Organizational Form and Liquidity:
Evidence from Closed-End and Open-End Municipal Bond Funds

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Abstract

We study the impact that organizational form has on the ability of mutual funds to manage illiquid assets. Using a sample of closed- and open-end municipal bond funds from 2001-2011, we find that closed-end funds hold more illiquid bonds than open-end funds hold. We also find evidence that closed-end funds outperform open-end funds before the financial crisis and underperform during the crisis period, possibly due to their higher exposure to liquidity risk. Our findings support the idea that closed-end funds exist because they have advantage over open-end funds in providing exposure to illiquidity to investors' portfolios. We also consider the potential systemic liquidity shock faced by levered closed-end funds. We find that highly levered closed-end funds choose to hold relatively liquid muni bonds to reduce the potential liquidation costs at periods when the market-wide liquidity is low.

1. Introduction

At year-end 2014, there are 568 closed-end mutual funds in the US holding $289 billion in assets.[1] Why do closed-end funds exist side-by-side with open end mutual funds? One common answer is that a closed-end fund has the ability to hold less liquid assets. (See e.g. Cherkes, Sagi, and Stanton (2008)) We explore the role that liquidity plays in open and closed end funds.

Differences in the mechanics of open-end and closed-end funds lead to the different trading environments and susceptibility to liquidity shocks. Closed end funds trade throughout the trading day at a price determined in the market, just like any other stock would trade, and the number of shares outstanding does not expand or contract with a purchase or sale of the fund. In contrast, open-end funds are priced once a day at an end of day valuation that is determined by the fund company, through its pricing service, and fund shares are created or redeemed with the inflow or outflow to/from an open-end fund which creates a change in the number of fund shares outstanding. A second observable difference is that closed-end funds commonly deploy leverage to alter the nature of their return profile.[2]

Because closed-end funds do not have to purchase or redeem assets in order to facilitate liquidity for fund owners, closed-end fund portfolio managers have control of their trading decisions. In contrast, open-end funds must either create or redeem shares for their fund holders on demand. As a result, open-end fund portfolio managers' trading decisions must accommodate pressures from purchase or sale decisions made by mutual fund holders. This pressure on open-end fund managers has the potential to expose the fund to the risk of needing to trade when the market for bonds is especially illiquid.

[1] 2015 ICI Factbook.

[2] According to the 1940 Investment Company Act, closed-end funds can lever up by borrowing bank loans or issuing preferred stock. It also requires funds to maintain minimum asset coverage ratio (3:1 for bank loans and 2:1 for preferred stocks). If the asset coverage ratio drops below the minimum requirement or liquidity dries up in the short-term borrowing market, then the funds will have to liquidate part of the holdings.

We focus on open-and closed-end municipal bond funds because compared to other major asset classes the municipal bond market includes a number of relatively illiquid assets and therefore is a market where, if the theory is correct, we should be able to observe a difference in the behavior of fund managers. In addition, muni bond funds account for a large share of assets in closed-end funds with 31% of closed end fund assets held by muni bond funds in 2014, suggesting that the closed-end fund structure has advantages for municipal bond funds.

Our samples of open- and closed-end municipal bond funds face different liquidity risks. As described above, open-end funds are subject to fund investors' redemption and purchase requests on a daily basis. Arguably these have a large idiosyncratic component. To the extent that we focus on closed-end funds that employ leverage, liquidity needs arise when they are exposed to systematic shocks in the market that increase the costs of trading and borrowing, such as those experienced during the 2008-2009 financial crisis.

We use a sample of municipal bond funds from 2001-2011 to study the differences in liquidity management by open-end funds and closed-end funds. Specifically, we look at the following questions: Do closed-end funds hold more illiquid muni bonds than open-end funds? Do closed-end funds earn a liquidity premium for holding illiquid bonds? Does leverage affect closed-end funds' choice of liquidity level? How do closed-end funds manage their portfolios when they are forced to reduce fund leverage? Do they suffer losses from liquidating muni bonds at systematic liquidity shocks?

We separate our sample into two periods: pre-crisis period (2001-Jul. 2007) and crisis period (Aug. 2007-2011). We use the pre-crisis period to test whether closed-end funds hold more illiquid muni bonds and earn higher returns for bearing liquidity risk. Investment funds can achieve their desired level of liquidity through holding cash, derivatives and other short-term securities. Edelen (1998) and Chernekno and Sunderam (2016) show that mutual funds use cash to accommodate inflows and outflows rather than transacting in equities or bonds. Jiang and Zhu (2015) find that mutual funds resort to credit default swaps when they face unpredictable liquidity needs and when the CDS securities are liquid relative to the

underlying bonds. In this paper, we directly look at the liquidity of municipal bonds held by muni bond funds.

There is no perfect measure of liquidity and no perfect way to measure the imperfect measures of liquidity. So we provide four measures of municipal bond liquidity that we aggregate quarterly for each fund. We find strong evidence that closed-end funds hold more illiquid muni bonds, holding bonds that trade more, cost less to trade, and hold bonds with lower measures of illiquidity. We also find that closed-end funds with high leverage tend to hold relatively liquid muni bonds. This negative association suggests that closed-end funds are aware of the systemic liquidity shocks they are face and that they increase fund liquidity when they have higher exposure to market-wide liquidity shocks.

We also examine whether closed-end funds earn higher returns for bearing liquidity risk and we present preliminary evidence that closed-end funds outperform open-end funds. We further find that the outperformance can be largely explained by the difference in funds' portfolio liquidity. For example, when a fund's average 3-month round-trip trading cost increases by 1%, its holding-based quarterly return increases by 13 basis points. We find negative associations between closed-end funds' leverage ratio and holding-based returns, consistent with the idea that closed-end funds choose higher liquidity levels if they employ leverage.

An important explanation for the existence of closed-end funds is that they offer special liquidity services to investors. Chordia (1996) shows that closed-end funds are likely to hold the least liquid securities, open-end funds with load fees hold more liquid assets and open-end funds without load fees hold the most liquid assets. Nanda, Narayanan and Warther (2000) argue that immunity to funding liquidity shocks allow closed-end funds to specialize in holding assets with high liquidation costs. Deli and Varma (2002) investigate the choice of organizational form for investment funds and find that funds that hold less liquid securities with less transparent prices are more likely to be closed-end. Cherkes, Sagi and Stanton (2009) build a rational, liquidity-based model to argue that closed-end funds "offer a means for investors to buy illiquid securities, without facing the potential costs associated with direct trading". They argue that closed-end funds exist

because they transform the illiquid underlying assets to relatively liquid closed-end fund shares so that investors can avoid the expensive trading costs. Our paper provides additional evidence to the liquidity-based explanation. We find that muni bond closed-end funds hold more illiquid muni bonds and charge higher advisory fees for providing investors with access to a liquidity premium.

Closed end funds also have the ability to use leverage. Elton, Gruber, Blake and Schachar (2013) look at closed-end bond funds and argue that the main advantage of closed-end funds is that they offer investors the opportunity to take leverage at very low borrowing rates. Using a matched sample of closed-end funds and open-end funds, they find that open-end funds and closed-end funds are similar except that closed-end funds are allowed to take leverage. Our paper considers the interaction of redemption risk and leverage risk. While immunity to redemption risk allow closed-end funds to tilt their portfolios toward illiquid muni bonds, these illiquid holdings can cause substantial losses when closed-end funds are forced to decrease their delever quickly. We look at closed-end funds' holdings and trading activity during the financial crisis to see how systematic liquidity shocks affect funds' investment strategy and performance.

2. Data

We use five data sources to construct our sample and variables: Morningstar open- and closed-end funds database, CRSP mutual fund database, MSRB EMMA municipal bond trades database, Mergent municipal bonds database, and hand-collect data from Form N-CSR for closed-end funds.

2.1. Fund performance and characteristics

Morningstar reports U.S. municipal bond funds' returns and characteristics for both open- and closed-end funds. We obtained muni bond funds' monthly net returns, gross returns, total net assets, annual expense ratio and turnover ratio. The Morningstar database has a number of missing values in fund characteristics

such as expense ratios and turnover ratios. We use information from CRSP and Form N-CSR to fill in these missing values.

The CRSP mutual fund database reports U.S. municipal mutual funds' returns and characteristics. We collect monthly net returns, annual expense ratios and turnover ratios from the CRSP mutual fund database. When Morningstar reports missing values in these three variables, we use the CRSP data. Investment funds are required to file Form N-CSR with SEC semi-annually. We also collect expense ratios and turnover ratios of closed-end funds from N-CSR filings and use them to replace missing values in Morningstar.

We obtain closed-end funds' leverage ratio from the N-CSR Form. Because the N-CSR Form is filed semi-annually and the Morningstar closed-end fund holdings are reported at a quarterly frequency, we assume that the leverage ratio reported in N-CSR in month t is the same during the preceding 6-months (t-5, t).

We use quarterly portfolio holdings reported in Morningstar. Morningstar reports quarterly portfolios for each muni bond fund, including name, CUSIP, shares outstanding, market value and portfolio weight of each municipal bond held by the fund at the end of a quarter. Morningstar also reports characteristics of each muni bond held by a fund, including the bond's coupon rate and maturity date.

We identify 324 closed-end and 1329 open-end muni bond funds in Morningstar from 1997-2014. We exclude a fund's observation in a quarter if it has less than $5 million in total net assets. Given missing CUSIPs and holdings for some funds, we require our sample funds to hold at least 20 securities and 10 municipal bonds in their portfolio. We require that each fund have CUSIPs for more than 90% of the fund's bond holdings. For open-end funds, we require the market value for the sum of the securities held, to be no less than 90% of the fund's reported total net assets. Finally, we require that funds hold more than 80% of their assets in fixed-rate bonds, measured relative to total assets reported in N-CSR Form for closed-end funds, and measured relative to total net assets reported in Morningstar for open-end funds.

We restrict our sample period to 2001-2011. The final sample consists of 20,200 quarterly observations for 712 open-end funds and 6090 quarterly observations for 296 closed-end funds. National municipal funds

account for 268 open-end funds and 130 closed-end funds, while single-state funds account for 444 open-end funds and 166 closed-end funds. We primarily focus on the national municipal bond funds.

All of our sample closed-end funds have only one share class, while some open-end funds have multiple share classes. For each multi-share class municipal open-end fund in the sample, we use lagged total net assets as weights to calculate the weighted-average monthly return, expense ratio and turnover ratio. We aggregate the total net assets of all share classes to calculate the fund's total net assets.

For each muni bond held by a fund in a quarter, we identify its coupon type (fixed-rate or floating-rate), credit rating, maturity, and coupon rate. We calculate the percentages of total net assets invested in investment-grade and fixed-rate municipal bonds. We use the market value of each muni bond held by a fund as the weight to calculate the weighted-average coupon rate and maturity for the fund in a quarter.

2.2. Portfolio liquidity

We use MSRB's EMMA database to compute liquidity measures for muni bonds. EMMA reports the trading price, trading size, and trade time for each municipal bond transaction. It also reports whether the transaction is a dealer-purchase, dealer-sell, or inter-dealer transaction. We estimate four variables to capture a muni bond's liquidity.

First, we use a turnover measure. For each CUSIP, we calculate the sum of all dealer-purchase transactions in a month and scale by the CUSIP's issue size. If a CUSIP does not appear in EMMA in a month, we assume zero trading volume in that month. We use these monthly measures to calculate a muni bond's trading volume in the previous 3 months (t-2,t) and 12 months (t-11,t).

Second, we estimate round-trip trading costs or dealer markup. We obtain the estimates of round-trip trading costs from Chalmers, Liu, and Wang (2018). Chalmers, Liu and Wang estimate the round-trip trading cost for each round-trip transaction. The round-trip trading cost is defined as follow.

$$\frac{P_{dealer\_sell} - P_{dealer\_buy}}{P_{dealer\_buy}}$$

We use trade size to calculate the weighted-average round-trip trading cost for a muni bonds in the past 3 months and 12 months.

Third, Lesmond, et al. (200?) argue that the percentage of zero volume trading days is a proxy for illiquidity. They argue that in a market with frictions, a trade only occurs when the value of information exceeds the trading costs. If the trading costs of illiquid securities are high, the assumption is that it takes more time for sufficient valuable information to accumulate for an illiquid security to trade. Therefore, illiquid securities have longer periods with no trading activity. We calculate the percentage of zero-trading days in a quarter for each muni bond using the EMMA database. When a bond does not appear in the MSRB database, we assume it is not traded during the quarter. Thus, its percentage of zero-trading days equals 1.

Fourth, we use a modified version of Amihud's (2002) illiquidity measure. The Amihud illiquidity variable measures the price impact of a trade per unit traded. It is defined as the daily absolute return to the dollar trading volume on a day. We adopt the modified measure from Dick-Nielsen, Feldhütter and Lando (2012). The intuition for the Amihud measure is that liquid securities can trade in large quantities with little impact on prices. So the Amihud measure gets larger for securities that are increasingly Illiquid. For each muni bond in day t, the measure is defined as the daily average of absolute returns r_j divided by the trade size Q_j (in millions) of consecutive transactions.

$$Amihud_t = \frac{1}{N_t}\sum_{j=1}^{N_t}\frac{|r_j|}{Q_j} = \frac{1}{N_t}\sum_{j=1}^{N_t}\frac{\left|\frac{P_j - P_{j-1}}{P_{j-1}}\right|}{Q_j}$$

where N_t is the number of returns on day t. At least two transactions are required on a given day to calculate the measure. We define a muni bond's quarterly Amihud illiquidity measure to be the median of daily Amihud illiquidity in that quarter.

For each of the liquidity measures, we use the market value of each muni bond held by the fund as a weight to compute the weighted-average liquidity measures for each fund at each quarter:

$$Liquidity_{m,t} = \sum_{b=1}^{N_{m,t}} w_{b,t} Liquidity_{b,t}$$

Where $Liquidity_{b,t}$ is the liquidity measure for each muni bond b held by fund m in quarter t, $N_{m,t}$ is the total number of muni bonds held by fund m in quarter t, and $w_{b,t}$ is the portfolio weight for bond b at quarter t.

2.3. Holding-based return

We follow Daniel, Grinblatt, Titman and Wermers (1997) and Cici and Gibson (2012) to construct the holdings-based quarterly return for each municipal bond fund.

$$Return_{m,t} = \sum_{b=1}^{N} w_{b,t-1} r_{b,t}$$

To compute monthly returns for muni bonds, we search EMMA and Morningstar for information on month-end prices of fixed-rate municipal bonds. We use the coupon rate and coupon frequency from Mergent to calculate a muni bond's coupon payment in a particular month and its accrued interest at the end of the month. We combine a bond's beginning-of-month price P_{t-1}, end-of-month price P_t, monthly coupon payment $Coupon_t$ and accrued interests AI_t to calculate the bond's monthly and quarterly buy-and-hold return:

$$r_t = \frac{P_t + AI_t + Coupon_t}{P_{t-1} + AI_{t-1}} - 1$$

EMMA reports the trading price and time for each transaction. Morningstar mutual fund holdings give the quarter-end price for each municipal bond held by an investment fund. Using these data, we determine an estimate of the muni bonds month-end price using the following algorithm:

(1) We search EMMA for municipal bonds that are traded at least once on the last day of a month. We use the last dealer-purchase transaction price as the bond's month-end bid price and the last dealer-sell

price as the bond's month-end ask price. If a bond has both month-end bid and ask price estimates, we compute its month-end price by averaging the two estimates. If only bid or ask price is available, we use it as the month-end price.

(2) We search the EMMA database for bonds that are traded at any time within a month. We use the prices of the last dealer-purchase and dealer-sell transactions and adjust them for market movements using the maturity-matched Barclay muni index return to attain a month-end bid and/or ask price. We use an average of the bid and the ask price if available, and we use what's available if we have only one side of the trade.

(3) We search Morningstar for muni bonds that are held by at least one muni bond fund at month-end. The bond's month-end price is the median of all prices reported by any investment funds that hold the bond at the end of the month.

We follow Cici and Gibson (2012) and require each muni bond have at least one year to maturity to be included in the sample.

We also calculate funds' quarterly alpha using holding-based returns. For each fund-quarter, we use its previous three-year quarterly returns to estimate its quarterly alpha:

$$r_{m,t} = \alpha_m + \beta_1 r_{mkt,t} + \beta_2 r^1_{Bar,t} + \beta_3 r^{10}_{Bar,t} + \beta_4 r^{20}_{Bar,t} + \varepsilon_{m,t}$$

where $r_{m,t}$ is the excess quarterly return of fund m, $r_{mkt,t}$ is the excess return of CRSP value-weight stock market index, and $r^1_{Bar,t}$, $r^{10}_{Bar,t}$ and $r^{20}_{Bar,t}$ are the excess returns of Barclay index of muni bond market with maturity of 1 year or less, 10 years, and 20 years. The Barclay muni index consists of state and local general obligation bonds, revenue bonds, insured bonds, and pre-refunded bonds.

2.4. Summary statistics

Table 1 provides summary statistics for open-end and closed-end funds. We present means for funds' characteristics, portfolio composition, liquidity, and returns. In Panel A we tabulate these data in period

predating the financial crisis. We find that open-end funds tend to be larger than closed-end fund in terms of both total net assets and gross assets. Closed-end funds have an average leverage ratio of 25.3%. However, closed-end funds' financial policies are far from universal. Forty closed-end funds have no leverage for at least a year during the sample period. The majority of closed-end funds are managed by large fund families that manage both open-end funds and closed-end funds. The largest ones includes Nuveen, Blackrock, Eaton Vance, and Legg Mason. Open-end funds have significantly lower expense ratios than closed-end funds. This is mainly because that open-end funds charge lower advisory fees than closed-end funds.

We also compare open-end funds with closed-end funds in terms of portfolio composition. Open-end funds invest more than 99% of their gross assets in muni bonds, while closed-end funds, on average, invest about 95.6% of gross assets in muni bonds. Open-end funds hold a very limited amount of cash in their portfolio, while closed-end funds hold about 1.2% of their net assets in cash. Surprisingly, closed-end funds hold more investment-grade muni bonds than open-end funds. Open-end funds on average invest 47.5% of gross assets in investment-grade muni bonds, while closed-end funds invest 67.1% in investment-grade muni bonds. We compute the average coupon rate and maturity of muni bonds held by funds and find that closed-end funds tend to hold muni bonds with longer maturity and higher coupon rates.

Panel A also shows summary statistics for our fund liquidity and return variables. We expect closed-end funds to hold more illiquid muni bonds, therefore, have lower average trading volume, higher round-trip trading costs, higher percentage of zero-trading days, and a higher Amihud illiquidity measure. The simple mean comparisons are consistent with our expectations, except for the percentage of zero-trading days variable. We also expect that closed-end funds earn a liquidity premium for holding illiquid asset. Panel A shows that closed-end funds have higher average quarterly net returns and gross returns than open-end funds. However, closed-end funds' higher reported returns may be a function of an illiquidity premium and/or their use of leverage. Closed-end funds' average quarterly holding-based return is 1.35% for open-end funds and 1.49% for closed-end funds. Closed-end funds earn 14 basis points more than open-end funds

each quarter. However, there is no significant difference between the mean abnormal returns (alphas) of open-end funds and closed-end funds.

Panel B of Table 1 shows the comparison between open-end funds and closed-end funds in the crisis period. As in panel A, open-end funds are larger than closed-end funds, have higher turnover and lower expense ratios, hold more muni bonds with lower coupon rates and shorter maturities. At the portfolio level, open-end funds hold fewer assets in investment-grade muni bonds. In the crisis period, closed-end funds continue to hold bonds with less liquidity, lower average trading volume, higher round-trip trading costs, and higher Amihud illiquidity measures, relative to open-end funds. However, closed-end funds' reported return and holding-based return are significantly lower than open-end fund returns in the crisis period. As in panel A, differences in alphas are not statistically different for open and closed-end funds.

We also look at how funds' characteristics, portfolio composition, and returns change during the crisis. Comparing Panels A and B, we find that open-end funds' TNA increased during the crisis, while closed-end funds' TNA did not increase. This sharp increase in open-end fund size suggests that muni bond open-end funds received large inflows as investors reallocated investments from equity to fixed-income securities during the financial crisis. We find that open-end funds hold more diversified portfolios as their size increases. Surprisingly, closed-end funds also hold more diversified portfolios even though they do not grow in size. Moreover, the average leverage ratio of closed-end funds decreased during the crisis period, suggesting that closed-end funds' gross assets actually decrease during the crisis. Both open-end funds and closed-end funds experienced small decreases in turnover. The percentage of assets invested in investment-grade muni bonds increase for both types of funds. We find mixed results when comparing fund illiquidity in the crisis period. The average trading volume does not change much for either type of fund. The average round-trip trading cost increased in the crisis period, while the average percentage of zero-trading days and Amihud price impact slightly decrease. While the returns of open-end funds do not change much during the crisis, the returns of closed-end funds decrease.

The simple univariate comparisons in Table 1 are consistent with the prediction that closed-end funds' hold more illiquid assets and that closed-end funds earn liquidity premiums from such illiquid investments. As expected, during the crisis period, the illiquid holdings and leverage results in reduced returns when liquidity became more highly valued.

3. Do closed-end funds hold more illiquid bonds than open-end funds?

Moving beyond our univariate results, we estimate the following regression to test our hypothesis that closed-end funds hold less liquid securities:

$$Liquidity_{m,t} = \alpha + \beta\ CEF_m + controls,$$

where $Liquidity_{m,t}$ is the liquidity of fund m, at quarter t, and CEF_m is a dummy variable that equals 1 for closed-end funds and 0 for open-end funds. We expect β to be significantly negative when we use trading volume as liquidity measure and positive when we use round-trip trading costs, percentage of zero-trading days, or Amihud price impact to measure liquidity.

3.1. Pre-crisis period

Table 2 presents the results from these regressions using a variety of control variables. Panel A shows regression results in the pre-crisis period. In the first set of regressions, we use average trading volume to measure funds' portfolio liquidity. The coefficients on CEF dummy variable are significantly negative, suggesting that closed-end funds hold muni bonds with lower trading volume. We control for fund characteristics, such as fund size, family size, turnover and expense ratio. It appears that larger fund families hold bonds that have lower trading volume but larger funds do not. We interpret this as evidence of economies of scale in liquidity management at the fund family level but not at the fund level. This finding is consistent with Chernenko and Sunderam (2016), who study mutual fund liquidity management through cash holdings and find no economies of scale at fund level, but strong evidence at fund family level. We also find that a fund's turnover ratio is positively associated with its portfolio weighted average trading

volume which simply controls for what is likely to be a mechanical relation. The characteristics of muni bonds held by a fund is also associated with the fund's liquidity. The results are robust after adding quarterly fixed-effects.

The next set of regressions uses funds' weighted average round-trip trading costs as the liquidity measure. The coefficients on CEF dummy are significantly positive, suggesting that closed-end funds hold more muni bonds with higher trading costs. The coefficients on lagged funds' TNA are modestly negative, but the coefficients on lagged fund family size are significantly positive, consistent with the previous evidence of economies of scale at fund family level. Funds' turnover ratios are negatively associated with funds' illiquidity. The characteristics of muni bonds held in a fund's portfolio are strongly associated with the fund's liquidity. The maturity of muni bonds held by a fund have significantly positive associations with the fund's average round-trip trading costs. Since bonds with longer maturity are commonly less liquid, this result is consistent with our hypothesis that closed-end funds hold more illiquid muni bonds. Closed-end funds' leverage ratio is negatively associated with their holding-based round-trip trading cost, suggesting that closed-end funds with high leverage risk choose to take less liquidity risk. The coefficient on cash percentage is significantly positive, suggesting that funds hold more cash when they have low portfolio liquidity. This finding is consistent with the idea that funds use cash as liquidity buffer in liquidity management.

The last set of regressions use funds' average percentage of zero-trading days and the Amihud illiquidity measures as dependent variables. The regression results are opposite to our expectation when we use average percentage of zero-trading days as the dependent variable. The regression results are broadly consistent with previous ones when we use Amihud illiquidity measure as the dependent variable. The coefficients on the CEF dummy are significantly positive, suggesting that muni bonds held by closed-end funds have larger price impact per unit of trade. Again, we find evidence of economies of scale at fund family level. Funds' turnover ratios are negatively associated with the average percentage of zero-trading

days and the Amihud illiquidity measure. Closed-end funds' leverage ratios are negatively associated with funds' illiquidity.

In Table 2, we find that closed-end funds hold more illiquid muni bonds than open-end funds and that funds from larger fund families hold more illiquid muni bonds. Furthermore, closed-end funds with higher leverage choose to hold more liquid muni bonds and funds use cash as liquidity buffer when they hold more illiquid assets.

3.2. Crisis period

Table 2 Panel B reports our regression estimates in the crisis period. The results are broadly similar to our results in the pre-crisis period. Closed-end funds hold more illiquid muni bonds when we use the average trading volume and Amihud illiquidity measure to as proxies for liquidity. When we use average round-trip trading costs as dependent variable, the coefficients on CEF dummy are significantly positive and become insignificant after controlling for fund characteristics. One possible explanation is that the trading costs of all muni bonds increased so much that we cannot observe significant difference between the relatively liquid and illiquid bonds during the crisis. We find that funds with higher turnover ratios hold more liquid muni bonds. We still find evidence of economies of scale in liquidity management at fund family level, but no such evidence at fund level. Funds with higher turnover ratios continue to hold more liquid muni bonds. However, we find that funds' illiquidity is not associated with lagged leverage or cash holdings in the crisis period. The evidence shown in Table 2 suggests that closed-end funds hold more illiquid muni bonds than open-end funds and they adjust liquidity and leverage jointly.

4. Fund performance and liquidity premia

In this section, we examine closed-end returns and whether they benefit from the ability to hold illiquid muni bonds. We estimate the following regression:

$$Return_{m,t} = \alpha + \beta\ CEF_m + \gamma\ Liquidity_{m,t} + controls$$

where $Return_{m,t}$ is the fund's return and $Liquidity_{m,t}$ is the fund's portfolio liquidity. We expect γ to be negative when liquidity is measured by trading volume and positive when liquidity is measured by round-trip trading costs, the percentage of zero-trading days, or Amihud illiquidity measure. Table 3 provides the quarterly fund return estimates for our samples of open and closed end funds in percent. Tables 4 and 5 provide our regression estimates.

4.1. Pre-crisis period

Panel A of Table 4 shows the regression results in the pre-crisis period. We run four sets of regressions using different variables to measure fund performance: quarterly holding-based returns, net returns, gross returns, and abnormal returns. We include the quarterly returns from five different maturities of Barclay's muni indices to control for price changes in municipal bond markets[3] in the first three sets of regressions.

The first set of regressions use holding-based returns as the dependent variable. We first regress funds' holding-based return on the CEF dummy. The coefficient on CEF dummy is significantly positive. We then add fund size, family size, expense ratio and advisory fees to the regression. Surprisingly, the coefficients on expense ratio and advisory fees are significantly positive. In column (5) to (10), we include funds' portfolio liquidity in the regression. The coefficients on CEF dummy are significantly positive, but smaller in magnitude. Moreover, the coefficients on average trading volume are negative and the coefficients on average round-trip trading costs and the Amihud illiquidity are significantly positive. This result suggests that a large portion of closed-end funds' outperformance is because that closed-end fund hold more illiquid muni bonds and earn a liquidity premium.

We further control for fund characteristics and portfolio composition. The results are show in columns (11)-(16). The coefficients on CEF dummy become insignificant, suggesting that portfolio managers of closed-end funds do not have better bond-picking skills. In addition, the coefficients on liquidity measures are

[3] The five Barclay indices are: municipal bond returns for bonds with maturities of 1 year or less, 5 years, 10 years, 20 years and longer than 22 years. We also estimate the regression with quarterly fixed-effects rather than market index returns and find the same qualitative results.

attenuated after we control for the average coupon rate, maturity, and percentage of assets invested in fixed-rate bonds. Only the coefficients on funds' average round-trip trading costs remain significantly positive. Fix_percent, Avgcoupon, and Avgmaturity are significantly positively associated with fund holding-based returns. Since these three variables are also positively associated with funds' average round-trip trading costs and Amihud illiquidity, we argue that they also proxy for muni bond liquidity.[4] We find that the percentage of assets invested in investment-grade muni bonds is negatively associated with fund returns because investment-grade bonds have lower credit risk, thus lower expected returns. We find a negative association between closed-end funds' lagged leverage ratio and holding-based returns. Together with Table 2, we find that funds with higher leverage choose to hold more liquid assets, and earn less liquidity premium. Somewhat surprisingly and in contrast to previous literature, we find no evidence that funds holding more cash have poor performance. Since funds that hold illiquid muni bonds tend to increase their cash holdings, it is possible that the negative effect of cash holdings is offset by the liquidity premium earned through holding illiquid bonds.

The second and third sets of regressions use quarterly net returns and gross returns as dependent variable. We find that closed-end funds significantly outperform open-end funds even after we control for liquidity, fund characteristics, and portfolio composition. Consistent with the literature, we find that expense ratios are significantly negatively related to funds' net returns but not gross returns. We find that closed-end funds' leverage ratios are positively associated with their net returns and gross returns. This is because the reported returns are calculated according to funds' TNA, thus are levered return. The percentage of assets invested in investment-grade bonds is negatively associated with fund returns. The coefficients on Avgmarkup, Avgzero and Avgamihud are generally positive, suggesting that funds earn higher returns when they hold more illiquid bonds. The coefficients on Avgcoupon and Avgmaturity are significantly positive, providing indirect evidence of liquidity premium.

[4] We recognize that we have an identification problem here and present these results as associations representing a set of stylized facts at this stage.

The last set of regressions use funds' holding-based abnormal return as dependent variable. These returns are intended to capture the bond-picking ability of fund managers. We find no evidence that closed-end funds outperform open-end funds. The coefficients on CEF dummy are close to 0, suggesting that closed-end funds' portfolio managers do not have better bond-picking skills than open-end funds' portfolio managers. We find no relationship between funds' portfolio liquidity and abnormal returns. The coefficients on liquidity variables are insignificant. Closed-end funds' leverage ratios are negatively associated with their abnormal returns. We find a significant positive association between fund abnormal return and the percentage of assets invested in investment-grade bonds. We also find a positive association between fund abnormal return and the average maturity of muni bonds held by the fund.

We do not have closed-end fund holding data in a few quarter in 2001, 2002 and 2011. Therefore, we re-estimate the regression using only 2003-2010 sample period and we find the same results. These regression results are shown in Table 5.

4.2. Crisis period

Panel B of Table 4 shows regression results in the crisis period. We include the quarterly return of five Barclay muni indices in all regressions[5]. In the first set of regressions, we use holdings-based returns as the dependent variable. The coefficients on the CEF dummy are modestly negative, suggesting that closed-end funds underperform open-end funds during the crisis period. We also use quarterly net returns and gross returns as dependent variables. The regression results are consistent. We find that closed-end funds slightly underperform open-end funds after controlling for the market-wide trend. The coefficients on CEF dummy are negative but marginally significant. In the last set of regressions, we use quarterly abnormal return as dependent variable. Similar to the results in the pre-crisis period, we find no evidence that closed-end funds earn higher abnormal returns than open-end funds.

[5] We also run regression with quarterly time fixed-effects. The results are broadly consistent.

Taking the evidence in Table 2, 4 and 5 together, we find that 1) closed-end funds hold more illiquid muni bonds relative to open-end funds; 2) closed-end funds outperform open-end funds before the crisis and underperform during the crisis period. The evidence supports the argument that closed-end funds provide investors with access to less liquid investments that are likely to include a liquidity premium.

4.3 Fund of Funds Analysis

In table 6, we convert the panel of funds over time into a single time-series regression. These results are preliminary. We create portfolios of closed-end funds and portfolios of open-end funds and calculate portfolios' monthly returns. We create a variable that is the difference between closed-end fund returns and open-end fund returns to test for a more general difference in returns and to attribute the risk factors used to generate differences in Returns. Columns 1 – 6 represent how we formed the portfolios among the sample of funds. Column 1 includes all sample funds, and columns 2-6 display return differences for various subsets of the data including national funds, single-state funds, High Yield Funds, etc.

Table 6 represents net (after-expense ratio) fund return differences between Closed-end and Open-end funds. The estimates of the constant terms in Panel A suggests that if anything, on average closed-end funds have underperformed relative to open end funds over the time period from 2001 – Q1 2011 with negative constant estimates throughout, though statistical significance in only two subsamples. More compelling is the attribution of return differences. Across the entire sample and every subsample of the data, except high yield, the muni excess return, credit spread and term spread are weighted significantly in explaining the difference in returns. We interpret this to mean that closed end funds generate returns that are significantly related to these risk factors relative to their open-end fund counterparts. We interpret the loading on muni excess returns to represent the impact that leverage has on average closed-end fund versus open-end fund differences. As we refine these tests, we will report updated results.

5. Conclusion

This paper studies the investment choices made by closed-end and open-end funds. We find that closed-end funds hold more illiquid securities in all states of the economy. Not surprisingly, this liquidity premium pays a premium in good states of the economy but is costly to investors in illiquid markets. We find some evidence that closed-end funds earn a liquidity premium and our time series regression suggest that the premium earned appears to compensate investors for credit, maturity and liquidity risks. We also find suggestive evidence that larger fund families are able to hold less liquid assets, perhaps because of their ability to move assets across funds.

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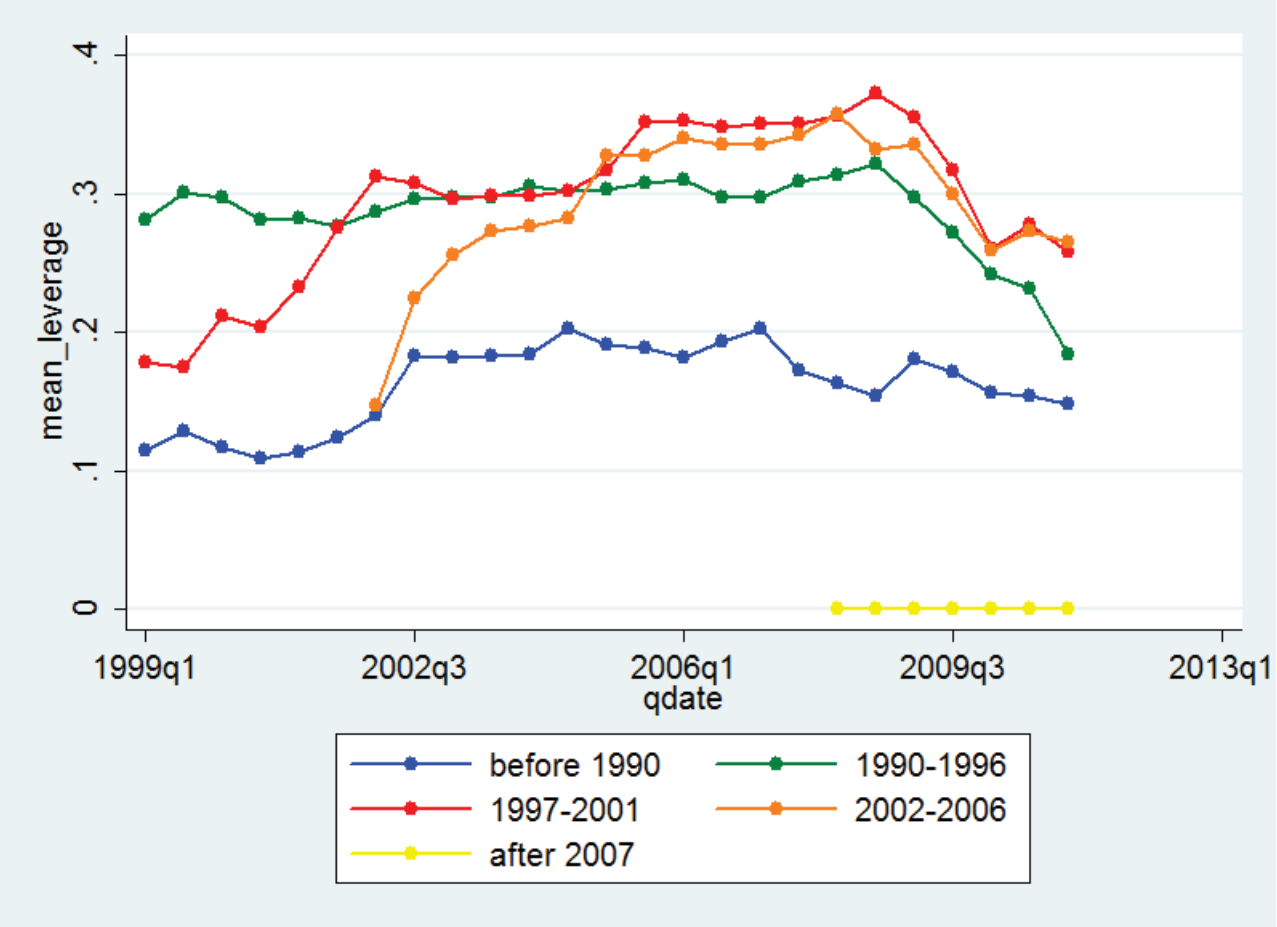
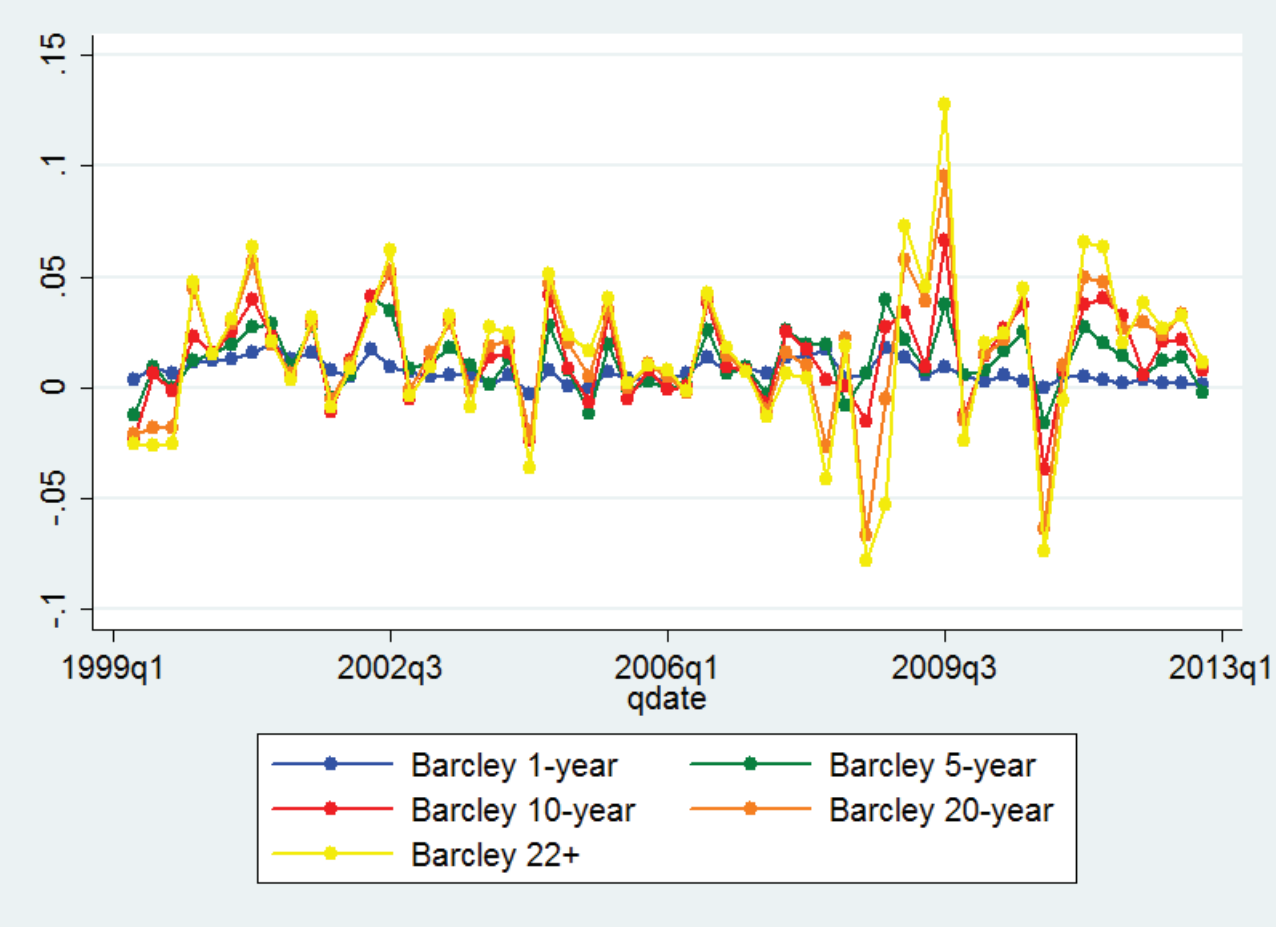
Figure 1: Time series of CEF leverage: grouped by inception date



This graph shows the time series of CEFs' leverage ratio. Sample CEFs are divided into five groups according to their inception date. The time series calculate the mean leverage ratio in each quarter for each group of CEFs.

Figure 2: Barcley indices quarter return



This graph shows the quarterly return of five Barcley national municipal bond indices with different maturities (1-year, 5-year, 10-year, 20-year, and above 22 years). The Barcley muni index consists of state and local general obligation bonds, revenue bonds, insured bonds, and pre-refunded bonds.

Table 1: Comparison of Open- and Closed-end Funds

Panel A: Comparison between OEFs and CEFs in the pre-crisis period

	Open-end Fund			Closed-end Fund				
	Obs	Mean	Std	Obs	Mean	Std	Diff	t-stats
TNA ($m)	4154	660.1732	1133.9462	1536	389.7956	315.9887	270.3777	9.21
Leverage	4154	0.0000	0.0000	1623	0.2530	0.1543	-0.2530	-105.67
Turnover	3915	41.9210	48.9347	1636	22.6223	18.2715	19.2987	15.51
Expratio (%)	4050	0.7825	0.2683	1632	1.0548	0.3303	-0.2722	-32.30
Advfee (%)	4001	0.4631	0.1497	1627	0.7446	0.2452	-0.2815	-52.46
Familysize ($m)	4126	8729.2644	12501.9674	1552	18987.9479	15005.0522	-10258.6835	-26.03
Numhold	4154	200.8760	194.5610	1642	137.6376	73.8097	63.2384	12.81
Nummuni	4154	200.3440	194.4006	1642	135.0432	72.5452	65.3008	13.25
Avgcoupon (%)	4142	5.3980	0.5623	1617	5.6280	0.8593	-0.2300	-11.90
Avgmaturity	4149	13.7053	5.1431	1642	19.6992	3.9953	-5.9939	-42.43
Muni_percent	4154	0.9944	0.0664	1642	1.0095	0.1003	-0.0151	-6.67
Cash_percent	4154	0.0001	0.0019	1642	0.0123	0.0673	-0.0122	-11.70
Corpbond_percent	4154	0.0008	0.0041	1642	0.0083	0.0192	-0.0075	-23.87
Govbond_percent	4154	0.0001	0.0020	1642	0.0005	0.0060	-0.0004	-3.46
Inv_percent	4154	0.4761	0.2847	1642	0.7093	0.2360	-0.2332	-29.44
Fix_percent	4154	0.9403	0.0795	1642	0.9600	0.1044	-0.0197	-7.76
Muni_ga	4154	0.9956	0.0124	1642	0.9560	0.0732	0.0396	33.70
Cash_ga	4154	0.0001	0.0019	1642	0.0086	0.0301	-0.0085	-18.16
Corpbond_ga	4154	0.0008	0.0040	1642	0.0080	0.0187	-0.0073	-23.67
Govbond_ga	4154	0.0001	0.0020	1642	0.0005	0.0060	-0.0004	-3.48
Inv_ga	4154	0.4751	0.2813	1642	0.6709	0.2174	-0.1959	-25.38
Fix_ga	4154	0.9416	0.0540	1642	0.9107	0.0878	0.0308	16.18
Avgtv3 (%)	4154	4.0346	2.6948	1642	2.9078	2.0185	1.1269	15.33
Avgtv12 (%)	4154	14.5115	6.9428	1642	11.3379	6.3606	3.1736	16.05
Avgmarkup3 (%)	4154	0.3861	0.6253	1642	0.7530	0.6235	-0.3669	-20.14
Avgmarkup12 (%)	4154	0.1500	0.7472	1642	0.4224	0.7663	-0.2724	-12.41
Avgzero	4154	0.9447	0.0306	1642	0.9130	0.0405	0.0316	32.20
Avgamihud	4154	0.3209	0.1994	1642	0.5014	0.1602	-0.1805	-32.74
Qret (%)	4045	1.1340	1.6156	1626	1.6290	2.2973	-0.4950	-9.18
Grossqret (%)	4038	1.3306	1.6226	1626	1.8962	2.3077	-0.5655	-10.43
Holdingret (%)	3308	1.3489	1.6390	1242	1.4926	1.7000	-0.1437	-2.61
Holdingalpha (%)	925	0.2315	0.5065	309	0.2761	0.4683	-0.0446	-1.36

Continued on next page

Panel B: Comparison between OEFs and CEFs in the crisis period

	Open-end Fund			Closed-end Fund				
	Obs	Mean	Std	Obs	Mean	Std	Diff	t-stats
TNA ($m)	2874	1067.2235	1677.4773	798	385.8986	324.8398	681.3249	11.41
Leverage	2874	0.0000	0.0000	791	0.2140	0.1727	-0.2140	-66.47
Turnover	2839	39.1594	43.9303	807	17.5246	15.7396	21.6348	13.74
Expratio (%)	2831	0.7300	0.2365	805	1.0747	0.3744	-0.3447	-31.61
Advfee (%)	2826	0.4363	0.1375	805	0.7755	0.2772	-0.3391	-47.65
Familysize ($m)	2871	11059.6751	15837.1418	798	21568.4128	17717.3860	-10508.7377	-16.15
Numhold	2874	308.6980	294.0177	807	187.4312	101.6900	121.2668	11.52
Nummuni	2874	307.7470	293.8895	807	184.5527	101.1712	123.1944	11.71
Avgcoupon (%)	2874	5.1807	0.5041	807	5.6054	0.8749	-0.4247	-17.62
Avgmaturity	2874	14.7093	5.3842	807	19.1099	3.2029	-4.4006	-22.14
Muni_percent	2874	0.9817	0.0415	807	1.0034	0.0837	-0.0218	-10.18
Cash_percent	2874	0.0002	0.0031	807	0.0121	0.0343	-0.0119	-18.37
Corpbond_percent	2874	0.0007	0.0034	807	0.0048	0.0144	-0.0040	-13.71
Govbond_percent	2874	0.0008	0.0084	807	0.0000	0.0008	0.0008	2.66
Inv_percent	2874	0.5539	0.3409	807	0.7396	0.2475	-0.1857	-14.44
Fix_percent	2874	0.9422	0.0593	807	0.9549	0.0863	-0.0127	-4.82
Muni_ga	2874	0.9901	0.0237	807	0.9654	0.0768	0.0247	14.91
Cash_ga	2874	0.0002	0.0031	807	0.0091	0.0211	-0.0089	-21.84
Corpbond_ga	2874	0.0007	0.0033	807	0.0044	0.0132	-0.0037	-13.63
Govbond_ga	2874	0.0007	0.0066	807	0.0000	0.0008	0.0007	2.88
Inv_ga	2874	0.5589	0.3431	807	0.7109	0.2357	-0.1520	-11.83
Fix_ga	2874	0.9506	0.0537	807	0.9198	0.0840	0.0308	12.54
Avgtv3 (%)	2874	4.3441	2.4585	807	3.1612	1.4548	1.1829	13.04
Avgtv12 (%)	2874	15.9000	6.6037	807	11.8638	3.9765	4.0363	16.54
Avgmarkup3 (%)	2874	0.7074	0.5653	807	1.0133	0.5397	-0.3059	-13.72
Avgmarkup12 (%)	2874	0.5615	0.5888	807	0.8241	0.6199	-0.2626	-11.07
Avgzero	2874	0.9216	0.0382	807	0.8974	0.0380	0.0242	15.87
Avgamihud	2873	0.2892	0.1641	807	0.4797	0.1313	-0.1905	-30.36
Qret (%)	2865	1.1164	3.8100	806	0.4371	6.3572	0.6792	3.79
Grossqret (%)	2865	1.3011	3.8172	806	0.7086	6.3767	0.5925	3.30
Holdingret (%)	2622	1.3830	3.6078	591	0.7572	3.8164	0.6258	3.77
Holdingalpha (%)	1973	-0.1665	2.3062	315	-0.4537	3.2755	0.2872	1.92

This table gives the summary statistics of open-end and closed-end funds. Panel A compares OEFs with CEFs before the financial crisis. Panel B compares OEFs with CEFs during the financial crisis. *TNA* is the fund's total net assets (in millions). *Leverage* is CEFs' leverage ratio. We let *Leverage* equals 0 for all OEFs. *Familysize* is the fund family's total TNA. *Expratio* is the fund's annual expense ratio. *Turnover* is the fund's turnover ratio. *Advfee* is the fund's advesory fee as percentage of its NAV. *Numhold* is the number of securities in the fund's portfolio. *Nummuni* is the number of muni bonds in the portfolio. *Cash_percent*(*Cash_ga*) is the percentage of cash in fund's TNA(gross assets). *Inv_percent*(*Inv_ga*) is the percentage of investment-grade muni bonds in fund's TNA(gross assets). *Fix_percent*(*Fix_ga*) is the percentage of fix-rate muni bonds in fund's TNA(gross assets). *Avgcoupon* is the weighted-average coupon rate of all fixed-rate muni bonds held by the fund. *Avgmaturity* is the weighted-average maturity of all muni bonds held by the fund. *Avgtv3*(*Avgtv12*) is the the weighted-average past 3-month(12-month) trading volume of all muni bonds held by the fund. *Avgmarkup3*(*Avgmarkup12*) is the weighted-average past 3-month(12-month) round-trip trading costs (dealer's markup) of all muni bonds held by the fund. *Avgzero* is the weighted-average percentage of zero-trading days in a quarter of all muni bonds held by the fund. *Avgamihud* is the weighted-average quarterly Amihud price impact measure of all muni bonds in a fund's portfolio. *Holdingret* is the fund's holding-based quarterly return. *Holdingalpha* is the fund's quarter abnormal holding-based return. *Qret* is the fund's quarterly net return. *Grossqret* is the fund's quarterly gross return.

Table 2: Determinants of Fund's Holding-based Liquidity

Panel A: Liquidity regression in the pre-crisis period

	3-month trading volumn					12-month trading volumn				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
CEF	-1.127***	-0.953***	-0.704***	-0.563***	-0.594***	-3.174***	-2.579***	-1.611***	-1.217**	-1.197**
	(-15.33)	(-11.02)	(-5.36)	(-4.04)	(-4.31)	(-16.05)	(-10.65)	(-4.35)	(-3.17)	(-3.11)
L.TNA ($b)		-0.073	-0.042	-0.042	-0.046		-0.182	-0.067	-0.036	-0.031
		(-1.88)	(-1.12)	(-1.12)	(-1.24)		(-1.68)	(-0.64)	(-0.35)	(-0.31)
L.Familysize ($b)		-0.019***	-0.010***	-0.011***	-0.011***		-0.066***	-0.045***	-0.041***	-0.042***
		(-6.56)	(-3.44)	(-3.85)	(-3.86)		(-8.25)	(-5.70)	(-5.27)	(-5.51)
Turnover			0.020***	0.019***	0.019***			0.054***	0.052***	0.051***
			(25.21)	(23.72)	(24.11)			(23.92)	(23.22)	(22.79)
Expratio			-0.163	0.006	-0.003			-1.148**	-0.281	-0.326
			(-1.21)	(0.04)	(-0.02)			(-3.02)	(-0.73)	(-0.86)
Advfee			-0.250	-0.241	-0.165			-0.140	-0.329	-0.097
			(-1.16)	(-1.12)	(-0.78)			(-0.23)	(-0.55)	(-0.16)
CEF×L.Leverage			0.582	0.131	0.105			0.974	0.971	0.571
			(1.38)	(0.30)	(0.24)			(0.82)	(0.80)	(0.47)
Inv_percent				-0.322*	-0.644***				-2.457***	-2.372***
				(-2.14)	(-3.62)				(-5.93)	(-4.78)
Cash_percent				-0.544	-0.558				0.134	-0.252
				(-0.64)	(-0.67)				(0.06)	(-0.11)
Fix_percent				-1.693***	-1.240**				-3.940***	-3.216**
				(-3.96)	(-2.90)				(-3.34)	(-2.70)
Avgcoupon				-0.402***	-0.440***				-1.138***	-1.313***
				(-6.98)	(-7.54)				(-7.16)	(-8.07)
Avgmaturity				0.014	0.021*				0.013	0.013
				(1.67)	(2.42)				(0.57)	(0.54)
Constant	4.035***	4.094***	3.436***	7.101***	6.382***	14.512***	14.919***	13.406***	23.786***	24.183***
	(103.12)	(87.78)	(27.78)	(14.64)	(11.64)	(137.89)	(114.22)	(38.51)	(17.77)	(15.81)
Time FE	No	No	No	No	Yes	No	No	No	No	Yes
adj. R^2	0.039	0.060	0.183	0.199	0.233	0.042	0.069	0.178	0.208	0.225
N	5796	4658	4405	4377	4377	5796	4658	4405	4377	4377

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	3-month round-trip trading costs					12-month round-trip trading costs				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
CEF	0.367***	0.328***	0.333***	0.161***	0.178***	0.272***	0.205***	0.247***	0.174***	0.191***
	(20.14)	(14.67)	(9.45)	(4.38)	(4.83)	(12.41)	(7.45)	(5.73)	(3.80)	(4.16)
L.TNA ($b)		0.006	0.018	-0.015	-0.012		-0.042***	-0.031*	-0.046***	-0.044***
		(0.63)	(1.81)	(-1.49)	(-1.20)		(-3.38)	(-2.49)	(-3.75)	(-3.57)
L.Familysize ($b)		0.007***	0.006***	0.005***	0.005***		0.009***	0.008***	0.008***	0.008***
		(8.92)	(7.62)	(6.80)	(6.81)		(9.66)	(8.33)	(8.14)	(8.29)
Turnover			-0.003***	-0.003***	-0.003***			-0.004***	-0.004***	-0.004***
			(-13.68)	(-14.08)	(-14.22)			(-16.33)	(-15.72)	(-15.40)
Expratio			0.164***	0.002	0.011			0.212***	0.113*	0.120**
			(4.53)	(0.07)	(0.31)			(4.77)	(2.46)	(2.64)
Advfee			0.198***	0.116*	0.098			0.189**	0.168*	0.161*
			(3.41)	(2.03)	(1.73)			(2.67)	(2.37)	(2.27)
CEF×L.Leverage			-0.561***	-0.297*	-0.328**			-0.828***	-0.739***	-0.753***
			(-4.95)	(-2.55)	(-2.81)			(-5.97)	(-5.08)	(-5.17)
Inv_percent				-0.072	0.015				0.017	-0.001
				(-1.81)	(0.32)				(0.35)	(-0.02)
Cash_percent				0.694**	0.695**				0.591*	0.605*
				(3.12)	(3.14)				(2.13)	(2.18)
Fix_percent				0.388***	0.283*				0.441**	0.520***
				(3.44)	(2.47)				(3.14)	(3.64)
Avgcoupon				0.073***	0.073***				0.063***	0.070***
				(4.78)	(4.68)				(3.31)	(3.60)
Avgmaturity				0.028***	0.026***				0.011***	0.010***
				(12.57)	(11.17)				(4.00)	(3.59)
Constant	0.386***	0.328***	0.218***	-0.688***	-0.393**	0.150***	0.114***	0.026	-0.794***	-1.050***
	(39.83)	(27.23)	(6.58)	(-5.39)	(-2.68)	(12.85)	(7.69)	(0.63)	(-4.99)	(-5.73)
Time FE	No	No	No	No	Yes	No	No	No	No	Yes
adj. R^2	0.065	0.101	0.156	0.210	0.221	0.026	0.053	0.125	0.140	0.149
N	5796	4658	4405	4377	4377	5796	4658	4405	4377	4377
	3-month percentage of zero-trading days					3-month Amihud price impact				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
CEF	-0.032***	-0.031***	-0.028***	-0.011***	-0.010***	0.180***	0.151***	0.152***	0.037***	0.057***
	(-32.20)	(-26.98)	(-14.75)	(-6.07)	(-5.83)	(32.74)	(21.44)	(13.95)	(3.61)	(5.75)
L.TNA ($b)		-0.006***	-0.007***	-0.004***	-0.004***		0.003	0.010***	-0.009***	-0.007*
		(-12.16)	(-13.45)	(-7.66)	(-7.71)		(0.98)	(3.34)	(-3.34)	(-2.47)
L.Familysize ($b)		-0.000***	-0.000***	-0.000	-0.000		0.003***	0.003***	0.002***	0.002***
		(-3.56)	(-4.88)	(-1.58)	(-1.41)		(11.73)	(11.03)	(9.81)	(8.85)
Turnover			-0.000***	-0.000**	-0.000**			-0.001***	-0.001***	-0.001***
			(-6.32)	(-3.17)	(-2.78)			(-12.38)	(-14.86)	(-17.44)
Expratio			-0.012***	0.002	0.002			0.102***	0.005	0.002
			(-6.06)	(0.92)	(0.96)			(9.12)	(0.48)	(0.16)
Advfee			-0.002	0.005	0.005			0.061***	0.015	0.013
			(-0.50)	(1.80)	(1.85)			(3.40)	(0.94)	(0.88)
CEF×L.Leverage			-0.005	-0.017**	-0.016**			-0.212***	-0.032	-0.084**
			(-0.91)	(-2.92)	(-2.87)			(-6.06)	(-0.99)	(-2.70)
Inv_percent				-0.004	-0.004				-0.032**	0.071***
				(-1.89)	(-1.93)				(-2.89)	(5.56)
Cash_percent				-0.040***	-0.039***				0.052	0.095
				(-3.65)	(-3.66)				(0.84)	(1.60)
Fix_percent				0.012*	0.017**				0.228***	0.175***
				(2.24)	(3.02)				(7.21)	(5.70)
Avgcoupon				0.003***	0.003***				0.043***	0.027***
				(3.57)	(4.33)				(10.11)	(6.38)
Avgmaturity				-0.003***	-0.003***				0.017***	0.015***
				(-28.47)	(-27.80)				(27.30)	(25.01)
Constant	0.945***	0.951***	0.965***	0.964***	0.953***	0.321***	0.294***	0.212***	-0.333***	-0.090*
	(1807.15)	(1510.71)	(543.21)	(154.35)	(133.44)	(109.36)	(77.50)	(20.66)	(-9.30)	(-2.28)
Time FE	No	No	No	No	Yes	No	No	No	No	Yes
adj. R^2	0.152	0.202	0.222	0.378	0.390	0.156	0.183	0.251	0.423	0.480
N	5796	4658	4405	4377	4377	5796	4658	4405	4377	4377

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Panel B: Liquidity regression in the crisis period

	3-month trading volumn					12-month trading volumn				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
CEF	-1.183***	-0.902***	-0.369**	-0.351*	-0.388**	-4.036***	-3.141***	-1.516***	-1.332***	-1.308***
	(-13.04)	(-8.98)	(-2.66)	(-2.47)	(-2.77)	(-16.54)	(-11.10)	(-3.86)	(-3.33)	(-3.30)
L.TNA ($b)		-0.110***	-0.070*	-0.098***	-0.088**		-0.263**	-0.195*	-0.259***	-0.228**
		(-3.79)	(-2.57)	(-3.60)	(-3.27)		(-3.20)	(-2.52)	(-3.37)	(-2.99)
L.Familysize ($b)		-0.020***	-0.010***	-0.014***	-0.015***		-0.064***	-0.039***	-0.054***	-0.055***
		(-7.51)	(-4.05)	(-5.47)	(-5.82)		(-8.55)	(-5.53)	(-7.60)	(-7.71)
Turnover			0.023***	0.021***	0.020***			0.060***	0.052***	0.049***
			(25.16)	(22.31)	(21.42)			(23.30)	(19.88)	(18.64)
Expratio			-0.075	-0.307	-0.263			-0.725	-1.126*	-1.136*
			(-0.48)	(-1.88)	(-1.63)			(-1.63)	(-2.45)	(-2.50)
Advfee			-0.372	-0.348	-0.349			-1.888**	-1.469*	-1.221
			(-1.52)	(-1.43)	(-1.46)			(-2.72)	(-2.14)	(-1.80)
CEF×L.Leverage			0.041	0.166	-0.048			1.142	0.165	-0.712
			(0.09)	(0.36)	(-0.11)			(0.90)	(0.13)	(-0.56)
Inv_percent				-0.256*	0.296				0.374	1.347*
				(-2.45)	(1.31)				(1.27)	(2.10)
Cash_percent				0.431	-0.053				0.848	-0.068
				(0.21)	(-0.03)				(0.15)	(-0.01)
Fix_percent				-2.608***	-3.279***				-6.947***	-7.952***
				(-4.58)	(-5.37)				(-4.33)	(-4.60)
Avgcoupon				-0.439***	-0.386***				-2.205***	-2.216***
				(-5.19)	(-4.38)				(-9.26)	(-8.87)
Avgmaturity				0.060***	0.061***				0.198***	0.208***
				(6.99)	(7.17)				(8.26)	(8.66)
Constant	4.344***	4.549***	3.754***	8.056***	8.285***	15.900***	16.740***	15.517***	31.011***	32.290***
	(102.29)	(90.30)	(30.04)	(12.78)	(12.93)	(139.16)	(117.85)	(43.74)	(17.46)	(17.80)
Time FE	No	No	No	No	Yes	No	No	No	No	Yes
adj. R^2	0.044	0.078	0.234	0.252	0.276	0.069	0.102	0.240	0.269	0.285
N	3681	3212	3164	3164	3164	3681	3212	3164	3164	3164

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	3-month round-trip trading costs					12-month round-trip trading costs				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
CEF	0.306***	0.219***	0.029	0.011	0.020	0.263***	0.155***	-0.022	0.037	0.052
	(13.72)	(8.39)	(0.75)	(0.30)	(0.63)	(11.07)	(5.57)	(-0.55)	(0.90)	(1.49)
L.TNA ($b)		0.001	0.003	-0.014	-0.013*		-0.017*	-0.019*	-0.024**	-0.023***
		(0.15)	(0.36)	(-1.86)	(-2.07)		(-2.16)	(-2.43)	(-3.11)	(-3.41)
L.Familysize ($b)		0.006***	0.005***	0.004***	0.003***		0.006***	0.005***	0.005***	0.004***
		(8.59)	(7.60)	(6.09)	(6.08)		(8.71)	(7.10)	(6.25)	(6.21)
Turnover			-0.003***	-0.003***	-0.002***			-0.004***	-0.003***	-0.003***
			(-10.89)	(-11.20)	(-10.93)			(-13.49)	(-12.43)	(-12.28)
Expratio			0.198***	0.032	0.058			0.098*	0.062	0.082*
			(4.62)	(0.74)	(1.59)			(2.16)	(1.33)	(2.06)
Advfee			0.221***	0.197**	0.155**			0.216**	0.234***	0.204***
			(3.30)	(3.04)	(2.84)			(3.05)	(3.33)	(3.43)
CEF×L.Leverage			-0.008	0.131	0.188			0.042	0.089	0.157
			(-0.07)	(1.08)	(1.83)			(0.32)	(0.68)	(1.40)
Inv_percent				-0.175***	0.558***				-0.233***	0.555***
				(-6.30)	(10.83)				(-7.73)	(9.88)
Cash_percent				-0.895	-0.031				-2.182***	-0.998*
				(-1.68)	(-0.07)				(-3.78)	(-2.03)
Fix_percent				0.753***	-0.138				0.792***	-0.208
				(4.96)	(-0.99)				(4.82)	(-1.37)
Avgcoupon				-0.128***	0.028				-0.120***	0.053*
				(-5.69)	(1.40)				(-4.94)	(2.43)
Avgmaturity				0.032***	0.024***				0.012***	0.002
				(14.32)	(12.67)				(4.78)	(1.14)
Constant	0.707***	0.688***	0.556***	0.292	-0.656***	0.562***	0.555***	0.537***	0.394*	-0.493**
	(67.74)	(52.47)	(16.27)	(1.74)	(-4.49)	(50.53)	(39.79)	(14.85)	(2.17)	(-3.10)
Time FE	No	No	No	No	Yes	No	No	No	No	Yes
adj. R^2	0.048	0.072	0.125	0.191	0.427	0.032	0.051	0.112	0.140	0.383
N	3681	3212	3164	3164	3164	3681	3212	3164	3164	3164

	3-month percentage of zero-trading days					3-month Amihud price impact				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
CEF	-0.024***	-0.024***	-0.017***	-0.010***	-0.009***	0.190***	0.172***	0.115***	0.057***	0.058***
	(-15.87)	(-13.09)	(-6.34)	(-4.22)	(-4.26)	(30.36)	(22.69)	(10.78)	(6.69)	(7.19)
L.TNA ($b)		-0.003***	-0.003***	-0.001	-0.001*		0.004	0.006**	-0.004*	-0.004**
		(-4.84)	(-6.13)	(-1.72)	(-2.04)		(1.94)	(3.07)	(-2.30)	(-2.64)
L.Familysize ($b)		-0.000***	-0.000***	-0.000**	-0.000		0.002***	0.002***	0.001***	0.001***
		(-5.03)	(-5.74)	(-2.61)	(-1.74)		(7.54)	(8.46)	(6.76)	(7.73)
Turnover			-0.000***	-0.000	-0.000**			-0.001***	-0.001***	-0.001***
			(-3.78)	(-1.52)	(-2.62)			(-8.64)	(-13.93)	(-13.85)
Expratio			-0.010**	0.017***	0.015***			0.166***	0.034***	0.031***
			(-3.09)	(6.26)	(5.87)			(13.78)	(3.52)	(3.35)
Advfee			-0.021***	-0.017***	-0.015***			0.028	-0.015	-0.015
			(-4.32)	(-4.35)	(-3.98)			(1.50)	(-1.04)	(-1.09)
CEF×L.Leverage			0.012	-0.001	-0.001			-0.111**	0.019	0.046
			(1.32)	(-0.08)	(-0.11)			(-3.21)	(0.70)	(1.77)
Inv_percent				0.007***	-0.030***				0.007	-0.001
				(4.10)	(-8.43)				(1.04)	(-0.04)
Cash_percent				-0.063	-0.097**				0.058	0.112
				(-1.92)	(-3.15)				(0.48)	(0.99)
Fix_percent				-0.082***	-0.036***				0.107**	0.122***
				(-8.80)	(-3.79)				(3.12)	(3.50)
Avgcoupon				0.021***	0.014***				-0.002	0.006
				(14.98)	(10.39)				(-0.35)	(1.23)
Avgmaturity				-0.005***	-0.005***				0.020***	0.020***
				(-37.99)	(-37.64)				(39.62)	(40.71)
Constant	0.922***	0.926***	0.945***	0.963***	0.990***	0.289***	0.278***	0.164***	-0.094*	-0.214***
	(1293.41)	(1004.57)	(382.52)	(93.51)	(99.15)	(98.43)	(73.27)	(17.02)	(-2.47)	(-5.84)
Time FE	No	No	No	No	Yes	No	No	No	No	Yes
adj. R^2	0.064	0.094	0.112	0.409	0.479	0.200	0.210	0.297	0.580	0.634
N	3681	3212	3164	3164	3164	3680	3211	3164	3164	3164

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table shows the results of regressing funds' liquidity on CEF dummy. Panel A shows the regression results before the financial crisis. Panel B shows the regression results during the financial crisis. The dependent variables are funds' liquidity measure. *Avgtv3*(*Avgtv12*) is the the weighted-average past 3-month(12-month) trading volume of all muni bonds held by the fund. *Avgmarkup3*(*Avgmarkup12*) is the weighted-average past 3-month(12-month) round-trip trading costs (dealer's markup) of all muni bonds held by the fund. *Avgzero* is the weighted-average percentage of zero-trading days in a quarter of all muni bonds held by the fund. *Avgamihud* is the weighted-average quarterly Amihud price impact measure of all muni bonds in a fund's portfolio. *CEF* is a dummy that equals 1 when a fund takes closed-end form, and 0 otherwise. *TNA* is the fund's total net assets (in billions). *Familysize* is the fund family's size (in billions). *Expratio* is the fund's annual expense ratio. *Turnover* is the fund's turnover ratio. *Advfee* is the fund's advesory fee. *Leverage* is the fund's leverage ratio. *Cash_percent* is the percentage of cash in fund's TNA. *Inv_percent* is the percentage of investment-grade bonds in fund's TNA. *Fix_percent* is the percentage of fix-rate bonds in fund's TNA. *Avgcoupon* is the fund's average coupon rate. *Avgmaturity* is the fund's average maturity.

Table 3: OEFs vs CEFs average return comparison by quarter

	Open-end Fund					Closed-end Fund			
	Qret	Grossqret	Holdingret	Holdingalpha		Qret	Grossqret	Holdingret	Holdingalpha
2001q1	2.3860	2.5885	2.6083	.	2001q1	2.1922	2.4367	.	.
2001q2	0.6774	0.8786	0.8327	.	2001q2	0.6749	0.9463	.	.
2001q3	2.6990	2.9132	2.7634	.	2001q3	.	.	.	.
2001q4	-0.4016	-0.2028	-0.6613	.	2001q4	.	.	.	.
2002q1	0.7547	0.9576	1.2812	.	2002q1	0.9297	1.2074	.	.
2002q2	3.3327	3.5391	3.6346	-0.1093	2002q2	3.8509	4.1210	3.1795	.
2002q3	4.1925	4.4026	4.3953	-0.3698	2002q3	5.1177	5.3999	4.1232	.
2002q4	0.2502	0.4573	-0.0029	.	2002q4	1.3020	1.6315	.	.
2003q1	0.8489	1.0539	1.3651	.	2003q1	0.9155	1.1804	1.6761	.
2003q2	2.4729	2.6908	2.7733	0.0974	2003q2	3.7445	4.0311	3.1810	.
2003q3	0.0160	0.2200	0.2670	-0.0424	2003q3	0.0072	0.2653	0.1669	.
2003q4	1.2828	1.4900	1.2554	-0.0352	2003q4	2.9457	3.2223	1.9726	.
2004q1	1.4009	1.6051	1.9654	0.8284	2004q1	2.2215	2.4795	2.4781	.
2004q2	-2.0405	-1.8446	-1.9529	0.1312	2004q2	-2.9673	-2.7183	-2.0203	.
2004q3	3.1405	3.3441	3.4953	-0.1579	2004q3	5.2562	5.5467	4.0790	.
2004q4	1.0276	1.2223	1.1091	0.5774	2004q4	2.2166	2.4861	1.6236	.
2005q1	-0.1766	0.0179	0.1540	0.6799	2005q1	0.5129	0.7780	0.6004	.
2005q2	2.3659	2.5654	2.6827	0.3082	2005q2	3.7701	4.0418	3.3409	0.4137
2005q3	0.0079	0.2003	0.0684	0.1759	2005q3	0.1550	0.4115	0.3114	0.1514
2005q4	0.5933	0.7858	0.6584	0.0858	2005q4	0.6778	0.9378	0.6671	0.0122
2006q1	0.4194	0.6105	0.6404	0.3604	2006q1	0.9815	1.2414	1.1772	0.4985
2006q2	0.1047	0.2938	0.2922	0.4011	2006q2	-0.0611	0.1957	0.2969	0.5247
2006q3	2.8159	3.0080	3.1006	0.0743	2006q3	4.0022	4.2767	3.3032	-0.1899
2006q4	1.1200	1.3086	1.1761	0.1248	2006q4	1.8247	2.0914	1.4935	-0.0652
2007q1	0.7042	0.8926	1.0334	0.3789	2007q1	0.7317	0.9980	1.2184	0.6019
2007q2	-0.3980	-0.2133	-0.2029	0.1624	2007q2	-1.0959	-0.8428	-0.2420	0.5412
2007q3	0.9615	1.1464	1.3122	-0.2642	2007q3	0.7018	0.9685	1.0443	-0.4286
2007q4	0.4875	0.6697	0.8616	-0.2599	2007q4	-0.1515	0.1176	0.5019	-0.2616
2008q1	-0.5926	-0.4112	-0.2976	1.1329	2008q1	-2.9752	-2.7028	-1.1290	1.7742
2008q2	0.4317	0.6162	0.4663	-0.7101	2008q2	3.1914	3.4757	0.5356	-1.2951
2008q3	-3.0723	-2.8959	-2.7016	-0.8462	2008q3	-6.8251	-6.5625	-3.8425	-0.9956
2008q4	-3.7116	-3.5355	-2.7923	-3.1514	2008q4	-8.6851	-8.4249	-5.4698	-4.7360
2009q1	4.2392	4.4354	4.5367	2.6693	2009q1	7.8894	8.2008	5.4110	3.6557
2009q2	3.3477	3.5465	3.4137	-2.0758	2009q2	6.1910	6.4784	4.1131	-3.8161
2009q3	7.4822	7.6853	7.8824	0.9088	2009q3	10.4949	10.7934	8.3810	1.3367
2009q4	-0.4812	-0.2954	-0.8278	-1.2868	2009q4	-0.3639	-0.1068	-0.5050	-4.5178
2010q1	1.4682	1.6543	2.1128	0.4433	2010q1	2.5129	2.7768	2.8066	1.0306
2010q2	1.7837	1.9678	2.1132	1.0842	2010q2	2.5879	2.8584	2.1633	2.8850
2010q3	3.2695	3.4574	3.5441	-0.3968	2010q3	4.9042	5.1826	3.5936	-0.6006
2010q4	-3.5193	-3.3463	-3.8521	-0.8890	2010q4	-6.5396	-6.2950	-4.5864	-0.8248
2011q1	-0.0776	0.1018	0.5077	-0.1793	2011q1	-7.9932	-7.7550	.	.
2011q2	3.6249	3.8115	4.0283	0.3774	2011q2	.	.	.	.
2011q3	2.9004	3.0801	3.5546	0.2531	2011q3	.	.	.	.
2011q4	1.8785	2.0582	1.8225	0.2408	2011q4	.	.	.	.

This table shows the mean returns of sample OEFS and CEFs in each quarter. *Holdingret* is the fund's holding-based quarterly return. *Holdingalpha* is the fund's quarter abnormal holding-based return. *Qret* is the fund's quarterly net return. *Grossqret* is the fund's quarterly gross return.

Table 4: Regression of fund's holding-based return

Panel A: Multivariate analysis in the pre-crisis period

	Dependent variable: Holding-base quarterly return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.2524***	0.2596***	0.1844***	0.1735***	0.1562***	0.1544***	0.1250***	0.1488***	0.1087***	0.0906**	0.0598	0.0600	0.0505	0.0496	0.0641	0.0577
	(11.51)	(10.34)	(6.88)	(5.95)	(5.29)	(5.25)	(4.26)	(5.10)	(3.60)	(3.07)	(1.47)	(1.47)	(1.24)	(1.22)	(1.57)	(1.42)
L.TNA ($b)		0.0318**	0.0443***	0.0439***	0.0466***	0.0466***	0.0449***	0.0490***	0.0328**	0.0421***	0.0048	0.0047	0.0054	0.0067	0.0069	0.0049
		(2.83)	(3.93)	(3.83)	(4.07)	(4.07)	(3.95)	(4.29)	(2.83)	(3.72)	(0.44)	(0.43)	(0.49)	(0.61)	(0.62)	(0.44)
L.Familysize ($b)		0.0001	0.0009	-0.0003	0.0005	0.0004	-0.0004	-0.0001	0.0003	-0.0011	-0.0004	-0.0003	-0.0006	-0.0007	-0.0004	-0.0004
		(0.18)	(1.10)	(-0.39)	(0.62)	(0.52)	(-0.42)	(-0.09)	(0.32)	(-1.29)	(-0.43)	(-0.39)	(-0.76)	(-0.88)	(-0.43)	(-0.49)
Expratio			0.2813***		0.2362***	0.2342***	0.2145***	0.2231***	0.2143***	0.1770***	-0.0082	-0.0079	-0.0094	-0.0140	-0.0093	-0.0087
			(7.87)		(5.66)	(5.61)	(5.16)	(5.35)	(5.14)	(4.25)	(-0.20)	(-0.19)	(-0.23)	(-0.34)	(-0.23)	(-0.21)
Advfee				0.3124***	0.1254	0.1271	0.1154	0.1212	0.1118	0.1186	0.1255	0.1255	0.1205	0.1158	0.1231	0.1253
				(5.57)	(1.93)	(1.95)	(1.79)	(1.87)	(1.73)	(1.85)	(1.95)	(1.95)	(1.88)	(1.80)	(1.92)	(1.95)
Avgtv3					-0.0043						0.0029					
					(-0.95)						(0.62)					
Avgtv12						-0.0024						0.0014				
						(-1.50)						(0.88)				
Avgmarkup3							0.1313***						0.0438*			
							(7.76)						(2.55)			
Avgmarkup12								0.0722***						0.0447**		
								(5.28)						(3.25)		
Avgzero									-2.0111***						0.5819	
									(-6.24)						(1.65)	
Avgamihud										0.5671***						0.0123
										(10.46)						(0.20)
Turnover											0.0000	-0.0000	0.0002	0.0002	0.0001	0.0001
											(0.04)	(-0.04)	(0.80)	(1.01)	(0.35)	(0.30)
CEF×L.Leverage											-0.3978**	-0.3990**	-0.3832**	-0.3619**	-0.3881**	-0.3968**
											(-3.08)	(-3.09)	(-2.97)	(-2.80)	(-3.00)	(-3.07)
Inv_percent											-0.1160*	-0.1140*	-0.1160*	-0.1201**	-0.1167*	-0.1171*
											(-2.49)	(-2.44)	(-2.49)	(-2.58)	(-2.50)	(-2.51)
Cash_percent											0.3724	0.3718	0.3430	0.3463	0.3912	0.3706
											(1.52)	(1.52)	(1.40)	(1.42)	(1.60)	(1.51)
Fix_percent											0.4842***	0.4858***	0.4653***	0.4614***	0.4745***	0.4781***
											(3.84)	(3.85)	(3.69)	(3.66)	(3.76)	(3.77)
Avgcoupon											0.1271***	0.1277***	0.1221***	0.1224***	0.1231***	0.1253***
											(6.99)	(7.02)	(6.74)	(6.77)	(6.79)	(6.87)
Avgmaturity											0.0424***	0.0424***	0.0413***	0.0421***	0.0443***	0.0422***
											(16.75)	(16.77)	(16.13)	(16.65)	(16.03)	(15.39)
Constant	0.2376***	0.2314***	-0.0057	0.0887*	-0.0064	0.0095	-0.0371	-0.0171	1.9037***	-0.1442**	-1.4607***	-1.4740***	-1.4055***	-1.3984***	-1.9932***	-1.4357***
	(8.17)	(7.57)	(-0.13)	(2.18)	(-0.13)	(0.18)	(-0.82)	(-0.38)	(6.10)	(-3.13)	(-9.66)	(-9.67)	(-9.51)	(-9.47)	(-5.45)	(-9.68)
adj. R^2	0.843	0.845	0.847	0.846	0.847	0.847	0.849	0.848	0.848	0.851	0.864	0.864	0.864	0.864	0.864	0.864
N	4550	4375	4327	4290	4290	4290	4290	4290	4290	4290	4121	4121	4121	4121	4121	4121

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	Dependent variable: Quarterly net return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.5716***	0.5761***	0.5374***	0.4910***	0.4892***	0.4913***	0.4599***	0.4784***	0.4274***	0.4309***	0.1948***	0.1959***	0.1883***	0.1843***	0.2031***	0.1956***
	(21.62)	(17.59)	(15.29)	(13.10)	(12.87)	(12.95)	(12.11)	(12.70)	(10.93)	(11.21)	(3.56)	(3.58)	(3.44)	(3.37)	(3.71)	(3.57)
L.TNA ($b)		0.0418**	0.0479**	0.0571***	0.0584***	0.0585***	0.0562***	0.0598***	0.0423**	0.0536***	0.0047	0.0047	0.0050	0.0066	0.0083	0.0040
		(2.86)	(3.24)	(3.88)	(3.96)	(3.97)	(3.82)	(4.06)	(2.82)	(3.65)	(0.32)	(0.32)	(0.34)	(0.45)	(0.56)	(0.27)
L.Familysize ($b)		0.0010	0.0013	0.0006	0.0008	0.0008	0.0000	0.0002	0.0004	-0.0006	-0.0003	-0.0002	-0.0005	-0.0007	-0.0003	-0.0002
		(0.90)	(1.17)	(0.52)	(0.71)	(0.77)	(0.04)	(0.19)	(0.36)	(-0.52)	(-0.27)	(-0.21)	(-0.43)	(-0.62)	(-0.24)	(-0.19)
Expratio			0.1418**		0.0612	0.0626	0.0443	0.0502	0.0368	0.0133	-0.1876***	-0.1867***	-0.1877***	-0.1926***	-0.1911***	-0.1874***
			(3.04)		(1.14)	(1.17)	(0.83)	(0.94)	(0.69)	(0.25)	(-3.42)	(-3.40)	(-3.42)	(-3.51)	(-3.48)	(-3.42)
Advfee				0.3204***	0.2727**	0.2711**	0.2661**	0.2727**	0.2596**	0.2711**	0.1479	0.1477	0.1437	0.1384	0.1441	0.1479
				(4.48)	(3.27)	(3.25)	(3.20)	(3.27)	(3.12)	(3.26)	(1.74)	(1.74)	(1.69)	(1.63)	(1.69)	(1.74)
Avgtv3					0.0011						0.0025					
					(0.20)						(0.41)					
Avgtv12						0.0012						0.0021				
						(0.62)						(0.96)				
Avgmarkup3							0.1022***						0.0303			
							(4.73)						(1.34)			
Avgmarkup12								0.0579***						0.0475**		
								(3.31)						(2.62)		
Avgzero									-2.2884***						1.0346*	
									(-5.45)						(2.17)	
Avgamihud										0.4556***						-0.0574
										(6.52)						(-0.71)
Turnover											0.0001	0.0001	0.0003	0.0004	0.0002	0.0001
											(0.44)	(0.26)	(0.87)	(1.19)	(0.71)	(0.43)
CEF×L.Leverage											0.4821**	0.4808**	0.4919**	0.5193**	0.5024**	0.4807**
											(2.78)	(2.77)	(2.84)	(2.99)	(2.90)	(2.77)
Inv_percent											-0.1921**	-0.1885**	-0.1915**	-0.1954**	-0.1940**	-0.1955**
											(-3.15)	(-3.08)	(-3.14)	(-3.21)	(-3.19)	(-3.20)
Cash_percent											0.5623	0.5618	0.5411	0.5327	0.6045	0.5638
											(1.71)	(1.71)	(1.64)	(1.62)	(1.83)	(1.71)
Fix_percent											-0.0947	-0.0894	-0.1101	-0.1229	-0.0930	-0.0859
											(-0.55)	(-0.52)	(-0.64)	(-0.72)	(-0.54)	(-0.50)
Avgcoupon											0.0686**	0.0699**	0.0653**	0.0646**	0.0648**	0.0695**
											(2.98)	(3.04)	(2.85)	(2.82)	(2.83)	(3.02)
Avgmaturity											0.0488***	0.0488***	0.0480***	0.0484***	0.0522***	0.0499***
											(14.56)	(14.56)	(14.11)	(14.44)	(14.16)	(13.65)
Constant	-0.0587	-0.1076**	-0.2216***	-0.2538***	-0.2883***	-0.3016***	-0.2920***	-0.2763***	1.9107***	-0.3784***	-0.8316***	-0.8621***	-0.7906***	-0.7697***	-1.8226***	-0.8280***
	(-1.66)	(-2.72)	(-3.93)	(-4.87)	(-4.53)	(-4.62)	(-5.05)	(-4.77)	(4.70)	(-6.35)	(-4.11)	(-4.24)	(-4.00)	(-3.90)	(-3.60)	(-4.18)
adj. R^2	0.766	0.788	0.789	0.794	0.794	0.794	0.795	0.795	0.795	0.796	0.805	0.805	0.805	0.805	0.805	0.805
N	5671	4577	4530	4493	4492	4492	4492	4492	4492	4492	4332	4332	4332	4332	4332	4332

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	Dependent variable: Quarterly gross return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.6396***	0.6444***	0.5404***	0.5055***	0.4911***	0.4933***	0.4616***	0.4802***	0.4283***	0.4323***	0.1935***	0.1947***	0.1869***	0.1829***	0.2017***	0.1943***
	(23.99)	(19.49)	(15.33)	(13.40)	(12.88)	(12.96)	(12.12)	(12.71)	(10.93)	(11.22)	(3.52)	(3.55)	(3.40)	(3.33)	(3.67)	(3.54)
L.TNA ($b)		0.0298*	0.0479**	0.0540***	0.0585***	0.0586***	0.0564***	0.0600***	0.0422**	0.0538***	0.0045	0.0045	0.0048	0.0065	0.0081	0.0039
		(2.02)	(3.23)	(3.65)	(3.96)	(3.97)	(3.82)	(4.07)	(2.81)	(3.65)	(0.31)	(0.31)	(0.33)	(0.44)	(0.55)	(0.26)
L.Familysize ($b)		0.0002	0.0012	-0.0004	0.0007	0.0008	-0.0000	0.0001	0.0003	-0.0006	-0.0004	-0.0003	-0.0006	-0.0008	-0.0003	-0.0003
		(0.20)	(1.12)	(-0.40)	(0.65)	(0.71)	(-0.03)	(0.13)	(0.29)	(-0.58)	(-0.33)	(-0.28)	(-0.50)	(-0.69)	(-0.30)	(-0.26)
Expratio			0.3896***		0.3070***	0.3084***	0.2900***	0.2959***	0.2822***	0.2587***	0.0567	0.0576	0.0567	0.0517	0.0533	0.0569
			(8.33)		(5.71)	(5.73)	(5.40)	(5.50)	(5.25)	(4.79)	(1.03)	(1.05)	(1.03)	(0.94)	(0.97)	(1.03)
Advfee				0.5236***	0.2787***	0.2770***	0.2720**	0.2787***	0.2654**	0.2771***	0.1526	0.1523	0.1483	0.1430	0.1488	0.1525
				(7.27)	(3.33)	(3.31)	(3.26)	(3.33)	(3.18)	(3.33)	(1.79)	(1.79)	(1.74)	(1.68)	(1.74)	(1.79)
Avgtv3					0.0010						0.0024					
					(0.18)						(0.39)					
Avgtv12						0.0012						0.0021				
						(0.62)						(0.96)				
Avgmarkup3							0.1032***						0.0306			
							(4.76)						(1.36)			
Avgmarkup12								0.0583***						0.0476**		
								(3.32)						(2.62)		
Avgzero									-2.3289***						1.0220*	
									(-5.53)						(2.14)	
Avgamihud										0.4596***						-0.0572
										(6.56)						(-0.70)
Turnover											0.0001	0.0001	0.0003	0.0004	0.0002	0.0001
											(0.42)	(0.24)	(0.85)	(1.16)	(0.68)	(0.41)
CEF×L.Leverage											0.4915**	0.4902**	0.5014**	0.5288**	0.5115**	0.4900**
											(2.83)	(2.82)	(2.88)	(3.04)	(2.94)	(2.82)
Inv_percent											-0.1931**	-0.1893**	-0.1923**	-0.1963**	-0.1949**	-0.1964**
											(-3.16)	(-3.09)	(-3.15)	(-3.21)	(-3.19)	(-3.21)
Cash_percent											0.5637	0.5633	0.5423	0.5340	0.6055	0.5652
											(1.71)	(1.71)	(1.64)	(1.62)	(1.83)	(1.71)
Fix_percent											-0.0941	-0.0885	-0.1095	-0.1222	-0.0922	-0.0852
											(-0.55)	(-0.51)	(-0.64)	(-0.71)	(-0.54)	(-0.49)
Avgcoupon											0.0685**	0.0699**	0.0653**	0.0646**	0.0649**	0.0695**
											(2.97)	(3.03)	(2.84)	(2.82)	(2.83)	(3.01)
Avgmaturity											0.0491***	0.0491***	0.0484***	0.0487***	0.0525***	0.0502***
											(14.61)	(14.62)	(14.16)	(14.49)	(14.19)	(13.69)
Constant	0.1431***	0.1091**	-0.2191***	-0.1364**	-0.2866***	-0.3004***	-0.2908***	-0.2749***	1.9507***	-0.3779***	-0.8320***	-0.8635***	-0.7915***	-0.7707***	-1.8115***	-0.8292***
	(4.02)	(2.73)	(-3.88)	(-2.60)	(-4.49)	(-4.59)	(-5.01)	(-4.73)	(4.78)	(-6.33)	(-4.10)	(-4.23)	(-4.00)	(-3.90)	(-3.57)	(-4.18)
adj. R^2	0.766	0.787	0.790	0.794	0.795	0.795	0.796	0.796	0.797	0.797	0.806	0.806	0.806	0.806	0.806	0.806
N	5664	4572	4530	4493	4492	4492	4492	4492	4492	4492	4332	4332	4332	4332	4332	4332

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	Dependent variable: Holding-base quarterly alpha															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.0446	0.0529	0.0337	0.0203	0.0207	-0.0019	0.0104	0.0166	0.0221	0.0157	0.0906	0.0768	0.0795	0.0825	0.0815	0.0852
	(1.36)	(1.36)	(0.82)	(0.47)	(0.46)	(-0.04)	(0.24)	(0.38)	(0.50)	(0.35)	(1.52)	(1.29)	(1.34)	(1.39)	(1.37)	(1.44)
L.TNA ($b)		0.0018	0.0040	0.0063	0.0063	0.0068	0.0072	0.0078	0.0070	0.0064	-0.0072	-0.0066	-0.0062	-0.0070	-0.0076	-0.0104
		(0.13)	(0.29)	(0.46)	(0.45)	(0.49)	(0.52)	(0.55)	(0.50)	(0.46)	(-0.52)	(-0.47)	(-0.44)	(-0.50)	(-0.55)	(-0.74)
L.Familysize ($b)		-0.0005	-0.0002	-0.0007	-0.0005	-0.0011	-0.0010	-0.0008	-0.0004	-0.0007	0.0009	0.0007	0.0006	0.0008	0.0008	0.0013
		(-0.43)	(-0.23)	(-0.62)	(-0.44)	(-0.95)	(-0.87)	(-0.67)	(-0.39)	(-0.57)	(0.81)	(0.57)	(0.52)	(0.69)	(0.71)	(1.07)
Expratio			0.0691		0.0339	0.0382	0.0305	0.0351	0.0394	0.0297	0.0098	0.0116	0.0104	0.0089	0.0064	0.0097
			(1.44)		(0.58)	(0.65)	(0.52)	(0.60)	(0.66)	(0.50)	(0.16)	(0.19)	(0.17)	(0.15)	(0.11)	(0.16)
Advfee				0.1316	0.0989	0.0906	0.0872	0.0901	0.0947	0.1004	0.1580	0.1491	0.1446	0.1539	0.1593	0.1591
				(1.64)	(1.01)	(0.92)	(0.89)	(0.91)	(0.96)	(1.02)	(1.57)	(1.48)	(1.43)	(1.50)	(1.58)	(1.58)
Avgtv3					0.0014						0.0086					
					(0.20)						(1.15)					
Avgtv12						-0.0067*						-0.0033				
						(-2.43)						(-1.12)				
Avgmarkup3							0.0475						0.0307			
							(1.53)						(0.97)			
Avgmarkup12								0.0205						0.0032		
								(0.78)						(0.12)		
Avgzero									0.2130						-0.2109	
									(0.43)						(-0.40)	
Avgamihud										0.0380						-0.1904
										(0.41)						(-1.65)
Turnover											-0.0001	0.0003	0.0002	0.0001	0.0001	-0.0001
											(-0.25)	(0.63)	(0.40)	(0.28)	(0.27)	(-0.20)
CEF×L.Leverage											-0.4631*	-0.4508*	-0.4461*	-0.4548*	-0.4602*	-0.4622*
											(-2.38)	(-2.32)	(-2.29)	(-2.30)	(-2.37)	(-2.38)
Inv_percent											-0.3652***	-0.3751***	-0.3779***	-0.3715***	-0.3733***	-0.3558***
											(-4.25)	(-4.37)	(-4.39)	(-4.30)	(-4.33)	(-4.13)
Cash_percent											-1.7741	-1.8929	-1.8740	-1.8187	-1.8190	-1.8701
											(-1.08)	(-1.16)	(-1.14)	(-1.11)	(-1.11)	(-1.14)
Fix_percent											0.3453	0.3392	0.3310	0.3443	0.3654	0.3629
											(1.62)	(1.59)	(1.55)	(1.61)	(1.68)	(1.71)
Avgcoupon											0.1131**	0.0999**	0.1044**	0.1070**	0.1084**	0.1176***
											(3.27)	(2.86)	(3.03)	(3.11)	(3.15)	(3.38)
Avgmaturity											0.0121**	0.0124**	0.0119**	0.0124**	0.0120**	0.0152***
											(2.98)	(3.06)	(2.91)	(3.06)	(2.82)	(3.46)
Constant	0.2315***	0.2348***	0.1770***	0.1747***	0.1559**	0.2605***	0.1560**	0.1624***	-0.0426	0.1543**	-0.7663**	-0.6204*	-0.6771**	-0.7067**	-0.5270	-0.7704**
	(14.16)	(11.68)	(3.96)	(4.12)	(2.79)	(4.14)	(3.24)	(3.38)	(-0.09)	(3.00)	(-3.04)	(-2.39)	(-2.71)	(-2.83)	(-1.00)	(-3.09)
adj. R^2	0.001	-0.001	0.000	0.001	-0.001	0.004	0.001	-0.000	-0.001	-0.001	0.047	0.047	0.047	0.046	0.047	0.049
N	1234	1225	1217	1215	1215	1215	1215	1215	1215	1215	1198	1198	1198	1198	1198	1198

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Panel B: Multivariate analysis in the crisis period

	Dependent variable: Holding-base quarterly return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	-0.1535	-0.1960	-0.2304	-0.2254	-0.2288	-0.2489	-0.3011*	-0.3208*	-0.2892*	-0.1672	-0.2576	-0.2658	-0.2708	-0.2911	-0.3348	-0.2374
	(-1.57)	(-1.72)	(-1.82)	(-1.65)	(-1.65)	(-1.79)	(-2.20)	(-2.35)	(-2.09)	(-1.19)	(-1.42)	(-1.47)	(-1.51)	(-1.63)	(-1.86)	(-1.31)
L.TNA ($b)		-0.0538	-0.0511	-0.0504	-0.0494	-0.0516	-0.0522	-0.0401	-0.0596	-0.0457	-0.0278	-0.0299	-0.0221	-0.0132	-0.0341	-0.0323
		(-1.70)	(-1.61)	(-1.57)	(-1.54)	(-1.61)	(-1.64)	(-1.26)	(-1.85)	(-1.42)	(-0.85)	(-0.92)	(-0.68)	(-0.41)	(-1.05)	(-0.99)
L.Familysize ($b)		0.0009	0.0011	0.0008	0.0012	0.0008	-0.0015	-0.0025	0.0002	0.0022	0.0020	0.0017	-0.0004	-0.0013	0.0008	0.0023
		(0.31)	(0.36)	(0.28)	(0.40)	(0.25)	(-0.50)	(-0.85)	(0.07)	(0.72)	(0.64)	(0.56)	(-0.13)	(-0.41)	(0.26)	(0.73)
Expratio			0.0926		0.0794	0.0756	-0.0063	0.0357	0.0506	0.1746	0.1266	0.1196	0.1027	0.0865	0.2445	0.1381
			(0.61)		(0.43)	(0.41)	(-0.03)	(0.19)	(0.27)	(0.92)	(0.65)	(0.61)	(0.53)	(0.45)	(1.25)	(0.71)
Advfee				0.1074	0.0404	0.0343	-0.0547	-0.0942	-0.0378	0.0622	0.0140	0.0086	-0.0830	-0.1335	-0.1217	0.0008
				(0.45)	(0.14)	(0.12)	(-0.19)	(-0.33)	(-0.13)	(0.21)	(0.05)	(0.03)	(-0.28)	(-0.46)	(-0.41)	(0.00)
Avgtv3					0.0091						0.0259					
					(0.47)						(1.21)					
Avgtv12						-0.0041						0.0016				
						(-0.59)						(0.21)				
Avgmarkup3							0.4580***						0.5411***			
							(5.63)						(6.38)			
Avgmarkup12								0.6163***						0.6574***		
								(7.86)						(8.14)		
Avgzero									-3.2860**						-7.5730***	
									(-3.01)						(-5.67)	
Avgamihud										-0.6240*						-0.6230
										(-2.26)						(-1.70)
Turnover											-0.0002	0.0002	0.0016	0.0022	0.0001	-0.0002
											(-0.17)	(0.21)	(1.44)	(1.92)	(0.05)	(-0.13)
CEF×L.Leverage											0.3928	0.3958	0.2371	0.1956	0.3377	0.4358
											(0.67)	(0.67)	(0.41)	(0.34)	(0.58)	(0.74)
Inv_percent											0.3258*	0.3179*	0.3387*	0.3536*	0.3253*	0.3246*
											(2.29)	(2.23)	(2.40)	(2.51)	(2.30)	(2.28)
Cash_percent											-6.2901**	-6.2985**	-6.1836**	-5.3600*	-6.9425**	-6.2375**
											(-2.65)	(-2.65)	(-2.62)	(-2.28)	(-2.93)	(-2.62)
Fix_percent											0.0884	0.0339	-0.2318	-0.3119	-0.5134	0.0757
											(0.13)	(0.05)	(-0.34)	(-0.45)	(-0.74)	(0.11)
Avgcoupon											0.3457**	0.3366**	0.3709***	0.3644***	0.4735***	0.3363**
											(3.28)	(3.16)	(3.55)	(3.51)	(4.42)	(3.21)
Avgmaturity											-0.0319**	-0.0307**	-0.0455***	-0.0348***	-0.0692***	-0.0180
											(-3.08)	(-2.95)	(-4.34)	(-3.41)	(-5.62)	(-1.43)
Constant	0.4443***	0.5007***	0.4318**	0.4529***	0.3848*	0.4935*	0.1153	0.0371	3.4903***	0.5199**	-1.2989	-1.1408	-1.3343	-1.3962	6.1484***	-1.1552
	(6.45)	(6.27)	(3.01)	(3.30)	(2.20)	(2.56)	(0.71)	(0.23)	(3.39)	(3.28)	(-1.66)	(-1.43)	(-1.76)	(-1.85)	(4.14)	(-1.51)
adj. R^2	0.663	0.666	0.665	0.665	0.665	0.665	0.668	0.672	0.666	0.665	0.668	0.668	0.673	0.676	0.672	0.669
N	3213	2986	2968	2968	2967	2967	2967	2967	2967	2966	2958	2958	2958	2958	2958	2958

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	Dependent variable: Quarterly net return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	-0.0299	-0.3534**	-0.3530*	-0.2310	-0.2740	-0.2785	-0.3410*	-0.3595*	-0.3143	-0.1483	-0.3587	-0.3600	-0.3770	-0.4126*	-0.4530*	-0.3139
	(-0.26)	(-2.62)	(-2.36)	(-1.42)	(-1.67)	(-1.69)	(-2.09)	(-2.21)	(-1.91)	(-0.89)	(-1.74)	(-1.75)	(-1.85)	(-2.02)	(-2.21)	(-1.51)
L.TNA ($b)		-0.0688	-0.0702	-0.0772	-0.0789*	-0.0793*	-0.0796*	-0.0667	-0.0865*	-0.0720	-0.0372	-0.0375	-0.0271	-0.0176	-0.0438	-0.0405
		(-1.78)	(-1.81)	(-1.96)	(-2.01)	(-2.02)	(-2.04)	(-1.71)	(-2.19)	(-1.84)	(-0.94)	(-0.95)	(-0.69)	(-0.45)	(-1.12)	(-1.03)
L.Familysize ($b)		0.0003	0.0002	0.0002	0.0006	0.0004	-0.0022	-0.0030	0.0000	0.0024	0.0019	0.0019	-0.0008	-0.0016	0.0009	0.0026
		(0.08)	(0.05)	(0.07)	(0.15)	(0.12)	(-0.62)	(-0.84)	(0.01)	(0.66)	(0.52)	(0.50)	(-0.23)	(-0.42)	(0.25)	(0.71)
Expratio			-0.0616		0.1038	0.1011	0.0036	0.0533	0.0781	0.2276	0.1631	0.1620	0.1361	0.1136	0.3124	0.1876
			(-0.34)		(0.46)	(0.45)	(0.02)	(0.24)	(0.34)	(0.98)	(0.69)	(0.69)	(0.58)	(0.49)	(1.33)	(0.80)
Advfee				-0.3679	-0.4524	-0.4561	-0.5463	-0.5777	-0.5087	-0.3986	-0.5598	-0.5608	-0.6673	-0.7184*	-0.7043*	-0.5730
				(-1.30)	(-1.30)	(-1.31)	(-1.57)	(-1.67)	(-1.46)	(-1.15)	(-1.59)	(-1.59)	(-1.91)	(-2.06)	(-2.01)	(-1.63)
Avgtv3					-0.0086						0.0052					
					(-0.36)						(0.20)					
Avgtv12						-0.0045						0.0005				
						(-0.53)						(0.05)				
Avgmarkup3							0.5108***						0.6642***			
							(5.12)						(6.47)			
Avgmarkup12								0.6341***						0.7585***		
								(6.68)						(7.88)		
Avgzero									-2.9224*						-9.2225***	
									(-2.20)						(-5.75)	
Avgamihud										-1.0186**						-0.7660
										(-3.05)						(-1.75)
Turnover											0.0015	0.0016	0.0032*	0.0037**	0.0013	0.0010
											(1.02)	(1.09)	(2.31)	(2.72)	(0.93)	(0.72)
CEF×L.Leverage											1.0092	1.0093	0.8479	0.8630	0.9656	1.0267
											(1.54)	(1.54)	(1.30)	(1.33)	(1.48)	(1.56)
Inv_percent											0.8742***	0.8723***	0.9155***	0.9336***	0.8934***	0.8765***
											(5.25)	(5.25)	(5.54)	(5.66)	(5.40)	(5.27)
Cash_percent											-13.2436***	-13.2453***	-13.0433***	-12.1877***	-14.0077***	-13.1637***
											(-4.57)	(-4.57)	(-4.53)	(-4.25)	(-4.86)	(-4.55)
Fix_percent											-0.4281	-0.4379	-0.8134	-0.8579	-1.1222	-0.3629
											(-0.52)	(-0.53)	(-0.99)	(-1.05)	(-1.35)	(-0.44)
Avgcoupon											0.6976***	0.6962***	0.7495***	0.7408***	0.8703***	0.6959***
											(5.64)	(5.57)	(6.11)	(6.07)	(6.90)	(5.66)
Avgmaturity											-0.0616***	-0.0614***	-0.0806***	-0.0666***	-0.1090***	-0.0460**
											(-4.95)	(-4.92)	(-6.39)	(-5.45)	(-7.36)	(-3.04)
Constant	0.1511	0.3133**	0.3757*	0.4938**	0.4949*	0.5331*	0.1099	0.0486	3.1807*	0.6362***	-2.3917*	-2.3653*	-2.6324**	-2.7334**	6.4691***	-2.4207**
	(1.78)	(3.24)	(2.17)	(3.01)	(2.36)	(2.30)	(0.57)	(0.25)	(2.55)	(3.36)	(-2.56)	(-2.48)	(-2.90)	(-3.02)	(3.63)	(-2.65)
adj. R^2	0.612	0.626	0.627	0.626	0.627	0.627	0.630	0.632	0.627	0.631	0.640	0.640	0.645	0.647	0.644	0.641
N	3671	3211	3176	3174	3173	3173	3173	3173	3173	3172	3163	3163	3163	3163	3163	3163

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	Dependent variable: Quarterly gross return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.0576	-0.2646	-0.3507*	-0.2139	-0.2732	-0.2775	-0.3402*	-0.3586*	-0.3134	-0.1478	-0.3626	-0.3637	-0.3808	-0.4164*	-0.4568*	-0.3179
	(0.51)	(-1.96)	(-2.34)	(-1.31)	(-1.66)	(-1.68)	(-2.09)	(-2.21)	(-1.91)	(-0.89)	(-1.76)	(-1.76)	(-1.86)	(-2.04)	(-2.22)	(-1.53)
L.TNA ($b)		-0.0736	-0.0706	-0.0769	-0.0792*	-0.0795*	-0.0798*	-0.0670	-0.0867*	-0.0723	-0.0376	-0.0380	-0.0275	-0.0180	-0.0442	-0.0409
		(-1.90)	(-1.81)	(-1.95)	(-2.01)	(-2.02)	(-2.04)	(-1.71)	(-2.20)	(-1.85)	(-0.95)	(-0.96)	(-0.70)	(-0.46)	(-1.13)	(-1.04)
L.Familysize ($b)		-0.0003	0.0002	-0.0004	0.0005	0.0004	-0.0023	-0.0030	0.0000	0.0024	0.0019	0.0018	-0.0009	-0.0016	0.0009	0.0026
		(-0.09)	(0.05)	(-0.12)	(0.14)	(0.11)	(-0.63)	(-0.85)	(0.00)	(0.65)	(0.51)	(0.50)	(-0.23)	(-0.43)	(0.24)	(0.70)
Expratio			0.1833		0.3462	0.3435	0.2457	0.2956	0.3204	0.4692*	0.4036	0.4026	0.3766	0.3541	0.5531*	0.4281
			(1.00)		(1.52)	(1.51)	(1.08)	(1.31)	(1.41)	(2.02)	(1.71)	(1.71)	(1.61)	(1.52)	(2.35)	(1.81)
Advfee				-0.1426	-0.4458	-0.4495	-0.5400	-0.5714	-0.5022	-0.3919	-0.5562	-0.5571	-0.6639	-0.7151*	-0.7006*	-0.5693
				(-0.50)	(-1.28)	(-1.29)	(-1.55)	(-1.65)	(-1.44)	(-1.13)	(-1.58)	(-1.58)	(-1.89)	(-2.04)	(-1.99)	(-1.62)
Avgtv3					-0.0089						0.0049					
					(-0.37)						(0.19)					
Avgtv12						-0.0045						0.0005				
						(-0.53)						(0.05)				
Avgmarkup3							0.5127***						0.6658***			
							(5.13)						(6.47)			
Avgmarkup12								0.6356***						0.7601***		
								(6.68)						(7.88)		
Avgzero									-2.9319*						-9.2257***	
									(-2.21)						(-5.74)	
Avgamihud										-1.0137**						-0.7634
										(-3.03)						(-1.74)
Turnover											0.0015	0.0016	0.0032*	0.0037**	0.0012	0.0010
											(1.02)	(1.08)	(2.31)	(2.71)	(0.92)	(0.72)
CEF×L.Leverage											1.0304	1.0305	0.8686	0.8838	0.9868	1.0478
											(1.56)	(1.56)	(1.33)	(1.35)	(1.51)	(1.59)
Inv_percent											0.8762***	0.8745***	0.9178***	0.9359***	0.8956***	0.8786***
											(5.25)	(5.25)	(5.54)	(5.66)	(5.40)	(5.27)
Cash_percent											-13.2235***	-13.2251***	-13.0226***	-12.1652***	-13.9877***	-13.1437***
											(-4.56)	(-4.56)	(-4.52)	(-4.23)	(-4.84)	(-4.53)
Fix_percent											-0.4359	-0.4450	-0.8213	-0.8658	-1.1295	-0.3702
											(-0.52)	(-0.54)	(-1.00)	(-1.05)	(-1.36)	(-0.45)
Avgcoupon											0.6997***	0.6983***	0.7518***	0.7431***	0.8725***	0.6981***
											(5.64)	(5.58)	(6.12)	(6.08)	(6.90)	(5.66)
Avgmaturity											-0.0615***	-0.0613***	-0.0805***	-0.0665***	-0.1089***	-0.0460**
											(-4.93)	(-4.90)	(-6.37)	(-5.43)	(-7.34)	(-3.03)
Constant	0.3310***	0.5091***	0.3795*	0.5843***	0.4989*	0.5363*	0.1113	0.0503	3.1921*	0.6381***	-2.3905*	-2.3658*	-2.6343**	-2.7355**	6.4709***	-2.4218**
	(3.88)	(5.25)	(2.19)	(3.56)	(2.37)	(2.31)	(0.57)	(0.26)	(2.55)	(3.36)	(-2.55)	(-2.47)	(-2.90)	(-3.02)	(3.62)	(-2.65)
adj. R^2	0.611	0.625	0.626	0.625	0.626	0.626	0.629	0.631	0.627	0.630	0.640	0.640	0.644	0.647	0.643	0.640
N	3671	3211	3176	3174	3173	3173	3173	3173	3173	3172	3163	3163	3163	3163	3163	3163

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	Dependent variable: Holding-base quarterly alpha															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	-0.2872	-0.3068	-0.2173	-0.2344	-0.2239	-0.2191	-0.2079	-0.1932	-0.2199	-0.0491	-0.1568	-0.1578	-0.1372	-0.1142	-0.1698	-0.0932
	(-1.92)	(-1.75)	(-1.16)	(-1.19)	(-1.13)	(-1.10)	(-1.05)	(-0.97)	(-1.11)	(-0.24)	(-0.58)	(-0.58)	(-0.50)	(-0.42)	(-0.62)	(-0.35)
L.TNA ($b)		-0.0188	-0.0233	-0.0232	-0.0248	-0.0241	-0.0247	-0.0214	-0.0263	-0.0148	-0.0307	-0.0301	-0.0275	-0.0242	-0.0312	-0.0436
		(-0.47)	(-0.58)	(-0.57)	(-0.61)	(-0.59)	(-0.61)	(-0.53)	(-0.64)	(-0.36)	(-0.74)	(-0.73)	(-0.66)	(-0.58)	(-0.75)	(-1.06)
L.Familysize ($b)		-0.0011	-0.0017	-0.0011	-0.0020	-0.0018	-0.0024	-0.0027	-0.0019	0.0022	-0.0033	-0.0032	-0.0033	-0.0035	-0.0033	-0.0006
		(-0.27)	(-0.42)	(-0.26)	(-0.49)	(-0.44)	(-0.58)	(-0.66)	(-0.48)	(0.53)	(-0.78)	(-0.75)	(-0.79)	(-0.82)	(-0.77)	(-0.13)
Expratio			-0.2678		-0.2646	-0.2640	-0.3013	-0.2920	-0.2703	0.0506	-0.2331	-0.2296	-0.2368	-0.2339	-0.2090	-0.0989
			(-1.26)		(-1.04)	(-1.04)	(-1.18)	(-1.15)	(-1.06)	(0.19)	(-0.86)	(-0.85)	(-0.88)	(-0.87)	(-0.77)	(-0.37)
Advfee				-0.2537	-0.0230	-0.0238	-0.0455	-0.0704	-0.0355	0.0034	0.1012	0.1038	0.0762	0.0545	0.0765	0.0717
				(-0.74)	(-0.06)	(-0.06)	(-0.11)	(-0.17)	(-0.09)	(0.01)	(0.24)	(0.25)	(0.18)	(0.13)	(0.18)	(0.17)
Avgtv3					-0.0166						-0.0185					
					(-0.60)						(-0.59)					
Avgtv12						-0.0025						-0.0028				
						(-0.25)						(-0.25)				
Avgmarkup3							0.1497						0.1373			
							(1.30)						(1.09)			
Avgmarkup12								0.2239*						0.1963		
								(2.10)						(1.72)		
Avgzero									-0.9197						-1.4629	
									(-0.56)						(-0.73)	
Avgamihud										-1.7122***						-2.7125***
										(-4.58)						(-5.54)
Turnover											-0.0009	-0.0012	-0.0010	-0.0007	-0.0015	-0.0041*
											(-0.47)	(-0.64)	(-0.52)	(-0.37)	(-0.84)	(-2.22)
CEF×L.Leverage											0.4484	0.4412	0.4231	0.3408	0.4780	0.7021
											(0.49)	(0.48)	(0.46)	(0.37)	(0.52)	(0.78)
Inv_percent											-0.3158	-0.3130	-0.2825	-0.2538	-0.3041	-0.3223
											(-1.80)	(-1.78)	(-1.59)	(-1.42)	(-1.73)	(-1.85)
Cash_percent											-4.8158	-4.7610	-4.9899	-4.7369	-4.9345	-2.8645
											(-1.07)	(-1.06)	(-1.11)	(-1.06)	(-1.10)	(-0.64)
Fix_percent											-0.5313	-0.5109	-0.5936	-0.6423	-0.6113	-0.3583
											(-0.50)	(-0.48)	(-0.55)	(-0.60)	(-0.57)	(-0.34)
Avgcoupon											-0.2973	-0.2960	-0.2624	-0.2592	-0.2492	-0.3168
											(-1.72)	(-1.70)	(-1.51)	(-1.50)	(-1.38)	(-1.86)
Avgmaturity											0.0054	0.0050	-0.0006	0.0005	-0.0025	0.0633***
											(0.36)	(0.33)	(-0.04)	(0.03)	(-0.14)	(3.47)
Constant	-0.1665**	-0.1245	0.0831	-0.0118	0.1638	0.1311	0.0174	-0.0054	0.9531	0.3272	2.3085	2.2599	2.0828	2.0557	3.5289	2.1542
	(-3.00)	(-1.65)	(0.45)	(-0.07)	(0.69)	(0.49)	(0.08)	(-0.03)	(0.61)	(1.58)	(1.92)	(1.83)	(1.77)	(1.75)	(1.60)	(1.85)
adj. R^2	0.001	0.000	0.001	0.000	-0.000	-0.000	0.000	0.002	-0.000	0.009	0.000	0.000	0.001	0.002	0.000	0.015
N	2288	2124	2113	2112	2112	2112	2112	2112	2112	2112	2108	2108	2108	2108	2108	2108

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table shows the results of regressing funds' quarterly returns on its liquidity measures. Panel A shows the regression results before the financial crisis. Panel B shows the regression results during the financial crisis. Regressions that use holding-based return, net return and gross return as dependent variables control for municipal bond market returns using five Barcley indices with different maturities. *Holdingret* is a fund's holding-based quarterly return. *Qret* is a fund's quarterly net return. *Grossqret* is a fund's quarterly gross return. *Holdingalpha* is a fund's quarter abnormal holding-based return. *Avgtv3*(*Avgtv12*) is the fund's average past 3-month(12-month) trading

volume. *Avgmarkup3*(*Avgmarkup12*) is the fund's average past 3-month(12-month) round-trip trading costs. *CEF* is a dummy that equals 1 when a fund takes closed-end form, and 0 otherwise. *TNA* is the fund's total net assets. *Familysize* is the fund family's size. *Expratio* is the fund's annual expense ratio. *Turnover* is the fund's turnover ratio. *Advfee* is the fund's advesory fee. *Leverage* is the fund's leverage ratio. *Cash_percent* is the percentage of cash in fund's TNA. *Inv_percent* is the percentage of investment-grade bonds in fund's TNA. *Fix_percent* is the percentage of fix-rate bonds in fund's TNA. *Avgcoupon* is the fund's average coupon rate. *Avgmaturity* is the fund's average maturity.

Table 5: Regression of fund's holding-based return (2003-2010)

Panel A: Multivariate analysis in the pre-crisis period

	Dependent variable: Holding-base quarterly return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.2982***	0.2947***	0.2115***	0.2140***	0.1955***	0.1908***	0.1610***	0.1904***	0.1427***	0.0920**	0.0476	0.0464	0.0409	0.0405	0.0540	0.0363
	(14.05)	(12.22)	(8.20)	(7.54)	(6.83)	(6.69)	(5.67)	(6.74)	(4.89)	(3.22)	(1.29)	(1.26)	(1.11)	(1.10)	(1.46)	(0.98)
L.TNA ($b)		0.0396***	0.0517***	0.0505***	0.0524***	0.0524***	0.0514***	0.0552***	0.0377***	0.0467***	-0.0025	-0.0024	-0.0017	-0.0008	-0.0006	-0.0004
		(3.63)	(4.73)	(4.54)	(4.73)	(4.74)	(4.69)	(5.00)	(3.37)	(4.32)	(-0.24)	(-0.23)	(-0.17)	(-0.08)	(-0.06)	(-0.04)
L.Familysize ($b)		0.0008	0.0018*	0.0004	0.0015	0.0014	0.0005	0.0009	0.0013	-0.0007	0.0012	0.0012	0.0010	0.0009	0.0013	0.0008
		(1.04)	(2.22)	(0.53)	(1.86)	(1.65)	(0.67)	(1.14)	(1.55)	(-0.87)	(1.59)	(1.54)	(1.29)	(1.19)	(1.67)	(1.06)
Expratio			0.3029***		0.2781***	0.2726***	0.2544***	0.2672***	0.2599***	0.1978***	0.0144	0.0132	0.0133	0.0104	0.0138	0.0119
			(8.69)		(6.72)	(6.58)	(6.19)	(6.48)	(6.31)	(4.86)	(0.37)	(0.34)	(0.34)	(0.27)	(0.36)	(0.31)
Advfee				0.2859***	0.0574	0.0637	0.0478	0.0492	0.0322	0.0567	0.0161	0.0169	0.0118	0.0053	0.0144	0.0166
				(5.21)	(0.89)	(0.99)	(0.75)	(0.77)	(0.50)	(0.90)	(0.27)	(0.28)	(0.20)	(0.09)	(0.24)	(0.28)
Avgtv3					-0.0048						-0.0016					
					(-1.08)						(-0.37)					
Avgtv12						-0.0037*						-0.0014				
						(-2.40)						(-0.92)				
Avgmarkup3							0.1419***						0.0396*			
							(8.42)						(2.44)			
Avgmarkup12								0.0709***						0.0367**		
								(5.26)						(2.85)		
Avgzero									-2.2547***						0.5377	
									(-7.18)						(1.66)	
Avgamihud										0.7843***						0.2154***
										(14.22)						(3.49)
Turnover											0.0002	0.0002	0.0003	0.0003	0.0002	0.0004
											(0.79)	(0.98)	(1.18)	(1.32)	(0.78)	(1.55)
CEF×L.Leverage											-0.3288**	-0.3264**	-0.3147**	-0.2962*	-0.3202**	-0.3142**
											(-2.85)	(-2.82)	(-2.72)	(-2.55)	(-2.77)	(-2.72)
Inv_percent											-0.4814***	-0.4839***	-0.4799***	-0.4786***	-0.4787***	-0.4954***
											(-9.84)	(-9.88)	(-9.84)	(-9.82)	(-9.81)	(-10.13)
Cash_percent											0.2720	0.2715	0.2466	0.2526	0.2912	0.2551
											(1.28)	(1.28)	(1.16)	(1.19)	(1.37)	(1.20)
Fix_percent											0.5246***	0.5200***	0.5146***	0.5087***	0.5173***	0.4907***
											(4.61)	(4.56)	(4.52)	(4.47)	(4.54)	(4.30)
Avgcoupon											0.1586***	0.1579***	0.1554***	0.1560***	0.1571***	0.1520***
											(9.44)	(9.42)	(9.27)	(9.32)	(9.38)	(9.04)
Avgmaturity											0.0566***	0.0566***	0.0557***	0.0564***	0.0582***	0.0534***
											(22.92)	(22.95)	(22.40)	(22.90)	(21.87)	(20.38)
Constant	0.2602***	0.2215***	-0.0352	0.0944*	-0.0171	0.0182	-0.0516	-0.0251	2.1201***	-0.2268***	-1.6763***	-1.6551***	-1.6568***	-1.6493***	-2.1972***	-1.6432***
	(8.64)	(7.20)	(-0.82)	(2.33)	(-0.35)	(0.36)	(-1.16)	(-0.56)	(6.98)	(-4.97)	(-12.19)	(-11.92)	(-12.29)	(-12.23)	(-6.55)	(-12.20)
adj. R^2	0.843	0.847	0.850	0.848	0.850	0.850	0.853	0.851	0.852	0.857	0.879	0.880	0.880	0.880	0.880	0.880
N	3905	3810	3772	3747	3747	3747	3747	3747	3747	3747	3591	3591	3591	3591	3591	3591

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	Dependent variable: Quarterly net return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.5983***	0.5530***	0.5081***	0.4684***	0.4673***	0.4674***	0.4317***	0.4576***	0.3892***	0.3701***	0.1576**	0.1586**	0.1515**	0.1502**	0.1651**	0.1508**
	(21.73)	(17.00)	(14.46)	(12.19)	(11.99)	(12.02)	(11.09)	(11.86)	(9.73)	(9.34)	(2.92)	(2.94)	(2.81)	(2.79)	(3.06)	(2.80)
L.TNA ($b)		0.0561***	0.0617***	0.0665***	0.0672***	0.0671***	0.0661***	0.0690***	0.0482**	0.0617***	-0.0009	-0.0009	-0.0003	0.0007	0.0020	0.0002
		(3.80)	(4.14)	(4.40)	(4.44)	(4.44)	(4.38)	(4.56)	(3.15)	(4.12)	(-0.06)	(-0.06)	(-0.02)	(0.05)	(0.13)	(0.01)
L.Familysize ($b)		0.0015	0.0020	0.0011	0.0015	0.0015	0.0005	0.0009	0.0010	-0.0006	0.0006	0.0006	0.0004	0.0003	0.0007	0.0004
		(1.39)	(1.79)	(1.03)	(1.34)	(1.36)	(0.47)	(0.82)	(0.89)	(-0.54)	(0.56)	(0.58)	(0.38)	(0.28)	(0.61)	(0.35)
Expratio			0.1582***		0.0792	0.0803	0.0545	0.0676	0.0542	0.0035	-0.1992***	-0.1984***	-0.2009***	-0.2040***	-0.2029***	-0.2012***
			(3.34)		(1.40)	(1.42)	(0.97)	(1.20)	(0.97)	(0.06)	(-3.54)	(-3.53)	(-3.58)	(-3.63)	(-3.61)	(-3.58)
Advfee				0.2856***	0.2194*	0.2184*	0.2200*	0.2211*	0.1944*	0.2316**	0.0908	0.0904	0.0883	0.0834	0.0896	0.0915
				(3.88)	(2.52)	(2.50)	(2.53)	(2.54)	(2.24)	(2.69)	(1.05)	(1.04)	(1.02)	(0.96)	(1.04)	(1.06)
Avgtv3					0.0026						0.0001					
					(0.44)						(0.01)					
Avgtv12						0.0011						0.0006				
						(0.51)						(0.28)				
Avgmarkup3							0.1172***						0.0307			
							(5.10)						(1.31)			
Avgmarkup12								0.0496**						0.0332		
								(2.70)						(1.79)		
Avgzero									-2.8587***						0.8366	
									(-6.54)						(1.73)	
Avgamihud										0.6756***						0.1179
										(8.81)						(1.32)
Turnover											0.0002	0.0001	0.0002	0.0003	0.0002	0.0003
											(0.46)	(0.37)	(0.74)	(0.87)	(0.59)	(0.81)
CEF×L.Leverage											0.2720	0.2707	0.2836	0.3017	0.2904	0.2804
											(1.61)	(1.61)	(1.68)	(1.78)	(1.72)	(1.66)
Inv_percent											-0.5170***	-0.5156***	-0.5167***	-0.5150***	-0.5168***	-0.5249***
											(-7.30)	(-7.28)	(-7.32)	(-7.29)	(-7.32)	(-7.41)
Cash_percent											0.5871	0.5875	0.5651	0.5665	0.6215*	0.5762
											(1.89)	(1.89)	(1.82)	(1.82)	(2.00)	(1.86)
Fix_percent											-0.1417	-0.1384	-0.1521	-0.1610	-0.1419	-0.1620
											(-0.83)	(-0.81)	(-0.90)	(-0.95)	(-0.84)	(-0.95)
Avgcoupon											0.0861***	0.0866***	0.0836***	0.0837***	0.0849***	0.0826***
											(3.75)	(3.77)	(3.64)	(3.65)	(3.71)	(3.59)
Avgmaturity											0.0656***	0.0656***	0.0649***	0.0654***	0.0682***	0.0638***
											(18.50)	(18.52)	(18.15)	(18.48)	(17.76)	(16.91)
Constant	0.0658	-0.0313	-0.1598**	-0.1600**	-0.2085**	-0.2130**	-0.2066***	-0.1860**	2.5382***	-0.3569***	-0.8490***	-0.8627***	-0.8258***	-0.8134***	-1.6644**	-0.8258***
	(1.64)	(-0.75)	(-2.73)	(-2.91)	(-3.12)	(-3.08)	(-3.40)	(-3.04)	(6.01)	(-5.66)	(-4.23)	(-4.26)	(-4.20)	(-4.13)	(-3.26)	(-4.20)
adj. R^2	0.757	0.781	0.782	0.782	0.782	0.782	0.784	0.783	0.785	0.787	0.804	0.804	0.804	0.804	0.804	0.804
N	4613	3927	3893	3868	3868	3868	3868	3868	3868	3868	3721	3721	3721	3721	3721	3721

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	Dependent variable: Quarterly gross return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.6670***	0.6233***	0.5096***	0.4814***	0.4684***	0.4686***	0.4325***	0.4587***	0.3892***	0.3704***	0.1560**	0.1571**	0.1498**	0.1486**	0.1634**	0.1491**
	(24.03)	(18.97)	(14.47)	(12.44)	(11.99)	(12.02)	(11.08)	(11.86)	(9.70)	(9.32)	(2.89)	(2.91)	(2.77)	(2.75)	(3.02)	(2.76)
L.TNA ($b)		0.0457**	0.0616***	0.0645***	0.0671***	0.0671***	0.0660***	0.0690***	0.0478**	0.0616***	-0.0013	-0.0013	-0.0007	0.0003	0.0015	-0.0001
		(3.06)	(4.12)	(4.24)	(4.43)	(4.42)	(4.37)	(4.55)	(3.12)	(4.10)	(-0.09)	(-0.09)	(-0.05)	(0.02)	(0.10)	(-0.01)
L.Familysize ($b)		0.0007	0.0019	0.0001	0.0015	0.0015	0.0005	0.0009	0.0009	-0.0007	0.0006	0.0006	0.0004	0.0003	0.0006	0.0003
		(0.61)	(1.75)	(0.05)	(1.29)	(1.31)	(0.42)	(0.78)	(0.84)	(-0.59)	(0.51)	(0.53)	(0.33)	(0.23)	(0.56)	(0.29)
Expratio			0.4080***		0.3281***	0.3293***	0.3032***	0.3165***	0.3028***	0.2519***	0.0487	0.0496	0.0470	0.0439	0.0452	0.0468
			(8.58)		(5.80)	(5.81)	(5.37)	(5.59)	(5.38)	(4.45)	(0.86)	(0.88)	(0.83)	(0.78)	(0.80)	(0.83)
Advfee				0.4937***	0.2218*	0.2207*	0.2224*	0.2235*	0.1963*	0.2341**	0.0918	0.0914	0.0893	0.0844	0.0907	0.0926
				(6.66)	(2.54)	(2.52)	(2.55)	(2.56)	(2.26)	(2.71)	(1.06)	(1.05)	(1.03)	(0.97)	(1.05)	(1.07)
Avgtv3					0.0025						-0.0000					
					(0.43)						(-0.00)					
Avgtv12						0.0011						0.0006				
						(0.52)						(0.29)				
Avgmarkup3							0.1183***						0.0312			
							(5.13)						(1.33)			
Avgmarkup12								0.0500**						0.0334		
								(2.72)						(1.79)		
Avgzero									-2.9021***						0.8177	
									(-6.62)						(1.69)	
Avgamihud										0.6813***						0.1209
										(8.86)						(1.36)
Turnover											0.0001	0.0001	0.0002	0.0003	0.0002	0.0003
											(0.43)	(0.33)	(0.71)	(0.84)	(0.55)	(0.78)
CEF×L.Leverage											0.2791	0.2777	0.2908	0.3089	0.2970	0.2877
											(1.65)	(1.64)	(1.72)	(1.82)	(1.76)	(1.70)
Inv_percent											-0.5208***	-0.5192***	-0.5204***	-0.5186***	-0.5205***	-0.5288***
											(-7.34)	(-7.31)	(-7.35)	(-7.32)	(-7.35)	(-7.44)
Cash_percent											0.5914	0.5920	0.5691	0.5708	0.6251*	0.5803
											(1.90)	(1.90)	(1.83)	(1.83)	(2.00)	(1.86)
Fix_percent											-0.1403	-0.1367	-0.1507	-0.1596	-0.1403	-0.1610
											(-0.82)	(-0.80)	(-0.89)	(-0.94)	(-0.83)	(-0.94)
Avgcoupon											0.0859***	0.0864***	0.0834***	0.0835***	0.0848***	0.0823***
											(3.73)	(3.76)	(3.62)	(3.64)	(3.70)	(3.57)
Avgmaturity											0.0659***	0.0659***	0.0652***	0.0658***	0.0685***	0.0641***
											(18.56)	(18.57)	(18.20)	(18.53)	(17.79)	(16.94)
Constant	0.2712***	0.1878***	-0.1587**	-0.0428	-0.2075**	-0.2128**	-0.2060***	-0.1852**	2.5804***	-0.3576***	-0.8494***	-0.8646***	-0.8266***	-0.8144***	-1.6472**	-0.8264***
	(6.69)	(4.47)	(-2.71)	(-0.77)	(-3.09)	(-3.07)	(-3.38)	(-3.02)	(6.09)	(-5.65)	(-4.22)	(-4.26)	(-4.19)	(-4.12)	(-3.22)	(-4.19)
adj. R^2	0.757	0.780	0.784	0.782	0.784	0.784	0.785	0.784	0.786	0.788	0.805	0.805	0.806	0.806	0.806	0.806
N	4612	3926	3893	3868	3868	3868	3868	3868	3868	3868	3721	3721	3721	3721	3721	3721

Continued on next page

	Dependent variable: Holding-base quarterly alpha															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.0368	0.0437	0.0218	0.0062	0.0061	-0.0160	-0.0057	0.0009	0.0061	-0.0012	0.0684	0.0551	0.0557	0.0570	0.0580	0.0634
	(1.13)	(1.13)	(0.53)	(0.14)	(0.14)	(-0.36)	(-0.13)	(0.02)	(0.14)	(-0.03)	(1.16)	(0.94)	(0.95)	(0.97)	(0.99)	(1.08)
L.TNA ($b)		0.0021	0.0045	0.0073	0.0072	0.0077	0.0084	0.0094	0.0075	0.0075	-0.0079	-0.0073	-0.0066	-0.0069	-0.0084	-0.0107
		(0.15)	(0.33)	(0.53)	(0.52)	(0.55)	(0.60)	(0.67)	(0.54)	(0.54)	(-0.57)	(-0.53)	(-0.47)	(-0.49)	(-0.61)	(-0.77)
L.Familysize ($b)		-0.0004	-0.0001	-0.0006	-0.0004	-0.0010	-0.0010	-0.0008	-0.0004	-0.0007	0.0011	0.0008	0.0007	0.0009	0.0009	0.0014
		(-0.35)	(-0.12)	(-0.57)	(-0.38)	(-0.88)	(-0.87)	(-0.69)	(-0.37)	(-0.59)	(0.95)	(0.73)	(0.61)	(0.74)	(0.83)	(1.18)
Expratio			0.0779		0.0373	0.0421	0.0337	0.0394	0.0397	0.0304	0.0081	0.0097	0.0092	0.0083	0.0039	0.0081
			(1.63)		(0.64)	(0.72)	(0.58)	(0.68)	(0.66)	(0.51)	(0.14)	(0.16)	(0.16)	(0.14)	(0.07)	(0.14)
Advfee				0.1508	0.1149	0.1057	0.1013	0.1024	0.1130	0.1175	0.1728	0.1637	0.1562	0.1607	0.1748	0.1723
				(1.89)	(1.18)	(1.08)	(1.03)	(1.04)	(1.15)	(1.20)	(1.73)	(1.64)	(1.55)	(1.58)	(1.74)	(1.73)
Avgtv3					0.0011						0.0092					
					(0.16)						(1.23)					
Avgtv12						-0.0067*						-0.0028				
						(-2.45)						(-0.98)				
Avgmarkup3							0.0555						0.0376			
							(1.79)						(1.20)			
Avgmarkup12								0.0293						0.0136		
								(1.12)						(0.51)		
Avgzero									0.0942						-0.2962	
									(0.19)						(-0.56)	
Avgamihud										0.0653						-0.1745
										(0.69)						(-1.50)
Turnover											-0.0002	0.0002	0.0001	0.0001	0.0001	-0.0001
											(-0.41)	(0.46)	(0.29)	(0.22)	(0.14)	(-0.28)
CEF×L.Leverage											-0.4509*	-0.4395*	-0.4309*	-0.4280*	-0.4482*	-0.4493*
											(-2.35)	(-2.29)	(-2.24)	(-2.19)	(-2.34)	(-2.35)
Inv_percent											-0.3711***	-0.3796***	-0.3849***	-0.3809***	-0.3803***	-0.3623***
											(-4.37)	(-4.47)	(-4.52)	(-4.46)	(-4.46)	(-4.25)
Cash_percent											-1.8735	-1.9811	-1.9876	-1.9410	-1.9223	-1.9648
											(-1.16)	(-1.23)	(-1.23)	(-1.20)	(-1.19)	(-1.22)
Fix_percent											0.2312	0.2257	0.2126	0.2232	0.2587	0.2481
											(1.10)	(1.07)	(1.01)	(1.06)	(1.20)	(1.18)
Avgcoupon											0.1301***	0.1175***	0.1204***	0.1226***	0.1255***	0.1335***
											(3.77)	(3.38)	(3.51)	(3.58)	(3.66)	(3.85)
Avgmaturity											0.0130**	0.0133**	0.0127**	0.0133**	0.0126**	0.0157***
											(3.20)	(3.28)	(3.12)	(3.30)	(3.00)	(3.61)
Constant	0.2393***	0.2413***	0.1764***	0.1726***	0.1536**	0.2571***	0.1513**	0.1591***	0.0680	0.1454**	-0.7518**	-0.6150*	-0.6519**	-0.6754**	-0.4350	-0.7488**
	(14.68)	(12.03)	(3.97)	(4.10)	(2.77)	(4.11)	(3.16)	(3.33)	(0.14)	(2.84)	(-3.03)	(-2.40)	(-2.65)	(-2.74)	(-0.84)	(-3.04)
adj. R^2	0.000	-0.001	0.000	0.001	-0.001	0.004	0.002	0.000	-0.001	-0.000	0.056	0.055	0.056	0.055	0.055	0.056
N	1220	1211	1203	1201	1201	1201	1201	1201	1201	1201	1184	1184	1184	1184	1184	1184

Continued on next page

Panel B: Multivariate analysis in the crisis period

	Dependent variable: Holding-base quarterly return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	-0.1523	-0.2110	-0.2146	-0.1975	-0.2010	-0.2191	-0.2729	-0.3059*	-0.2421	-0.0620	-0.1945	-0.2017	-0.2123	-0.2310	-0.2735	-0.1638
	(-1.45)	(-1.68)	(-1.53)	(-1.30)	(-1.30)	(-1.42)	(-1.78)	(-2.00)	(-1.56)	(-0.39)	(-0.98)	(-1.02)	(-1.07)	(-1.17)	(-1.38)	(-0.82)
L.TNA ($b)		-0.0771*	-0.0765	-0.0772	-0.0767	-0.0788*	-0.0761	-0.0615	-0.0828*	-0.0689	-0.0357	-0.0371	-0.0329	-0.0229	-0.0454	-0.0408
		(-1.98)	(-1.95)	(-1.95)	(-1.93)	(-1.99)	(-1.93)	(-1.56)	(-2.08)	(-1.74)	(-0.89)	(-0.92)	(-0.82)	(-0.57)	(-1.13)	(-1.01)
L.Familysize ($b)		0.0014	0.0014	0.0013	0.0015	0.0011	-0.0008	-0.0024	0.0010	0.0039	0.0028	0.0025	0.0010	-0.0002	0.0021	0.0034
		(0.40)	(0.39)	(0.38)	(0.43)	(0.29)	(-0.21)	(-0.67)	(0.27)	(1.06)	(0.75)	(0.66)	(0.27)	(-0.04)	(0.55)	(0.91)
Expratio			0.0038		0.0225	0.0181	-0.0291	0.0075	0.0046	0.2003	0.2515	0.2455	0.2125	0.1905	0.3404	0.2710
			(0.02)		(0.11)	(0.09)	(-0.14)	(0.04)	(0.02)	(0.93)	(1.14)	(1.11)	(0.96)	(0.87)	(1.54)	(1.22)
Advfee				-0.0325	-0.0481	-0.0618	-0.1122	-0.1876	-0.0825	-0.0208	-0.0795	-0.0875	-0.1471	-0.2179	-0.1944	-0.0919
				(-0.12)	(-0.15)	(-0.19)	(-0.34)	(-0.57)	(-0.25)	(-0.06)	(-0.24)	(-0.26)	(-0.44)	(-0.65)	(-0.58)	(-0.27)
Avgtv3					0.0052						0.0207					
					(0.22)						(0.81)					
Avgtv12						-0.0056						-0.0004				
						(-0.69)						(-0.04)				
Avgmarkup3							0.3540***						0.3920***			
							(3.73)						(3.93)			
Avgmarkup12								0.5819***						0.5702***		
								(6.34)						(5.91)		
Avgzero									-1.9245						-7.4678***	
									(-1.44)						(-4.50)	
Avgamihud										-1.2303***						-0.8412*
										(-3.79)						(-2.00)
Turnover											0.0002	0.0006	0.0017	0.0023	0.0005	-0.0000
											(0.16)	(0.47)	(1.26)	(1.78)	(0.36)	(-0.03)
CEF×L.Leverage											0.3294	0.3281	0.2738	0.2448	0.3212	0.3863
											(0.52)	(0.52)	(0.43)	(0.39)	(0.51)	(0.61)
Inv_percent											0.8998**	0.9052**	0.6295*	0.5292	0.6328*	0.9155**
											(2.99)	(3.00)	(2.04)	(1.73)	(2.07)	(3.04)
Cash_percent											-5.3356*	-5.3333*	-5.4962*	-4.8873	-6.1248*	-5.2247*
											(-2.08)	(-2.08)	(-2.15)	(-1.92)	(-2.39)	(-2.04)
Fix_percent											-0.7051	-0.7863	-0.5597	-0.5190	-0.8409	-0.7205
											(-0.80)	(-0.90)	(-0.64)	(-0.60)	(-0.97)	(-0.83)
Avgcoupon											0.4985***	0.4871***	0.4730***	0.4541***	0.5862***	0.4965***
											(3.68)	(3.56)	(3.52)	(3.39)	(4.31)	(3.69)
Avgmaturity											-0.0606***	-0.0594***	-0.0659***	-0.0564***	-0.0952***	-0.0430**
											(-4.86)	(-4.76)	(-5.29)	(-4.58)	(-6.49)	(-2.89)
Constant	0.4193***	0.4908***	0.4929**	0.5095**	0.4795*	0.5986**	0.2763	0.1751	2.2973	0.7094***	-1.4918	-1.2956	-1.4575	-1.5083	5.7997**	-1.4048
	(4.90)	(4.97)	(2.91)	(3.12)	(2.31)	(2.62)	(1.45)	(0.94)	(1.82)	(3.76)	(-1.58)	(-1.34)	(-1.59)	(-1.65)	(3.18)	(-1.53)
adj. R^2	0.663	0.666	0.665	0.665	0.665	0.665	0.667	0.670	0.665	0.667	0.670	0.670	0.672	0.675	0.673	0.671
N	2672	2445	2431	2431	2430	2430	2430	2430	2430	2429	2421	2421	2421	2421	2421	2421

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	Dependent variable: Quarterly net return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.0273	-0.2906	-0.2865	-0.1807	-0.2136	-0.2297	-0.2987	-0.3204	-0.2645	-0.0160	-0.1733	-0.1790	-0.1873	-0.2093	-0.2786	-0.1317
	(0.22)	(-1.92)	(-1.70)	(-0.99)	(-1.15)	(-1.24)	(-1.62)	(-1.75)	(-1.42)	(-0.09)	(-0.75)	(-0.77)	(-0.81)	(-0.91)	(-1.20)	(-0.56)
L.TNA ($b)		-0.1014*	-0.1031*	-0.1098*	-0.1104*	-0.1122*	-0.1097*	-0.0943	-0.1185*	-0.1006*	-0.0369	-0.0380	-0.0325	-0.0230	-0.0509	-0.0414
		(-2.11)	(-2.14)	(-2.24)	(-2.26)	(-2.30)	(-2.26)	(-1.95)	(-2.42)	(-2.08)	(-0.75)	(-0.77)	(-0.67)	(-0.47)	(-1.04)	(-0.85)
L.Familysize ($b)		0.0015	0.0013	0.0014	0.0018	0.0013	-0.0011	-0.0023	0.0012	0.0047	0.0024	0.0021	0.0003	-0.0006	0.0018	0.0032
		(0.35)	(0.31)	(0.32)	(0.41)	(0.31)	(-0.25)	(-0.54)	(0.28)	(1.09)	(0.53)	(0.46)	(0.07)	(-0.14)	(0.41)	(0.71)
Expratio			-0.0803		0.0555	0.0515	-0.0182	0.0279	0.0309	0.2622	0.3671	0.3624	0.3160	0.2863	0.4954	0.3945
			(-0.38)		(0.22)	(0.20)	(-0.07)	(0.11)	(0.12)	(1.00)	(1.37)	(1.35)	(1.18)	(1.08)	(1.85)	(1.47)
Advfee				-0.3484	-0.3850	-0.3990	-0.4596	-0.5251	-0.4201	-0.3391	-0.4947	-0.5040	-0.5699	-0.6377	-0.6258	-0.5122
				(-1.07)	(-0.97)	(-1.00)	(-1.16)	(-1.32)	(-1.05)	(-0.86)	(-1.22)	(-1.24)	(-1.41)	(-1.58)	(-1.55)	(-1.26)
Avgtv3					0.0017						0.0076					
					(0.06)						(0.24)					
Avgtv12						-0.0061						-0.0031				
						(-0.61)						(-0.28)				
Avgmarkup3							0.4660***						0.5215***			
							(3.99)						(4.31)			
Avgmarkup12								0.6557***						0.6771***		
								(5.88)						(5.86)		
Avgzero									-2.5453						-10.6019***	
									(-1.56)						(-5.31)	
Avgamihud										-1.6978***						-0.8758
										(-4.31)						(-1.72)
Turnover											0.0020	0.0023	0.0035*	0.0042**	0.0019	0.0015
											(1.19)	(1.39)	(2.19)	(2.62)	(1.23)	(0.91)
CEF×L.Leverage											0.6325	0.6312	0.5727	0.5774	0.6281	0.6649
											(0.86)	(0.86)	(0.79)	(0.79)	(0.86)	(0.91)
Inv_percent											1.5634***	1.5685***	1.2052**	1.1083**	1.1695**	1.5792***
											(4.28)	(4.29)	(3.23)	(2.99)	(3.15)	(4.33)
Cash_percent											-12.6849***	-12.6840***	-12.8914***	-12.2401***	-13.8093***	-12.5437***
											(-4.05)	(-4.05)	(-4.13)	(-3.93)	(-4.42)	(-4.00)
Fix_percent											-1.5873	-1.6426	-1.3507	-1.2808	-1.7073	-1.5443
											(-1.50)	(-1.56)	(-1.29)	(-1.23)	(-1.64)	(-1.47)
Avgcoupon											0.8978***	0.8862***	0.8768***	0.8537***	1.0301***	0.9016***
											(5.55)	(5.43)	(5.46)	(5.33)	(6.35)	(5.60)
Avgmaturity											-0.0973***	-0.0963***	-0.1057***	-0.0928***	-0.1480***	-0.0796***
											(-6.49)	(-6.41)	(-7.06)	(-6.27)	(-8.38)	(-4.44)
Constant	0.2279*	0.3862**	0.4666*	0.5595**	0.5340*	0.6459*	0.2453	0.1686	2.9141	0.8632***	-2.7043*	-2.5351*	-2.8199*	-2.8945**	7.4875***	-2.7368*
	(2.15)	(3.20)	(2.27)	(2.85)	(2.13)	(2.33)	(1.07)	(0.75)	(1.90)	(3.81)	(-2.39)	(-2.19)	(-2.57)	(-2.65)	(3.41)	(-2.49)
adj. R^2	0.615	0.617	0.617	0.617	0.618	0.618	0.620	0.623	0.618	0.624	0.634	0.634	0.636	0.638	0.638	0.634
N	3018	2597	2574	2573	2572	2572	2572	2572	2572	2571	2562	2562	2562	2562	2562	2562

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	Dependent variable: Quarterly gross return															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	0.1146	-0.2016	-0.2835	-0.1614	-0.2123	-0.2282	-0.2975	-0.3191	-0.2630	-0.0150	-0.1766	-0.1822	-0.1905	-0.2126	-0.2818	-0.1351
	(0.93)	(-1.33)	(-1.68)	(-0.88)	(-1.14)	(-1.23)	(-1.61)	(-1.74)	(-1.41)	(-0.08)	(-0.76)	(-0.78)	(-0.82)	(-0.92)	(-1.21)	(-0.58)
L.TNA ($b)		-0.1063*	-0.1034*	-0.1091*	-0.1106*	-0.1123*	-0.1098*	-0.0944	-0.1187*	-0.1008*	-0.0373	-0.0383	-0.0328	-0.0233	-0.0512	-0.0417
		(-2.20)	(-2.14)	(-2.22)	(-2.26)	(-2.30)	(-2.26)	(-1.94)	(-2.42)	(-2.08)	(-0.76)	(-0.78)	(-0.67)	(-0.48)	(-1.05)	(-0.85)
L.Familysize ($b)		0.0008	0.0013	0.0006	0.0018	0.0013	-0.0012	-0.0024	0.0012	0.0047	0.0023	0.0020	0.0003	-0.0007	0.0018	0.0031
		(0.19)	(0.31)	(0.15)	(0.40)	(0.30)	(-0.26)	(-0.55)	(0.27)	(1.08)	(0.52)	(0.45)	(0.06)	(-0.15)	(0.40)	(0.70)
Expratio			0.1640		0.2968	0.2928	0.2228	0.2691	0.2722	0.5027	0.6068*	0.6021*	0.5555*	0.5258*	0.7351**	0.6341*
			(0.78)		(1.15)	(1.13)	(0.86)	(1.05)	(1.05)	(1.91)	(2.26)	(2.25)	(2.08)	(1.97)	(2.75)	(2.36)
Advfee				-0.1249	-0.3771	-0.3910	-0.4519	-0.5175	-0.4121	-0.3310	-0.4904	-0.4996	-0.5657	-0.6336	-0.6213	-0.5076
				(-0.38)	(-0.94)	(-0.98)	(-1.13)	(-1.30)	(-1.03)	(-0.84)	(-1.21)	(-1.23)	(-1.40)	(-1.57)	(-1.54)	(-1.25)
Avgtv3					0.0014						0.0072					
					(0.05)						(0.23)					
Avgtv12						-0.0061						-0.0031				
						(-0.61)						(-0.29)				
Avgmarkup3							0.4681***						0.5235***			
							(4.00)						(4.32)			
Avgmarkup12								0.6575***						0.6792***		
								(5.88)						(5.87)		
Avgzero									-2.5530						-10.6025***	
									(-1.57)						(-5.30)	
Avgamihud										-1.6930***						-0.8722
										(-4.28)						(-1.71)
Turnover											0.0020	0.0023	0.0035*	0.0042**	0.0019	0.0015
											(1.20)	(1.39)	(2.19)	(2.62)	(1.23)	(0.91)
CEF×L.Leverage											0.6551	0.6538	0.5951	0.5999	0.6507	0.6874
											(0.89)	(0.89)	(0.81)	(0.82)	(0.89)	(0.94)
Inv_percent											1.5643***	1.5693***	1.2046**	1.1076**	1.1703**	1.5799***
											(4.27)	(4.29)	(3.22)	(2.98)	(3.15)	(4.32)
Cash_percent											-12.6653***	-12.6644***	-12.8727***	-12.2191***	-13.7898***	-12.5247***
											(-4.03)	(-4.03)	(-4.11)	(-3.91)	(-4.40)	(-3.99)
Fix_percent											-1.5966	-1.6508	-1.3575	-1.2875	-1.7151	-1.5525
											(-1.51)	(-1.56)	(-1.29)	(-1.23)	(-1.64)	(-1.48)
Avgcoupon											0.8999***	0.8884***	0.8790***	0.8559***	1.0324***	0.9039***
											(5.55)	(5.43)	(5.47)	(5.34)	(6.35)	(5.60)
Avgmaturity											-0.0972***	-0.0962***	-0.1056***	-0.0927***	-0.1480***	-0.0796***
											(-6.47)	(-6.39)	(-7.04)	(-6.25)	(-8.36)	(-4.43)
Constant	0.4102***	0.5850***	0.4717*	0.6526***	0.5389*	0.6502*	0.2477	0.1713	2.9250	0.8661***	-2.7003*	-2.5330*	-2.8201*	-2.8948**	7.4887***	-2.7358*
	(3.87)	(4.83)	(2.29)	(3.32)	(2.15)	(2.35)	(1.08)	(0.76)	(1.91)	(3.81)	(-2.38)	(-2.18)	(-2.57)	(-2.64)	(3.40)	(-2.48)
adj. R^2	0.615	0.617	0.617	0.616	0.617	0.617	0.620	0.623	0.618	0.624	0.633	0.633	0.636	0.638	0.637	0.634
N	3018	2597	2574	2573	2572	2572	2572	2572	2572	2571	2562	2562	2562	2562	2562	2562

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	Dependent variable: Holding-base quarterly alpha															
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
CEF	-0.1974	-0.2167	-0.1178	-0.1131	-0.1049	-0.1006	-0.0927	-0.0942	-0.0873	0.1240	-0.1153	-0.1154	-0.1276	-0.1075	-0.1096	-0.0632
	(-1.20)	(-1.10)	(-0.56)	(-0.51)	(-0.47)	(-0.45)	(-0.41)	(-0.42)	(-0.39)	(0.55)	(-0.38)	(-0.38)	(-0.42)	(-0.35)	(-0.36)	(-0.21)
L.TNA ($b)		-0.0367	-0.0408	-0.0442	-0.0452	-0.0445	-0.0438	-0.0420	-0.0421	-0.0341	-0.0231	-0.0230	-0.0223	-0.0213	-0.0200	-0.0391
		(-0.74)	(-0.82)	(-0.87)	(-0.89)	(-0.88)	(-0.87)	(-0.83)	(-0.83)	(-0.68)	(-0.45)	(-0.45)	(-0.43)	(-0.41)	(-0.38)	(-0.76)
L.Familysize ($b)		-0.0023	-0.0031	-0.0023	-0.0033	-0.0031	-0.0028	-0.0033	-0.0027	0.0018	-0.0050	-0.0050	-0.0045	-0.0047	-0.0045	-0.0019
		(-0.48)	(-0.62)	(-0.46)	(-0.65)	(-0.62)	(-0.56)	(-0.67)	(-0.54)	(0.35)	(-0.94)	(-0.95)	(-0.86)	(-0.89)	(-0.86)	(-0.37)
Expratio			-0.2914		-0.2473	-0.2454	-0.2349	-0.2506	-0.2329	0.1194	-0.1161	-0.1148	-0.0900	-0.1029	-0.1062	0.0154
			(-1.19)		(-0.84)	(-0.84)	(-0.80)	(-0.85)	(-0.79)	(0.40)	(-0.37)	(-0.36)	(-0.29)	(-0.33)	(-0.34)	(0.05)
Advfee				-0.3715	-0.1576	-0.1605	-0.1549	-0.1810	-0.1502	-0.1456	-0.1030	-0.1025	-0.0912	-0.1115	-0.0852	-0.1243
				(-0.92)	(-0.33)	(-0.33)	(-0.32)	(-0.38)	(-0.31)	(-0.30)	(-0.21)	(-0.21)	(-0.18)	(-0.22)	(-0.17)	(-0.25)
Avgtv3					-0.0191						-0.0277					
					(-0.57)						(-0.72)					
Avgtv12						-0.0032						-0.0074				
						(-0.27)						(-0.55)				
Avgmarkup3							-0.0175						-0.0706			
							(-0.13)						(-0.47)			
Avgmarkup12								0.1047						0.0429		
								(0.80)						(0.31)		
Avgzero									0.5936						0.9322	
									(0.28)						(0.35)	
Avgamihud										-2.1038***						-2.8895***
										(-4.74)						(-5.04)
Turnover											-0.0010	-0.0013	-0.0020	-0.0015	-0.0017	-0.0045*
											(-0.44)	(-0.56)	(-0.91)	(-0.71)	(-0.80)	(-2.09)
CEF×L.Leverage											0.3253	0.3063	0.3325	0.3102	0.3026	0.6221
											(0.33)	(0.31)	(0.33)	(0.31)	(0.30)	(0.63)
Inv_percent											0.9947*	0.9910*	1.0389*	0.9516*	1.0325*	0.9388*
											(2.11)	(2.11)	(2.15)	(1.97)	(2.12)	(2.01)
Cash_percent											-4.5566	-4.5039	-4.2413	-4.4674	-4.2792	-2.3192
											(-0.91)	(-0.90)	(-0.84)	(-0.89)	(-0.85)	(-0.47)
Fix_percent											-2.4370	-2.4209	-2.3704	-2.2979	-2.3420	-2.1404
											(-1.67)	(-1.66)	(-1.63)	(-1.58)	(-1.62)	(-1.49)
Avgcoupon											-0.0028	-0.0126	0.0131	0.0055	-0.0028	-0.0071
											(-0.01)	(-0.05)	(0.05)	(0.02)	(-0.01)	(-0.03)
Avgmaturity											-0.0137	-0.0138	-0.0130	-0.0152	-0.0109	0.0484*
											(-0.74)	(-0.74)	(-0.69)	(-0.82)	(-0.50)	(2.17)
Constant	-0.2563***	-0.1842*	0.0416	-0.0177	0.1637	0.1329	0.0809	0.0364	-0.4863	0.3928	1.9037	1.9547	1.6570	1.6545	0.7705	1.5559
	(-3.80)	(-1.99)	(0.19)	(-0.08)	(0.57)	(0.41)	(0.33)	(0.15)	(-0.24)	(1.60)	(1.25)	(1.24)	(1.12)	(1.12)	(0.27)	(1.06)
adj. R^2	0.000	-0.000	0.000	-0.000	-0.001	-0.001	-0.001	-0.001	-0.001	0.012	0.001	0.001	0.000	0.000	0.000	0.015
N	1874	1710	1703	1702	1702	1702	1702	1702	1702	1702	1698	1698	1698	1698	1698	1698

t statistics in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

This table shows the results of regressing fund's holding-based return on its liquidity measures. The sample period is 2003-2010. Panel A shows the regression results before the financial crisis. Panel B shows the regression results during the financial crisis.

Table 6: Explaining The Difference Between Monthly Closed-end Fund Returns and Monthly Open End Fund Returns

We estimate regressions to examine what factors explain differences between closed-end fund returns and open-end fund returns. For each month, we calculate the weighted average return of all closed and open end municipal bond funds that are at least one year old and have at least $5 million in NAV. We take the difference (closed-end fund returns minus open end fund returns) each month for reported returns net of expense ratios (Panel A) and for holdings based returns (Panel B), which we calculate from the returns of the bonds that the funds own. To calculate holdings based returns we require that we have at least 80% of the holdings for that particular fund in our data. Column 1 uses all of our data, while columns 2-6 use subsets of the closed and open-end fund universe as denoted by the column headers. Stock market excess return is the value weighted CRSP stock return less the one-month t-bill rate taken from Ken French's website. Muni Excess Return is the Barclay's municiapl bond index less the one-month risk free rate. The credit spread is the monthly difference in the barclay's high yield index less the AAA index return. Term spread is the difference in the returns between Barclay's 20 year index and the 1 year Barclay's index return. *, **, *** denote significance levels of 10%, 5%, and 1% respectively.

Returns based on reported fund returns (net of fees)

	(1)	(2)	(3)	(4)	(5)	(6)
	All Sample Funds	**National Funds**	**Single-State Funds**	**High Yield Funds**	**Muni National Long**	**Muni National Intermediate**
Constant	-0.0282	-0.0249	-0.0392**	0.0460	-0.0335**	0.0122
	(-1.42)	(-1.13)	(-2.15)	(1.58)	(-1.99)	(0.41)
Stock Market Excess Return	-0.0020	-0.0023	-0.0014	0.0044	0.0047	0.0097
	(-0.42)	(-0.43)	(-0.31)	(0.63)	(1.17)	(1.37)
Muni Excess Return	0.3597***	0.3349***	0.4362***	0.0916	0.3453***	0.2807***
	(7.33)	(6.11)	(9.65)	(1.23)	(8.29)	(3.83)
Credit Spread	0.1532***	0.1783***	0.0975***	0.1655***	0.1380***	0.1874***
	(13.33)	(13.87)	(9.21)	(9.60)	(14.14)	(10.92)
Term Spread	0.3343***	0.3801***	0.2343***	0.1143*	0.2306***	0.1068*
	(8.29)	(8.42)	(6.30)	(1.86)	(6.73)	(1.77)
adj. R-sq	0.947	0.941	0.946	0.597	0.945	0.766
N	168	168	168	166	168	168