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# THE MARKETING OF CLOSED-END FUND IPOS: EVIDENCE FROM TRANSACTIONS DATA

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# The Marketing of Closed-end Fund IPOs: Evidence from Transactions Data

**Abstract:** We examine aftermarket transactions data for closed-end fund IPOs and document large sell-to-buy imbalances in the first days of trading. Despite this selling pressure, we observe little initial price movement, followed by sharp price drops and significantly wider spreads. We find that the timing of the subsequent price drop is related to both the initial selling imbalance and use of the over-allotment option. These findings suggest that lead underwriters are stabilizing and managing the supply of shares in the aftermarket. Buys (sells) are mainly small (large) trades, and small traders fare significantly worse than large traders. We conclude that closed-end fund IPOs are "marketed" to a poorly informed public.

## 1. Introduction

The anomalous price behavior of closed-end fund initial public offerings (IPOs) is well-documented. While industrial IPOs have an average initial day return of approximately 16%, closed-end fund IPOs experience average first day returns that are close to zero. Furthermore, while the short-term price of industrial IPOs increases, the short-term price of closed-end fund IPOs decreases. After five months of trading, industrial IPOs provide a cumulative market-adjusted return of 18.5% [Ritter (1990)], compared to a -12.6% return for closed-end funds [Weiss (1989), Peavy (1990)].

Many models with rational agents attribute the underpricing of industrial IPOs to information asymmetry between the IPO issuer and the investing public.[1] Since closed-end funds typically do not have pre-existing assets or proprietary rights, there is little information asymmetry about their asset valuation. Consequently, these models suggest that closed-end funds should exhibit less underpricing than industrial IPOs. However, information asymmetry theories cannot explain why closed-end funds are successfully brought to market *overpriced.* Specifically, closed-end funds are overpriced at issue relative to their net asset values (NAVs) due to substantial underwriting fees that average approximately 8% of total issue size. These funds do not have existing shareholders, so new investors bear the entire cost of the underwriting. In effect, an investor who pays $10 for a fund possesses assets worth only $9.20 at the commencement of trading.

This systematic overpricing raises two issues regarding closed-end funds that current theory does not explain. First, existing models cannot explain the rationale for purchasing funds that inevitably decline in price. Prudent investors could simply wait several months before buying into these securities. Anticipating such behavior, prospective issuers and underwriters would have no incentive to bring these offerings to market. Consequently, in a rational expectation equilibrium, these funds should not get started at all. Lee, Shleifer and Thaler (1991) identify this as the first, and arguably most perplexing, aspect of the closed-end fund puzzle.

Second, closed-end fund prices are slow to adjust to equilibrium values as compared to industrial IPOs. Barry and Jennings (1992) and Schultz and Zaman (1994) demonstrate that the underpricing of industrial firm IPOs is resolved within minutes. Since closed-end funds are generally overpriced by 8%, and this fact is publicly available before trading begins, market

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[1] For example, Rock (1986), Beatty and Ritter (1986), Carter and Manaster (1990), Allen and Faulhaber (1989), Grinblatt and Huang (1989), and Welch (1989).

efficiency dictates that fund prices should drop by this amount immediately. However, Weiss (1989) reports that most of the price decline in closed-end funds occurs between 30 and 100 days after the issue.

This study investigates these two anomalies, and describes regulatory and institutional mechanisms that help explain not only these two puzzles, but also several other unusual patterns in the aftermarket trading data. In particular, we document a pronounced imbalance in the aftermarket order flow -- i.e., we show that much of the aftermarket trading is initiated by sellers. Using the Lee-Ready (1991) algorithm, we report sell-to-buy imbalances in share volume as high as 70:1 in the first days of trading. Since short-selling is not possible during this time period, this selling pressure confirms the presence of "flippers": investors who buy shares in the IPO and immediately resell them in the aftermarket.

Despite these large selling imbalances, we find little price movement during the first *three weeks* of trading, followed by sharp price declines. This evidence is consistent with intense price stabilization lasting much longer than that reported in prior studies [e.g., Schultz and Zaman (1994) and Hanley, Kumar and Seguin (1993)]. As underwriters withdraw their stabilizing bids over the first 100 days, we show that prices decline sharply and quoted bid-ask spread increase by 40%.

Left unchecked, the massive flipping documented in this study could result in large losses for the stabilizing underwriter. We investigate the methods by which underwriters mitigate the costs of flipping. Our evidence suggests that underwriters manage these costs by 1) risk sharing, 2) creating a short position in the number of shares issued, and 3) selectively using an over-allotment option. As a result, we find that the intensity of the flipping in the first days of trading, and the use of the over-allotment option, jointly determine when price stabilization ends (and hence the time required for a fund's price to reach its equilibrium level).

Finally, we document pronounced asymmetric behavior in small and large trades. Using a trade-size proxy to distinguish small traders from large traders (those who submit orders in excess of $10,000 each), we find that a significantly higher proportion of the buys (sells) over the first 30 days are initiated by small (large) traders. In fact, nearly 80% of the buys over this period are trades of $10,000 or less. A trading rule test shows that small traders, on average, fare significantly worse than large traders. Most of the directional asymmetry between trade size groups occurs in the first two weeks of trading. By day 30, both buys and sells tend to be small trades.

Collectively, these findings support a marketing hypothesis advocated by Weiss (1989), Peavy (1990), and Lee, Shleifer and Thaler (1991), which posits that closed-end fund IPOs are sold by enterprising professionals to a less-informed public. To protect their reputation and improve the likelihood of a successful offer, lead underwriters promise to stabilize prices in the aftermarket. The stabilization bid provides the opportunity for some syndicate members to sell large blocks to flippers during the pre-issue period. The number and size of sell orders in the first few days of trading show that a sizable number of these traders exercise this option and flip their shares back to the syndicate. While the size of the buyer-initiated trades in the aftermarket does not directly identify these traders, it does suggest that they are small, retail customers. Furthermore, the low institutional ownership of these funds after one quarter of trading suggests that most small investors who bought at the IPO retain their pre-issue shares and subsequently, suffer losses of approximately 8%.

Our evidence raises some interesting regulatory issues. Existing S.E.C. regulations assume investors read (and can costlessly decipher) prospectuses that report underwriting fees. Our results suggest that many small investors ignore this information, and do not understand the pricing implications of the 8% fee. Through price stabilization, underwriters are able to further obscure the relation between the fee and the subsequent price decline, and this seems to help facilitate their marketing efforts. Moreover, stabilization produces artificially high aftermarket prices that temporarily defy the laws of supply and demand. We show that some investors, particularly small traders, purchase shares at these artificial prices. Security regulators may need to weigh this new evidence on the costs of stabilization against the perceived benefits of the practice.

Our findings also provide new insights into the economics of underwriting. Prolonged stabilization and extensive flipping could create significant costs for underwriters. However, we show that these costs can be mitigated by sharing risk, taking short positions at the commencement of trading, and using the over-allotment option. When the amount of flipping is fully anticipated, we show the costs of stabilization can be minimal. Even when there is some uncertainty about the extent of flipping, the over-allotment option provides underwriters with a substantial margin of error in forecasting flipping activities. These results help explain why stabilization can persist for several weeks after the IPO. Since flipping and price stabilization are activities common to all IPOs, this part of our analysis is applicable to IPOs in general, and not just to closed-end funds.

The remainder of the paper is organized as follows. In the next section, we discuss the institutional relationships between the underwriting syndicate members and their clients. Section 3 describes the sample and our research methodology. Section 4 reports the results and Section 5 concludes.

## 2. The Marketing of Closed-end Fund IPOs: Institutional Details

### *2.1 The Underwriting Syndicate*

The closed-end fund initial public offering begins with the formation of an underwriting syndicate. Syndicate members are typically investment houses with established distribution channels in the retail sector. One or more investment houses will assume lead underwriting responsibilities. The lead underwriter, in conjunction with a fund manager, brings these offerings to market under firm-commitment contracts.[2]

The lead underwriter of the syndicate performs many functions, both during the pre-issue and in the aftermarket. First, in conjunction with the fund manager, it establishes the expected terms of the offering (including the anticipated offer price and shares to be issued) and files the necessary documents with the SEC. Second, it retains a large (typically the largest) allotment of shares and sells these shares through its brokerage channels. Third, it coordinates and supports the sales efforts of the other syndicate members. Finally, it makes a commitment to provide aftermarket price support for the shares of the closed-end fund IPO during the first days of trading.

Syndicate members participate in the offering by accepting responsibility for the distribution of a certain portion of the total issue. In return for their participation, members are paid a selling fee. Closed-end funds are marketed primarily to retail investors, so higher selling fees (around 4.5% of the proceeds, compared to 3.7% for other IPOs) are offered to the sales force [Weiss (1989)]. These high fees compensate brokers for the difficulty and time involved in selling to retail customers.

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[2] IPOs may be brought to market under a best-effort or firm-commitment basis. In theory, a firm-commitment offering is riskier for the lead underwriter, since it must guarantee the proceeds of the offering to the issuer. However, as we show later, the lead underwriters of closed-end funds have substantial flexibility in setting the offer size, so the firm-commitment requirement is not as onerous for closed-end funds.

The low percentage of institutional ownership in closed-end funds provides corroborating evidence that these funds are marketed to individual investors. Weiss (1989) reports that at the end of the first quarter of trading, only 3.5% of the shares of closed-end funds issued during 1986-1987 are held by institutional investors. In contrast, institutions held 21.8% of the shares in a size-controlled sample of industrial IPOs during the same period. Our sample provides similar results: at the end of the first quarter of trading, institutions hold less than 5% of the shares of our sample funds.

*2.2 Price Stabilization and Flipping*

As mentioned above, one of the responsibilities of the lead underwriter is to stabilize aftermarket prices.[3] Price stabilization is an attempt to smooth or mitigate immediate price declines. The recent literature offers three complementary motivations for price stabilization. Hanley, Kumar, and Seguin (1993) argue that stabilization protects the lead underwriter's relationship with investors as well as its reputational capital. Second, they also argue that:

> ...if a price drop is apportioned over a number of days, the perception of overpricing may be obscured by intervening market moves or informational shocks, thus concealing the overpricing from the underwriter's clients.

In this respect, stabilization of closed-end funds may be used to help "camouflage" underwriting and sales fees. Brokers are known to tell investors these IPOs involve "no commissions." This representation would appear less credible if fund prices dropped immediately in the aftermarket. Finally, Schultz and Zaman (1994) argue that the primary motivation for stabilization is to control the supply of stock in the aftermarket. They suggest that underwriters issue fewer shares than the actual pre-issue demand in anticipation of selling activity during the first few trading days. That is, the underwriter buys shares at the stabilizing bid merely to cover a net short position established at the time of issue.

The combination of price stabilization and high selling fees presents syndicate members with an interesting moral hazard problem. Specifically, selling brokers have an incentive to place large blocks of shares with flippers, or large investors with no long-term interest in the stock. This

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[3] SEC Rule 10b-7 sets forth the guidelines regulating stabilization activities. This rule requires that the intent of the underwriter and the syndicate to stabilize the issue be disclosed in the prospectus. When there is no existing market for the security, as is the case with IPOs, the only limit on the stabilizing bid is that it cannot exceed either the offer price or the bid of the highest independent dealer. Once a stabilization bid is entered, it may be maintained or reduced but may be raised only if the stabilizer has made no purchases for three successive business days. See Hanley, Kumar, and Seguin (1993) for a more detailed discussion of the regulation and economics of stabilization.

share placement arrangement allows syndicate members to quickly collect brokerage fees without the time-consuming task of selling to retail customers. With costly and imperfect monitoring of syndicate members, flipping has become a common problem for underwriters.[4]

Given the high selling fees associated with closed-end fund IPOs, brokers other than the lead underwriter are clearly motivated to sell to flippers. However, the motivation for flippers to participate in overpriced offerings is less clear. We argue that the flippers' incentives stem from their long-term relationship with their brokers. In exchange for the flippers' participation, brokers may promise favors, including large allocations in future underpriced IPOs [Benveniste and Spindt (1989)], research services, and other "soft-dollar" inducements [Blume (1993)]. There are even allegations that some "brokers and institutions are acting in collusion, splitting the generous selling concessions between themselves." [Dutt (1988), p.22]

Flippers can derive these benefits at surprisingly little cost. Since pre-issue IPO investors do not pay an explicit brokerage commission, the transaction costs for flippers are negligible. Moreover, since the lead underwriter supports the issue at or near the offer price, flippers assume little or no price risk when reselling their shares. In fact, some closed-end funds may even appreciate in value in the first few days of trading, thus providing a windfall for flippers.[5]

In order to discourage flipping, several punishments have been threatened and/or implemented against brokers whose allotment is sold back within the first 30 days of trading [Correra (1992)]. One penalty is to exclude the broker from participation in future issues brought to market by the lead underwriter. Alternatively, sales commissions may be withheld if a broker's shares are immediately resold. However, the offending broker can rarely be identified. More recently, many funds have instituted a system of physical delivery of the securities sold, so that the identity of the flippers and their brokers can be traced. This method of monitoring, however, is quite expensive.

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4 While this discussion centers on closed-end funds, flipping is a problem in all IPOs. For example, the *IPO Reporter* (1988) observed that since "...syndicate members don't have their name attached to the issue, they have nothing to lose -- and substantial commissions to gain -- by placing shares with investors who don't really want them... who buy the securities to pay back a broker for previous research or advice (and)...unload their positions the moment the stock opened to trade."

5 For example, two of our sample funds experienced large price increases on day 1 [the Thai Fund and the Brazil Fund] while none decreased in value. Thus, a strategy of buying all pre-issue closed-end funds and flipping on day 1 would actually yield a positive return in our sample.

*2.3 Managing the Cost of Flipping*

The cost of flipping to the lead underwriter is potentially high and extensive flipping could threaten to unravel the syndicate.[6] These costs stem from two main sources. First, a sales commission is paid on the flippers' "fictitious" demand. In other words, this sales commission is paid on stock that is returned to the underwriter and must be resold. Second, flipped shares reacquired during the stabilization period may need to be resold at some uncertain and, typically, lower price, thus imposing an inventory risk.

Our discussions with underwriters suggest both costs can be mitigated. For example, monitoring costs are minimized if a single underwriter takes the total allocation. However, given the large size of many closed-end fund offers and the disperse nature of the targeted investor base, even large underwriters find it helpful to tap into the distribution channels of other investment houses. Thus, in forming a syndicate, underwriters trade-off increased monitoring costs with the benefits of a broader distribution base.

Monitoring costs within the syndicate can be reduced by spreading the risk -- that is, through the sharing of lead underwriting responsibilities. Since flipping is a more serious and costly problem for overpriced IPOs such as closed-end funds, we expect a greater tendency for closed-end fund syndicates to adopt a risk-sharing strategy by using multiple lead underwriters.

We find evidence consistent with this reasoning. Comparing the number of lead underwriters for a sample of closed-end funds issued between 1982 and 1987 to a control sample of all IPOs issued over the same time period, we find that the closed-end fund sample has a greater average number of lead underwriters (2.8 versus 1.4). This difference is statistically significant (t-statistic of 7.0) even after controlling for the offer size and the sign of the initial return (under or overpricing).

The inventory risk from flipping can also be managed by anticipating the number of shares that will be flipped, and incorporating this estimate in establishing the issue size. During the pre-issue period, if the underwriter knows the amount of subsequent flipping with certainty, then he would simply assume a net short position in the issue equal to the amount of flipping. To

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[6]For example, Colonial Government Income Trust rescinded its $180 million dollar offering in 1988 after it learned that sell orders amounted to as much as a third of the number of shares to be offered. Rather than absorbing such large flipping through stabilization activities, the underwriter, Morgan Keegan, canceled the offering.

illustrate, assume that the reported demand for a closed-end fund is 10 million shares but the lead underwriter knows that 5%, or 500,000 shares, will subsequently be flipped. To accommodate this flipping, the underwriter, just prior to issuance, would set the issue size to 9.5 million shares.[7] Since 9.5 million shares are being issued, yet 10 million have been sold, the underwriter is short 500,000 shares. The 5% of the shares that are flipped are used by the underwriter to cover this short position.

Since the amount of flipping is not known with certainty, the underwriter must proceed using forecasts. In making these forecasts, underwriters face asymmetric costs in under- and over-estimating the amount of flipping, due to the availability of an over-allotment option. This option allows the underwriter to obtain additional shares (up to 15% of the issue) from the fund at the offer price, net of underwriting fees. The option is exercisable within the first 30 days of trading.[8] For example, assume that the underwriter forecasts 500,000 shares will be flipped, but, in fact, no flipping takes place. The underwriter covers the resulting short position by simply exercising the over-allotment option and purchasing 500,000 shares at the offer price, net of fees. Thus, levels of flipping below expectations are dealt with inexpensively.

However, a more costly problem arises if the level of flipping is higher than expected. In this case, the underwriter must either purchase the excess shares flipped and suffer an eventual capital loss, or cease stabilization prematurely, and suffer potential reputational damage. Therefore, a preferred strategy for underwriters is to set the offer size below an unbiased forecast of the "true" demand (stated demand minus anticipated flipping) and use the over-allotment option to cover any shortfall in ex post flipping. For example, using the numbers above, the underwriter can set the issue size as low as 8.7 million shares. If no flipping occurs, the underwriter can still use the option to issue up to 1.3 million additional shares (15% of 8.7 million) without incurring additional costs.

Consistent with this analysis, we find that in 28 funds (45% of our sample), the lead underwriter exercises the over-allotment option. The extensive use of this option in our sample

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[7]Closed-end funds appear to have more flexibility in setting offer size than industrial IPOs. Hanley (1993) reports that industrial IPOs generally do not change their offer size from the initial filing of the preliminary prospectus to the offer date. When they do, these offer size changes are typically effected by changing both the offer price and the number of shares issued. In contrast, 78% of the closed-end funds in this sample changed their issue size prior to the offer date. These changes are effected entirely by changing the number of shares offered -- in no case was the offer price altered.

[8]Muscarella, Peavy, and Vetsuypens (1992) contrast the optimal exercise of the over-allotment option in over- and underpriced IPOs and show that the option is exercised for virtually all underpriced IPOs but is only exercised in 29% of their sample of overpriced IPOs.

may seem surprising at first, since most of our sample funds experience price declines. The over-allotment option is normally exercised in IPOs that increase in price to fulfill excess demand for an issue. In the case of closed-end funds, this option is apparently being exercised to cover an initial short position when ex post flipping is lower than expected.

*2.4 The Economics of Underwriting and the Role of Small Investors*

Although the marketing of closed-end fund IPOs appears to involve significant risks, the rewards to underwriters can be substantial. Underwriting fees for these offers typically range from 6 to 8% of the offering amount. This translates into fees of around $16 million on an average-sized closed-end fund IPO. In addition, lead underwriters often double as managers of the fund, which entitles them to annual management fees. Lead underwriters must weigh this compensation against administration and stabilization costs.

But what of the small investors whose apparent gullibility drives the IPO? In our scenario, small investors may be irrational noise traders, as defined by DeLong, Shleifer, Summers, and Waldmann (1990). In that context, they have erroneous expectations about future fund performance. Alternatively, they could be rational decision makers acting on incomplete information: their brokers' advice. If the cost of information gathering and processing is sufficiently high, reliance on broker advice may be a rational investment strategy. In either case, small investors appear to be unaware of either the 8% load that is associated with closed-end fund IPOs, or the generous selling commission paid to their broker.

## 3. Sample and Data Description

We obtain our initial sample of 75 closed-end fund IPOs, and information on the characteristics of the offering, from *Securities Data Corporation.* We cross-check this list against the *Wiesenberger* investment company listings to ensure that all closed-end funds public offerings on the AMEX and NYSE between January 1, 1988 and May 31, 1989 are included. Ten funds are dropped for a number of reasons: mismatched offer dates on the Institute for the Study of Securities Markets (ISSM) tapes (5 firms), negative reported volumes (2), mismatched ticker symbol on the ISSM tape (2), and misidentification of a real estate investment trust (REIT) as a closed-end fund.

Appendix A presents the final sample of 65 funds, and lists the issue date, offer price, number of shares issued, total dollar value of offering, and total underwriting costs (gross spread plus

miscellaneous expenses). Although the number of shares issued varies across funds, offer prices are clustered, with 91% of the sample offered at either $10 (43 issues) or $12 (16 issues). Collectively, the funds in our sample raised over $17 billion, with four funds raising at least $1 billion each. The smallest offering in the sample, Hampton Utilities Trust, raised only $10.2 million.

Transactions data from the ISSM contains all trades and quote revisions for securities traded on the New York (NYSE) and American (AMEX) Stock Exchanges. We report the volume of trading and, more importantly, decompose this volume into buyer-initiated and seller-initiated trades using the Lee and Ready (1991) algorithm, which we summarize in Appendix B. We also analyze bid-ask spreads and price volatility during the first 100 days of trading. We calculate bid-ask spreads as the difference between the last BBO-eligible ask and bid of each day. A quote is BBO-eligible if it is a tradable quote (eligible to be included in the best-bid-or-offer calculation for the National Association of Security Dealers).

## 4. Results

### *4.1 A Case Study*

Table 1 presents data for American Government Income Portfolio, which is the first closed-end fund IPO by ticker symbol on the 1988 ISSM consolidated tape. Although this is only one fund in our sample, the following sequence of events is representative of the sample as a whole. American Government Income Portfolio went public on September 22, 1988 and commenced trading at 10:58:28 A.M. The opening trade is for 113,000 shares at $10 and the opening quote by the specialist is at an ask of 10 1/8 and a bid of 10. During the first day of trading, all trades except the opening trade[9] are classified by the Lee-Ready algorithm as sells with an average size of approximately 11,000 shares. Note that the specialist never changes his bid or ask but merely revises his quoted depth, despite a cumulative sell imbalance of 226,000 shares or $2.26 million.

This pattern of selling continues until day 4, when the first buy transaction appears for a mere 100 shares. Almost uniformly over the next three days, buyer-initiated trades are substantially smaller than seller-initiated trades. By the end of day 7, cumulative sell volume is 30 times the

[9]The first trade, for 113,000 shares, is unclassified and is not included in the cumulative level of sells. Note that the trade was executed at the subsequent bid, and therefore could reasonably have been classified as a sell. We chose to not classifying this trade, however, and in so doing, present conservative net sell imbalance estimates.

volume of cumulative buys. Amazingly, the specialist still has not changed his bid or ask price, even though the cumulative sell imbalance (cumulative sells minus cumulative buys) is 392,400 shares or $3.9 million of stock.

Table 1 suggests that large traders are actively selling in the first few days of trading, yet the price of the fund is insensitive to this order flow. This finding stands in stark contrast to much of the microstructure literature, which documents a contemporaneous relation between the direction of trade imbalances and price moves [e.g., Hasbrouck (1988), Blume, MacKinlay, and Terker (1989), and Lee and Ready (1991)]. Recent studies also show that specialist quote revisions are responsive to single buys (upward revisions) and sells (downward revisions) [e.g., Petersen and Umlauf (1991) and Huang and Stoll (1991)]. Under normal trading conditions, the large selling activity we observe should lower the bid price within seconds, yet we find no quote revisions in one week of trading. As we demonstrate below, the price behavior of this fund is quite representative of the funds in our sample.

*4.2 Mean versus Median Price Effects*

We begin by documenting the aftermarket returns to our sample of funds to ensure that the systematic price decline reported in earlier studies is present during 1988-89. Figure 1 depicts the mean and median cumulative return for our sample of 65 funds in the first 100 days of trading. The mean cumulative return series (dashed line) is similar to the mean return pattern presented by Weiss (1989) and Peavy (1990). The only notable deviation is a temporary positive average cumulative return in our sample that reaches a maximum of 0.7% on day 2. This difference is entirely attributable to the inclusion of two foreign country funds that each gained over 20% in the first two days of trading (the Brazil Fund and the Thai Fund). By trading day 100, however, the average cumulative return for our entire sample is –6.8%, which is similar to the average bond fund returns documented in Weiss (1989) and Peavy (1990). Like these earlier studies, we find the price decline in closed-end fund IPOs to be pervasive. Fifty-seven funds have negative cumulative returns by day 100, six funds have zero returns, and only two funds (the R.O.C. Taiwan fund and the Thai Fund) have positive returns.

The median cumulative return, also plotted in Figure 1, behaves quite differently from the mean cumulative return. The median cumulative return is zero for the first 29 days of trading and then drops sharply at discrete intervals. This suggests that the gradual decline associated with the mean cumulative return is a function of the smoothing which takes place in the averaging process. Indeed, auxiliary tests suggest that when individual fund price corrections do occur, they occur swiftly. For individual funds that have negative cumulative returns by day 100, we

find that the mean (median) greatest single day price drop equaled 71% (44%) of the negative cumulative 100 day return.

Note also that the median cumulative return is higher than the mean for most of the first three months. This indicates distributional skewness, with large negative returns in a small number of funds. The skewness gradually disappears, so that by day 100, the median firm experiences approximately the same decline as the mean firm. Again, this evidence suggests that stabilization is responsible for the difference between mean and median returns.

*4.3 Trading Volume and Order Imbalances*

In this subsection, we use transactions data to examine the volume and direction of aftermarket trades. There are good reasons to expect low volume in the first days of trading in closed-end fund IPOs. If traders have rational expectations about an imminent price decline, few will buy. Moreover, if investors participate willingly and with full information in the pre-issue, few will sell. Finally, short-selling in the first 30 days is difficult since brokers typically do not deliver stock certificates until one month after trading begins [Peavy (1990)].

The prediction of low volume is examined in Figure 2. To construct this figure, we first calculate the daily order imbalance as the difference between the volume of sells and the volume of buys classified using the Lee–Ready algorithm. Figure 2 then plots the sell imbalance for each day and the cumulative sell imbalance over the first 100 days. Both are expressed as a percentage of the total number of shares issued.

Figure 2 shows that volume immediately after the issue is extremely high, and overwhelmingly seller-initiated. In fact, the ratio of the volume of seller-initiated to buyer-initiated trades on the first day is approximately 19:1. When the six foreign country funds are removed from the sample this ratio exceeds 70:1.[10] The cumulative amount of selling continues to increase through time. After 30 trading days, the cumulative sell imbalance reaches 9% of the total shares issued. Daily volume of buys do not equal sells until the second month of trading. Since short-sellers cannot enter the market at this early stage of trading, the large selling activity during the initial aftermarket strongly suggests the presence of flippers.

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[10]Some foreign country funds, such as the Thai fund, hold stock in restricted markets in which U.S. investors have access only through the closed-end fund. For this reason, these funds may be highly sought after by investors since there are no substitutes in the market.

*4.4 Stabilization*

Given the large volume and the imbalance of seller-initiated trades during the initial trading period, laws of supply and demand dictate that quoted prices should decline. However, despite these sell imbalances, closed-end fund prices exhibit little movement in the first days of trading. Figure 3 shows the percentage of firms where the specialist's quoted bid price never moves from the offer price. During the first day of trading, approximately 85% of the sample does not experience *any* price movement. In fact, the only funds whose price does change on day 1 are foreign country funds. After seven trading days, when the cumulative sell imbalance is 5% of the total number of shares issued, 71% of the sample firms have yet to experience a price change. In the first days of trading, prices for our sample of closed-end funds are surprisingly insensitive to order flow. We argue that the breakdown in this relation is due to price stabilization.

Following Hanley, Kumar, and Seguin (1993), we examine the behavior of bid-ask spreads in the aftermarket to provide complementary evidence for the existence of stabilization. Since the bid-ask spread compensates the market-maker for providing liquidity, the width of the spread reflects the costs of market-making, including administrative costs, costs from inventory risk and costs from losses to informed traders or information asymmetry risk [Glosten and Harris (1988) and Stoll (1989)]. According to the information asymmetry hypothesis, as more firm-specific information becomes public over time, the information advantage of informed traders is reduced. Thus bid-ask spreads should narrow in event time.[11]

Conversely, price stabilization should have the opposite effect on bid-ask spreads. Stabilization creates a temporary floor, which truncates the probability distribution of post-issue IPO market prices. This truncation reduces the costs to liquidity providers of trading against informed traders. If the dealer market is competitive, then the dealer cost reduction, which Hanley, Kumar, and Seguin (1993) model as the value of a put option, should be incorporated into the bid-ask spread. As price support is withdrawn, spreads should increase over time.

Figure 4a documents that the average daily closing spread (based on the last BBO-eligible quote for each day) increases over the first 100 days. The average spread on the first day is 12.6 cents per share while the spread averaged over days 95 to 100 is 17.5 cents per share, an increase of nearly 40%. When we regress the daily cross-sectional average spread against a

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[11] Other factors may cause spreads on IPOs to widen over time [See Hedge and Miller (1989)].

linear time-trend, the estimated intercept is 13.1 cents per share, with a slope of 0.047 cents per share (t-statistic = 20.85), indicating an average increase in the spread of approximately 0.05 cents per day. The $R^2$ for the regression is 0.816, suggesting a large proportion of the day-to-day variation is captured by the linear model. Figure 4b shows that over 90% of the sample firms have the minimum spread of one tick (12.5 cents) over the first ten trading days despite large sell imbalances. In contrast, by day 100, the percentage of firms with the minimum spread drops below 60%. Again, the evidence suggests that bid-ask spreads are initially narrower than their free market levels.

The bid-ask spread results are consistent with extensive price stabilization in the first few weeks of trading. Furthermore, these findings also dispel the notion that the specialist is stabilizing the price. If the specialist is stabilizing, bid-ask spreads would widen to reflect the greater inventory risk associated with buying such large quantities of stock. Thus, we speculate that the underwriter is stabilizing by placing a limit order at the offer price.

Overall, the results of this section are consistent with price stabilizing activities in the market for closed-end fund IPOs. These activities artificially prop up the observed price and decrease the bid-ask spread. As the IPO seasons, however, bid-ask spreads widen and prices drop, indicating a withdrawal of stabilizing activities. We conclude that the slow decline in value documented by Weiss (1989) and Peavy (1990) is due to the systematic abandonment of price supporting activities by the lead underwriter.

*4.5 Sell Imbalances and Price Declines*

In this subsection, we explore the relation between order imbalances over the first trading days and the eventual aftermarket performance measured on day 100. Specifically, we examine whether order imbalances over the first few trading days convey information about either the magnitude or timing of subsequent price declines. We consider two hypotheses. First, if incoming orders convey information about the degree of initial overpricing, then larger sell imbalances reflect worse news about the eventual equilibrium value of the fund. Under this scenario, we would expect eventual price declines to be correlated with initial imbalances. Alternatively, if underwriters are using the flipped shares to cover short positions, then the greater the initial selling, the faster the short position will be covered. In this case, order imbalances will be related to the timing, but not necessarily the magnitude, of the eventual price decline.

To evaluate these hypotheses, we compute the cumulative trade imbalance ($IMBALANCE_{it}$) for fund *i* over the first *t* (*t* = 1, 3 or 5) trading days as the difference between the volume of all sells and all buys, divided by the number of shares outstanding. We also compute the subsequent cumulative return ($CR_i(t,T)$) from day t+1 to day T (T = 10, 20, 40, 70 or 100) for each of the sample funds. Note that there is no overlap in accumulation periods for the imbalance and the cumulative return. Though not reported, our results are robust to model specifications that include data on underwriting expenses, institutional and insider ownership, and over-allotment options as additional explanatory variables.

Table 2 reports the results of cross-sectional regressions of the cumulative return on the corresponding order imbalance. These results indicate that selling imbalances over the first days of trading are significantly correlated with subsequent cumulative returns, but only for a subset of combinations of t and T. Specifically, the size of the selling imbalance in the first few days forecasts the subsequent price decline for the shorter accumulation intervals only. Imbalances have little explanatory power for returns generated over longer horizons (and only minor predictive power for cumulative returns on day 100), suggesting that these imbalances are not correlated with the eventual equilibrium price decline. In other words, order imbalance in the first few days of trading predicts the *timing*, rather than the *magnitude*, of the price drop.

Specifically, we find that funds with the most selling pressure in the first three or five days are also those that experienced the greatest declines in the first 10 or 20 days. However, initial selling imbalance is not correlated with subsequent returns to day 100, when, presumably, stabilization has been abandoned for all funds and equilibrium prices have been established. This suggests that although all issues eventually attain their unencumbered values, the abandonment of stabilization is sooner for those issues with larger initial imbalances. This evidence is consistent with Schultz and Zaman (1994), who argue that underwriters cease stabilizing once their short position is fully covered. Since "covering" occurs more quickly when early imbalances are large, large initial order imbalances serve as triggering mechanisms for the abandonment of stabilization.

*4.6 Stabilization Abandonment and the Over-allotment Option*

The results of the previous section suggest underwriters tend to abandon stabilization faster when the amount of flipping is relatively high. What happens when the amount of flipping is lower than expected? In particular, when early sell imbalances are insufficient to fully cover a short position, the underwriter will need to obtain additional shares. In this case, the

underwriter may: i) extend the stabilization period, and/or ii) exercise the over-allotment option.[12]

Since these two options are not mutually exclusive, we hypothesize a relation between the exercising of the over-allotment option and the duration of the stabilization bid. Specifically, when too few shares are flipped, the stabilization period is extended in the hope of buying additional shares. Eventually, the over-allotment option may have to be used. Thus, funds that have longer stabilization periods are more likely to exercise the over-allotment option than are funds with shorter stabilization periods.

Table 3 reports the results of three cross-sectional regressions that examine the relation between the length of the stabilization period and whether or not the over-allotment option is exercised. We include all 62 funds that have zero or negative 100 day returns and available over-allotment data in the analysis. Our results are robust when we exclude the one fund (Brazil Fund, ticker: BZL) that initially increased in price yet had a day 100 price less than the issue price. Following Hanley, Kumar, and Seguin (1993), we use the first day that the bid price drops below the issue price [Edate] as a proxy for the end of the stabilization period. This date is separately regressed on three variables: 1) OA, a dummy variable that equals one for the 28 funds that exercised the over-allotment option, 2) OAFull, a dummy variable that equals one for the 16 funds that used the full 15% over-allotment; and 3) OAShrs, a continuous variable that measures the shares purchased through the over-allotment option as a percentage of total shares issued.

The intercept term in row 1 of Table 3 shows that the 34 non-exercising funds have their first price drop around day 24. Funds that exercise the over-allotment option, on the other hand, do not experience their first price drop until 10.5 days later (t-statistic = 2.2). This difference is even more pronounced for the 16 funds that exercise the full 15% of the option. Row 2 shows that these firms, on average, do not experience a price drop until 16 days later (t-statistic = 3.0), or on day 40. Furthermore, there is a relation between the number of over-allotment shares used and the timing of the end of stabilization. Row 3 documents that, on average, the stabilization period is increased by 0.81 days for each additional 1% of the over-allotment option used (t-statistic = 2.2). These results indicate that the stabilization period is longer for exercising funds, and longest for funds that exercised the full allotment. The evidence

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[12] Dropping the stabilization bid at this point may induce more investors to buy, but not sell. Increasing the stabilization price may induce more sellers, but underwriters are not legally allowed to stabilize above the offer price. Moreover, this method is clearly more expensive than exercising the over-allotment option.

suggests that stabilization is used to cover an initial short position, and that the over-allotment option is used when an insufficient number of shares are purchased in the open market.

*4.7 Trade Size and Trader Identity*

In this subsection, we use trade size proxies to provide further evidence on trader identity. While our data does not permit the identification of specific traders, we can use trade size to provide indirect evidence of the types of traders involved. Figure 5 reports the daily average trade size for buyer- and seller-initiated trades. This figure shows that, on the first day of trading, the average sell transaction is over 11,000 shares. Given the mean issue price for our sample, the average seller is transacting over $120,000 per trade on day 1. Clearly, the early sellers are not small individual investors. This evidence suggests that large block trades occur primarily in the first days of the trading.

Conversely, buy transactions are much smaller in size. Except for the first day, when buys average around 5,700 shares, the average size of a buy transaction is between 1,000 and 1,500 shares. When foreign country funds are excluded, these buy transactions fall to 3,500 shares on the first day, and average below 1,000 shares on the remaining days. Since few institutional trades are of this size [Lee (1992)], it seems likely that most of the buy transactions are initiated by small individual investors. By day 30, however, differences in trade size between buys and sells are insignificant. Both buys and sells average under 1,000 shares, indicating that large investors are no longer active in the market for closed-end fund IPOs by this time.

*4.8 Direction and Profitability by Trade Size*

We next provide direct evidence on differences in the direction and profitability of large and small trades. Following Lee (1992), we use a firm-specific trade size threshold to separate small and large trades. This procedure avoids the price-sensitivity of dollar-based classification schemes that can occur when small price movements can cause artificial changes in "small" trade volume. For example, using a $10,000 threshold value, if a stock is trading at $10, all trades of 1000 shares or less are classified as small trades. If the stock moves to 10 1/8, perhaps only because of bid-ask bounce, all 1000 share trades are then classified as "large." Since traders may not immediately alter their trade size in response to small price changes, the dollar-based classification scheme may indicate an artificial, temporary drop in small trade volume.

By contrast, our definition of small and large traders uses the original issue price of each fund to determine the largest number of round lot shares that are less than or equal to $10,000. Trades transacted for a fund at this number of shares or less are deemed small trades throughout the sample period, regardless of the contemporaneous market price. For example, if the issue price of a share is $12, then all trades for this fund involving 800 shares or less are classified as small trades, regardless of the prevailing market price.

Table 4 reports the joint frequency distribution of trade size and direction for all the trades made in the first 30 event days. The six country funds are excluded from the analysis but inclusion of these funds does not change the results. We focus on the first 30 days, since most of the large trades take place during this period. After this time, buys and sells are roughly equivalent in size.

Table 4 indicates that 27,115 (55.6%) of the total 48,742 transactions are classified as small trades. Of the total number of trades, 36,576 (74.8%) are seller-initiated; 12,173 trades (25%) are buyer-initiated; and 93 trades (0.2%) cannot be classified by the Lee-Ready algorithm. Results in the first column show that seller-initiated trades are almost equally split between the large trade category (52%) and the small trade category (48%). In contrast, 78% of the buyer-initiated trades are in the small (under $10,000) trade size category. The buyer-initiated trades are particularly interesting, since these traders are buying into funds that should decline in price. This table suggests most such purchases are made by small investors.

To assess the economic significance of these results, we examine the relative profitability of large and small trades. Our trading strategy mimics the action of the trade initiator. That is, for seller- (buyer-) initiated trades, we assume a short (long) position in the stock at the transaction price. We do this for each trade transacted in the first 30 days of trading, and unwind the position at the end of day 100. To incorporate the cost of the bid-ask spread, all long (short) positions are closed at the quoted bid (ask) price at the end of trading on day 100. We calculate percent trading profits for small and large trade size categories separately. These calculated profits are not realized gains or losses, however, since many of the sellers are original buyers in the pre-issue. For example, flipped shares sold in the first few days do not represent short positions, but rather represent the unwinding of long positions taken in the pre-issue. Thus, the profits we calculate represent the difference between actual, realized profits and the profits that would have been realized had the transaction not been performed (or had been postponed to day 100).

By regressing the percent trading profits on a large trade dummy variable, we find that small active traders earn an average profit of 0.86% (t-statistic = 15.79) after transactions costs. The estimated coefficient on the large trade indicator is 2.29% (t-statistic = 28.41), suggesting that large trades are, on average, 2.7 times more profitable than small trades. Taken together, these two results indicate that trades over the first 30 days are generally unprofitable for the passive trader (the specialist or underwriter who is supporting prices). We also estimate separate regressions for the sample of 9,257 trades involving the six country funds and the 48,742 trades that did not. The results for the domestic funds are similar to those for the full sample. For foreign funds, however, large trades remain profitable but small trades show insignificant returns.

A day-by-day analysis of the profitability of active trades provides an alternative perspective on the information asymmetry between large and small trades. Figure 6 presents the average trading profit for large and small trades executed on each of the first 30 trading days. Although large trades are profitable throughout the first 30 days, small trades are most profitable in the first two days. Small trades beyond this day typically yield little or negative profits. These results again suggest that uninformed, small traders are the main purchasers of overpriced closed-end funds in the aftermarket, especially past the second trading day.

## 5. Summary

Using transactions data, we establish a number of empirical regularities in the aftermarket trading of closed-end fund IPOs. First, we show that the vast majority of volume in the first four weeks of trading is seller-initiated. Depending on the time frame examined, sells outnumber buys in ratios ranging from 5:1 to 70:1. Since short-selling is not possible during this time period, the selling imbalance confirms the presence of flippers.

However, we show these imbalances do not immediately translate into price declines. Consistent with the existence of intense price stabilization, 75% of the funds had *no* price moves in the first five days of trading and median cumulative returns remained at zero throughout the first 29 days. Furthermore, bid-ask spreads typically begin at the minimum tick-size width (1/8th) and widen through time. As the number of issues that are stabilized declines over time, the proportion of issues trading at unencumbered, market-determined (and lower) prices increases. In our sample, the abandonment of stabilization occurs at different times for individual firms, thus generating the perceived pattern of gradual decline in aftermarket prices.

We also provide evidence that underwriters manage the cost of stabilizing by creating a net short position in the number of shares issued during the pre-market period. Our results show that the selling imbalance in the first few trading days has predictive power for the timing of subsequent price decline: the faster the short position is covered through stabilizing purchases, the sooner the price drops. Furthermore, funds that exercise the over-allotment option experience longer stabilization periods. In this case, the underwriter is unable to completely cover the short position through stabilizing activities, and is forced to acquire additional shares using the over-allotment option.

Last, we document significant trade size asymmetries. Seller-initiated trades are both larger and more profitable than buyer-initiated trades in the aftermarket period. Most buyer-initiated trades (nearly 80%) are small trades, for amounts of $10,000 or less and these trades tend to lose money. More to the point, small investors who buy shares in the aftermarket engage in open market transactions that they believe are at unencumbered prices. In fact, their purchases occur at artificially high prices that are supported by underwriters.

Our findings are largely consistent with a marketing hypothesis for closed-end funds. Specifically, we interpret our results as evidence of immediate aftermarket selling by large traders (flippers), price stabilization by underwriters, and post-issue buying by smaller (and less informed) investors. This hypothesis helps explain our two main puzzles: 1) both flippers and small investors participate in the offering, but only small investors hold these shares in the long run and, 2) the slow price adjustment pattern is due to sequential abandonment of price stabilization by underwriters.

Our results suggest that small investors face substantial information processing costs and may be quite susceptible to marketing tactics. The abysmal aftermarket performance of closed-end fund offerings during 1986 and 1987 was well-documented in the popular press prior to our study period [Liang (1987), Henry (1987), and Jereski (1987)]. Yet, during our study period, a further $17 billion was raised using these instruments. These offerings involved approximately $1.3 billion in underwriting fees – seemingly an expensive tribute to the informational disadvantage of small investors.

How can new fund offerings continue to succeed in light of well-publicized prior failures? Our discussions with closed-end fund investors and market practitioners suggest two main marketing ploys. First, new funds typically distance themselves from prior funds by

promoting new investment strategies and objectives -- thus a wave of bond fund IPOs are followed by a series of country fund IPOs, then a collection of tax-exempt income funds, etc. Since 1992, the S.E.C. has required new closed-end funds to disclose in their prospectuses the fact that, historically, closed-end funds often traded at discounts to their net asset values. However, we observe that this discussion is often couched in the context of how the current fund differs from its predecessors.

Second, some brokers are known to assert that the pre-issue shares are available to investors on a "no commission" basis, even though these securities are sold with a substantial underwriting load. This misleading assertion is technically correct, since an explicit brokerage commission is not charged. Investors find the assertion credible in part because the stock subsequently trades at the offer price in the aftermarket. What many investors may not realize is that the aftermarket price is being stabilized, thus obscuring the underwriting fees.

The legality of the scenario we have outlined appears to be within the guidelines of current securities regulation. However, our findings raise some interesting questions about the adequacy of existing disclosure rules, and the propriety of regulation that permit short-term price stabilization. By stabilizing prices in the aftermarket, underwriters are able to obscure the relationship between the underwriting fee and the subsequent price decline. Moreover, stabilization produces artificial aftermarket prices. We show that some investors, particularly small traders, have purchased shares at these artificially high prices. Regulators should weigh this new evidence on the costs of stabilization against any perceived benefits of the practice.

Finally, our results may provide an alternative explanation for two other IPO anomalies. Prior studies show IPOs of master limited partnership (MLPs) [Michaely and Shaw (1992)] and real estate investment trusts (REITs) [Wang, Chan, and Gau (1992)] are overpriced. Interestingly, these IPOs are also sold almost entirely to small individual investors. While we do not examine these securities, we suspect that the marketing hypothesis proposed in this paper is relevant for MLPs and REITs. Our investigation predicts that similar patterns of selling pressure, price stabilization, and asymmetric behavior between large and small trades may be found in these securities.

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## Table 1

## A Case Study

The following are detailed trades and quotes for AMERICAN GOVT INCM PTFL INC. (Cusip: 02591910, Ticker: AAF), a closed-end fund that commenced trading on the New York Stock Exchange on Sept. 22 1988 (CRSP day 6594). This is the first closed-end fund by ticker symbol sequence on the 1988 ISSM consolidated tape. All trades and quotes for the first 7 days of trading are reported. Time is in EST (hh:mm:ss). TrdQte is a trade or quote indicator. If the record is a trade, PriAsk (VolBid) represents the trade price (volume), if the record is a quote, PriAsk (VolBid) represents the quoted ask (bid) price. CondCode is a condition code (i.e., E signifies an eligible trade or quote, O means opening quote, C means closing quote, L mean an in-sequence late trade, and Z means an out-of-sequence late trade). AskDep and BidDep are quoted depths at the bid and ask prices respectively. BuySell indicates trade direction (S for sells, B for buys), and CumBuy and CumSell are cumulative buys and sells, respectively. All volume measures are in terms of 100 share round lots.

| Date | Time | Trd Qte | Pri Ask | Vol Bid | Cond Code | Ask Dep | Bid Dep | Buy Sell | Cum Buy | Cum Sell |
|---|---|---|---|---|---|---|---|---|---|---|
| **DAY 1** | | | | | | | | | | |
| 6594 | 105828 | T | 10 | 1130 | E | | | - | - | - |
| **6594** | **105830** | **Q** | **10 1/8** | **10** | **O** | **600** | **990** | | | |
| **6594** | **105849** | **Q** | **10 1/8** | **10** | **E** | **600** | **99** | | | |
| 6594 | 110756 | T | 10 | 100 | E | | | S | - | 100 |
| 6594 | 111224 | T | 10 | 300 | E | | | S | - | 400 |
| 6594 | 112436 | T | 10 | 90 | E | | | S | - | 490 |
| **6594** | **114217** | **Q** | **10 1/8** | **10** | **E** | **500** | **99** | | | |
| 6594 | 122052 | T | 10 | 25 | E | | | S | - | 515 |
| 6594 | 122227 | T | 10 | 250 | E | | | S | - | 765 |
| 6594 | 123104 | T | 10 | 200 | E | | | S | - | 965 |
| 6594 | 123158 | T | 10 | 120 | E | | | S | - | 1085 |
| 6594 | 123158 | T | 10 | 25 | E | | | S | - | 1110 |
| 6594 | 125030 | T | 10 | 130 | L | | | S | - | 1240 |
| 6594 | 125654 | T | 10 | 20 | E | | | S | - | 1260 |
| **6594** | **131137** | **Q** | **10 1/8** | **10** | **E** | **300** | **99** | | | |
| 6594 | 131140 | T | 10 | 280 | E | | | S | - | 1540 |
| 6594 | 132828 | T | 10 | 25 | E | | | S | - | 1565 |
| 6594 | 140542 | T | 10 | 200 | E | | | S | - | 1765 |
| 6594 | 140948 | T | 10 | 25 | E | | | S | - | 1780 |
| 6594 | 142450 | T | 10 | 100 | E | | | S | - | 1880 |
| 6594 | 154853 | T | 10 | 80 | E | | | S | - | 1960 |
| 6594 | 155105 | T | 10 | 20 | E | | | S | - | 1980 |
| 6594 | 155316 | T | 10 | 100 | E | | | S | - | 2080 |
| 6594 | 155323 | T | 10 | 10 | E | | | S | - | 2090 |
| 6594 | 155728 | T | 10 | 170 | E | | | S | - | 2260 |
| **6594** | **160330** | **Q** | **10 1/8** | **10** | **C** | **1** | **1** | | | |
| 6594 | 161317 | T | 10 | 52 | Z | | | - | | |

## Table 1
## (continued)

| Date | Time | Trd Qte | PriAsk | VolBid | Cond Code | Ask Dep | Bid Dep | Buy Sell | Cum. Buys | Cum. Sells |
|---|---|---|---|---|---|---|---|---|---|---|
| **DAY 2** | | | | | | | | | | |
| **6595** | **94038** | **Q** | **10 1/8** | **10** | **O** | **700** | **100** | | | |
| 6595 | 94041 | T | 10 | 488 | E | | | S | - | 2748 |
| 6595 | 95031 | T | 10 | 50 | E | | | S | - | 2798 |
| 6595 | 95034 | T | 10 | 200 | E | | | S | - | 2998 |
| 6595 | 95136 | T | 10 | 50 | E | | | S | - | 3048 |
| **6595** | **100722** | **Q** | **10 1/8** | **10** | **E** | **999** | **100** | | | |
| 6595 | 113249 | T | 10 | 10 | E | | | S | - | 3058 |
| 6595 | 144730 | T | 10 | 50 | E | | | S | - | 3108 |
| 6595 | 152804 | T | 10 | 50 | E | | | S | - | 3158 |
| **6595** | **160316** | **Q** | **10 1/8** | **10** | **C** | **1** | **1** | | | |
| **DAY3** | | | | | | | | | | |
| **6596** | **93623** | **Q** | **10 1/8** | **10** | **O** | **999** | **100** | | | |
| **6596** | **94927** | **Q** | **10 1/8** | **10** | **E** | **999** | **101** | | | |
| **6596** | **102706** | **Q** | **10 1/8** | **10** | **E** | **999** | **106** | | | |
| 6596 | 111325 | T | 10 | 20 | E | | | S | - | 3178 |
| **6596** | **121846** | **Q** | **10 1/8** | **10** | **E** | **999** | **101** | | | |
| **6596** | **123958** | **Q** | **10 1/8** | **10** | **E** | **999** | **107** | | | |
| 6596 | 130450 | T | 10 | 20 | E | | | S | - | 3198 |
| **6596** | **130506** | **Q** | **10 1/8** | **10** | **E** | **999** | **100** | | | |
| **6596** | **140936** | **Q** | **10 1/8** | **10** | **E** | **999** | **123** | | | |
| **6596** | **160332** | **Q** | **10 1/8** | **10** | **C** | **1** | **1** | | | |
| **DAY 4** | | | | | | | | | | |
| **6597** | **93630** | **Q** | **10 1/8** | **10** | **O** | **999** | **103** | | | |
| 6597 | 94207 | T | 10 | 20 | E | | | S | - | 3218 |
| 6597 | 94301 | T | 10 | 10 | E | | | S | - | 3228 |
| 6597 | 95229 | T | 10 | 50 | E | | | S | - | 3278 |
| **6597** | **95615** | **Q** | **10 1/8** | **10** | **E** | **999** | **120** | | | |
| 6597 | 114645 | T | 10 1/8 | 1 | E | | | B | 1 | 3278 |
| 6597 | 115926 | T | 10 1/8 | 10 | E | | | B | 11 | |
| 6597 | 120431 | T | 10 1/8 | 2 | E | | | B | 13 | |
| 6597 | 125312 | T | 10 1/8 | 24 | E | | | B | 37 | |
| 6597 | 131733 | T | 10 | 50 | E | | | S | 37 | 3328 |
| **6597** | **131733** | **Q** | **10 1/8** | **10** | **E** | **999** | **100** | | | |
| 6597 | 134343 | T | 10 1/8 | 20 | E | | | B | 57 | 3328 |
| 6597 | 134621 | T | 10 | 3 | E | | | S | 57 | 3331 |
| 6597 | 153434 | T | 10 1/8 | 1 | E | | | B | 58 | |
| 6597 | 154331 | T | 10 | 1 | E | | | S | 58 | 3332 |
| **6597** | **160246** | **Q** | **10 1/8** | **10** | **C** | **1** | **1** | | | |
| **DAY 5** | | | | | | | | | | |
| **6598** | **94104** | **Q** | **10 1/8** | **10** | **O** | **999** | **101** | | | |
| 6598 | 105448 | T | 10 1/8 | 1 | E | | | B | 59 | |
| 6598 | 112655 | T | 10 1/8 | 5 | E | | | B | 64 | |
| 6598 | 121600 | T | 10 | 40 | E | | | S | | 3372 |
| 6598 | 123627 | T | 10 | 20 | E | | | S | | 3392 |
| **6598** | **123627** | **Q** | **10 1/8** | **10** | **E** | **999** | **100** | | | |
| 6598 | 131546 | T | 10 | 40 | E | | | S | | 3432 |
| **6598** | **132943** | **Q** | **10 1/8** | **10** | **E** | **960** | **100** | | | |

## Table 1
## (continued)

| Date | Time | Trd Qte | PriAsk | VolBid | Cond Code | Ask Dep | Bid Dep | Buy Sell | Cum. Buys | Cum. Sells |
|---|---|---|---|---|---|---|---|---|---|---|
| DAY 5 | (cont.) | | | | | | | | | |
| 6598 | 132947 | T | 10 1/8 | 25 | E | | | B | 89 | |
| 6598 | 153222 | T | 10 1/8 | 1 | E | | | B | 90 | |
| 6598 | 155248 | T | 10 | 10 | E | | | S | | 3442 |
| **6598** | **160259** | **Q** | **10 1/8** | **10** | **C** | **1** | **1** | | | |
| DAY 6 | | | | | | | | | | |
| 6599 | 93249 | T | 10 | 153 | E | | | S | | 3595 |
| **6599** | **93301** | **Q** | **10 1/8** | **10** | **O** | **999** | **100** | | | |
| 6599 | 94507 | T | 10 | 94 | E | | | S | | 3689 |
| 6599 | 101653 | T | 10 | 10 | E | | | S | | 3699 |
| 6599 | 104514 | T | 10 1/8 | 5 | E | | | B | 95 | |
| 6599 | 115612 | T | 10 1/8 | 1 | E | | | B | 96 | |
| **6599** | **125632** | **Q** | **10 1/8** | **10** | **E** | **999** | **110** | | | |
| 6599 | 130113 | T | 10 1/8 | 2 | E | | | B | 98 | |
| 6599 | 135609 | T | 10 1/8 | 2 | E | | | B | 100 | |
| 6599 | 140140 | T | 10 1/8 | 2 | E | | | B | 102 | |
| 6599 | 140508 | T | 10 1/8 | 4 | E | | | B | 106 | |
| 6599 | 144904 | T | 10 1/8 | 1 | E | | | B | 107 | |
| 6599 | 144928 | T | 10 1/8 | 1 | E | | | B | 108 | |
| 6599 | 145918 | T | 10 | 5 | E | | | S | | 3704 |
| **6599** | **150943** | **Q** | **10 1/8** | **10** | **E** | **93** | **100** | | | |
| 6599 | 150947 | T | 10 | 10 | E | | | S | | 3714 |
| 6599 | 151206 | T | 10 1/8 | 1 | E | | | B | 109 | |
| **6599** | **151908** | **Q** | **10 1/8** | **10** | **E** | **910** | **110** | | | |
| 6599 | 151911 | T | 10 1/8 | 15 | E | | | B | 124 | |
| 6599 | 152200 | T | 10 | 4 | E | | | S | | 3718 |
| **6599** | **160146** | **Q** | **10 1/8** | **10** | **C** | **1** | **1** | | | |
| DAY 7 | | | | | | | | | | |
| 6600 | 93917 | T | 10 | 157 | E | | | S | | 3875 |
| **6600** | **93917** | **Q** | **10 1/8** | **10** | **O** | **900** | **100** | | | |
| 6600 | 100501 | T | 10 | 106 | E | | | S | | 3981 |
| **6600** | **101440** | **Q** | **10 1/8** | **10** | **E** | **900** | **111** | | | |
| 6600 | 101905 | T | 10 | 5 | E | | | S | | 3986 |
| **6600** | **101905** | **Q** | **10 1/8** | **10** | **E** | **900** | **106** | | | |
| **6600** | **111431** | **Q** | **10 1/8** | **10** | **E** | **900** | **119** | | | |
| **6600** | **120144** | **Q** | **10 1/8** | **10** | **E** | **900** | **140** | | | |
| **6600** | **133950** | **Q** | **10 1/8** | **10** | **E** | **870** | **100** | | | |
| 6600 | 133953 | T | 10 | 13 | E | | | S | | 3999 |
| 6600 | 134102 | T | 10 | 5 | E | | | S | | 4004 |
| 6600 | 134446 | T | 10 | 4 | E | | | S | | 4008 |
| **6600** | **134447** | **Q** | **10 1/8** | **10** | **E** | **870** | **127** | | | |
| **6600** | **142102** | **Q** | **10 1/8** | **10** | **E** | **870** | **115** | | | |
| 6600 | 142105 | T | 10 | 20 | E | | | S | | 4028 |
| 6600 | 143620 | T | 10 | 20 | E | | | S | | 4048 |
| **6600** | **143620** | **Q** | **10 1/8** | **10** | **E** | **870** | **80** | | | |
| **6600** | **143631** | **Q** | **10 1/8** | **10** | **E** | **870** | **100** | | | |
| **6600** | **153353** | **Q** | **10 1/8** | **10** | **E** | **85** | **100** | | | |
| 6600 | 153354 | T | 10 1/8 | 10 | E | | | B | 134 | |
| **6600** | **153356** | **Q** | **10 1/8** | **10** | **E** | **850** | **100** | | | |
| 6600 | 154344 | T | 10 | 10 | E | | | S | | 4058 |
| **6600** | **160811** | **Q** | **10 1/8** | **10** | **C** | **1** | **1** | | | |

## Table 2

## Predictability of Subsequent Returns Using Trade Imbalances

For a sample of 65 closed-end fund initial public offerings between 1/1/88 and 6/1/89, cross-sectional regressions are estimated to determine the link between trade imbalances and subsequent returns. This table presents estimated slope coefficients, t-statistics (in parentheses) and $R^2$s (in italics) from regressions of the form:

$$CR_j(t, T) = \alpha + \beta\ IMBALANCE_{jt} + \varepsilon_j$$

where $IMBALANCE_{jt}$ is the cumulative trade imbalance for firm j over the first t trading days calculated as the difference between the volume of all seller initiated trades for the first t trading days and the volume of all buyer initiated trades. The difference is then standardized by dividing by the number of shares outstanding. $CR_j(t,T)$ is the cumulative bid-to-bid return for firm j from the close of trading day t to the close of day T.

| *Dependent Variable:* Cumulative return from the close of event day t until the close of event day T: | *Independent Variable:* Trade imbalance as of event day t: | | |
|---|---|---|---|
| | t = 1 | t = 3 | t = 5 |
| T=10 | -.339<br>(-1.08)<br>*.018* | -.411<br>(-7.29)<br>*.457* | -.323<br>(-6.99)<br>*.437* |
| T=20 | -.457<br>(-1.51)<br>*.035* | -.521<br>(-8.64)<br>*.542* | -.403<br>(-6.94)<br>*.433* |
| T=40 | -.543<br>(-1.83)<br>*.050* | -.333<br>(-2.96)<br>*.122* | -.201<br>(-1.95)<br>*.057* |
| T=70 | -.259<br>(-077)<br>*.010* | -.327<br>(-2.58)<br>*.095* | -.262<br>(-2.38)<br>*.082* |
| T=100 | -.105<br>(-0.34)<br>*.002* | -.234<br>(-1.71)<br>*.044* | -.219<br>(-1.83)<br>*.050* |

## Table 3

## Duration of Stabilization and Use of the Over-allotment Option

This table reports results of three cross-sectional regressions that examine the relation between the length of the stabilization period and the exercise of the over-allotment option. All 62 funds issued between 1/1/88 and 6/1/89 that had zero or negative 100 day returns and over-allotment option information are included. The dependent variable (Edate) is the first day that the bid price dropped below the issue price. In model 1, the independent variable (OA) equals one for the 28 funds that exercised the over-allotment option, zero otherwise. In model 2, the independent variable (OAFull) equals one for the 16 funds that used the full 15% over-allotment, zero otherwise. In model 3, the independent variable (OAShrs) is the number of shares purchased through the over-allotment option, as a percentage of total shares issued. T-statistics are in parentheses.

| Model | Intercept | OA | OAFull | OAShrs | Adj. $R^2$ |
|---|---|---|---|---|---|
| 1 | 23.82<br>(7.29) | 10.50<br>(2.16) | - | - | 5.7 |
| 2 | 24.46<br>(8.98) | - | 15.92<br>(2.97) | - | 11.4 |
| 3 | 24.26<br>(7.82) | - | - | 80.84<br>(2.21) | 6.0 |

## Table 4

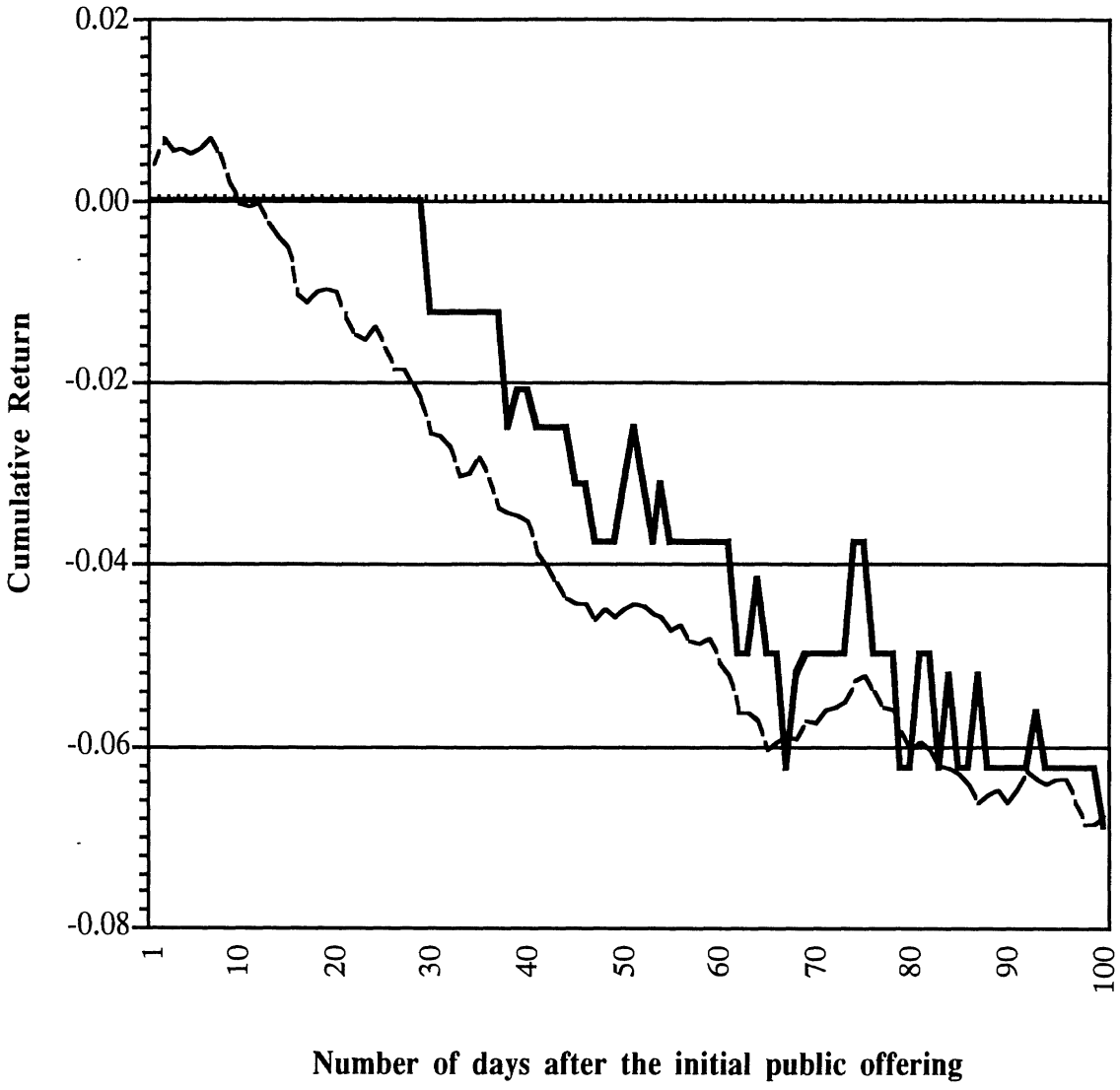
## Joint Frequency Distribution of Trade Size and Buy:sell Direction

This table reports the joint frequency distribution of trades by size and buy:sell direction for a sample of closed-end fund IPOs. All 65 funds issued between 1/1/88 and 6/1/89 are included, except 6 foreign country funds. All transactions in the first 30 days of trading are included. Trades are classified as small if they are less than a firm-specific size threshold that approximates $10,000. The Lee-Ready (1991) algorithm is used to classify trades as seller- or buyer-initiated. Trades are classified as indeterminable if the prevailing quote is non-tradable (e.g. during trading halts or fast trading conditions), if it is the first trade of the year, or if it carries an out-of-sequence code. Percentage of total sample are in parentheses, percentage of column total is italicized.

| Trade Size | Trade Direction | | | |
|---|---|---|---|---|
| | **Buys** | **Indeterminable** | **Sells** | **Total** |
| **Large Trades** | 2680<br>(5.5%)<br>*22.0* | 65<br>(0.1%)<br>*69.9* | 18882<br>(38.7)<br>*51.8* | 21627<br>(44.4%) |
| **Small Trades** | 9493<br>(19.5%)<br>*78.0* | 28<br>(0.1%)<br>*30.1* | 17594<br>(36.1%)<br>*48.2* | 27115<br>(55.6%) |
| **Total** | 12173<br>(25.0%) | 93<br>(0.2%) | 36476<br>(74.8%) | 48742<br>(100.0%) |

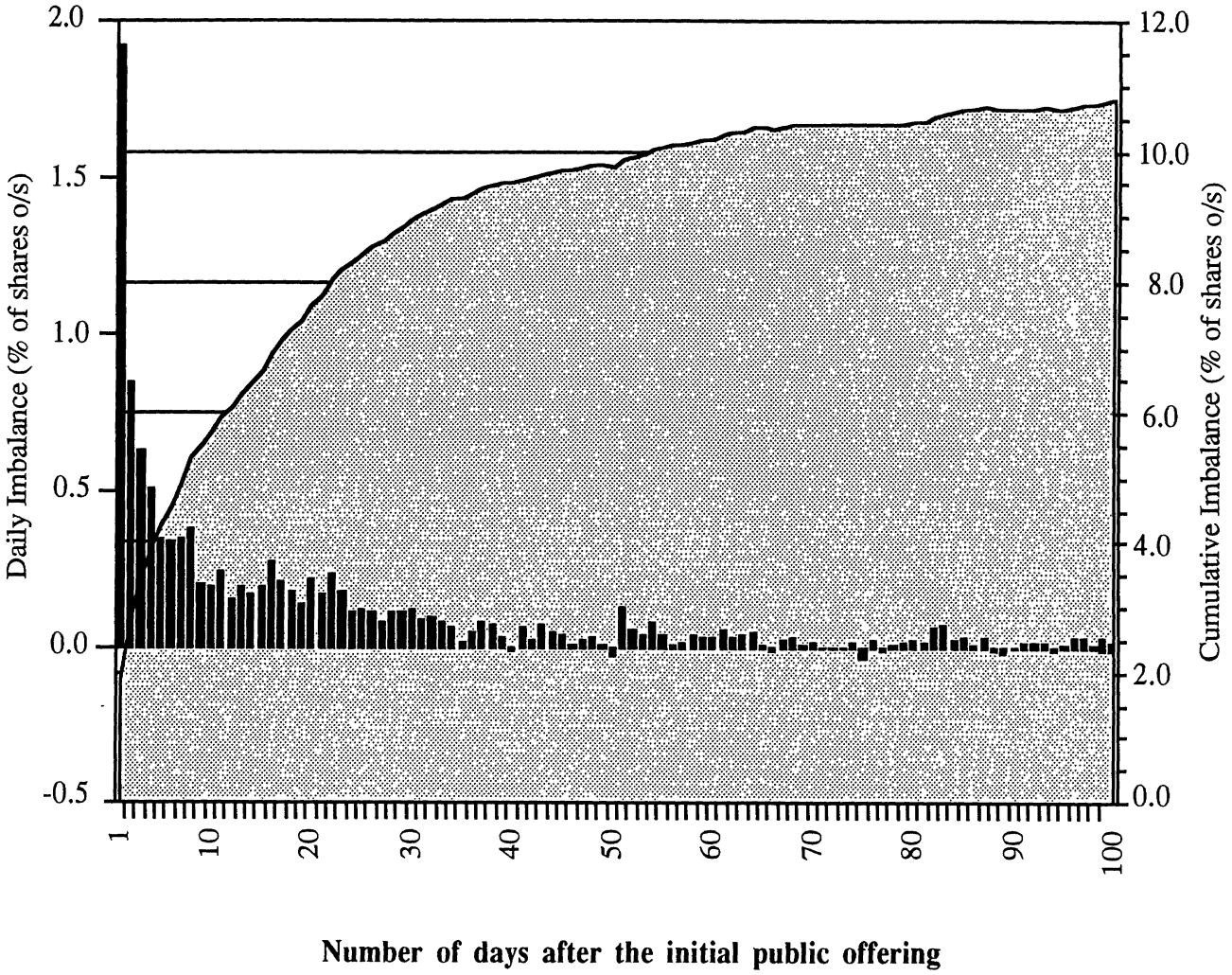
## Figure 1. Mean and median cumulative returns

This graph depicts the mean and median cumulative returns over the first 100 trading days for a sample of 65 closed-end funds that began trading on the New York or American stock exchanges between 1/1/88 and 6/1/89. Daily returns are computed using the bid price of the last tradable quote for each day, obtained from the Institute for the Study of Security Markets (ISSM) database.



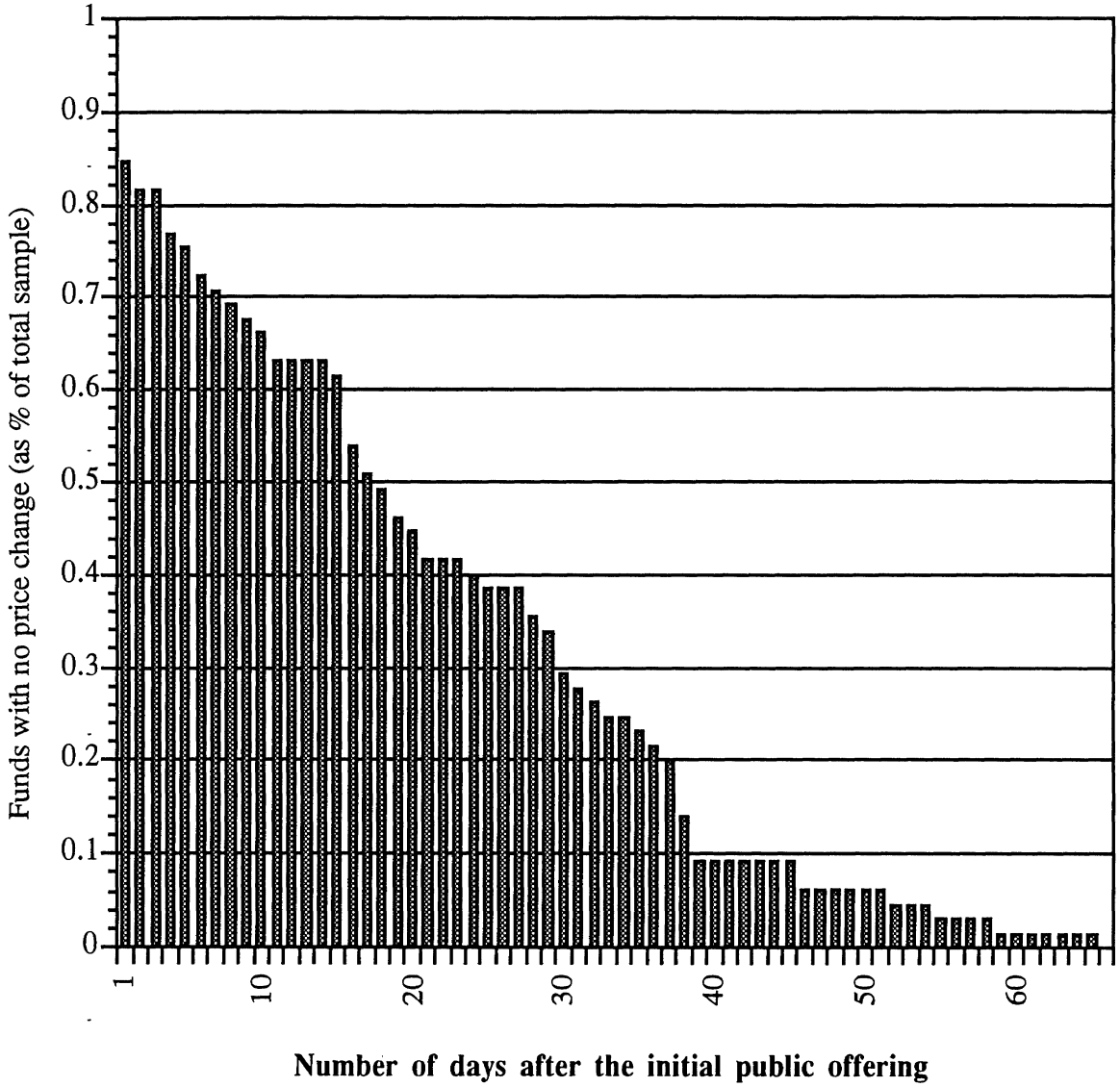
## Figure 2. Daily and cumulative order imbalance

This graph depicts the daily and cumulative order imbalance over the first 100 trading days for a sample of 65 closed-end funds that began trading on the New York or American stock exchanges between 1/1/88 and 6/1/89. Order imbalance is defined as (shares sold - shares bought) / total shares issued. The Lee and Ready (1991) algorithm is used to classify each trade as buyer- or seller-initiated. Transactions data on trades and quotes is obtained from the Institute for the Study of Security Markets (ISSM) database.



## Figure 3. Percentage of funds that experienced no price change since the opening of trading

This graph depicts the percentage of funds that experienced no price change over the first 100 trading days for a sample of 65 closed-end funds that began trading on the New York or American stock exchanges between 1/1/88 and 6/1/89. A fund is deemed to have experienced no price change if the specialist's quoted bid price never moved from the offer price. Transactions data on trades and quotes is obtained from the Institute for the Study of Security Markets (ISSM) database.



## Figure 4. The behavior of bid-ask spreads

These graphs depict the behavior of bid-ask spreads over the first 100 trading days for a sample of 65 closed-end funds that began trading on the New York or American stock exchanges between 1/1/88 and 6/1/89. Figure 4a reports the daily average closing spread in dollars per share. Figure 4b reports the percentage of sample funds with a closing spread of 1/8th. The last tradable quote of each day is used to compute daily spreads. Transactions data is obtained from the Institute for the Study of Security Markets (ISSM) database.

Figure 4a : Average Raw Spread

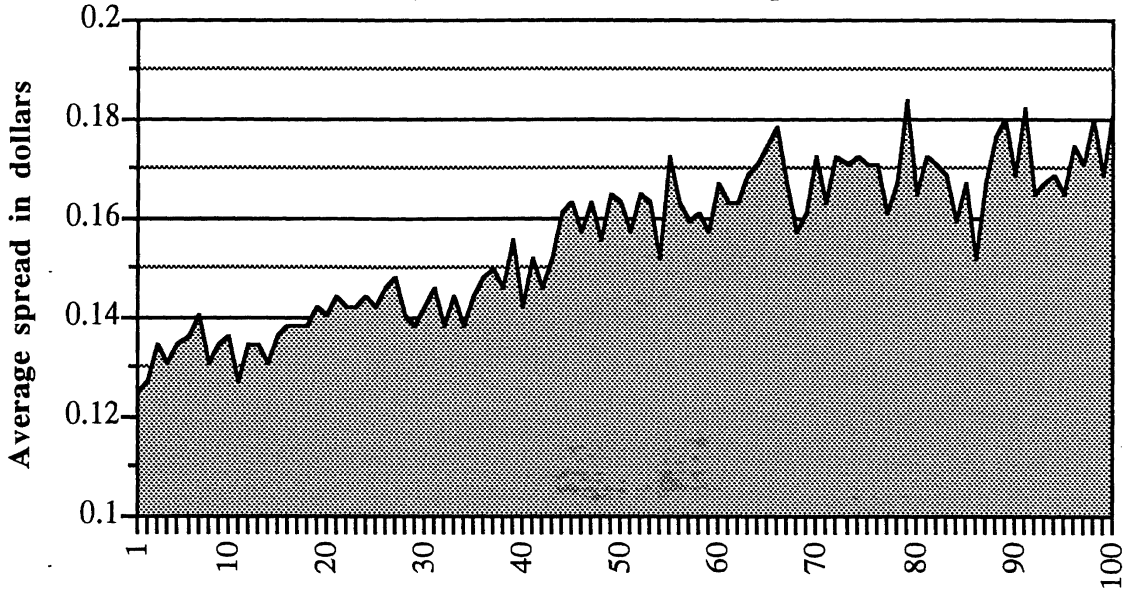
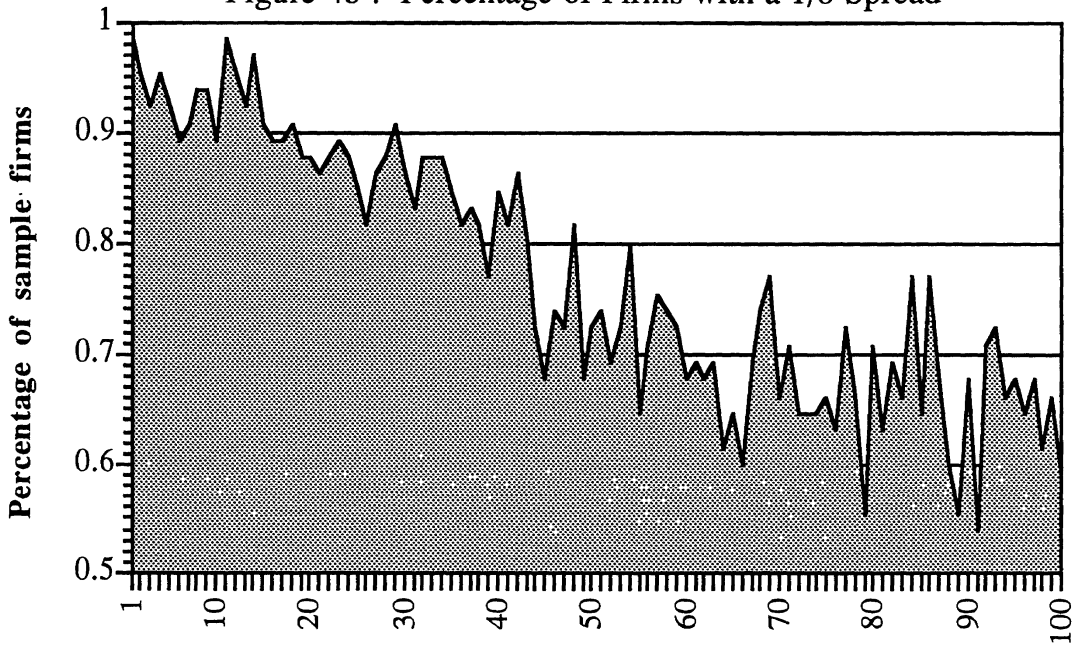


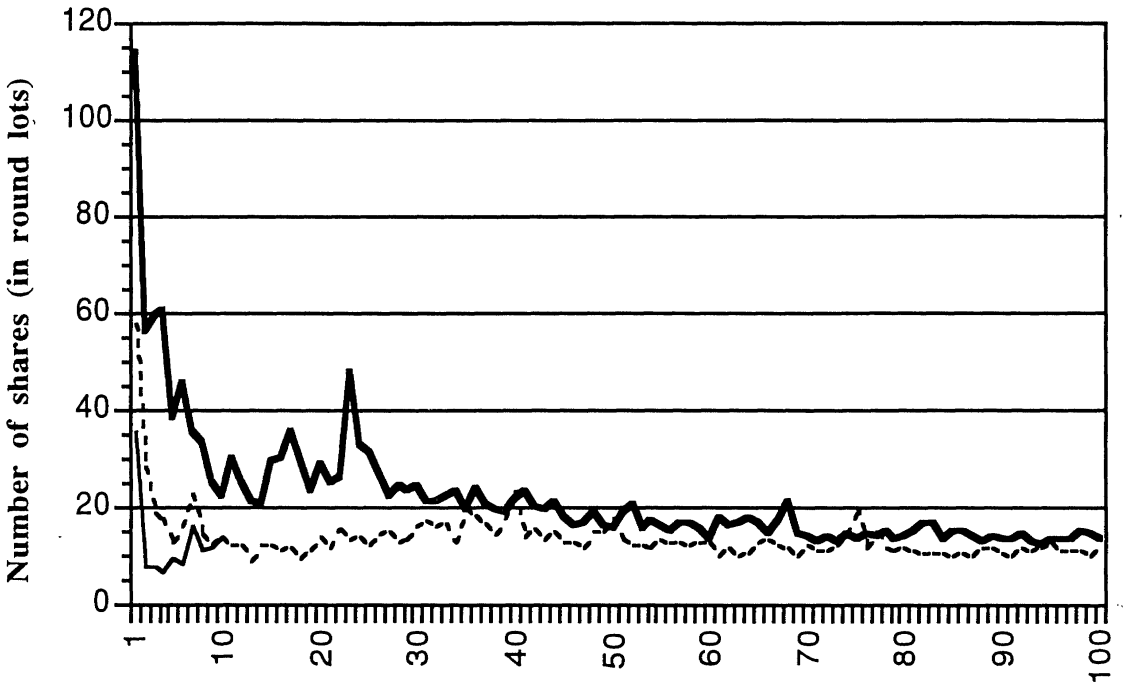

Figure 4b : Percentage of Firms with a 1/8 Spread




**Number of days after the initial public offering**

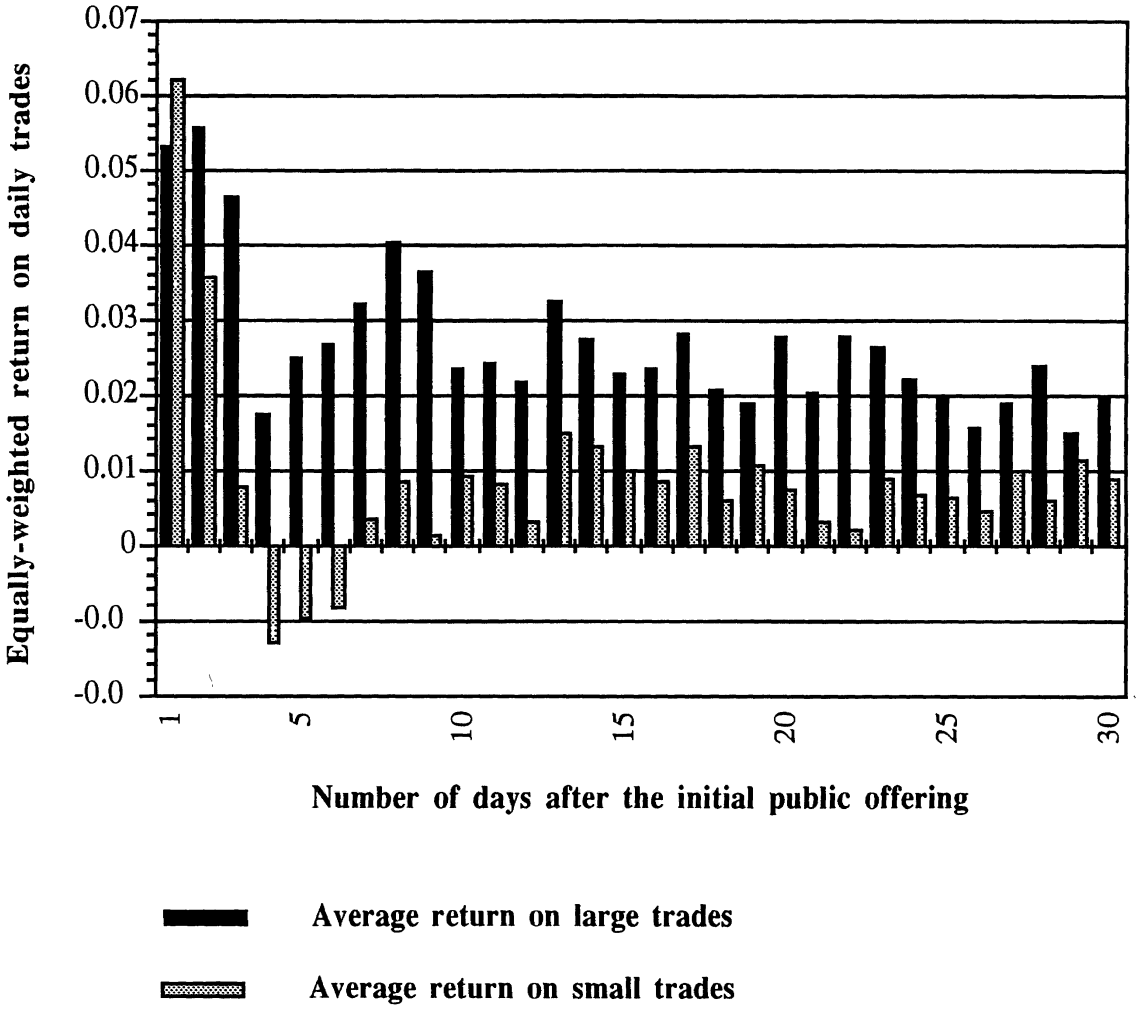
## Figure 5. Average size of buy and sell transactions

This graph depicts the average trade size for buyer-initiated and seller-initiated trades over the first 100 trading days for a sample of 65 closed-end funds that began trading on the New York or American stock exchanges between 1/1/88 and 6/1/89. The average trade size is computed by dividing the total number of shares transacted in buyer-initiated (seller-initiated) trades by the total number of buyer-initiated (seller-initiated) trades. The Lee and Ready (1991) algorithm is used to classify each trade as buyer- or seller-initiated. Transactions data on trades and quotes is obtained from the Institute for the Study of Security Markets (ISSM) database.



## Figure 6. Average "trading profit" for initiators of large and small trades over the first 30 days

This graph depicts the daily equally-weighted average returns for large and small trades transacted in the first 30 days of trading. The sample consists of 59 domestic closed-end funds that began trading on the New York or American stock exchanges between 1/1/88 and 6/1/89. Trades are classified by size using a firm-specific share size threshold such that small (large) trades are generally under (over) $10,000 in value. The trading profit on each trade is computed relative to the quoted bid and ask prices at the close of trading on day 100. Buyer-initiated trades are sold at the quoted bid price on day 100, seller-initiated trades are bought back at the quoted ask price on day 100. The Lee and Ready (1991) algorithm is used to classify trades into buyer- and seller-initiated categories. Transactions data is obtained from the Institute for the Study of Security Markets (ISSM) database.



## Appendix A
## Offering characteristics

Offering characteristics for a sample of 65 closed-end funds that went public from January 1988 through May 1989. All data are from *Securities Data Corporation.*

| CUSIP | Issuer | Offer Date | Offer Price | Shares Offered[a] | Amount Offered[b] | Total Expenses[c] | Exchange |
|---|---|---|---|---|---|---|---|
| 000918 | ACM Gov't Opportunity Fund | 880818 | 10.00 | 11500.0 | 115.0 | 0.07704 | NYSE |
| 000917 | ACM Government Spectrum Fd | 880519 | 10.00 | 27000.0 | 270.0 | 0.07259 | NYSE |
| 00091T | ACM Managed Income Fund | 881027 | 10.00 | 18000.0 | 180.0 | 0.07422 | NYSE |
| 00142G | AIM Strategic Income Fund | 890323 | 10.00 | 5700.0 | 57.0 | 0.07629 | AMEX |
| 025917 | American Government Income Fd | 880421 | 8.00 | 16500.0 | 132.0 | 0.07432 | NYSE |
| 025920 | American Government Term Trust | 890119 | 10.00 | 7000.0 | 70.0 | 0.06669 | NYSE |
| 025919 | American Govt Income Portfolio | 880922 | 10.00 | 18750.0 | 187.5 | 0.07280 | NYSE |
| 009250 | Blackstone Income Trust | 880722 | 10.00 | 58500.0 | 585.0 | 0.07184 | NYSE |
| 092521 | Blackstone Target Term Trust | 881117 | 10.00 | 83000.0 | 830.0 | 0.06193 | NYSE |
| 105759 | Brazil Fund | 880331 | 12.50 | 12000.0 | 150.0 | 0.07701 | NYSE |
| 195743 | Colonial High Income Muni Tr | 890216 | 10.00 | 27000.0 | 270.0 | 0.07208 | NYSE |
| 195763 | Colonial Intermed High Income | 880721 | 10.00 | 11000.0 | 110.0 | 0.07529 | NYSE |
| 195768 | Colonial Invt Grade Muni Trust | 890519 | 12.00 | 10000.0 | 120.0 | . | NYSE |
| 205763 | Comstock Partners Strategy Fd | 880519 | 10.00 | 110000.0 | 1100.0 | . | NYSE |
| 261881 | Dreyfus Calif Municipal Income | 881021 | 10.00 | 3700.0 | 37.0 | 0.07838 | AMEX |
| 26201R | Dreyfus Municipal Income | 881021 | 10.00 | 16000.0 | 160.0 | 0.07356 | AMEX |
| 26201T | Dreyfus NY Municipal Income | 881021 | 10.00 | 3000.0 | 30.0 | 0.07953 | AMEX |
| 319344 | First Boston Strategic Inc Fd | 880422 | 12.00 | 7250.0 | 87.0 | 0.07779 | NYSE |
| 320532 | First Iberian Fund | 880413 | 10.00 | 2750.0 | 27.5 | 0.10545 | AMEX |
| 35459D | Franklin Principal Maturity Tr | 890119 | 10.00 | 17700.0 | 177.0 | 0.07463 | NYSE |
| 355145 | Franklin Universal Trust | 880923 | 10.00 | 23000.0 | 230.0 | 0.07402 | NYSE |
| 37933L | Global Income Plus Fund | 880824 | 10.00 | 21000.0 | 210.0 | 0.07368 | NYSE |
| 409528 | Hampton Utilities Trust | 880307 | 10.00 | 1022.5 | 10.2 | 0.07650 | AMEX |
| 42967M | High Income Advantage Tr III | 890221 | 10.00 | 11500.0 | 115.0 | 0.07342 | NYSE |
| 429906 | High Yield Plus Fund | 880415 | 10.00 | 10750.0 | 107.5 | 0.07744 | NYSE |
| 454090 | India Growth Fund | 880812 | 12.00 | 3300.0 | 39.6 | 0.08462 | NYSE |
| 48841G | Kemper High Income Trust | 880421 | 12.00 | 17000.0 | 204.0 | 0.07436 | NYSE |
| 488413 | Kemper Intermediate Govt Trust | 880721 | 10.00 | 28000.0 | 280.0 | 0.07271 | NYSE |
| 48842B | Kemper Multi-Market Income Tr | 890123 | 12.00 | 17000.0 | 204.0 | 0.07539 | NYSE |
| 48842C | Kemper Municipal Income Trust | 881020 | 12.00 | 31000.0 | 372.0 | 0.07403 | NYSE |
| 488427 | Kemper Strategic Muni Income | 890322 | 12.00 | 10000.0 | 120.0 | 0.07858 | NYSE |
| 541542 | Lomas Mortgage Securities Fund | 881123 | 12.00 | 25000.0 | 300.0 | 0.07024 | NYSE |
| 55273C | MFS Intermediate Income Trust | 880310 | 10.00 | 200000.0 | 2000.0 | . | NYSE |
| 55273P | MFS Multimarket Total Return | 880721 | 10.00 | 15000.0 | 150.0 | 0.07584 | NYSE |
| 576299 | MassMutual Participation Invts | 881021 | 10.00 | 8500.0 | 85.0 | 0.07962 | NYSE |
| 626243 | MuniEnhanced Fund | 890223 | 12.00 | 25000.0 | 300.0 | 0.07235 | NYSE |
| 626295 | MuniVest Fund | 880922 | 10.00 | 48000.0 | 480.0 | 0.06617 | AMEX |
| 67062B | Nuveen CA Municipal Income Fd | 880420 | 12.00 | 5000.0 | 60.0 | 0.07336 | NYSE |
| 67062J | Nuveen Municipal Income Fund | 880420 | 12.00 | 7000.0 | 84.0 | 0.07569 | NYSE |
| 67062L | Nuveen NY Municipal Income Fd | 880420 | 12.00 | 2300.0 | 27.6 | 0.08022 | AMEX |
| 67062T | Nuveen Premium Income Muni Fd | 880721 | 15.00 | 45000.0 | 675.0 | 0.06563 | NYSE |
| 683939 | Oppenheimer Multi-Government | 881123 | 10.00 | 5500.0 | 55.0 | 0.07700 | NYSE |
| 683933 | Oppenheimer Multi-Sector Tr | 880324 | 12.00 | 28000.0 | 336.0 | 0.07227 | NYSE |

## Appendix A (continued)

| CUSIP | Issuer | Offer Date | Offer Price | Shares Offered[a] | Amount Offered[b] | Total Expenses[c] | Exchange |
|---|---|---|---|---|---|---|---|
| 743586 | Prospect Street High Income | 881128 | 10.00 | 12000.0 | 120.0 | . | NYSE |
| 74435G | Prudential Intermediate Fund | 880519 | 10.00 | 47000.0 | 470.0 | 0.07245 | NYSE |
| 746781 | Putnam High Yield Muni Income | 890518 | 10.00 | 18500.0 | 185.0 | . | NYSE |
| 746798 | Putnam Intermed Govt Inc Trust | 880616 | 10.00 | 60000.0 | 600.0 | 0.07110 | NYSE |
| 746823 | Putnam Managed Muni Income Tr | 890216 | 10.00 | 40000.0 | 400.0 | 0.07261 | NYSE |
| 746909 | Putnam Master Intermediate Tr | 880421 | 10.00 | 36000.0 | 360.0 | 0.07171 | NYSE |
| 746853 | Putnam Premier Income Trust | 880218 | 10.00 | 130000.0 | 1300.0 | . | NYSE |
| 749208 | RAC Income Fund | 881223 | 12.00 | 9600.0 | 115.2 | 0.07731 | NYSE |
| 749651 | R.O.C. Taiwan Fund | 890512 | 14.55 | 4112.6 | 59.8 | 0.08849 | NYSE |
| 756008 | Real Estate Sec Income Fund | 880823 | 10.00 | 2400.0 | 24.0 | 0.08669 | AMEX |
| 846330 | Spain Fund | 880621 | 12.00 | 3250.0 | 39.0 | 0.11718 | NYSE |
| 879929 | Templeton Global Govts Inc Tr | 881122 | 10.00 | 17500.0 | 175.0 | 0.07563 | NYSE |
| 880198 | Templeton Global Income Fund | 880317 | 10.00 | 110000.0 | 1100.0 | . | NYSE |
| 882904 | Thai Fund | 880217 | 12.00 | 8333.3 | 100.0 | 0.08317 | NYSE |
| 872527 | TIS Mortgage Investment | 880819 | 10.00 | 7406.7 | 74.1 | 0.07756 | NYSE |
| 903291 | USF&G Pacholder Fund | 881116 | 20.00 | 1638.0 | 32.8 | 0.08890 | AMEX |
| 920910 | Van Kampen Merritt Cal Muni Tr | 881025 | 10.00 | 2800.0 | 28.0 | 0.08750 | AMEX |
| 920911 | Van Kampen Merritt Intermed Tr | 890119 | 10.00 | 13200.0 | 132.0 | 0.07659 | NYSE |
| 920913 | Van Kampen Merritt Ltd Term Tr | 890421 | 12.00 | 7500.0 | 90.0 | 0.07778 | NYSE |
| 920909 | Van Kampen Merritt Muni Inc Tr | 880819 | 10.00 | 24000.0 | 240.0 | 0.07387 | NYSE |
| 98148D | World Income Fund | 880922 | 10.00 | 27000.0 | 270.0 | 0.06685 | AMEX |
| 989361 | Zenith Income Fund | 880420 | 10.00 | 8500.0 | 85.0 | 0.08260 | NYSE |

[a]Shares offered are in thousands.
[b]Amount offered is in millions.
[c]Total expenses are the sum of the percentage gross spread and the percentage miscellaneous expenses.

## Appendix B

## Inferring Trade Direction

The direction of individual trades is inferred by the following algorithm developed in Lee and Ready (1991). Only NYSE issued quotes which are BBO-eligible are used (a quote is BBO-eligible if it qualifies for the National Association of Security Dealers' Best-Bid-Or-Offer calculation) :

1. Current Quote Match - If the trade price is at the bid or ask, and the current quote was not revised within the last 5 seconds, then the direction of the trade is determined by the current quote ( i.e. a buy if it's at the ask and a sell if it's at the bid).

2. Delayed Quote Match - If the current quote is less than 5 seconds old, it is ignored and the trade price is compared to the bid and ask prices of the previous quote.

3. Outside the Spread - If the trade price, when compared to the quote in either 1. or 2., is greater than the ask (less than the bid), then the transaction is deemed a buy (sell).

4. Tick Test - If the trade is at the midpoint of the spread, or if a BBO-eligible quote is not available, the tick test is used to determine trade direction. A BBO-eligible quote is deemed to be unavailable if the last NYSE-quote issued has a non-tradable condition code. Using the tick test, if the last price change was positive (negative), then the current trade is deemed a buy (sell). All out-of-sequence trades are ignored in updating price changes.

5. Proximity to Bid/Ask - If a trade is between the spread but not at the midpoint, then the trade is classified according to its proximity to the bid or ask price. Trades at prices above the midpoint are classified as buys and trades at prices below the midpoint are classified as sells.

6. Indeterminable - This classification is assigned to a trade when none of the above conditions apply. Specifically, it applies to the first trade of the year for each firm and any trade which is reported out-of-sequence.