analysts providing earnings estimates or visibility (#Est), and price-to-earnings ratio (P/E). The model is estimated using a single equation maximum likelihood procedure to correct for autocorrelation. The table reports t-statistics in parentheses next to each coefficient estimate and, in the final two rows, the regression R^2 and an F-test of the null hypothesis that all coefficients equal zero.
**Statistically significant at the 1% level.
*Statistically significant at the 5% level.

(SepOct87), and the natural logarithms of firm characteristics including market value (MV), number of analysts providing earnings estimates or visibility (#Est), and P/E ratio. The natural logarithm of #Est is our proxy for visibility. Because diagnostic tests failed to indicate the presence of non-standard residuals, the model is estimated with the 43,408 observations for which we have complete data using ordinary least squares.

Table 6 reports each coefficient estimate, with t-statistics below and, in the final two rows, the regression R^2 and an F-test of the null hypothesis that all coefficients equal zero. Agency-motivated behavior by institutional investors has an important effect on market pricing. The estimated coefficient of the number of analysts is negative, indicating that highly followed firms earn negative abnormal returns, consistent with Arbel and Strebel's [1983] empirical results and Merton's model [1987].[15]

In contrast to "neglected" firms that outperform the market, our "followed" firms underperform. Interestingly, it is not the largest firms that have the lowest abnormal returns or those with high P/E ratios. We find that excess returns are lower for firms with lower market value and P/E ratios. Furthermore, strong seasonality in excess returns is documented: January returns are significantly lower than in all other months.

Consistent with the results reported by Ackert and Athanassakos [2000], the pattern in returns is opposite to that reported for samples of small, low-priced stock. Rather than earning positive abnormal returns in January, the sample of highly followed firms earned *negative* abnormal returns after controlling for visibility.

Table 6. *Regression of Excess Returns on Seasonal Dummies and Firm Characteristics*

Intercept	–0.0496	(–16.94)**
February	0.0092	(6.00)**
March	0.0139	(9.02)**
April	0.0211	(13.66)**
May	0.0242	(15.95)**
June	0.0255	(16.84)**
July	0.0245	(16.13)**
August	0.0239	(15.73)**
September	0.0110	(6.13)**
October	0.0350	(23.36)**
November	0.0261	(17.40)**
December	0.0230	(15.30)**
SeptOct87	0.0097	(8.85)**
MV	0.0012	(3.37)**
#Est	–0.0035	(–3.78)**
P/E	0.0096	(14.66)**
R^2	0.0241	
F-statistic	71.47**	

Note: The dependent variable is the firm's excess return where excess returns are calculated using portfolio rankings determined by beta. The independent variables include seasonal dummy variables taking the value of one for each month from February through December, a dummy variable taking the value of one during the market crash months of September and October 1987 (SepOct87), and the natural logarithms of firm characteristics including market value (MV), number of analysts providing earnings estimates or visibility (#Est), and price-to-earnings ratio (P/E). The model is estimated using ordinary least squares. The table reports t-statistics in parentheses next to each coefficient estimate and, in the final two rows, the regression R^2 and an F-test of the null hypothesis that all coefficients equal zero.

**Statistically significant at the 1% level.

*Statistically significant at the 5% level.

Discussion of Results and Conclusion

We show that market frictions are important concerns for institutional investors when they make portfolio allocation decisions. The availability of information about a firm is a significant friction, so that institutional holding increases with market value and firm visibility as proxied by the number of analysts following the firm.

We also report a significant seasonal pattern in institutional holdings. We find that institutions adjust their portfolios away from highly visible firms at the beginning of the year, but increase their holdings in these firms as year-end approaches. This pattern is consistent with the gamesmanship hypothesis, which asserts that institutions rebalance their portfolios due to agency considerations.

We find that seasonality in excess returns is not a phenomenon observed only for small-firm stocks or for those with low prices. For a sample of highly followed firms, strong seasonality in excess returns is reported, but with unusually *low* excess returns in January. According to the gamesmanship hypothesis, we would expect to see the seasonal pattern reported here for highly followed firms. As financial institutions rebalance their portfolios in January to sell the stock of highly visible firms acquired toward the end of the previous year, there is downward price pressure in January. This downward pressure is alleviated over the year. Our results suggest that gamesmanship is an important determinant of the seasonal pattern in stock returns. Finally, we find that performance deteriorates as the following by financial analysts increases. "Followed" firms actually exhibit inferior market performance.

Clearly, institutional investors are a large force in the U.S. market and their behavior has a significant impact on stock price movements. Our results indicate that firm characteristics and agency considerations are important when institutional investors form equity portfolios. It is most interesting to note that financial analysts affect stock prices both directly as information intermediaries and indirectly through institutional investors. Because institutions are evaluated ex post based on portfolio performance, firm visibility as measured by analyst following is critical in their decision-making process.

Our understanding of their decision process, however, remains incomplete. For example, future research could examine how institutional investors are affected by information quality. Analyst forecasts are not identical in terms of informativeness, with higher analyst quality reflected in forecast accuracy or inclusion in the *Institutional Investor* All-American Research Team. Stickel [1992] concludes that the All-American analysts impact prices more than other analysts, they are better forecasters, and they are paid more.

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Notes

1. According to Haugen and Lakonishok [1988], gamesmanship also takes the form of window dressing, in which case portfolio managers are concerned about their portfolios containing marginal investments in unknown firms at the end of the year. Institutional investors buy risky securities at the beginning of the year and, as returns are locked in over the year, they rebalance their portfolios to include well-known securities. Our focus is on performance hedging, although the seasonality we document is also consistent with window dressing for institutions whose fiscal year-end is December. Because we are unable to identify the fiscal year for the institutional investors in our sample firms, we cannot shed light on the window dressing hypothesis here.
2. Bonuses based on calendar-year performance are reported in the popular press. See, for example, Hulbert [1998, 1999]. In the academic literature, Cuny, Fedenia, and Haugen [1996] argue that annual compensation schedules influence the behavior of professional money managers. In addition, Lakonishok et al. [1991] provide empirical support for the proposition that pension fund managers sell poorly performing stocks particularly in the fourth quarter of the year.
3. See also Haugen and Lakonishok [1988].
4. Many performance-ranking organizations such as Morningstar use annual performance to rate funds. The managers of these funds are then remunerated based on their performance relative to their peers or a benchmark index over the calendar year. Thus, the calendar year is the significant time period.
5. Recent evidence supports the use of beta as a measure of risk (Pettengill, Sundaram, and Mathur, 1995). The CRSP daily excess return is the excess of the daily return above that on a portfolio of stocks with similar risk. Benchmark portfolios are defined using portfolio rankings determined by beta values (beta excess return) for the entire population of firms included in the CRSP database.
6. For some perspective on size for our sample firms, see the market value quartiles reported in Table 2.
7. See the July 1993 Chicago Board of Trade Supplement.
8. Although not reported in Table 1, the mean of the consensus forecasts of annual earnings per share exceeds the mean of actual earnings. This suggests that analysts are optimistic in their earnings predictions for the overall sample, which is consistent with prior research (e.g., Ali, Klein, and Rosenfeld, 1992).
9. Firms with negative profits are excluded from the analysis because the Standard & Poor's Stock Guide does not report their P/E ratios.
10. Analyst decisions to follow a firm and institutional investor decisions to hold the firm's stock are intertwined (O'Brien and Bhushan, 1990). As pointed out by Bhushan [1989], the number of institutions holding a firm's shares impacts the demand and supply of analysts following the firm. If institutions use outside analysts to procure information about a firm, demand for their services will increase with the number of institutional investors. In addition, because analysts attempt to generate transactions business, the supply of analysts following a firm is likely to be large when the number of institutional investors is high. Unlike O'Brien and Bhushan's [1990] work, however, our purpose here is to examine the portfolio decisions of institutions using analyst following to measure visibility.

    Furthermore, endogeneity tests (Hausman, 1978, 1983 and Beaver, McAnally, and Stinson, 1997) did not support a simultaneous equations approach to examine institutions' decisions. As a result, we do not use a simultaneous equations model. However, to investigate whether inferences change in a simultaneous model, we estimated a system with the dependent variables being the number of analysts following and the number of institutional investors. In the institutional holdings regression, some relationships carried over from the single equation results. For example, the effects of firm size and the P/E ratio remained positive and negative. However, our visibility measure, the number of analysts' estimates, was not significant.
11. Falkenstein [1996] uses a censored regression model to examine the effects of various firm characteristics on mutual fund ownership. In his case, a censored approach is appropriate because some sample funds hold short positions. The dependent variable in our sample, the number of institutions holding the firm's shares, takes a minimum value of one.
12. We include the SepOct87 dummy variable to control for extreme market behavior during that time.
13. Although others have used a simultaneous equations approach (see O'Brien and Bhushan, 1990), a single equation estimation technique is appropriate given the results of diagnostic tests. Furthermore, our motivation differs from O'Brien and Bhushan's, who examine the joint decision environment of analysts and institutions and how they respond to each other. We examine the portfolio allocation decisions of institutional investors and include analyst following to proxy firm visibility, rather than to measure how institutions respond to analysts.
14. In addition to using the maximum likelihood technique, we estimated the institutional holdings regression using first differences, but the results indicate that an autocorrelation problem may still remain. The maximum likelihood technique provides efficient estimates when the error term is an autoregressive process (Judge et al., 1985). Durbin–Watson tests indicated that no autocorrelation problem remained. Computed variance inflation factors indicated that collinearity was not a problem (Kennedy, 1992).
15. We re-estimated the regression including the number of institutional investors as the independent variable. The coefficient estimate again was negative and significant. When we included both the number of estimates and institutions, the coefficients were insignificant due to multicollinearity. From Table 4 we see that the two variables are highly correlated (0.69).

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