Private Liquidity Funds: Characteristics and Risk Indicators[1]

Daniel Hiltgen January 27, 2017

At the end of 2015, $534 billion in assets were held by private liquidity funds or managed in their parallel accounts that follow similar investment mandates as money market mutual funds (MMFs), but are unregistered. Limited information is publically available about these funds that are in AUM terms roughly a quarter of the size of institutional MMFs. This white paper characterizes these private liquidity funds using data from Form PF and compares them to MMFs. I find that while most liquidity funds and their parallel accounts did not formally commit themselves to rule 2a-7 risk limits, during the period studied the vast majority of them held portfolios that were consistent with these limits. Among those funds that did not adhere to these limits, I find some that offered higher yields for investors. However, I find no evidence that these increases in yields were related to exceeding these 2a-7 limitations but rather from the funds' overall investment strategy. Finally, I find no evidence that 17 months after the adoption, but 10 months before the compliance date of the 2014 reforms investors had reallocated significant amounts of dollars from MMFs to private liquidity funds and their parallel accounts.

I. Introduction

Assets under management in private liquidity funds and their parallel managed accounts ($534 billion) are roughly a sixth of the size of assets under management in MMFs ($3,079 billion). Since they follow similar investment mandates as MMFs, they are viewed as potential substitutes to MMFs, especially after the Commission adopted the 2014 reforms.[2] However, because they are unregistered, little information is publicly available about this sector, the risk-taking and performance of these funds, and the investors in these funds and their potential behavior.

During September 2008 as the financial crisis unfolded, approximately 33% of institutional dollars flowed out of prime MMFs.[3] These large redemptions followed the collapse of Lehmann Brothers and the Reserve Primary Fund "breaking the buck." A staff report in November 2012

[1] This white paper was prepared for Mark Flannery, Director and Chief Economist of the Division of Economic and Risk Analysis (DERA). The Commission, as a matter of policy, disclaims responsibility for any private publication or statement by any of its employees. The views expressed herein are those of the author and do not necessarily reflect the views of the Commission or of the author's colleagues on the staff of the Commission.

[2] All MMFs are subject to rule 2a-7 under the Investment Company Act of 1940. As discussed in Section III, rule 2a-7 limits the risk in a money market fund's portfolio by governing the maturity, diversification, and liquidity of their investments.

[3] *See*, Response to Questions Posed by Commissioners Aguilar, Paredes, and Gallagher, Page 10, found at http://www.sec.gov/news/studies/2012/money-market-funds-memo-2012.pdf .

found evidence that much of these dollars flowed into Government MMFs as these institutional investors likely sought liquidity, quality, transparency, and performance.[4] Following the 2008 financial crisis, the SEC adopted a series of regulatory reforms with the goal to make MMFs more resilient in times of market stress.[5] The February 2010 reforms tightened conditions on interest rate, liquidity risk, and credit risk exposures and enhanced transparency,[6] and the July 2014 reforms, with a compliance date of October 2016, require institutional non-government funds to operate with a floating NAV and allow all funds to impose fees on withdrawals or raise redemption gates.

While these reforms are designed to make MMFs more resilient during times of market stress, they render MMFs potentially less attractive to some institutional investors,[7] which raises the concern that they may migrate from MMFs to the sector of unregistered private liquidity funds.[8,9] Private liquidity funds are defined as "any private fund that seeks to generate income by investing in a portfolio of short term obligations in order to maintain a stable net asset value (NAV) per unit or minimize principal volatility for investors."[10] Some investment advisers also offer parallel managed accounts designed for high net worth clients that want to pursue a substantially similar strategy and want to invest side-by-side in substantially the same positions as the private liquidity fund, but do not want to co-mingle their assets with a fund and often require different fee structure or withdrawal capabilities.

Private liquidity funds are free to operate without adhering to the MMF conditions and will not be required to float their NAV starting October 2016 as a result of the July 2014 reforms.[11] Because they are unregistered, less information is publicly available about these funds compared to traditional MMF that report their holdings on a monthly basis.[12] However, since 2012 certain investment advisers of private liquidity funds and their parallel accounts are required to file with the Commission on Form PF and report basic identifying and operational information.[13] Drawing

---

[4] Ibid, Page 7.
[5] *See* Money Market Fund Reform; Amendments to Form PF, Investment Company Act Release No. 31166 (2014), at Section II.D.
[6] *See* Money Market Fund Reform, Investment Company Act Release No. 29132 (Feb. 23, 2010) at https://www.sec.gov/rules/final/2010/ic-29132.pdf.
[7] For investor statements see, for example, Section III.A.1.c.iv, Investor Movement out of Money Market Funds, Page 73, of the 2014 MMF adopting release at http://www.sec.gov/rules/final/2014/33-9616.pdf.
[8] *See* Commissioners Gallagher and Aguilar statements http://www.sec.gov/News/Speech/Detail/Speech/1370542350411#.U-kOs21OTqw, and http://www.sec.gov/News/Speech/Detail/Speech/1370542342915#.U-kRRW1OTqw.
[9] Other alternatives to MMFs include bank money market accounts, CDs, and short-term and ultrashort bond funds.
[10] *See* Form PF: Glossary of terms.
[11] Private liquidity funds that are unregistered MMFs under rule 12d1-1 adhere to the MMF conditions.
[12] *See* Private Funds Statistics at https://www.sec.gov/divisions/investment/private-funds-statistics.shtml.
[13] Form PF adopted in 2011 and its instructions upon which this white paper relies can be downloaded from https://www.sec.gov/rules/final/2011/ia-3308-formpf.pdf. Amendments to Form PF from the 2014 MMF reform, which went into effect in April 2016, now require large liquidity advisers to report substantially the same portfolio information on Form PF as registered MMFs are required to report on Form N-MPF. The first filings on this amended Form PF were made with respect to the second quarter of 2016. The amended Form PF, which includes

on Form PF data from April 2012 to December 2015, I analyze their risk profiles and yields and compared them to MMFs.[14] I find that about 80% and 45% of the private liquidity funds report that they use the amortized cost method and the penny rounding method, respectively, and hence that they offer a stable NAV as compared to a floating NAV for institutional non-government MMFs post the 2014 reforms. While rule 2a-7 provides a range of safeguards that apply to MMFs, this analysis is limited in scope to certain rule 2a-7 risk limiting conditions that are reported on Form PF. I further find that while only about half of the private liquidity funds formally commit to conform to rule 2a-7 risk limits, in practice the vast majority of these funds held during the period studied portfolios with characteristics consistent with the risk limiting constraints imposed by rule 2a-7. Among the private liquidity funds that are inconsistent with the risk limiting conditions of rule 2a-7, I find evidence that, on average, they generate higher yields when compared to those private liquidity funds that are consistent.

I further examine whether investors prefer unregistered private liquidity funds over regulated MMFs after the adoption of the 2014 reforms. Analyzing the difference in investor flows into private liquidity funds relative to flows into MMFs, I find no evidence of a general shift in preference since the adoption of the 2014 reforms. However, since the sample ended in December in 2015, and the requirement for institutional non-government funds to operate under a floating NAV regime just went into effect in October 2016,[15] it is unclear whether the reforms had no effect on investor preference or whether a shift did occur, but is not reflected in the data yet.[16]

The rest of the paper is organized as follows. Section II describes the data and methodology. In Section III I evaluate the riskiness of private liquidity funds and their parallel accounts by comparing their self-imposed restrictions and their reported portfolio holdings to those of rule 2a-7 MMFs. Section IV describes the universe of private liquidity funds and their parallel accounts and analyzes whether significant flows from the MMF sector into private liquidity funds occurred since the adoption of the July 2014 reforms. I present private liquidity fund investor characteristics in Section V and private liquidity fund asset compositions in Section VI. In Section VII I analyze fund performance to investigate whether private liquidity funds compensate investors with higher yields for additional risk taken. Finally, section VIII concludes.

---

differences in wording and numbering of the questions, can be found here: https://www.sec.gov/about/forms/formpf.pdf.

[14] As discussed later, data found in Section 3 of Form PF covers private liquidity funds, but not parallel accounts. Therefore, most of the results of this white paper are reported with respect to private liquidity funds. However, because private liquidity funds and their parallel accounts by definition (*See* Form PF: Glossary of terms) invest in substantially the same investments, their risk profiles and yields should be substantially the same.

[15] MMFs had until April 2016 to comply with the disclosure, diversification and stress testing requirements.

[16] Most of the changes observed to date occurred within the traditional MMF space and are the result of the investment advisers re-positioning their funds from prime to government. *See*, e.g., T. Rowe Price Prime Money Fund Switches to Government Focus, at http://blogs.wsj.com/cfo/2016/08/02/t-rowe-price-prime-money-fund-switches-to-government-focus/.

II. Data and Methodology

In this section I first discuss Form PF reporting requirements, organization, and data. Second, I briefly discuss my benchmarks and an issue with institutional MMF data.

In June 2012, certain registered investment advisers started filing Form PF, which contains detailed information about the private funds they advise.[17] The Commission adapted a two-stage phase-in period for private liquidity fund advisers. Advisers with over $5 billion in combined MMF and private liquidity fund assets had a compliance date of June 15, 2012. All other advisers had a compliance date of December 15, 2012. In this report, I include all Form PF data reported from April 2012 to December 2015 but note that data prior to December 2012 reflects mostly large advisers.[18] Since Form PF filings are non-public, I report only aggregated, nonproprietary information.[19]

A complex can have multiple advisers,[20] and each investment adviser files Form PF either annually or quarterly, depending on the size of the assets under management (AUM) attributable to private funds and the types of private funds it advises. Table 1 presents the titles of each of the four sections of Form PF.[21] Sections 1b and 3 are most relevant to private liquidity funds and their parallel accounts. Advisers with at least $150 million in private fund AUM file Section 1 of Form PF annually. Section 1b provides general information about private liquidity funds and their parallel accounts. Larger advisers with at least $1 billion in private liquidity fund and MMF AUM also file quarterly Section 3 of Form PF. Since Section 3 covers private liquidity funds but no parallel accounts, unless otherwise stated, the analyses of data in this white paper generally do not include information on parallel accounts. I categorized a fund as a private liquidity fund if its adviser reported it as a private liquidity fund in Section 1a or if its adviser filed Section 3. In 2015Q4, for example, advisers for 44 private liquidity funds filed Form PF with the Commission with all funds completing Section 1b (filed annually) and 41 of the 44 funds completing Section 3 (filed quarterly by larger advisers).

[17] Quarterly data filed in June 2012 will contain three months of data from April 2012 to June 2012.
[18] Where appropriate feeder funds in a feeder-master structure were removed from our analyses.
[19] Certain entries in tables may be redacted and replaced with *** to prevent possible disclosure of proprietary information.
[20] In this white paper, "Complex" refers to a group of liquidity funds and their parallel accounts whose investment advisers are related persons.
[21] *See* footnote 13.

Table 1: Form PF Organization

Section	Form PF Organization
1a	General Identifying Information on advisers and related persons
1b	Information about private funds advised
1c	Information about hedge funds advised
2	Information provided by large hedge fund advisers
3	Information provided by large liquidity fund advisers
4	Information provided by large private equity advisers

Source: Form PF.

While Form PF does not provide the same portfolio position detail as Form N-MFP, it does provide information about the funds' asset maturity structures.[22] In addition, Form PF contains data potentially related to several important dimensions of the rule 2a-7 conditions including:

Maturity – The 2010 reforms require a portfolio security's maturity to be limited to reduce the fund's exposure to sudden interest rate movements and to restrict a funds ability to invest in long-term floating rate securities.[23] Form PF asks if private liquidity funds have a policy of complying with the maturity conditions of rule 2a-7. Form PF also provides data on weighted average maturity (WAM), weighted average life (WAL) and securities with a maturity greater than 397 days, which allow me to analyze if private liquidity funds' managers foregoing these rules take on greater interest and credit risk and earn higher yields than MMFs.

Diversification – Generally, rule 2a-7 requires MMFs to maintain a diversified portfolio by limiting funds to holding assets issued by any single issuer to no more than 5% of the funds' assets.[24] The 2014 rules, which went into effect in October 2016, require funds to treat affiliated entities as single issuers when calculating the 5% limit. Private liquidity funds report on Form PF if they have a policy of complying with the rule 2a-7 diversification conditions and each open position that represents more than 5% or more of the fund's NAV. This allows me to address if private liquidity funds are less diversified than MMFs, which could make them less resilient in times of market stress.[25]

Liquidity – The 2010 rules require MMFs to hold sufficient amounts of daily and weekly liquid assets to meet future redemptions.[26] Form PF asks if private liquidity funds have a policy of complying with the liquidity conditions of rule 2a-7. Form PF also provides

[22] Ibid.
[23] *See* Money Market Fund Reform, Investment Company Act Release No. 29132 (Feb. 23, 2010) at Section II.B.
[24] *See* rule 2a-7(d)(3)(i) and (ii). All references to rule 2a-7 under the Investment Company Act are to 17 CFR 270.2a-7.
[25] It is possible for a fund to appear rule 2a-7 compliant based on the limited Form PF data, but in reality is not. For example, rule 2a-7 conditions on the amount a fund can invest in any single guarantor can be fully assessed with Form N-MFP data, but not Form PF data.
[26] *See* rule 2a-7(d)(4)(ii) and (iii).

data on the amount of daily and weekly liquid assets held in private liquidity funds, which allows me to address whether private liquidity funds sacrificing liquidity and flexibility with redemptions earn higher yields than MMFs.[27]

MMFs, whose portfolio choices are limited by the Commission's February 2010 amendments to rule 2a-7, provide a benchmark for assessing the riskiness of private liquidity funds and parallel accounts. These reforms tightened conditions for MMFs on interest rate, liquidity risk, and credit risk exposures and enhanced transparency. For example, a fund's maximum permissible weighted average maturity (WAM) was reduced from 90 days to 60 days,[28] and its weighted average life (WAL) was restricted to 120 days.[29] Rule 2a-7 also requires funds to hold minimum levels of daily and weekly liquid assets (DLA and WLA).[30] To establish these benchmarks, I collected detailed data from Form N-MFP and iMoneyNet for the period April 2012 until December 2015.[31]

To analyze the potential that institutional investors might migrate from MMFs to the unregulated sector of private liquidity funds as a result of the July 2014 reforms, I compare Form PF data with institutional MMF data where possible. Since Form N-MFP does not offer a break-down by investor types between institutional and retail investors, I calculated the monthly percentage of institutional investors using iMoneyNet data, and multiplied it by the total net assets in aggregate from Form N-MFP to determine the dollars associated with institutional investors.[32]

III. Private Liquidity Funds' Reported Compliance with Certain MMF Rule 2a-7 Conditions

Although private liquidity funds are not required to comply with rule 2a-7's risk limiting conditions (the limits on maturity, diversification, credit quality, and liquidity), some funds' advisers report on Form PF that they have a policy of complying with some or all of these

[27] There were several instances where a Form PF answer from one question was inconsistent with an answer from another question. Data that appeared to be erroneous were corrected or removed from the data analysis. For example, the amount of weekly liquid assets (Question 55(h)) was reported to be zero even though a fund reported a nonzero amount of daily liquid assets (Question 55(g)). In this case, the weekly liquid asset values were set equal to the daily liquid asset value because the weekly liquid assets should include the daily liquid assets.
[28] *See* rule 2a-7(d)(1)(ii).
[29] *See* rule 2a-7(d)(1)(iii).
[30] *See* rule 2a-7(d)(4)(ii) and (iii).
[31] The 2010 reforms require MMFs to disclose monthly their portfolio holdings and net asset values on Form N-MFP.
[32] The aggregate industry dollars obtained from iMoneyNet data is less than that from Form N-MFP because iMoneyNet data is self-reported and not every Form N-MFP filer reports to iMoneyNet. To address this shortcoming, I use the percent of institutional investors over the dollar value attributed to them.

conditions.[33] While not adhering to some conditions might preclude certain MMF investors from considering such funds,[34] other investors might be attracted to their higher expected returns.

The answers to certain questions on Form PF allow for a quantitative assessment of the extent to which private liquidity funds appear to comply with certain rule 2a-7 limitations and of the extent to which the risk return profiles of such funds match those of MMFs.[35] And in this section, I first present how many funds report that they have a policy of complying with rule 2a-7's risk limiting conditions. Then, I assess to which extent funds' reported holdings are consistent with the conditions involving weighted average asset maturity (WAM), weighted average asset life (WAL), assets with maturities greater than 397 days, daily liquid asset (DLA), and weekly liquid assets (WLA).

Table 2 presents the average quarterly frequency of private funds reporting that they have a policy of complying with the risk limiting conditions of rule 2a-7 and bins the data into three categories: dollars invested in private liquidity funds, dollars invested in parallel accounts, and dollar invested in both private liquidity funds and parallel accounts. A little less than a quarter of the private liquidity fund dollars and about half of the parallel account dollars report that they have a policy of complying with the rule 2a-7 risk limiting conditions. In addition, the last column of Table 2 shows that a higher percent of dollars appear to comply with diversification and credit quality conditions than with liquidity and maturity conditions.

[33] *See* Form PF: Glossary of terms. Risk limiting conditions as adopted in 2011are defined as "The conditions specified in paragraphs (c)(2)(maturity), (c)(3)(quality), (c)(4)(diversification), and (c)(5)(liquidity) of rule 2a-7." Risk limiting conditions as adopted in 2014 are defined as "The conditions specified in paragraphs (d) of rule 2a-7."

[34] *See*, e.g., the text and footnote 34 on page 17 of the 2014 MMF adopting release at http://www.sec.gov/rules/final/2014/33-9616.pdf: "Many Investors use money market funds for principal preservation and as a cash management tool, and, consequently, these funds can attract investors who are less tolerant of incurring even small loses, even at the cost of forgoing higher expected returns."

[35] With the arrival of the October 2016 compliance date for the July 2014 reforms, MMF managers appear to be shortening their portfolios (i.e., decrease their asset maturities, WAMs and WALs and increase their levels of DLA and WLA) in anticipation of shareholder redemptions and as MMF sponsors convert many prime funds into government funds. *See*, e.g., Prime money markets funds pull back from short-date debt paper, at http://www.ft.com/cms/s/0/680f68dc-1613-11e6-b197-a4af20d5575e.html?siteedition=intl#axzz4K3rJU5VC and Liquidity, Liquidity, Liquidity New Mantra Says Cunningham; Latest WLA, at http://cranedata.com/archives/all-articles/6279/ .

Table 2: Reported Policy of Compliance with Rule 2a-7 Risk Limiting Conditions

This table reports from 2012Q2 through 2015Q4 the average quarterly percent of dollars where the private fund has reported it has a policy of complying with either all or part of the following four provisions of rule 2a-7: diversification conditions, credit quality conditions, liquidity conditions and/or maturity conditions.

Reported Policy of Compliance	Liquidity Funds (%)	Parallel Accounts (%)	Liquidity Funds and Parallel Accounts (%)
All Conditions	22.3	48.4	37.1
Diversification Condition	24.5	***	52.3
Credit Quality Condition	24.6	***	52.3
Liquidity Condition	24.2	58.1	43.1
Maturity Condition	24.2	58.1	43.1

Source: Form PF Question 54.

Weighted Average Maturity (WAM)

Securities with longer maturities tend to be more sensitive to interest rate changes and less liquid in the secondary market, especially during market stress. As such, the traditional measure of a MMF's maturity profile has been a fund's weighted average asset maturity or WAM. When calculating WAM each asset's maturity is adjusted to reflect the time until its coupon rate adjusts or a demand feature can be exercised. (For example, a variable rate demand note (VRDN) might have its interest rate reset weekly.) WAM is then a weighted average of these adjusted maturities for each security, where each maturity is weighted by the asset's proportion of all AUM in the portfolio. Because WAM measures a fund's sensitivity to interest rate changes and the potential price impact resulting from these changes, the amendments to rule 2a-7 adopted in February 2010 require MMFs to limit their WAM to 60 days.

Figure 1 presents the weighted average monthly WAM over our sample period for private liquidity funds and MMFs.[36] The overall weighted average WAM are 44.0 and 43.0 days for private liquidity funds and MMFs, respectively, suggesting the average private liquidity fund and MMF have a similar risk exposure to interest rates. However, over the sample period 35 fund filings with respect to eight funds or about 2.2% of the private liquidity fund filings by number,[37] reported a WAM greater than 60 days with a weighted average WAM of 63.9 days. These funds that exceed the limit on WAM will have a slightly greater exposure to interest rate changes compared to MMFs.

[36] Unless otherwise stated, the analyses in the tables and figures do not include parallel account data. "All Liquidity Funds" refers only to private liquidity fund data from Section 3 of Form PF. "All Money Market Funds" includes both institutional and retail funds.

[37] A fund filing is a reference to an individual liquidity fund.

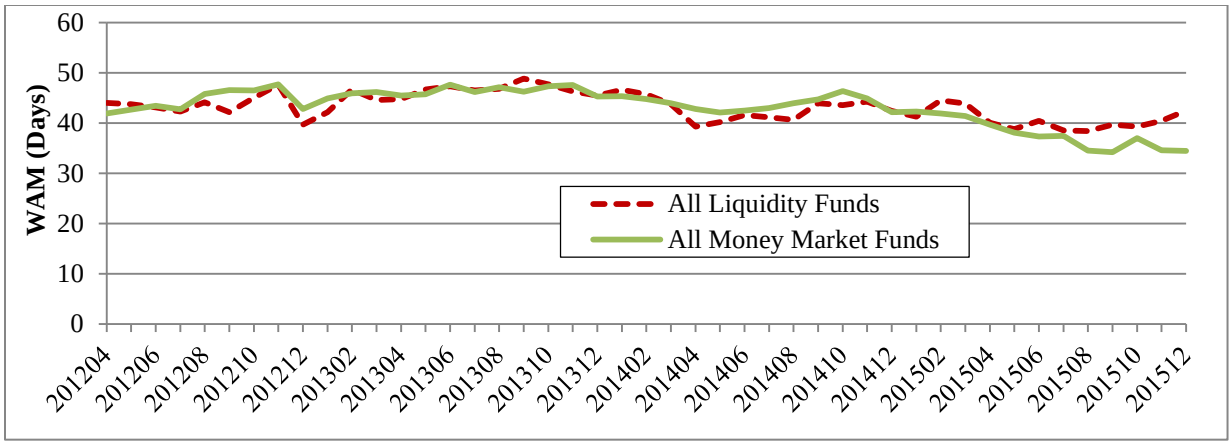

Figure 1: Weighted Average Monthly WAM

Source: Form PF Question 55(d) for private liquidity funds and Form N-MFP Item 11 for MMFs.

Weighted Average Life (WAL)

To limit the extent to which a MMF can invest in longer term floating rate securities and to lower their riskiness, the Commission in 2010 required funds to measure the dollar-weighted average life of their portfolio (WAL). Unlike WAM, a fund's WAL does not take interest rate resets into account. For example, for an adjustable-rate security without a demand feature the maturity is set equal to its final legal maturity, and for VRDNs with the demand feature, the WAL calculation sets the security's final maturity date equal to the next date at which full payment of interest and principal can be demanded. Therefore, unlike WAM, WAL reflects the risk a fund faces for holding its entire portfolio of securities to their final maturities, and WAL measures a fund's sensitivity to widening credit spreads or worsening liquidity conditions. For MMFs, WAL must be less than 120 days as compared to 60 days for WAM.

Figure 2 shows the weighted average monthly WAL over our sample period for private liquidity funds and MMFs. The overall weighted average WAL are 64.4 and 69.3 days for private liquidity funds and MMFs, respectively, suggesting the average private liquidity fund has money tied up for a shorter period of time as compared to MMFs.

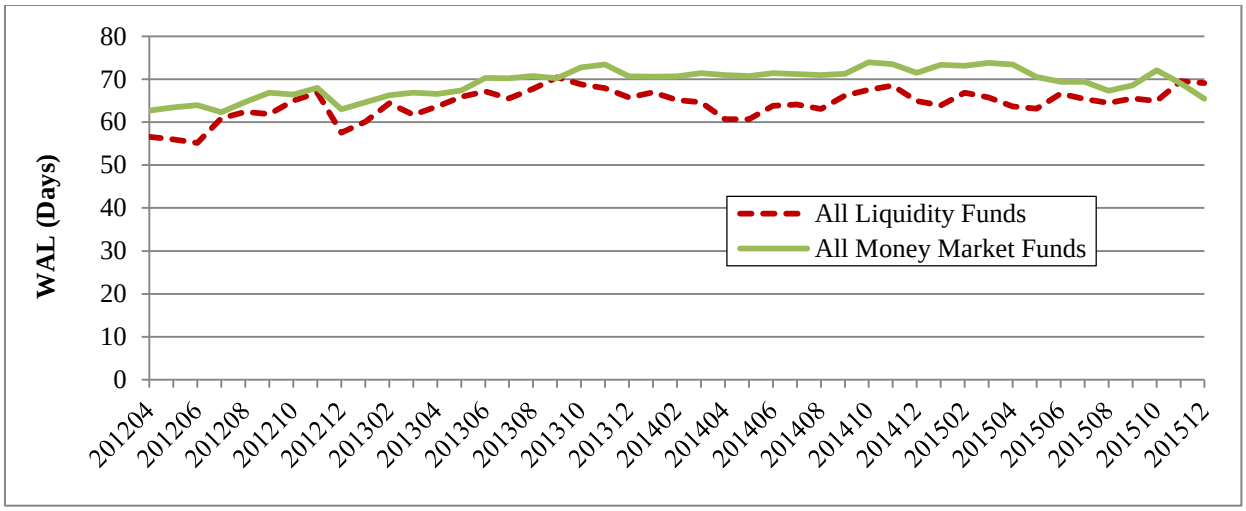

Figure 2: Weighted Average Monthly WAL

Source: Form PF Question 55(e) for private liquidity funds and Form N-MFP Item 12 for MMFs.

Maturity > 397 days

In addition to the WAM and WAL maturity conditions, MMFs are also restricted from holding securities with a remaining maturity greater than 397 days. Private liquidity funds are not restricted and may acquire a security with a maturity beyond 397 days. A private liquidity fund holding these longer term securities would have a risk profile more similar to an ultrashort bond fund than to a MMF. Ultrashort bond funds generally take on greater interest and credit risk and appeal to investors looking to earn higher yields than MMFs.[38] During the sample period, the quarterly average of private liquidity fund assets invested in securities with maturities greater than 397 days was 1.0%. However, only 18.1% of all the fund filings with 5.9% of the aggregated NAV held such assets. In total, eight different funds invested on average 12.1% of their portfolio in such assets.

Table 3 reports the types of assets with maturities longer than 397 days held by private liquidity funds during the sample period. Although a MMF under rule 2a-7 could only hold U.S. Government securities with maturities greater than 397 days, no private liquidity fund restricted its longer-dated assets to U.S. Government securities. Moreover, most of the assets in Table 3 are not floating rate notes, suggesting that these funds are taking on greater duration risk and making them more susceptible to changes in market interest rates and adverse credit events.[39]

[38] According to Morningstar Direct, 33 ultrashort bond funds had an effective duration of between 200 and 450 days in December 2015 with an average annual yield of 0.92 basis points. However, in response to the July 2014 reforms, many of the newer ultrashort bond funds now limit maximum security maturity to 397 days.

[39] I assumed the U.S. state and local bonds are fixed-rate, fixed-maturity municipal notes and not VRDNs with demand features because the filer stated their maturities were greater than 397 days.

Table 3: Asset Types with a Maturity Greater Than 397 Days

Several funds held securities with a maturity greater than 397 days. This table reports the quarterly percentages of each category's aggregated asset dollars with a maturity exceeding 397 days in private liquidity funds over the sample period.

Asset Type	Quarterly Avg. (%)
ABS and Structured Products (Non-ABCP), CDs, and Unsecured Commercial Paper	0.30%
Sovereign Bonds and Municipal Bonds (Includes U.S. Treasuries)	0.21%
Other Assets (Includes Floating Rate Notes)	0.51%
Total	1.02%

Source: Form PF Question 56.

Despite that only 24.2% of the private liquidity funds dollarwise report having a specific policy of complying with rule 2a-7's maturity conditions, the reported data indicate that most private funds adhered to these limits over the sample period.[40] For example, nearly 98% of the funds with 99% of the aggregated NAV have a WAM less than 60 days and approximately 82% of the funds with 94% of the aggregated NAV hold no securities with a maturity greater than 397 days.

Daily and Weekly Liquid Assets

Rule 2a-7 requires MMFs to hold securities that are adequately liquid for the purpose of meeting shareholder redemptions. This liquidity will allow a fund to meet heavy redemption demands should the secondary markets for short-term assets seize up as they did in 2008 and a fund cannot liquidate portfolio assets. More specifically, all taxable MMFs are required to hold at least 10% of their total assets in daily liquid assets (DLA) and all MMFs are required to hold at least 30% of their total assets in weekly liquid assets (WLA).[41] These requirements further preclude a MMF with DLA and WLA that has fallen below these thresholds from investing in short-term securities that do not improve fund liquidity. Private liquidity funds are not subject to these limits and could compete with MMFs by reaching for yield through investing a smaller fraction of their portfolio in such assets.

Figure 3 presents the calculated weighted average DLA as a percent of NAV in both private liquidity funds and MMFs. Over the sample period, private liquidity funds reported holding an

[40] The limited Form PF data do not permit analysis of rule 2a-7 compliance along other dimensions like diversification.

[41] Daily liquid assets consists of cash, direct obligations of U.S. government, assets that mature or include a demand feature that is payable and exercisable within one business day, and any receivables expected to be paid within one business day. Weekly liquid assets consists of all assets included in the daily liquid assets category, plus: government agency discount notes maturing in 60 days or less, assets that mature or include a demand feature that is payable and exercisable within five business days, and any receivables expected to be paid within five business days. Currently, DLA and WLA values for private liquidity funds are self-reported on Form PF and cannot be verified like they can on Form N-MFP for MMFs by analyzing the fund's portfolio securities.

average of 49.1% DLA, suggesting their reported portfolio liquidity is considerably higher than would be required if they were organized as MMFs and required to comply with rule 2a-7. Furthermore, over the entire sample period 93.9% of all private liquidity fund holdings or 98.8% of the aggregate NAV reported on Form PF were above the rule 2a-7 DLA threshold, and compared to all MMFs, private liquidity funds held on average 12.4 percentage points more DLA.

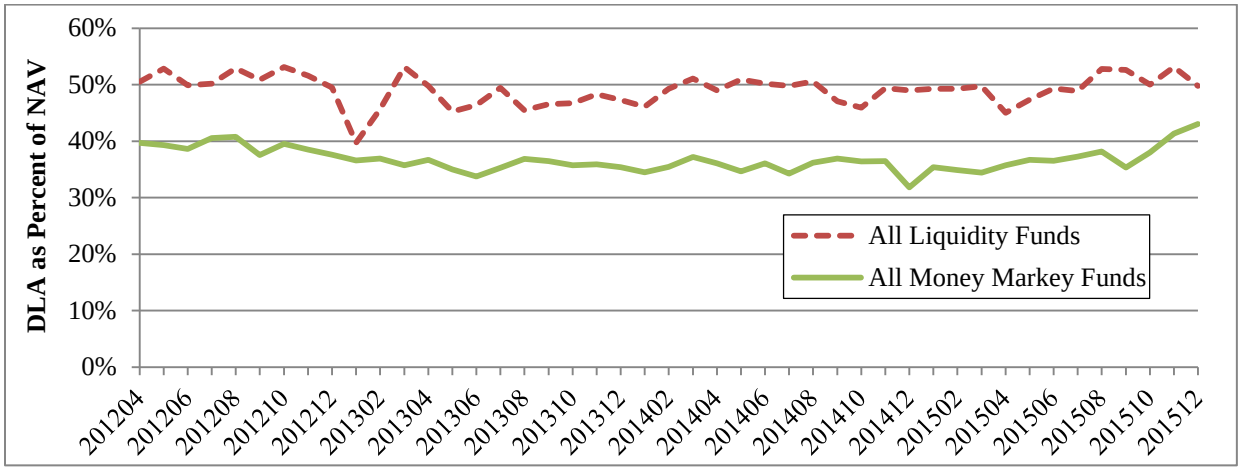

Figure 3: Weighted Average Amount of Daily Liquid Assets as a Percent of NAV for Private liquidity funds and MMFs

Source: Form PF Questions 55(a) and 55(g) and Form N-MFP for MMFs.

However, several of the private liquidity funds predominantly invest in U.S. Treasury securities and U.S. government repos, biasing the results in Figure 3 upwards and rendering them more comparable to Treasury MMFs who hold nearly their entire portfolio in DLA. About 21% of the private liquidity funds or 36% of the aggregated NAV invest over 80% of their portfolio in these securities over the sample period. For MMFs, 11% are Treasury MMFs with 15% of the aggregated MMF NAV. In contrast, seven different private liquidity funds held at some point during the 45 months of the sample a portfolio with less than 10% of their assets in DLA for a total of 89 monthly observations.[42]

Figure 4 presents for private liquidity funds the weighted average amount of WLA as percent of NAV.[43] The overall weighted average of the amount of WLA as percentage of NAV are 56.5% and 57.0% for private liquidity funds and MMFs, respectively, suggesting at first glance that both industries have similar weekly liquidity profiles. However, in contrast to those private

[42] There are several reasons why a MMF could have less than 10% daily liquid assets and still be 2a-7 compliant. First, MMFs calculate their percentage of daily liquid assets at the time of purchase. The value may drop below 10% as a result of redemptions. Second, tax-exempt municipal MMFs are not required to meet the 10% threshold.
[43] Several funds reported that their percentage of weekly liquid assets was zero or less than their percentage of daily liquid assets. In these cases, the percentage of weekly liquid assets was recalculated by summing the daily and weekly liquid assets together.

liquidity funds that invest their entire portfolio in daily liquid securities, 15 different private liquidity funds reported for 226 months a WLA below the rule 2a-7 threshold of 30%. This was two and half times the number that reported amounts below the DLA threshold corresponding to 15.7% of the funds or 12.2% of aggregated NAV. This might reflect some funds actively reducing their WLA level and reaching for yields in other segments of the short–term securities market.[44] Over the 45 month sample period, eight of these 15 funds accounted for 185 monthly observations with WLA below the 30% threshold.

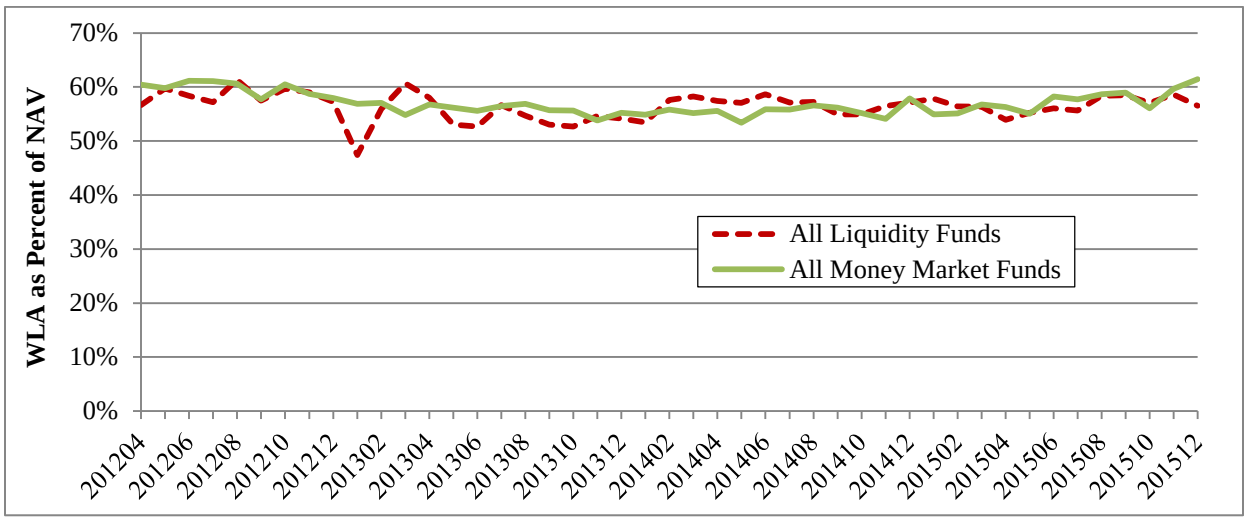

Figure 4: Weighted Average Amount of Weekly Liquid Assets as a Percent of NAV for Private liquidity funds and MMFs

Source: Form PF Questions 55(a) and 55(h) and Form N-MFP for MMFs.

Summarizing the results on liquidity conditions, I find that while only 24.2% of the reporting private liquidity funds dollarwise report a policy of complying with the liquidity conditions of rule 2a-7, the data reported in Form PF suggests that in practice at least 98.8% and 87.8% of private liquidity fund dollars do comply with the daily and weekly liquidity provisions, respectively.

Reported Compliance

Even if a private liquidity fund does not explicitly report that it has a policy of complying with the rule 2a-7 risk limiting conditions, it may appear to invest consistently with those conditions at times. The monthly information in Form PF Question 55 on asset maturities and portfolio liquidity allows for a comparison of a fund's reported policies with its reported holdings.[45]

[44] MMFs calculate their percentage of weekly liquid assets at the time of purchase. The value may drop below 30% as a result of redemptions.

[45] Form PF does not provide enough information on credit quality and diversification to allow for a comparison of apparent compliance with a fund's reported policies on the relevant conditions.

Specifically, the reported data on portfolio maturity allows analysis of apparent compliance with conditions that prohibit a MMF from acquiring any instrument with a remaining maturity of greater than 397 days, maintaining a WAM that exceeds 60 days, or from maintaining a WAL that exceeds 120 days. However, because compliance is an acquisition test with respect to the DLA and WLA liquidity thresholds as described above, I can only assess the consistency of a fund's reported policies with its reported holdings.[46] As such, I describe funds as "consistent" and "inconsistent" with the risk limiting conditions of rule 2a-7 based on answers to Form PF Question 55 in contrast to those funds with or without a reported policy of complying in response to Form PF Question 54. I considered a private liquidity fund inconsistent in any given month if the fund's reported portfolio breaks at least one of the rule 2a-7 thresholds on WAM, WAL, 397 days asset maturities, DLA, or WLA during that month.[47] In addition, it is also possible that information reported by private liquidity funds in Questions 54 and 55 may not have been correctly reported or calculated under rule 2a-7,[48] resulting in the wrong consistency determination. Figure 5 shows that in any given month between August 2012 and December 2015 at least five and at most 13 funds reported holdings that appeared inconsistent with at least one risk limiting condition of rule 2a-7 based on maturity and liquidity data reported in Form PF Question 55, corresponding to 27.9% of the private liquidity funds or 15.8% of the aggregated NAV over the entire sample period.

[46] For example, a fund with 31% of its portfolio in WLA would be consistent with rule 2a-7 WLA risk limiting condition because its percentage of WLA is above the 30% threshold. In contrast, a fund with 29% of its portfolio in WLA would be inconsistent with rule 2a-7 because its value is below the 30% threshold. However, because the percentage of WLA relevant under rule 2a-7 is calculated when a security is purchased and the percentage may drop below 30% as a result of redemptions, it is possible for a fund to have its percentage of WLA below the 30% threshold and still be rule 2a-7 compliant.

[47] These are not mutually exclusive. For example, a fund could have a WAL greater than 120 days and less than 30% of its portfolio in WLA. These funds also include both stable and floating NAV.

[48] There were several instances where a Form PF answer from Question 54(a) conflicted with an answer from Question 55. In these cases, staff outreach to these Form PF filers confirmed the responses to Questions 55 were erroneous. These data points were removed from the data analysis.

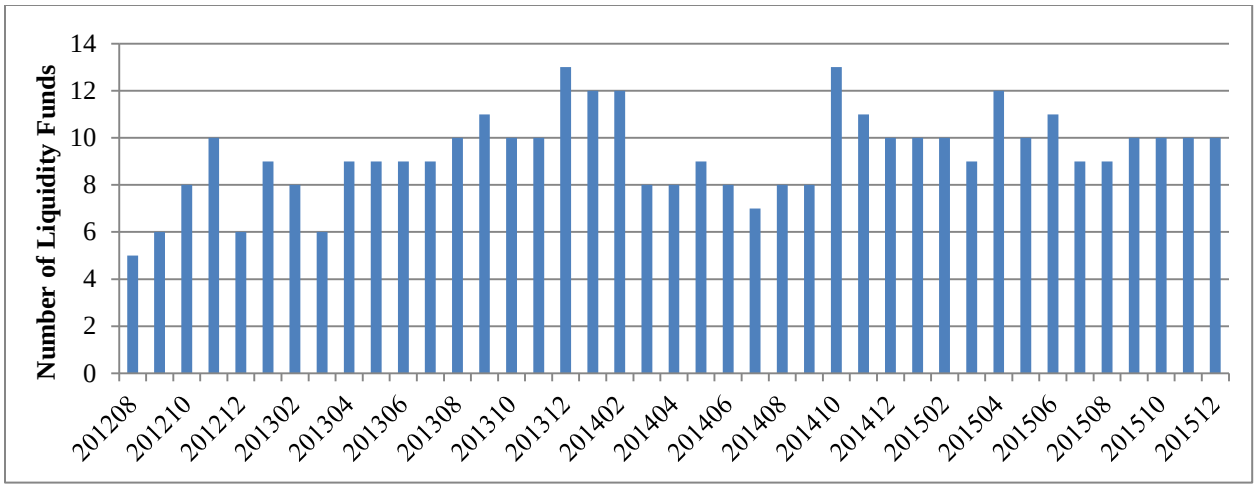

Figure 5: Number of Rule 2a-7 Inconsistent Private Liquidity Funds

Source: Form PF Question 55.

Table 4 tabulates the frequency with which funds report that they have a policy of complying with the risk limiting conditions of rule 2a-7 and the frequency with which funds' reported holdings are consistent with rule 2a-7 based on Form PF data. The results suggest that significantly more funds appear to adhere to the five maturity or liquidity conditions of rule 2a-7 I am analyzing. For example, I find that while only 47.2% of the reporting private liquidity funds report in Form PF Question 54(b) a policy of complying with the liquidity conditions of rule 2a-7, the data reported in Question 55 suggests that in practice at least 93.9% and 84.3% of the private liquidity funds do comply with the daily and weekly liquidity provisions, respectively.[49] This greater number of funds whose holdings are apparently consistent with the daily and weekly liquidity requirements tested in Question 55 – compared to the lesser number of funds that report a policy in Question 54 to comply with the liquidity risk limiting conditions of rule 2a-7 – could be the result of private liquidity funds not following other liquidity risk limiting conditions of rule 2a-7 that cannot be analyzed with Form PF data. Or it could reflect that the private liquidity funds' managers do not adopt a policy of complying, but in the market conditions that prevailed during the sample period voluntarily invested in a manner consistent with the risk limiting conditions of rule 2a-7 or, at the very least, the five maturity or liquidity conditions of rule 2a-7 I am analyzing.

[49] While the minimum daily and weekly liquidity requirements (rule 2a-7(d)(4)(ii) and(iii)) are testable with Form PF, the illiquid securities condition (rule 2a-7(d)(4)(i)) is not.

Table 4: Consistency of Funds' Reported Holdings with Certain Rule 2a-7 Risk Limiting Conditions

This table tabulates the frequency with which funds' reported holdings appear consistent with the five maturity and liquidity conditions of rule 2a-7 tested using Form PF data and the frequency with which funds reported that they have a policy of complying with either all or part of the risk limiting conditions of rule 2a-7 (Table 2). The monthly data is aggregated over the entire sample period.

Compliance	% of Funds	% of Dollars
All Conditions		
Reported Policy of Complying With All Rule 2a-7 Conditions	37.5	22.3
Consistent With All Five Rule 2a-7 Conditions Tested	72.1	84.2
Maturity Conditions		
Reported Policy of Complying With Rule 2a-7 Maturity Conditions	47.2	24.2
Consistent With WAM ≤ 60 Days	97.8	98.9
Consistent With WAL ≤ 120 Days	***	***
Consistent With Asset Maturity ≤ 397 Days	81.9	94.1
Liquidity Conditions		
Reported Policy of Complying with Rule 2a-7 Liquidity Conditions	47.2	24.2
Consistent With DLA ≥ 10% of Portfolio	93.9	98.8
Consistent With WLA ≥ 30% of Portfolio	84.3	87.8

Source: Form PF Questions 54 and 55.

Table 5 compares the reported policy of complying with the risk limiting conditions of rule 2a-7 with the available Form PF data at the fund and complex level. Over the sample period 27.9% of private liquidity funds reported holdings that appear inconsistent with the risk limiting conditions of rule 2a-7, based on the five maturity and liquidity conditions I tested using Form PF data, matching their lack of a reported policy of complying with the risk limiting conditions of rule 2a-7. On the other hand, 34.5% of private liquidity funds appear to have met the rule 2a-7 conditions I tested even though they did not have a reported policy of doing so, suggesting that some private liquidity funds are consistent during the sample period, but may want to retain the flexibility to be inconsistent at some point in the future. Again, this difference could also be the result of a private liquidity fund not following other risk limiting conditions of rule 2a-7 that cannot be tested with Form PF data.

Table 5: Reported Compliance with Rule 2a-7 Risk Limiting Conditions by Level

This table compares the reported policy of complying with the risk limiting conditions of rule 2a-7 with the consistency of reported Form PF data on asset maturities and portfolio liquidity with the risk limiting conditions of rule 2a-7 at the fund and complex level. The data tabulates the percentage and number of private liquidity funds and complexes (fund-month observations) with a given metric over the entire sample period.[50]

Level	Percentage *with* a Reported Policy of Complying with Rule 2a-7 (%)	Percentage *without* a Reported Policy of Complying with Rule 2a-7 (%)
Fund Level		
Percentage *Consistent* with Rule 2a-7 Based on Form PF data (%)	37.5	34.5
Percentage *Inconsistent* with Rule 2a-7 Based on Form PF data (%)	0.0	27.9
Complex Level		
Percentage *Consistent* with Rule 2a-7 Based on Form PF data (%)	52.2	52.2
Percentage *Inconsistent* with Rule 2a-7 Based on Form PF data (%)	0.0	56.5
	Number *with* a Reported Policy of Complying with Rule 2a-7	Number *without* a Reported Policy of Complying with Rule 2a-7
Fund Level		
Number *Consistent* with Rule 2a-7 Based on Form PF data	541	498
Number *Inconsistent* with Rule 2a-7 Based on Form PF data	0	403
Complex Level		
Number *Consistent* with Rule 2a-7 Based on Form PF data	12	12
Number *Inconsistent* with Rule 2a-7 Based on Form PF data	0	13

Source: Form PF Questions 54(a) and 55.

[50]Because not all funds in the same complex are consistent or inconsistent, the percentages for funds but not for complexes total to 100%.

IV. The Size and Concentration of the Private Liquidity Fund Industry

The closer the characteristics of private liquidity funds and their parallel accounts emulate those of MMFs, the more similar their risk profiles are. So from a risk management perspective, it is important to understand the size and concentration of this industry relative to the MMF industry. If this industry is dominated by a few funds or is significant in size relative to the MMF industry, then a change in financial conditions in just a small number of private liquidity funds could adversely affect this industry as a whole, the MMF industry and the short-term funding market. Without detailed information on this segment of the market, it may be difficult to understand and address risk and investor behavior within the regulated markets, especially if private liquidity funds and parallel accounts are a substitute for MMFs.

Figure 6 compares the quarter-end net asset values for all MMFs, institutional MMFs, private liquidity funds, parallel accounts, and the combination of private liquidity funds and parallel accounts.[51] As of 2015Q4, the combined net asset value in private liquidity funds and their parallel accounts ($533.7 billion) is about one sixth (17.3%) the size of MMF net assets ($3,079 billion). Within the private fund sector, parallel accounts hold 46.9% of assets ($250.1 billion vs. $283.6 billion in private liquidity funds). Even though the number of MMFs (502) in 2015Q4 is significantly larger than the number of private liquidity funds reporting (44), the average size of a private liquidity fund ($6.4 billion) is similar to an average size MMF ($6.1 billion). These 44 private liquidity funds from 21 complexes had 16 parallel accounts associated with them.

The aggregate size of MMFs appears largely constant over the past three years, suggesting dollars may not have left the industry as a result of the July 2014 reforms. Of course, it could be that investors are delaying their withdrawals until around the October 2016 deadline for funds to comply. What is interesting to note is the significant decrease in the size of parallel accounts since 2015Q2 with a simultaneous, albeit smaller, increase in the size of private liquidity funds.[52]

[51] Form PF provides monthly net asset values (Question 55(a)) for liquidity funds and quarterly net asset values (Questions 9 and 11) for liquidity funds and their parallel accounts. To make the data consistent, I used the quarterly data.

[52] Although not fully analyzed, more recent Form PF data suggests the trend reverses and the aggregate totals continue to remain flat.

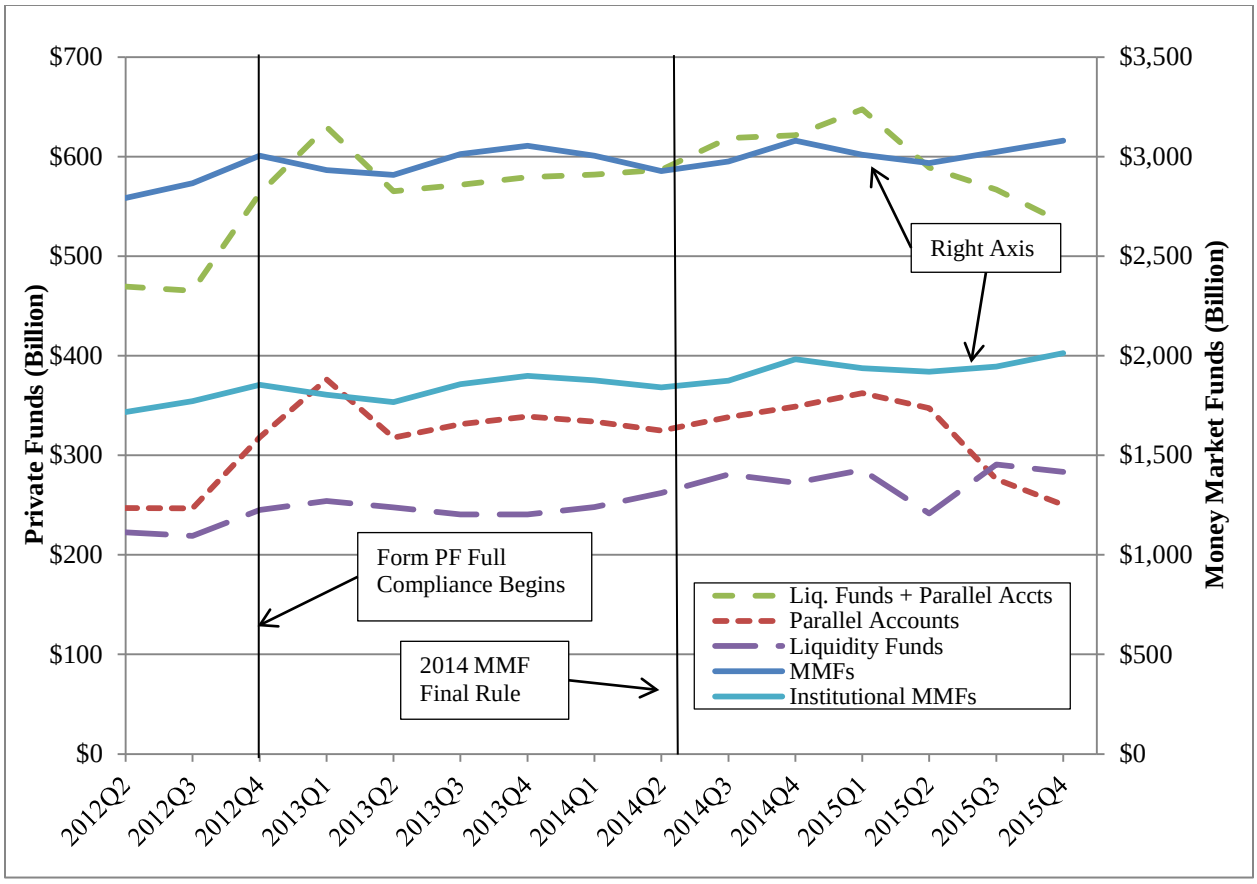

Figure 6: Net Asset Values

Source: Form PF Questions 9 and 11 for private liquidity funds and their parallel accounts and Form N-MFP Item 16 and ImoneyNet for MMFs.

One measure of concentration is the Herfindahl index, which measures the distribution of relative size of firms compared to their industry. The closer the index is to one, the more concentrated the industry is. The Herfindahl index for the private liquidity funds and their parallel accounts and for MMFs is 0.09 and 0.01, respectively. This suggests that the private liquidity fund industry is more concentrated than the regulated MMF industry. Indeed, Table 6 shows that the twelve largest private liquidity funds plus parallel accounts manage 87.7% of the total dollars, suggesting assets in private liquidity funds and their parallel accounts are highly concentrated within relatively few investment funds and complexes. The bottom half of Table 6 indicates that private fund assets are even more concentrated at the complex level than they are at the fund level. For example, the twelve largest complexes of private liquidity funds plus their parallel accounts control 97.2% of the population's NAV.

Table 6: Concentration of Private liquidity fund and Parallel Account Dollars for 2015Q4 by Level

In 2015Q4, advisers for 44 private liquidity funds from 21 complexes filed Form PF. This table reports the percent of industry dollars in the top 5 and 12 funds and complexes.

Level	Top 5	Top 12
Fund Level		
Private liquidity funds	***	86.7%
Parallel Accounts	***	99.3%
Private liquidity funds + Parallel Accounts	***	87.7%
Complex Level		
Private liquidity funds	88.8%	97.1%
Parallel Accounts	95.5%	100.0%
Private liquidity funds + Parallel Accounts	84.7%	97.2%

Source: Form PF Questions 1(b), 9 and 11 and Form ADV schedule D.

Difference-in-Difference Regression

Figure 6 suggests that the aggregate levels of NAV of private liquidity funds plus parallel accounts and MMFs appear largely constant since 2012Q4 with no discernable pattern of investors shifting from MMFs to private liquidity funds. To corroborate this view, I analyze in a difference-in-difference framework whether flows indicate that investors favored private liquidity funds over MMFs since the July 2014 adoption of the new rules governing money market funds.[53] The dependent variable $Flow_{i,t}$ is the flow into fund *i* during period *t*, and the independent variables are dummy variables taking the values of one or zero. Variable $D_{LF,i}$ equals one if fund *i* is a private liquidity fund or parallel account and zero otherwise, and variable $D_{After,t}$ equals one after July 2014, when the rule 2a-7 reforms were adopted, and zero otherwise. I then estimate the following regression model using imputed flows into private liquidity funds and MMFs

$$Flow_{i,t} = \alpha + \beta_{LF} D_{LF,i} + \beta_{After} D_{After,i} + \beta_{interaction} D_{LF,i} D_{After,t} + \varepsilon_{i,t}$$

where α is a constant, β are model coefficients, and ε is the model error term.

A positive $\beta_{interaction}$ implies that flows, on average, into private liquidity funds and parallel accounts after the July 2014 reforms were larger, or less negative, than flows into MMFs. Using monthly and quarterly flows for all private liquidity funds and MMFs or only Institutional MMFs or private liquidity funds plus their parallel accounts the coefficients are never statistically significant. This suggests no migration of MMF dollars to private liquidity funds or parallel accounts had happened by the end of the sample period.

[53] *See* Money Market Fund Reform; Amendments to Form PF, Investment Company Act Release No. 31166 (2014).

V. Investor Information

Analyzing the profile of the private liquidity fund investor base, including the type of investor, the relative size of their investment, the percentage of equity purchased through securities lending, investor liquidity, and restrictions on redemptions and withdrawals may allow a better understanding of how fund investors might react in times of stress. For instance, institutional investors historically were more likely to make large redemptions quickly during market stress.[54] If ownership in a fund is concentrated among a few institutional investors and if any of these investors were to run from the fund, the fund might be forced to sell significant amounts of assets to meet these redemptions. Hence, concentrated ownership from institutional investors might render private liquidity funds more vulnerable than MMFs in a crisis, especially if their redemption rights are similar.

Beneficial Ownership

First, I analyze investor concentration among all funds identified as private liquidity funds and present the results in Table 8. The largest group of investors in private liquidity funds is Private Funds, which own an average of 28.0% of aggregated NAV. Furthermore, the table shows that private liquidity fund shareholders are overwhelmingly institutional and not retail investors. In comparison, MMFs have a lower percentage of institutional investors at 67%.[55]

Table 8: Investor Types

This table reports the percentage of total NAV that is beneficially owned by different groups of investors. The total NAV is given for reference. The Quarterly Average is calculated over the entire sample period. Each column sums to 100%.

Investor Type	2012Q4	2013Q4	2014Q4	2015Q4	Quarterly Avg.
Total NAV (Billion)	245.2	240.6	272.4	283.4	255.6
Private Funds	24.4%	28.6%	27.7%	29.0%	28.0%
Other	19.5%	14.9%	23.5%	18.0%	17.7%
Unknown Non-US Investors	19.5%	19.3%	14.8%	15.7%	16.0%
Banking /Thrift Inst., Broker/Dealers, Sov. Wealth Funds	12.0%	14.0%	13.6%	15.0%	13.9%
Non-U.S. Individuals	7.2%	7.1%	7.3%	9.9%	10.0%
Registered Investment Co.	8.9%	7.1%	5.6%	5.9%	6.9%
Insurance Co.	3.0%	3.6%	3.5%	2.9%	3.0%
Pension Plans	3.0%	3.4%	1.9%	1.9%	2.7%
State or Muni. Government Entities & Pension Funds	1.3%	1.2%	1.3%	1.0%	1.2%
US Individuals, Non-Profits	0.9%	0.6%	0.6%	0.4%	0.7%

Source: Form PF Question 16.

[54] *See*, e.g., Response to Questions Posed by Commissioners Aguilar, Paredes, and Gallagher, op. cit.; Marcin Kacperczyk & Philipp Schnabl, *How Safe are Money Market Funds?*, 128 Q. J. ECON. 1017 (April 5, 2013); Russ Wermers, et al., *Runs on Money Market Funds* (Jan. 2, 2013), *available at* http://www.rhsmith.umd.edu/files/Documents/Centers/CFP/WermersMoneyFundRuns.pdf.

[55] Source: IMoneyNet.

Figure 7 presents for all filings from private liquidity funds the largest equity interest. Over the sample period, for 194 out of 646 filings (30%) from 18 different funds the largest equity interest was 100%. In contrast, for only 18 filings the largest equity interest was at or below 5%. This suggests that for more than half of the 646 filings, funds reported a largest beneficial owner of more than 40%.[56]

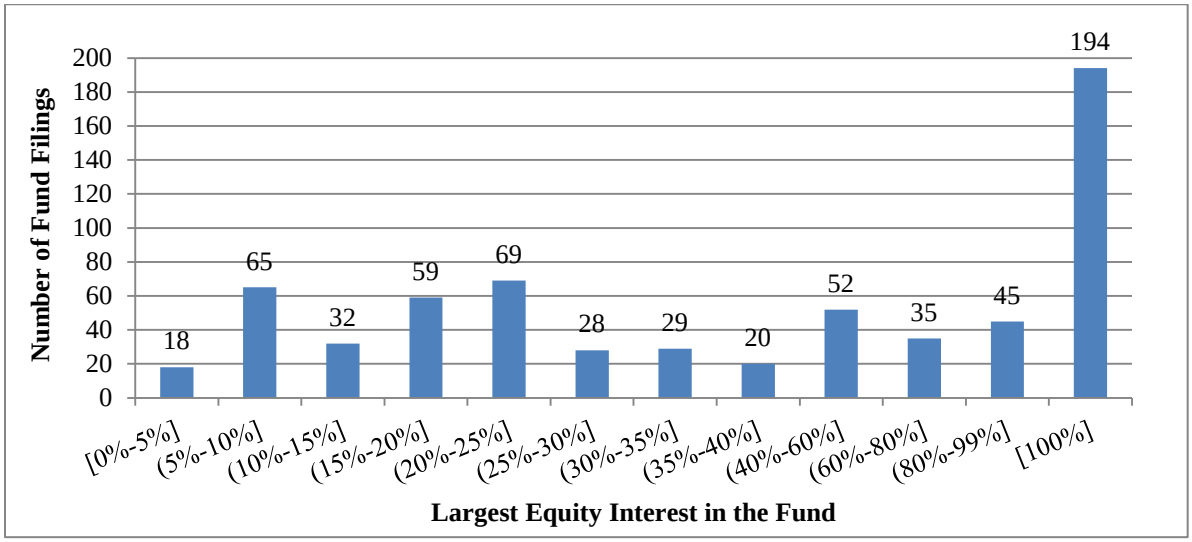

Figure 7: The Percentage of Private liquidity fund's Equity Beneficially Owned by the Beneficial Owner Having the Largest Equity Interest in the Fund

Source: Form PF Question 61(a).

Figure 8 presents the number of investors in a fund with beneficial ownership of at least 5%. The 225 fund filings with only one investor owning 5% or more corresponds largely to the 194 fund filings in Figure 7 that reported a single shareholder owning 100%. Only 32 fund filings reported that there were more than 6 beneficial owners above the 5% level.

[56] Of the 646 fund-quarter filings, 326 (=52+35+45+194) filings reported a largest equity interest of more than 40%.

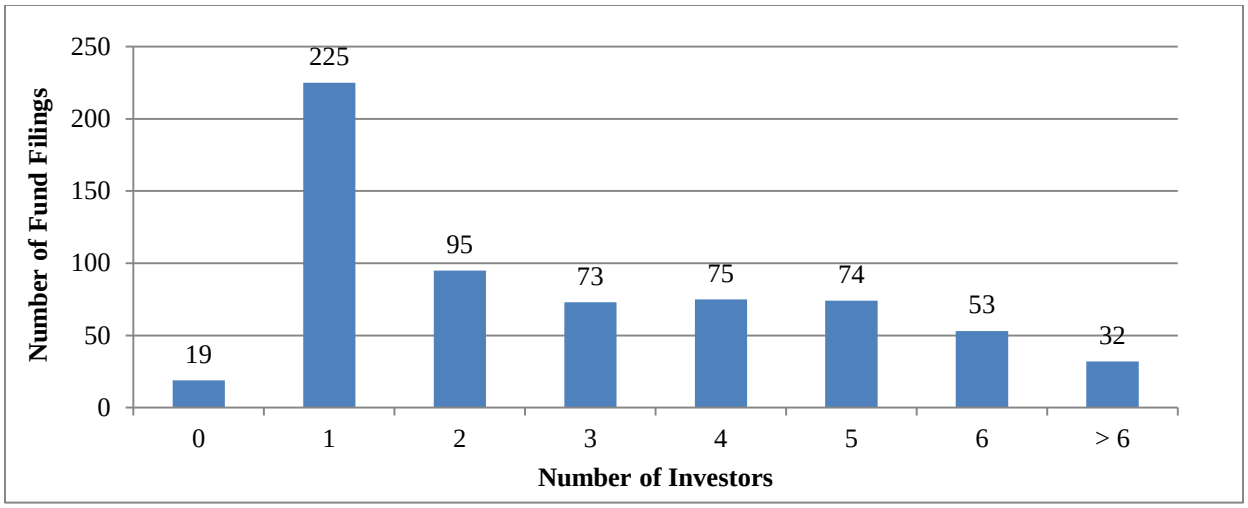

Figure 8: Number of Private Liquidity Funds with a Certain Level of Investors Who Beneficially Owned 5% or More of the Equity

Source: Form PF Question 61(b).

Securities Lending Collateral

Market participants that engage in securities lending generally receive cash collateral for the temporary transfer of a security. While some securities lenders face regulatory restrictions on reinvestment of this collateral others do not and possibly invest the cash collateral with private liquidity funds. To that extent, the inertia of such investment in a private liquidity fund is driven by the securities lending parties, and funds with significant ownership attributable to such collateral investors are exposed to the dynamics of the securities lending market. Funds report on Form PF a good faith estimate of the percentage of the reporting fund's outstanding equity that was purchased using securities lending collateral. Figure 9 shows that over the sample period 93.4% of the aggregated private liquidity funds' NAV dollars (75.4% of fund filings) reported no estimated exposure to securities lending collateral reinvestment. However, the results also suggest that 6.6% of aggregated private liquidity funds' NAV dollars (24.6% of fund filings) are fully exposed to collateral reinvestment investors.

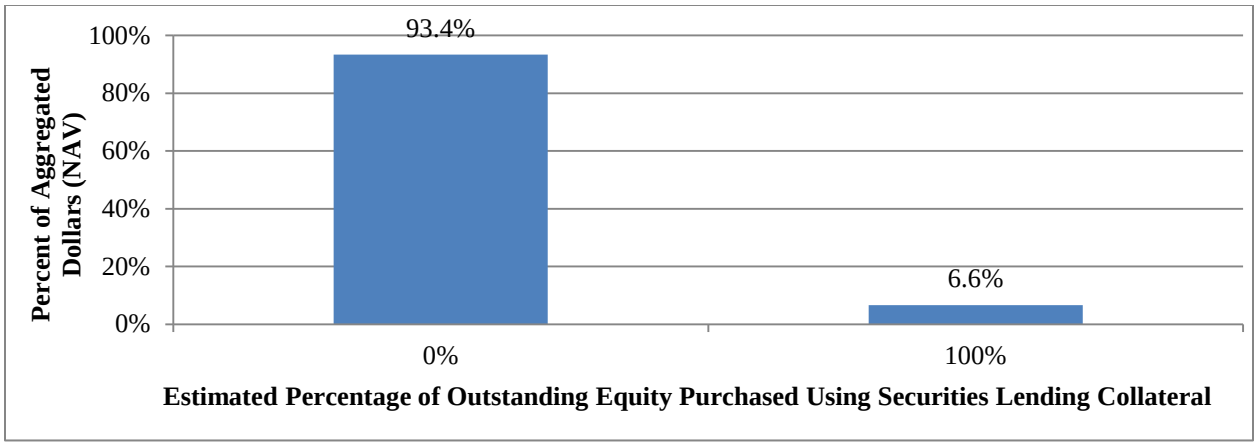

Figure 9: Estimated Percent of Private liquidity fund Dollars with a Certain Level of Outstanding Equity that was Purchased Using Securities Lending Collateral

Source: Form PF Question 62.

Susceptibility to heavy shareholder redemptions

The Commission adopted reforms in 2014 to address MMFs' susceptibility to heavy shareholder redemptions and improve their ability to manage and lessen potential contagion from such redemptions. The reforms allow all MMFs, during periods of extreme volatility, to temporarily prevent investors from making withdrawals or to levy liquidity fees for investors who redeem shares, [57] allowing a fund's board of directors to address a run on a fund.[58] Form PF provides information on several of the tools private liquidity funds have to manage liquidity when facing heavy shareholder redemption requests.[59] First, a private liquidity fund can have one or more committed liquidity facilities to bridge a temporary liquidity impasse from redemptions.[60] Second, a private liquidity fund may impose suspensions or material restrictions on investor redemptions and withdrawals.[61] And third, a private liquidity fund can have a lock-up period. Figures 10 and 11 shows the percent of aggregated NAV dollars with a specific percentage of a fund's NAV that an adviser or governing body has the right to suspend (94.0%) or restrict (57.7%).[62]

[57] Pursuant to Section 22(e) of the Investment Act of 1940, a registered open-end investment company has up to seven days to meet investor redemption requests. In practice, redemption requests are usually paid out within one or two days.
[58] The board of directors of a government MMF can choose not to impose redemption gates and liquidity fees.
[59] *See* Form PF Questions 59 (committed liquidity facilities), 63 (suspensions and restrictions) and 64(investor liquidity).
[60] There is no standard definition, but usually a committed liquidity facility is a bank line of credit. Often a bank line of credit can be withdrawn with no notice if the bank chooses not to honor it.
[61] Even though the suspensions or material restrictions on investor redemptions and withdrawals are designed to prevent bank-like runs, it is possible it could cause a run when lifted or with the mere prospect of imposition.
[62] No funds reported any actual suspensions or material restrictions.

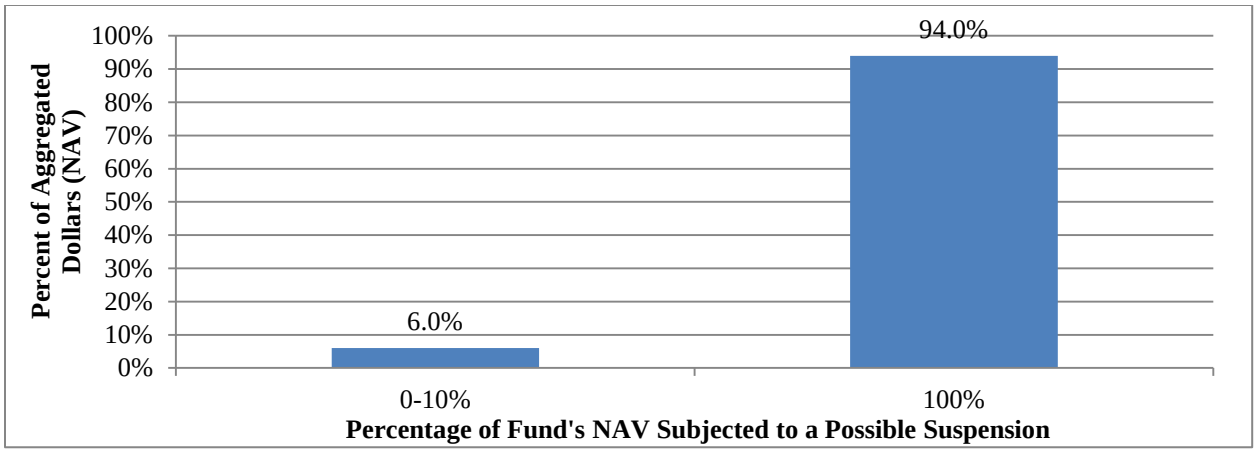

Figure 10: Percent of Aggregated Dollars Over All Dates and Funds with a Specific Percentage of a Fund's NAV Subjected to a Possible Suspension of Investor Redemptions and Withdrawals

Source: Form PF Question 63(a).

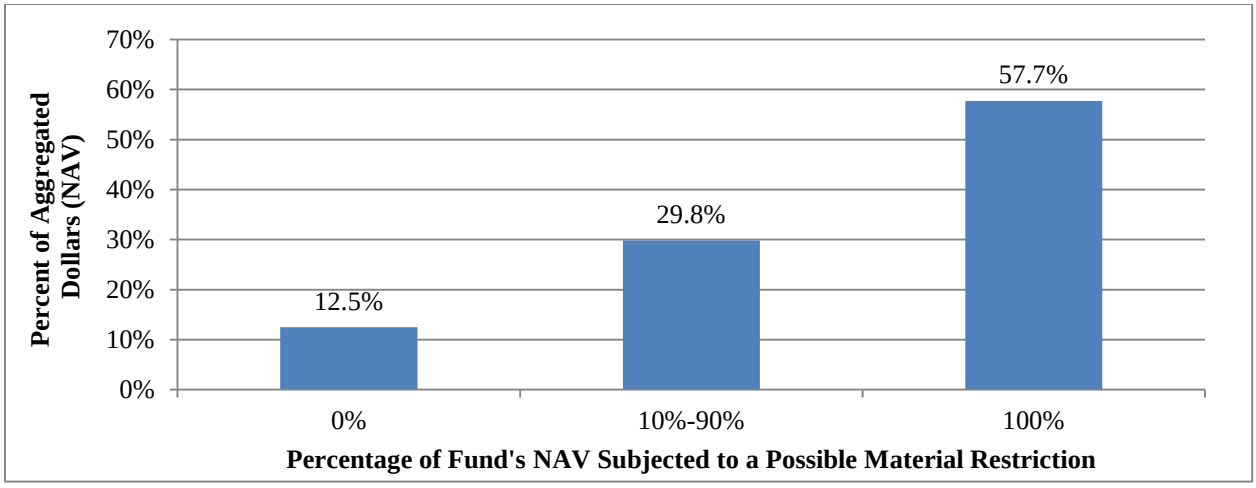

Figure 11: Percent of Aggregated Dollars Over All Dates and Funds With a Specific Percentage of a Fund's NAV Subjected to a Possible Material Restriction of Investor Redemptions and Withdrawals

Source: Form PF Question 63(b).

Unlike MMF investors who generally can redeem daily, private liquidity fund investors may be subject to a lock-up period for withdrawing invested funds or receiving redemption payments. The more illiquid a fund's portfolio, the more likely a fund manager restricts redemptions in order to protect the fund from being forced to sell securities at depressed prices to meet redemption requests. The lock-up period allows a fund to hold a lower amount of lower-yielding cash and daily liquid assets. Table 9 shows investor liquidity as a percentage of NAV. Industrywide, investors can withdraw their investment or receive redemption payments on

average within one day, seven days, and thirty days from 71.6%, 91.2%, and 99.2% of reporting funds, respectively.

Table 9: Investor Liquidity as a Percentage of NAV

Private liquidity funds report investor lock-up periods in several categories on Form PF. For each lock-up period, the NAV is aggregated at the end of the fourth quarter of each sample year to determine investor liquidity as percentage of NAV. The quarterly average is calculated over the entire sample period.

Lock-Up Period	2012Q4 (%)	2013Q4 (%)	2014Q4 (%)	2015Q4 (%)	Quarterly Avg. (%)
Up to 1 Day	70.4	72.0	71.9	74.4	71.6
Up to 7 Days	90.8	91.2	91.4	92.2	91.2
Up to 30 Days	99.3	99.3	99.3	99.4	99.2
Up to 90 Days	100.0	100.0	100.0	100.0	100.0
Up to 180 Days	100.0	100.0	100.0	100.0	100.0
Up to 365 Days	100.0	100.0	100.0	100.0	100.0

Source: Form PF Question 64.

VI. Asset Composition

Analyzing asset composition also allows a better understanding of the risk profile of this industry. As investors in short-term debt, private liquidity funds and MMFs provide short-term funding to financial intermediaries and non-financial entities alike when they purchase assets like commercial paper and repurchase agreements. Generally, a fund's risk profile and portfolio composition are a reflection of the fund investors' risk appetite. However, the fund might alter its portfolio as a function of changes in interest rates, the credit market, and market liquidity. In this section, I analyze the portfolio composition of private liquidity funds, including the number of open positions, and compare them to MMFs.

Asset Composition of Private Liquidity Funds

Table 10 reports the portfolio allocation of private liquidity funds in each of the 29 asset types on Form PF. With an average allocation of 23.7% over the sample period, U.S. Treasury securities are the asset most commonly held by private liquidity funds, followed by repos from U.S. financial institutions backed by U.S. government securities collateral at 13.9%. Both these asset types are considered some of the safest assets private liquidity funds can invest in.[63] However,

[63] *See* Response to Questions Posed by Commissioners Aguilar, Paredes, and Gallagher, op. cit. During the 2008 financial crisis money flowed out of prime MMFs into government MMFs, including Treasury MMFs. There is also evidence that Treasury bills even sold above the pre-crisis price because funds invested in these safer assets, offsetting losses in other assets during the 2008 crisis (*see*, e.g., Comment Letter of Fidelity Management & Research Company (April 22, 2014), Exhibit 4, http://www.sec.gov/comments/s7-03-13/s70313-339.pdf. They reported that 1-year Treasury bills during the crises week (September 15-19, 2008) transacted above the pre-crisis price.)

as discussed above several private liquidity funds with portfolios similar in style and riskiness to Treasury MMFs portfolios greatly skew these averages upwards.

Table 10: **Private Liquidity Fund Asset Allocations**

This table reports the allocation average for each asset class at the end of the fourth quarter of each sample year. Each column adds up to 100%. The Quarterly average is calculated over the entire sample period.

Asset Class based on Form PF	2012Q4 (%)	2013Q4 (%)	2014Q4 (%)	2015Q4 (%)	Quarterly Avg. (%)
Sovereign Bonds and Municipal Bonds					
Agency securities	1.9	1.9	1.2	1.2	1.4
GSE bonds	1.5	1.0	0.8	***	1.5
Other sovereign and supranational bonds	0.6	***	0.4	***	0.4
Sovereign bonds issued by non-U.S. G10 countries	***	1.5	***	3.1	1.8
U.S. state and local bonds	0.6	0.3	0.2	0.2	0.3
U.S. treasury securities	22.3	22.4	25.7	28.9	23.7
Instruments Issued by U.S. Financial Institutions					
ABCP	2.3	4.5	2.7	3.2	3.1
ABS and structured products (non-ABCP)	***	***	0.2	***	0.2
Certificates of deposit	4.1	4.7	6.0	6.9	5.5
Floating rate notes	0.8	1.0	0.9	1.2	1.0
Repurchase agreements (Inv. Grade Corporate Bond)	***	***	***	0.3	0.3
Repurchase agreements (Other assets)	***	0.6	1.8	0.6	0.6
Repurchase agreements (U.S. Gov't)	12.2	17.0	11.3	10.4	13.9
Unsecured commercial paper	4.2	1.5	2.2	1.7	2.6
Instruments Issued by non-U.S. Financial Institutions					
ABCP	0.6	1.1	1.3	1.8	1.0
ABS and structured products (non-ABCP)	***	***	***	***	***
Certificates of deposit	10.6	11.8	13.5	8.6	11.3
Floating rate notes	2.3	3.0	3.3	5.3	3.1
Repurchase agreements (Invest. Grade Corporate Bond)	***	***	***	***	0.4
Repurchase agreements (Other assets)	***	***	***	***	2.3
Repurchase agreements (U.S. Gov't)	9.6	3.5	2.5	1.6	4.3
Unsecured commercial paper	9.2	8.2	9.9	9.9	9.5
Instruments Issued by non-Financial Institutions					
Other combined - U.S.	0.5	0.5	0.3	0.6	0.4
Unsecured commercial paper - U.S.	1.1	1.1	1.2	0.8	1.1
Other combined - Non-U.S.	0.5	0.4	0.3	0.3	0.4
Unsecured commercial paper - Non-U.S.	0.9	1.3	0.8	0.4	0.8
Other Instruments					
Cash and cash equivalents	6.7	6.6	6.5	5.5	6.3
Investments in private liquidity funds	***	***	***	***	***
Investments in money market funds	3.3	2.8	2.5	2.7	2.8

Source: Form PF Question 56.

Generally, rule 2a-7 requires MMFs to maintain a diversified portfolio by limiting funds to holding assets issued by any single issuer to no more than 5% of the funds' assets.[64] Rule 2a-7, however, makes exceptions to the 5% limit for certain asset types, including those securities issued by the federal government and its agencies, other MMFs, and repurchase agreements collateralized by government securities. For private liquidity funds, Table 11 tabulates the average number of open positions that represent 5% or more of a fund's NAV by type and the average number of funds with at least one open position that exceeds the 5% limit each month. The vast majority of such assets are repurchase agreements.[65] On average 19.7 private liquidity funds in the aggregate hold 54.6 repurchase agreement positions each month. The second most common positions are in U.S. Treasuries. Since MMFs are not allowed to exceed the 5% limit for CDs, Bonds and Other assets listed in Table 11, some private liquidity funds may not be as diversified as MMFs in non-exempt assets.[66]

Table 11: Open Positions That Represent 5% or More of a Fund's NAV

This table provides the average number of open positions and funds with at least one open position each month that represents 5% or more of a fund's NAV.

	Open Positions that Represent 5% or More of a Fund's NAV	
Asset Class	Average Number Of Open Positions	Average Number of Funds with at Least One Open Position
Repurchase Agreements	54.6	19.7
US Treasuries	16.6	6.8
Registered Investment Funds (incl. MMFs)	6.3	6.1
Bonds: GSE, Non-U.S. G10 Sovereign & Supranational	4.8	2.9
Agency Securities	4.5	3.3
Other Cash Deposits	3.4	2.4
CDs	2.8	1.0
Other Cash & Cash Equivalents	2.4	1.8
Other	2.2	1.9

Source: Form PF Question 57.

Comparison to MMFs

I next compare the asset allocation of private liquidity funds to that of MMFs. More specifically, I assign the Form PF assets types to 12 categories common to both private liquidity funds and

[64] *See* rule 2a-7(d)(3)(i) and (ii).

[65] Even though Form PF doesn't specify the type of repurchase agreement, they are most likely government repurchase agreements, considering the asset types in Table 10.

[66] The rule 2a-7 diversification requirement is measured at the time of acquisition of the security. A fund's position can be above the 5% threshold and not be in violation of rule 2a-7, if the asset value changed after purchase.

MMFs and report the average quarterly allocations in Figure 12 and Table 13. On average the four highest concentrations for MMFs are in government repurchase agreements (18.2%), CDs (18.1%), U.S. Treasuries (16.7%), and government agency securities (14.1%). For private liquidity funds the four highest allocations over the same period are in U.S. Treasuries (23.7%), government repurchase agreements (18.1%), CDs (16.8%) and financial CP (12.1%). On average 41.8% (23.7%+18.1%) of the private liquidity fund assets are either in U.S. Treasury securities or in repos collateralized by U.S. Treasury securities and government agency securities compared to only the 34.9% (18.2%+16.7%) for MMFs. If I include government agency securities these averages increase to 44.7% and 49.0% for private liquidity funds and MMFs, respectively. Over the sample period, the relative amount of Other and U.S. Treasuries in private liquidity funds compared to MMFs increased, while the relative amount of government repurchase agreements decreased. Interestingly, I find significantly lower concentration levels of municipal securities and government agency securities in private liquidity funds than in MMFs. No fund held over 22% of their assets in U.S. state and local bonds. This suggests none of the private liquidity funds have an investment strategy similar to a tax-exempt municipal MMF, but rather private liquidity funds might only hold tax-exempt municipal securities as a way to diversify their portfolio or increase yield. Overall, private liquidity funds seem to be generally more similar to either Treasury or prime MMFs and not to tax-exempt municipal and government MMFs.

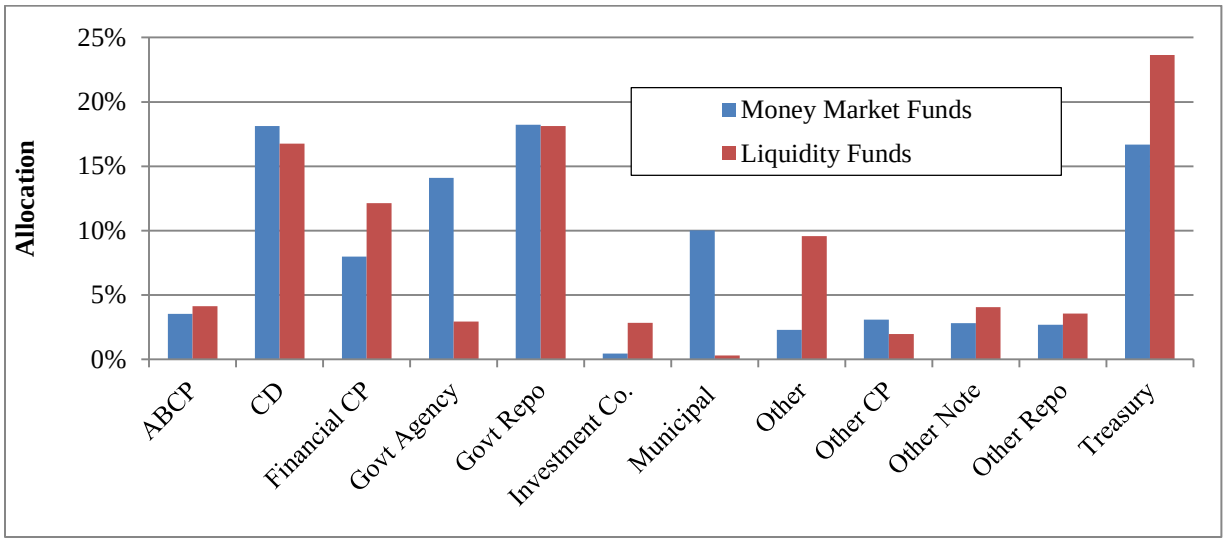

Figure 12: Quarterly Average Asset Allocations

Source: Form PF Question 56 for private liquidity funds and Form N-MFP Item 31 for MMFs.

Table 13: MMF and Private liquidity fund Asset Allocations

This table reports the concentration in each of the 12 asset types common to both Form N-MFP and Form PF. The Quarterly Average is calculated over the entire sample period. Each column adds up to 100%.

Money Market Fund Asset Concentrations					
Type	2012Q4 (%)	2013Q4 (%)	2014Q4 (%)	2015Q4 (%)	Quarterly Avg. (%)
ABCP	4.2	3.5	3.2	3.3	3.5
CDs	17.6	19.2	18.8	14.7	18.1
Financial CP	7.5	8.2	7.7	6.9	8.0
Government Agency Debt	13.6	14.4	14.8	17.4	14.1
Government Repos	17.0	15.7	19.9	22.8	18.2
Investment Co.	0.4	0.5	0.4	0.5	0.5
Municipals	11.4	10.1	8.9	8.1	10.0
Other	3.0	2.3	2.1	1.8	2.3
Other CP	2.8	2.8	2.7	2.6	3.1
Other Note	2.6	2.7	2.7	2.2	2.8
Other Repo	2.8	2.6	3.0	2.4	2.7
U.S. Treasuries	17.1	17.9	15.7	17.3	16.7
Private liquidity Fund Asset Concentrations					
Type	2012Q4 (%)	2013Q4 (%)	2014Q4 (%)	2015Q4 (%)	Quarterly Avg. (%)
ABCP	2.9	5.5	4.0	5.0	4.1
CD	14.7	16.5	19.5	15.6	16.8
Financial CP	13.4	9.7	12.1	11.7	12.1
Government Agency Debt	3.4	2.9	2.0	3.2	2.9
Government Repos	21.9	20.5	13.8	12.0	18.1
Investment Co.	3.3	2.8	2.5	2.7	2.8
Municipals	0.6	0.3	0.2	0.2	0.3
Other	8.9	9.8	9.6	9.8	9.6
Other CP	2.0	2.4	2.0	1.3	2.0
Other Note	3.1	4.0	4.2	6.6	4.0
Other Repo	3.5	3.2	4.2	3.1	3.6
U.S. Treasuries	22.3	22.4	25.7	28.9	23.7

Source: Form PF Question 56 for private liquidity funds and Form N-MFP Item 31 for MMFs.

VII. Fund Performance

7-Day Gross Yield

After analyzing risk taking among private liquidity funds, especially funds that do not follow the 2a-7 limitations, I next analyze fund performance. The 7-day gross yield measures the average yield on a fund's securities.[67] Figure 13 shows that while the 7-day gross yield for private

[67] The 7-day gross yield measures the average yield without subtracting fund operating expenses or fees, which are not reported on Form PF.

liquidity funds and MMFs increased following Federal Reserve's 25 basis point rate increase in December 2015, their weighted monthly averages were almost identical over the sample period. However among the private liquidity funds, 9.5% of them offered higher yields than the monthly maximum yield observed among MMFs. The question is whether private liquidity funds, in particular rule 2a-7 inconsistent private liquidity funds, are taking riskier asset positions that may increase yields.

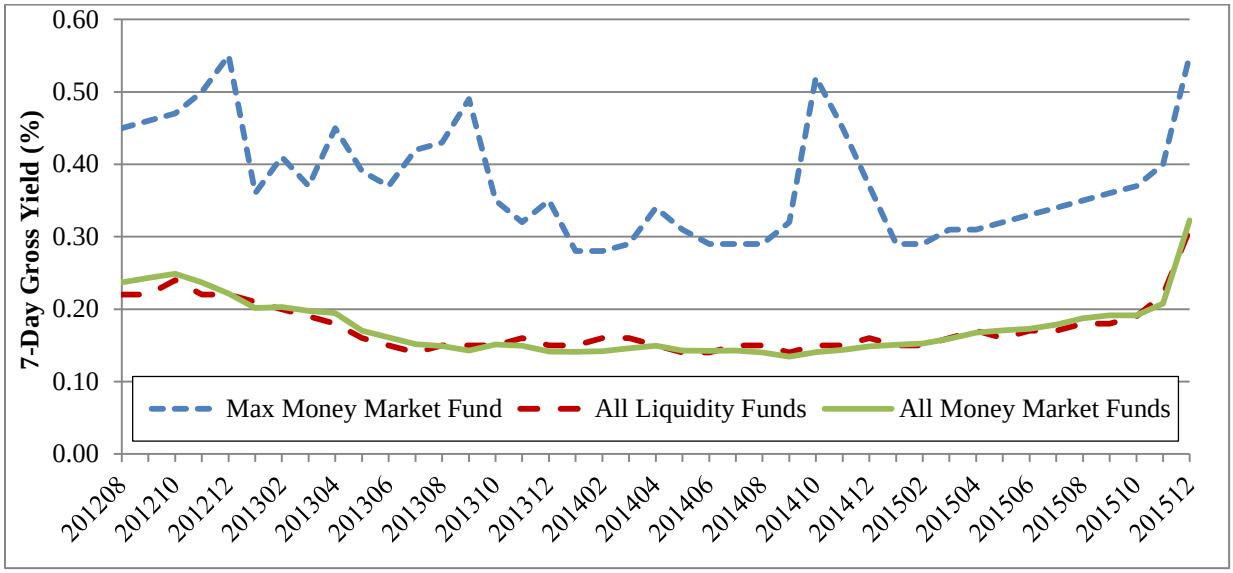

Figure 13: Weighted Average Monthly 7-Day Gross Yields

Source: Form PF Question 55(f) for private liquidity funds and Form N-MFP Item 17 for MMFs.

Figure 14 presents the weighted average 7-day gross yield for private liquidity funds with a reported policy to comply with rule 2a-7, for private liquidity funds without such a policy, and, for comparison, the weighted average 7-day gross yield of MMFs.[68] Generally, both private liquidity fund groups offered yields comparable to MMFs, which indicates that these funds, on average, are compensated as if they have taken on similar levels of risk. Since this is less of a surprise for funds that have a stated policy to comply with the conditions of rule 2a-7, it is not clear whether funds without such a policy implicitly comply and hence have the same risk and performance profile as funds that do. To further investigate the effects rule 2a-7 conditions have on the 7-day gross yield, I analyze the apparently inconsistent funds as identified earlier and compare them to the apparently consistent funds.

[68] Again, I note the initial compliance date for Form PF for most advisers was December 15, 2012.

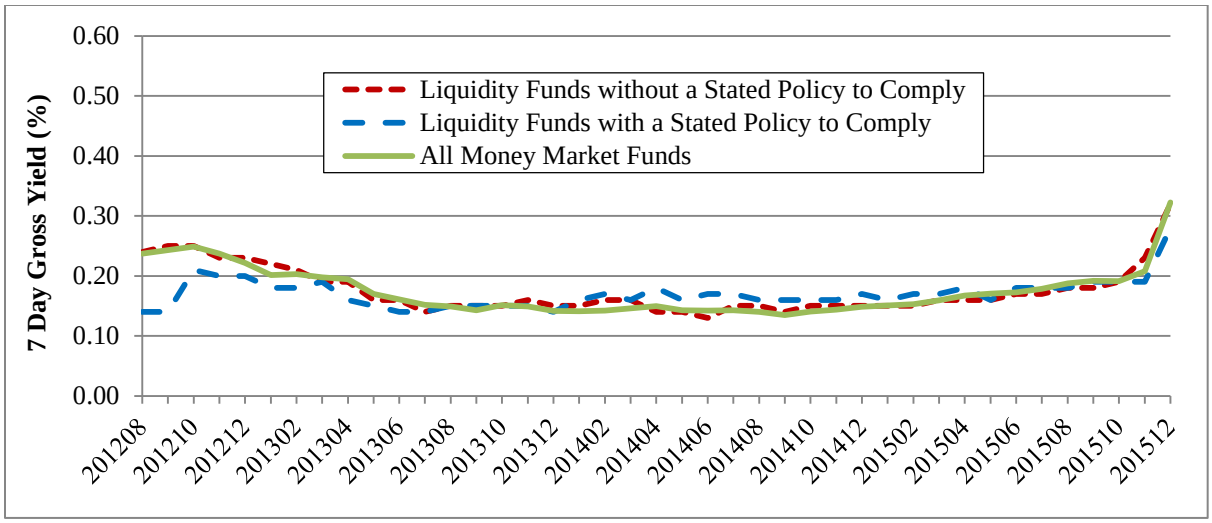

Figure 14: Weighted Average Monthly 7-Day Gross Yields, by Reported Compliance

Source: Questions 54(a) and 55(f) on Form PF for private liquidity funds and Item 17 on Form N-MFP for MMFs.

Figure 15 shows that the weighted average 7-day gross yields over the sample period for inconsistent and consistent private liquidity funds are 34 and 16 basis points, respectively. The weighted average yields for these private liquidity funds that are inconsistent with rule 2a-7 are double the yield of those that are consistent, but it is not clear which of the inconsistent areas generates this additional performance. Therefore, I next investigate the impact of breaking each of the WAM, WAL, 397 days asset maturity, DLA, and WLA thresholds on the increase yields found in private liquidity funds that are inconsistent with rule 2a-7.

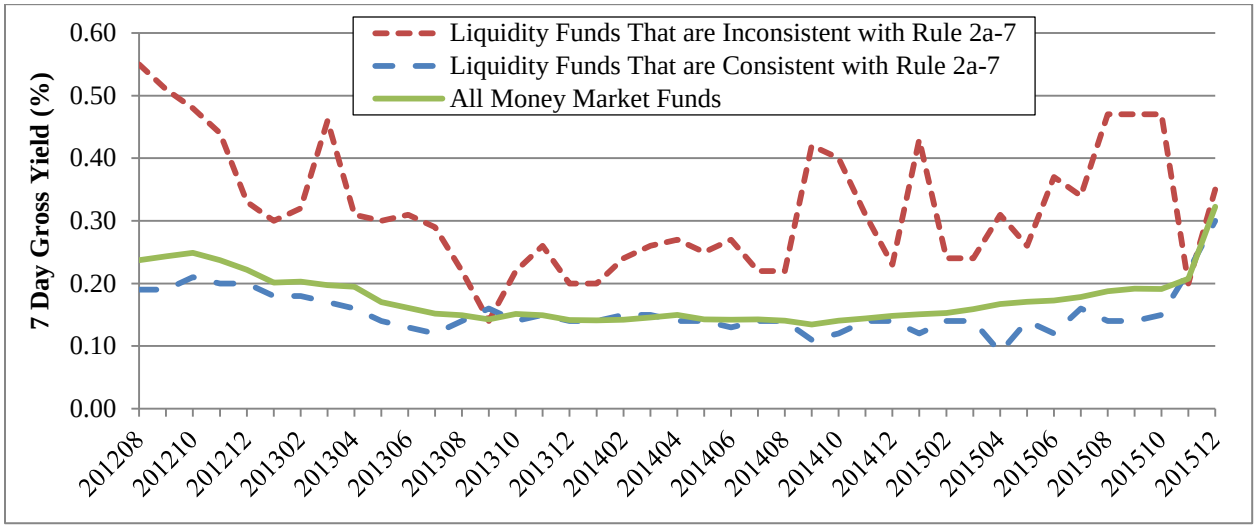

Figure 15: Weighted Average Monthly 7-Day Gross Yields, by Consistency with Rule 2a-7 Conditions

Source: Form PF Question 55.

Regression Analysis

To analyze statistically the effect of breaking any of the five thresholds had on the 7-day gross yields, I employ a simple regression framework, using monthly data, starting in October 2012.[69] The dependent variable is the 7-day gross yield. The independent variables include whether or not a fund breaks any of the five thresholds, fund fix effects,[70] and an expected risk adjusted 7-day gross yield. More specifically, each dummy variable in $\{D_{WAM}, D_{WAL}, D_{MAT}, D_{DAL}, D_{WAL}\}$ equals one if the fund exceeded one of the WAM, WAL, 397 days asset maturity, DLA, and WLA thresholds on any given month and zero otherwise. To control for the contribution to the yield of a fund's particular portfolio allocation independent of the exceedances, I include the yields of twelve representative portfolios created from funds that observe rule 2a-7 and have significant exposure to each of the twelve asset classes in Table 13. To calculate these yields, I identify at time *t*–1 the top 5% MMFs invested by investment percentage in each asset class *k* in Table 13 and compute at time *t* their average 7-day gross yields $Y_{k,t}$. I then estimate the following regression across all private liquidity funds

$$y_{i,t} = \alpha + \sum_{j=1}^{5} \beta_j D_{j,i,t} + \sum_{k=1}^{12} \gamma_{k,i} Y_{k,t} + \varepsilon_{i,t}$$

where β_j are the common coefficients across funds measuring the impact on fund yield for exceeding a threshold j, and $\gamma_{k,i}$ represent fund specific coefficients to adjust for exposure to the twelve asset classes.[71] A positive (negative) β indicates a rise (reduction) in the 7-day gross yield. The results are presented in Table 14.

First, I estimate the regression separately for each D_j and present the results in models (1) through (5). All threshold coefficients are positive, but only two, β_{WAM} and β_{DLA}, are significant at the 10% level. Furthermore, the coefficients generally are economically small. For example, in model (1) the sign and economic significance of β_{WAM} suggests only a modest 1.3 basis points increase in the 7-day gross yield when a fund's WAM exceeds the 60 day threshold. In model (6), I include all threshold indicators variables. The coefficients remain similar in size but now only β_{DLA} is significant. In model (7) after including fund fix effects, I find that none of them are significantly positive. The insignificance of the parameter estimates of the five D_j variables implies no economic value added when a fund breaks the WAM, WAL, 397 days asset

[69] Quarterly data filed in December 2012 will contain three months of data from October 2012 to December 2012.
[70] Fund fixed effects are non-random effects that are constant across individual funds.
[71] As robustness tests, I also included monthly fixed effects but the results did not change. Furthermore, I calculated Cook's distance measure for each observation and found no influential observations in any of the models.

maturity, DLA, and WLA thresholds. This suggests that the increase in 7-day gross yield presented in Figure 15 is tied more to private liquidity funds overall investment strategy rather than to the adherence of the five rule 2a-7 thresholds tested.

Table 14: Regression Analysis

*This table reports coefficient estimates from four regression models. *, **, and *** indicate that the coefficient is statistically different from zero and the p-values given in parentheses are less than or equal to 0.05, 0.01, and 0.001, respectively.*

	(1)		(2)		(3)		(4)		(5)		(6)		(7)
β_{WAM}	0.013	*									0.011		0.011
	(0.040)										(0.078)		(0.067)
β_{WAL}			0.065								0.056		0.014
			(0.051)								(0.067)		(0.182)
β_{MAT}					0.010						0.010		0.015
					(0.080)						(0.086)		(0.053)
β_{DLA}							0.011	*			0.010	*	0.007
							(0.025)				(0.050)		(0.180)
β_{WLA}									0.004		0.002		0.002
									(0.426)		(0.746)		(0.557)
α	0.049	***	0.044	***	0.046	***	0.050	***	0.049	***	0.040	***	0.001
	(0.000)		(0.000)		(0.000)		(0.000)		(0.000)		(0.001)		(0.977)
Risk Adjustment	Y		Y		Y		Y		Y		Y		Y
Fund Fix Effects	N		N		N		N		N		N		Y
N	1290		1290		1290		1290		1290		1290		1290
Adj. R^2	0.970		0.970		0.970		0.970		0.970		0.971		0.981

VIII. Conclusion

Private liquidity funds and parallel accounts compete with MMFs for institutional investors, especially after the 2014 MMF reforms, but little information is publicly available about these private funds. I analyze Form PF data to help the general public, qualified investors, and regulators understand this segment of market that is at least one-sixth the size of the MMF industry. The data show that the market is highly concentrated at both the fund and complex level with 97.2% of the private liquidity fund and their parallel account dollars tied to 12 complexes. Looking at the investor composition, I find that on average the largest beneficial owner holds a significant portion in almost every fund. Furthermore, I find that private liquidity funds hold significantly less municipal debt and government agency securities compared to MMFs, which suggests that most private liquidity funds and parallel accounts are similar to institutional Treasury and institutional prime MMFs.

Although, nearly a quarter (22.3%) of the private liquidity funds or about a third of the aggregated NAV (37.5%) reported a policy of complying with the risk limiting conditions of rule 2a-7, I find that the vast majority of funds (72.1% of the private liquidity funds or 84.2% of the aggregated NAV) in practice do appear to follow the five maturity and liquidity conditions of

rule 2a-7 (WAM, WAL, 397 days asset maturities, DLA, and WLA) that are testable using Form PF data. However, since private liquidity funds are not required to comply with rule 2a-7, it is not clear whether they will continue to do so as interest rates in the U.S. will likely start to rise. By contrast, a MMF must remain compliant.

I also find evidence that some private liquidity funds and parallel accounts may be reaching for yield to the extent that they take additional risks (less liquidity and longer asset duration than allowed under rule 2a-7) compared to MMFs. While the weighted average 7-day gross yield of private liquidity funds that appear consistent with the rule 2a-7 conditions is 16 basis points (and similar to that of MMFs), for apparently inconsistent funds it is 34 basis points. However, after adjusting for risk (asset exposure) and fund fix effects, I find no statistically significant contribution from not complying with any of the limits tested. Hence, the analysis suggests that the substantial increase in yields found in inconsistent funds relative to consistent funds does not result from exceeding any of the five 2a-7 thresholds examined but rather from the funds' overall investment strategy.

Finally, I find no evidence that during the sample period MMF dollars, including institutional dollars, moved into private liquidity funds and their parallel accounts as a result of rulemaking that went into effect subsequently in October 2016. The additional risk taking, reduced transparency (non-public Form PF compared to public Form N-MFP), and more restrictive access (for example, longer lock up periods) when compared to MMFs may make private liquidity funds a less attractive investment especially for those investors who prefer cash preservation over an increase in yield.