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RESERVE PRIMARY: FOOLS RUSH IN WHERE WISE MEN FEAR TO TREAD!*

Ozgur (Ozzy) Akay[a], *Mark D. Griffiths*[b] *and Drew B. Winters*[c]

This is a clinical analysis of the demise of the Reserve Primary Fund, the first ever money market fund. Reserve Primary was caught in a perfect storm of its own making when the financial markets went into a full-blown crisis mode with the bankruptcy of Lehman Brothers on September 15, 2008. However, if the fund's management had not abandoned the core principles that had guided the fund for more than 30 years, then the Lehman bankruptcy would likely not have led to the closing and liquidation of the Reserve Primary Fund.

"Damn the torpedoes, Full speed ahead!"
Admiral David Glasgow Farragut
Mobile Bay, Alabama
5, August 1864

1 Introduction

Reserve Primary Fund was the world's first money market fund. It broke the buck following the bankruptcy of Lehman Brother on September 15, 2008, signaling the entrance into a full-blown financial crisis. This paper provides a clinical analysis of Reserve Primary from its beginnings as a low-risk Money Market Fund (MMF) through its structural shift toward more risk taking which ultimately led to its downfall and eventual liquidation.

Reserve Primary did not have a sponsoring organization and thus was unable to access non-market liquidity when the value of its position in short-term Lehman debt collapsed after the bankruptcy announcement. Other MMFs held short-term Lehman debt, but had access to the necessary liquidity through direct sponsor support. We analyze the role of sponsors' support. This paper concludes with a discussion of the liquidation of Reserve Primary.

*Views and opinions expressed are those of the authors and do not necessarily represent official OFR or Treasury positions or policy.

[a]Office of Financial Research, U.S. Department of Treasury, USA. E-mail: Ozzy.Akay@treasury.gov.
[b]Jack Anderson Professor of Finance, Miami University, USA. E-mail: Mark.Griffiths@miamioh.edu.
[c]Lucille and Raymond Pickering Chair in Finance, Texas Tech University, USA. E-mail: Drew.Winters@ttu.edu.

2 History of Reserve Primary

Bruce R. Bent Sr. and his partner Henry B. R. Brown launched the world's first money market mutual fund in 1970, a time when certificates of deposit with interest rates higher than bank accounts were available only to the wealthy. Bent told *Fortune* magazine in 1999 the idea was to buy $100,000 of CDs and spread the higher yield among individuals with as little as $1,000 to invest.[1]

Bruce Bent Sr. introduced a formal discipline and developed the "rules" for this new "game". The original Reserve Fund was designed to have virtually no market risk. That is, the idea was to give investors immediate liquidity and safety for their money above any concern for return. One of the much quoted rules of the game propounded by Bent and Brown was the concept that the best money-market funds should be "boring." This idea of security was manifested in the concept of a constant $1 net asset value (NAV). That is, every dollar an investor puts in is worth at least a dollar at all times. Gains are credited to investors daily and are distributed monthly as cash or new shares. If a fund's share value drops below $1 because of an investment loss, the fund is said to "break the buck."[2]

Not breaking the buck is of utmost importance to the MMF industry because of the way Bent developed the funds. His vision was to create a method for retail investors to buy into market rate yielding CDs. The alternative place for retail investors to store their cash is in insured bank deposits. Accordingly, the industry concern is that if the buck is broken then MMF investors will run back to insured deposits.[3] Thus, the MMF was created to provide effective cash management, a guaranteed return of funds invested and beyond that a reasonable rate of return. These concepts have since been codified into Rule 2a-7 of the amended Investment Company Act of 1940 to define the portfolio composition required for a mutual fund to claim status as a money market fund.[4] The result is an industry worth more than US $3 trillion and which serves tens of millions of both retail and institutional investors.

From its inception through the end of 2005 Reserve Primary stuck to its low-risk roots following Bent's much repeated statement that investment in money market mutual funds should be "so safe it would lull clients to sleep". As an example of this low-risk philosophy, Exhibit 1 Panel A depicts Reserve Primary's portfolio holdings as of February 28, 2006. The portfolio consists of 77% in certificates of deposit, 19% in repurchase agreements, 3% in floating rate notes, and 1% in asset-backed securities. The Fund was invested in 51 different instruments with a weighted average maturity of 60 days and a weighted average yield of 4.54%. For comparison purposes, the average yield on 4-week T-bills was 3.97% and the average yield on 30-day non-financial CP was 4.36% for the 3 months ending 2/28/06. In the Reserve Fund's Semi-Annual Report to Shareholders in March 2006, investors were advised that it had "slightly underperformed" its rivals, owing to a "more conservative and risk averse manner" of investing stating "for example, the Reserve Funds do not invest in commercial paper."[5]

However, after publishing such statements, a substantial change was made to the Fund's investment strategy. Within 18 months, the allocation in commercial paper grew from zero to one-half of the Fund's assets. The higher yields associated with these investments attracted new investors resulting in the Reserve Primary Fund becoming the fastest-growing US money market fund family in 2006, 2007, and 2008. In fact, the Fund doubled in size in the first 8 months of 2008 alone.[6] In what follows, we discuss how this money market fund originally designed to

have virtually no market risk went out of business almost overnight due to a position that represented only 1.2% of its assets. This is a story of a perfect financial storm. However, as our title suggests, it is a storm of the fund's own making and thus was completely avoidable.

3 The evolution of Reserve Primary before the Lehman bankruptcy

In 2001, *Reuters* reported Bent as saying, "Commercial paper is anathema to the concept of the money fund, …, people prostituted the concept by putting garbage in the funds and reaching for yield."[7] The next year, *Investor's Business Daily* quotes him as saying, "we don't drink, smoke or buy commercial paper."[8] Nonetheless in 2006, Reserve Primary was lagging behind its rivals and the decision was made to hold commercial paper.

By the end of August 2008, the portfolio had been re-allocated so as to be virtually unrecognizable as a "boring" MMF. As Exhibit 1 Panel B shows, the portfolio at that time comprised: 20% in certificates of deposits, 13% in floating rate notes, 6% in repurchase agreements, 37% in asset-backed commercial paper, and 21% in financial commercial paper and minor holdings (less than 1% each) in asset-backed securities, medium-term notes, and corporate securities. The Fund is now invested in 333 different issues with a slightly longer portfolio weighted maturity of 67 days.[9] The weighted average yield was 2.72% with the benchmarks at 1.64% on 4-week T-bills and 2.09% on 30-day non-financial CP. The additional risk taking has more than doubled the yield spread for the fund over the benchmarks.

This dramatic change in portfolio composition was not an abrupt one quarter turnabout, but was more of an evolution as the financial crisis unfolded as Reserve Primary's management increased the risk of the portfolio in lock-step with the deepening of the crisis. Specifically, the evolution of Reserve Primary goes as follows:

(1) For the six quarters leading into the beginning of the financial crisis (BNP halting redemptions from three money market funds[10]) Reserve Primary remained low risk with its portfolio mix similar to the mix reported in Exhibit 1 Panel A. However, its yield spread declined from between 19 and 25 basis points (bps) to between 9 and 13 bps.[11] Interestingly, the decline in yield spread came as the management increased the maturity of the fund.
(2) On 8/9/07 BNP Paribas halted redemptions from three MMFs because of issues related to valuing ABCP. During Reserve's reporting quarter that included the BNP Paribas halt, Reserve Primary began its structural change in risk with a significant move into ABCP from 1% of its portfolio in ABCP to 17% (see Table 1, Panel A).[12] This change increased the yield spread to 28 bps.
(3) As the financial crisis progressed toward its second major event (the bailout of Bear Stearns), Reserve Primary continued to increase its holdings in ABCP. By the quarter end of 2/29/08 (last quarter report prior to the Bear Stearns purchase), Reserve Primary had increased its holdings in ABCP from 17% to 46% and financial CP (FCP) from 0% to 10% (see Table 1, Panel B). The increase in risk increased the yield spread to 41 bps.

In the quarter that includes the purchase of Bear Stearns, Reserve Primary continued its move into FCP and saw its spread increase to 92 bps with assets under management reaching $64.4B.[13] The growth in the assets under management across 2007 was generally from institutional investors. So, while Reserve Primary was moving away from its roots of a conservative asset mix, it was also moving away from its roots as a retail fund.

Table 1

Panel A: BNP Paribus halts redemptions

Date	CD	FRN	RP	ABCP	FCP	Principal	# of sec.	spread	Maturity (days)
5/31/07	52%	17%	29%	1%	0%	$28.0 B	68	0.11%	119
8/9/07	BNP Paribas halts redemptions on three funds								
8/31/07	44%	21%	17%	17%	0%	$29.1 B	114	0.28%	96

Panel B: Bear Stearns failure

Date	CD	FRN	RP	ABCP	FCP	Principal	# of sec.	spread	Maturity (days)
2/29/08	16%	19%	6%	46%	10%	$48.1 B	265	0.41%	106
3/24/08	JP Morgan purchases Bear Stearns to prevent its failure								
5/31/08	19%	16%	9%	36%	18%	$64.4 B	324	0.92%	83

Panel C: Lehman Brother files bankruptcy

Date	CD	FRN	RP	ABCP	FCP	Principal	# of sec.	spread	Maturity (days)
8/31/08	20%	13%	6%	37%	21%	$64.2 B	333	0.66%	67
9/15/08	Lehman Brothers files for Chapter 11 bankruptcy								

Note: CD = certificate of deposit, FRN = floating rate note, RP = repo, ABCP = asset-backed commercial paper, FCP = financial commercial paper.

One might question whether investing in FCP was deemed as risky following the workout of Bear Stearns in which the federal government guaranteed the first $30 billion in losses. In testimony before the Financial Crisis Inquiry Commission, Reserve Primary Fund Portfolio Manager Michael Luciano stated that after the government-assisted rescue of Bear, he "assumed that the federal government would similarly save the day if Lehman or one of the other investment banks, which were much larger and posed greater apparent systemic risks, ran into trouble."[14] Hence, one could argue that the government guarantee in the rescue of Bear Stearns and its subsequent activities created a situation of moral hazard wherein the fund managers such as those at Primary Reserve believed that they would be protected from the consequences of risky investment behavior by government guarantees and bailouts using taxpayer dollars. It is worth noting that over half of the FCP holdings of Reserve Primary were from foreign issuers and the financial crisis was clearly global. It is also important to note that investors clearly approved the additional risk since, after just 1 year of the new risk profile, the fund has more than doubled in size going from $28 billion at 5/31/07 to $64 billion at 5/31/08.[15]

(4) For the quarter ending 8/31/08, 15 days before the Lehman Bankruptcy, Reserve Primary had $64.2 billion under management while continuing its risk profile from the previous quarter. At this point, only 1.2% of its portfolio was invested in Lehman; however, 21% of its portfolio was in FCP (see Table 1, Panel C and Exhibit 1 Panel B). Exhibit 1, Panel B shows that Reserve Primary's largest single individual investment was in FCP and three of the portfolio's 10 largest positions were in FCP. This represented a substantial

investment in an industry whose future was becoming very much in question.[16]

There are several issues that are particularly remarkable about the Reserve Primary management's decision to modify the portfolio.

First, it is clear that Bent was chasing returns in Reserve Primary. In fact, by early September 2008, Reserve Primary was the third highest yielding money fund out of 227 funds in the United States. The higher yields also attracted more investments and Reserve Primary doubled in size between May 2007 and May 2008.[17] Reserve Primary had shifted from its roots in courting individuals to attracting large corporate accounts such as Time Warner, Walmart, Univision Communications, Ameriprise, Goodyear Tire & Rubber, Henry Ford Health System, Visa USA Inc., and the China Investment Corp.

Second, this change in investment policy was unusual both given Bent's stature in the industry and the fact that for years, he had shunned commercial paper as too risky and had scolded managers of other funds for sacrificing safety to earn higher yields. "When they dumped it out into the marketplace, there were cats and dogs, and there were snakes, but there were also pearls," Bent said in an interview with *Bloomberg* in June 2008. "So I go through and I pick out the carrots and the peas, and the rest of the stuff I let it go."[18]

One of the "peas" Bent acquired as part of his move into commercial paper was FCP issued by Lehman. Reserve Primary held $375 million Lehman commercial paper on December 1, 2007 while Lehman's stock price was $65.44. By March 3, 2008 Reserve Primary had increased its position Lehman to $775 million (FCP and medium term notes) as Lehman's stock price declined to $37.64. The next quarter Reserve Primary went to $785 million in Lehman short-term debt as Lehman's stock price slid further to $19.81. The fund maintained this position until Lehman's bankruptcy even though it had opportunities to reduce the position as the debt matured. This discussion suggests that the stock market was not as high on Lehman as Bent was. However, the increasing positions in Lehman are consistent with the view that the US government would not let large financial institutions fail.

3.1 Fools rush in where wise men fear to tread

Reserve Primary changed their risk preference and moved into the CP market and into Lehman short-term debt as Lehman's stock price declined. Now, we examine trends in the CP market in conjunction with Reserve Primary's move into these markets as Mr. Bent attempted to pick off opportunities. Exhibit 2 provides a timeline of ABCP and FCP outstanding across the crisis.

At the commencement of the financial crisis Reserve Primary had virtually no exposure to CP. It chose to enter ABCP in the quarter that included the peak of the ABCP market and the August 9, 2007 halt of redemptions by BNP Paribas. Over the next two quarters, Reserve Primary held between 46% and 48% of its assets in ABCP even though the market for ABCP contracted by $200 billion, which followed an earlier $200 billion market-wide contraction in the previous quarter. Exhibit 2 suggests that Reserve Primary was rushing in as many others were exiting the market.

Throughout the earlier stages of the crisis Reserve Primary increased its position in FCP from 5% to 21% of assets and consistently divided their position between domestic and foreign FCP. The total market for FCP was relative stable across this period staying at or slightly above $800 billion outstanding. With the Lehman bankruptcy

filing, the FCP market contracted 12.9% from $800 billion at the beginning of the September, 2008 to $697 billion outstanding by the end of that month.

Reserve Primary's small position in Lehman ($785 million, but only 1.2% of assets), but larger position in FCP (21% or $13.48 billion) coupled with the lack of a sponsor for support lined the fund up for the perfect storm. That is, Reserve Primary held a position in the investment bank that the US Treasury and Federal Reserve could not or would not save and it held a large position in an industry whose future was now in question. Whether intentional or not, Bent had placed a considerable wager on the apparent belief that the US government would not allow major financial institutions to fail.

4 The Lehman bankruptcy

On Monday, September 15, 2008, Lehman Brother filed for bankruptcy.[19] Over the preceding weekend, officials of both the US Department of Treasury and the Federal Reserve Bank of New York (Fed) had been attempting to find a purchaser for Lehman Brothers in an attempt to head off the bankruptcy of the 158-year-old investment bank with $613 billion in liabilities.[20] Given the failure to find a purchaser for Lehman, the greatest concern of Fed and Treasury officials for the coming week centered on unwinding Lehman-related credit default swaps which are insurance-like contracts made to compensate counterparties in the event companies are unable to repay their debts.[21] Unfortunately, the ripple effects of the Lehman bankruptcy were much more far-reaching.

The effect of the Lehman's bankruptcy became apparent well before the market opened on Monday, September 15. By 8:37 a.m., Reserve Primary's investors had demanded the return of $5.2 billion. The timing of the move by investors relates to the constant $1 NAV. Because mutual fund shares are redeemed at the fund's NAV, Reserve Primary's investors were moving quickly to redeem their shares at the $1 NAV before any loss in value from the Lehman bankruptcy appeared in the fund's NAV.

By 1 p.m., Reserve Primary client demands for immediate cash-outs totaled $18 billion, more than 25% of the fund's assets. More indicative of the Fund's looming demise, Reserve Primary's bank, Boston-based State Street Corp., stopped honoring withdrawal requests after 10:10 a.m. Just before 2 p.m., Reserve executives concluded that no one was willing to help them raise cash by purchasing their Lehman commercial paper.[22] The lack of such a purchaser was particularly significant for Reserve Primary because it was not a part of a larger fund family and therefore did not have the family sponsoring to provide the necessary non-market liquidity by purchasing the Lehman debt to maintain fund value.

The run on Reserve Primary continued the next day. According to Crane Data, between the time of Lehman's Chapter 11 announcement and 3 p.m. on Tuesday (September 16, 2008), investors demanded the return of approximately $39.9 billion, more than half of the fund's assets. At 4 p.m., the trustees determined that the $785 million investment in Lehman loans which had been valued at 100% the previous week was now worth nothing. With all the earlier redemptions from the fund, the NAV of the fund fell to 97 cents. When news that Reserve Primary broke the buck hit the wires at 5:04 p.m. the widespread run on money market mutual funds began in earnest.

We conclude this section with a comment on the data available to investors at this time. The data used here come from Morningstar, a primary source of mutual fund data at the time.

An alternative source for money market fund data is the iMoneyNet *Money Fund Report*. Both sources were quarterly at this time, so information about portfolios is infrequent. Morningstar has data on Reserve Primary as of 8/31/2008, hence investors had access to Reserve's portfolio positions 2 weeks before the Lehman bankruptcy. Accordingly, investors were likely running from Reserve Primary based on generally knowledge of portfolio positions and risk instead of knowledge of specific positions.

4.1 Institutional features[23]

The investors' immediate move to redeem their shares in Reserve Primary, as soon as the Lehman bankruptcy became apparent, raises several questions about the process of redeeming share in MMFs. We provide some details here.

Mutual funds estimate their NAVs daily at the close of business. MMFs follow this practice, even though MMFs report a $1 fixed NAV. MMFs maintain a $1 fixed NAV through the use of the amortized cost method of share valuation, which records portfolio positions at cost plus amortized interest with the interest regularly posted to investor accounts. In addition, MMFs examine their positions daily to determine if any security has had a material change resulting in a loss in value. If there is a loss in value the MMF would have to reduce its NAV from $1. In the case of Reserve Primary's holding in Lehman, the investors were moving quickly in the hopes of exiting the fund before Reserve determined that the Lehman debt had declined in value and consequently reduce the fund's NAV.

To exit an MMF, investors place redemption orders which are accumulated throughout the day and processed at the end of the day at the end-of-the-day NAV. This process is discussed in a fund's prospectus.[24] Hence, Reserve's investors were attempting to move before the Board recognized the reduction in the value of its position in Lehman; a process which took 2 days in this case. However, with the Federal Reserve and the Treasury unable or unwilling to prevent Lehman from going bankrupt, the valuation of the 21% of Reserve's portfolio held in FCP was now an open question and investors attempted to exit the fund before these positions lost value. To further our point that investment in Lehman was only a symbol of the problem, Putnam Prime Money Market Fund was swamped by calls for redemptions even though it had no investments in Lehman.[25]

At roughly 11 a.m. on that Monday, September 15, 2008, the Federal Reserve noticed a flurry of electronic draw down demands from US money accounts of approximately $550 billion had taken place over the previous 2 hours. The Treasury intervened and, later argued that had they not closed down the accounts, they estimated that by 2 p.m. roughly $5.5 trillion would have been drawn out of the US money market system which would have led to a collapse of the world economy within 24 hours.[26] Lehman's bankruptcy filing marked the start of a run on money funds that helped freeze global credit markets and which abated only after the U.S. Treasury Department guaranteed all such funds against losses on September 19.

5 Sponsor's support for MMFs during the financial crisis

When Lehman declared bankruptcy Reserve Primary held $785 million, or about 1.2% of its assets, in the investment bank's debt. Having exposure to Lehman's debt would create losses for Reserve Primary (and potentially "break the buck"), but given that Reserve Primary held such a small percentage of its assets in Lehman debt it would seem that this event should be unlikely to lead to the end of a money market

fund industry leader. However, as we discuss below, at the time of the Lehman Bankruptcy, Reserve Primary had two particular frailties that were exposed by the financial crisis. The first was behavioral on the part of the fund's management team and the second was structural in its access to liquidity.[27]

From the discussion in the previous section, it is clear that the MMF investors had an incentive to move quickly away from any MMF with exposure to the banking industry (both investment and commercial). With this incentive to move quickly to exit MMFs with FCP exposure, an important question is why was Reserve Primary the only MMF to break the buck? The answer appears to be sponsor support and in this section we analyze sponsors' support of MMFs during the financial crisis and with direct exposure to Lehman.

In July 2012, the head of the SEC reported that in the 30-plus year history of money market funds that there have been more than 300 instances where fund families have provided support to their money market funds to prevent breaking the buck.[28] Conversations with industry insiders suggest that the 300 number dramatically overstates that number of times sponsors actually provided support. There are a variety of different reports on MMF sponsor support; a few of those reports are discussed here to determine the role of sponsors' support in MMFs surviving the financial crisis.

Brady *et al.* (2012) examine credit losses and sponsors' support for MMFs beginning in 2007 and extending through 2011. They find 123 instances of sponsor support across 78 funds in the amount of $4.4 billion. Of the 78 funds that received support only 31 received support in excess of 0.5% of assets under management. The 0.5% threshold is important because as long as a fund's NAV is $0.995 or higher the fund is allowed to report the $1 NAV. Reserve Primary is not in this set of funds because it did not receive sponsor support. Brady *et al.* (2012) show that 31 additional MMFs would have broken the buck during the financial crisis without sponsor support, however they do not provide the names of the sponsors.

Kacperczyk and Schnabl (2013) examine sponsors' support immediately following Lehman defaulting on its debt. They report 28 occurrences of sponsors' support from 10/20/08 through 10/24/08 and report the distress reason. Seven of the 28 occurrences of sponsors' support list the Lehman bankruptcy as the reason for distress. Other reasons for distress include AIG notes (8) and the entire fund (6). Additionally, 26 of the 28 funds indicate that the sponsors' support is to maintain fund value at $0.995 with one fund maintaining value at $0.9975.[29] Kacperczyk and Schnabl (2013) provide the names of the sponsors and the sponsors come from three different types of firms: commercial banks (9), investment firms (16), and insurance companies (3). The important insights from this evidence are (1) that direct exposure to Lehman was not a necessary condition for MMF distress, (2) sponsors' support is intended to prevent breaking the buck, and (3) sponsors providing support come from different types of financial institutions.

Comment (2012) reviews MMFs that have received sponsor support and identifies 14 such institutions that held defaulted Lehman debt. We reproduce this list in Exhibit 3 with the addition of Reserve Primary. This exhibit provides a number of interesting insights. First, although Reserve Primary is the largest fund on the list, size does not appear to be a necessary condition for exposure to Lehman. Second, the average exposure to Lehman is 1.79% of fund assets with the maximum at 3.89%. This puts Reserve Primary (with 1.2%) below average in terms of portfolio exposure to Lehman. Third, sponsor support for the

other 14 MMFs is similar to the amount of dollar exposure each fund had to Lehman and each of these 14 MMFs continues on in some form.[30] Finally, the sponsors in this list comprise 10 commercial banks, three investment firms and one insurance company.[31] The mix of sponsors providing support for funds holding Lehman debt is much more heavily weighted toward commercial banks than the general list of distress and sponsors' support provided in Kacperczyk and Schnabl (2013).

The lists of Lehman exposures from Comment (2012) and Kacperczyk and Schnabl (2013) show that Reserve's position in Lehman was twice the dollar value of the next largest position. So, while Lehman was not a large percentage of Reserve Primary's portfolio, it was a large dollar position that the market was unwilling to purchase.[32] Brady *et al.* (2012) show the dollar value of sponsors' support and only two of the 78 occurrences of support were in excess of the $785 million needed to cover Reserve's position in Lehman. Our review of the sponsors' support shows that a substantial number of MMFs received sponsors' support across the crisis and yet Reserve Primary was the only MMF that broke the buck and was liquidated.

The final question is whether Reserve Primary could have survived with sponsor support. To address this question we compare Reserve's last portfolio before the Lehman bankruptcy with the weighted average portfolio of the 14 MMFs in Comment (2012) identified as having positions in Lehman and sponsors' support. Exhibit 4 provides the weighted average portfolio for the MMFs in Comment's (2012) list using each MMF's last portfolio report before the Lehman Bankruptcy. Exhibit 1 Panel B shows the four largest positions of Reserve Primary as: ABCP (36.9%), FCP (20.64%), CD (19.52%), and FRN (12.80%). Exhibit 4 shows the four largest positions for the MMFs in Comment's list as: FCP (29.09%), ABCP (23.78%), CD (17.11%), and RP (10.83%). With the Lehman bankruptcy, financial sector risk increased as the US government was unable or unwilling to rescue a major financial institution. At this point in time, Reserve Primary had about 40% of its portfolio in FCP and CDs. By comparison, the MMFs in Comment's list had about 46% of their positions in FCP and CDs. Accordingly, Reserve Primary does not appear to be substantially more risky than the other MMFs and therefore there is no reason to expect that Reserve Primary could not have survived the financial crisis with sponsors' support.

We conclude that the ultimate downfall of Reserve Primary was the lack of a deep pocket sponsor to provide non-market liquidity. Reserve Primary's redemption requests were about half of the fund's assets while the sponsors' support for the MMF list in Exhibit 3 are about similar to each fund's exposure to Lehman. Thus, it appears that having a sponsor to backstop the fund limited any run on the funds with exposure to Lehman so the sponsors "only" had to support fund's exposure to Lehman.[33] Conversely, it emphasizes the risk undertaken with the belief in an implicit government guarantee of support.

Ironically, Reserve had opportunities to join financial institutions that could have provided the sponsor's support to keep Reserve Primary open and operating. In the 9 months prior to its collapse at least 24 firms including Federated and Bank of New York Mellon considered purchasing the Reserve family of funds but could not agree on a valuation. In January 2008, Reserve had considered five bids which valued the company at between $90 million and $625 million. The Bents considered $1 billion a more appropriate price.[34] Reserve remained independent to its end.

6 Conclusion

Reserve Primary was caught in the perfect storm of its own making. Bent was supposedly purchasing "the carrots and the peas" as others abandoned the ABCP and FCP markets. Institutional investors generally funded these purchases as they joined in large numbers as the Fund chased returns. This process led to a small, for Reserve Primary, investment in Lehman FCP and medium term notes. When the Lehman bankruptcy signaled the beginning of the full-on financial crisis, Reserve Primary's investors ran for the door with redemption requests in excess of half of the fund's assets.[35] With the markets in turmoil and no sponsor to backstop the fund by purchasing the Lehman debt (to prevent breaking the buck), and a crisis growing in the financial markets causing valuation concerns on FCP and similar assets, the run was on at the Reserve Primary Fund and ended with its liquidation.

6.1 Epilogue

On May 5, 2009, the Securities and Exchange Commission filed a civil action in the United States District Court for the Southern District of New York charging the entities and individuals operating the Reserve Primary Fund, including the Reserve Management Company, Inc. (RMCI), its Chairman, Bruce Bent Sr., its Vice Chairman and President, Bruce Bent II, and Reserve Partners, Inc., with fraud for failing to provide key material facts to investors and trustees about the fund's vulnerability as Lehman Brothers Holdings, Inc. sought bankruptcy protection. According to the complaint filed by the SEC, the Bents "engaged in a systematic campaign to deceive the investing public" into believing the Primary Fund was secure despite its substantial Lehman holdings.[36]

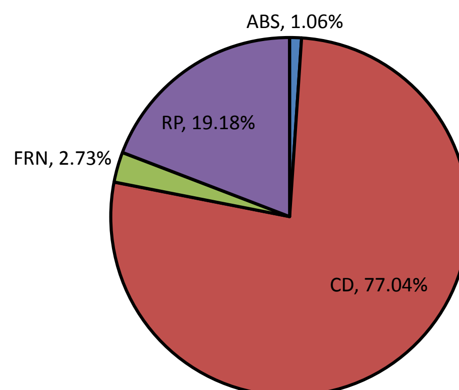
According to the SEC's complaint, the defendants misrepresented that RMCI would provide the credit support necessary to protect the $1 net asset value of the Primary Fund when, in fact, RMCI had no such intention. The SEC also alleged that RMCI significantly understated the volume of redemption requests received by the fund and failed to provide the trustees with accurate information concerning the value of Lehman securities. Investors in Reserve Primary lost access to most of their money for several months following the fund's demise although as of July 2011, shareholders had recovered 99.04% of their investments.[37]

In a statement, the senior Mr. Bent said that his company would defend itself vigorously and that the Lehman bankruptcy had "created an unforeseeable and out-of-control condition for many parties and the results were serious. Our management worked extremely hard throughout the chaotic and fast-moving events of September 15–16 and we remain confident we acted in the best interests of our shareholders." In later court proceedings, consistent with our earlier arguments regarding the creation of a situation of moral hazard, the Bents blamed the US government for Reserve's breaking the buck arguing that the government's refusal to bail-out Lehman Brothers caused the run on the fund.[38]

On August 1, 2011, almost 3 years after the bankruptcy of Lehman Brothers and the ensuing demise of his iconic Reserve Primary Fund, Bent was named one of 60 visionaries of the mutual fund business who "helped to create the foundation of the industry and have led and protected it in the past quarter-century," by New York-based fund research firm Strategic Insight in an e-mailed statement.[39] This position had been presaged by Lynch (1989, p. 69), the former Fidelity Investments fund manager, in his book *One Up on Wall Street* in which he said, "There ought to be a monument to Bruce Bent and Harry Brown for inventing the money-market fund."[40]

Exhibit 1: Panel A

Date: 2/28/06



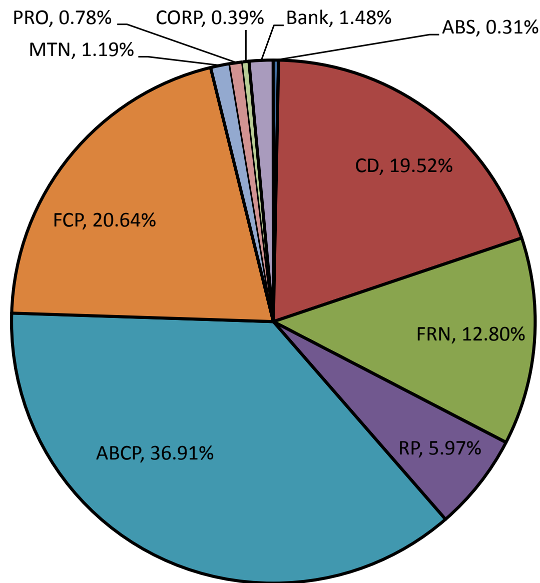
Principal amount $23,664,000,000
Number of securities 51
Average maturity 92 days
Portfolio-weighted maturity 60 days

Issuer (top 10 and ties)	Principal	Type of security	Average maturity
Bear Stearns & Co	2,239,000,000	RP	1
Barclay's bank PLC	1,300,000,000	RP	1
Depfa bank PLC	1,050,000,000	CDF	21
Norinchukin bank	1,025,000,000	CDF	37
Societe generale	1,000,000,000	CDF	55
Washington mutual bank	1,000,000,000	CDUS	82
Deutsche bank	1,000,000,000	RP	1
Bank of Tokyo-Mitsubishi	900,000,000	CDF	36
Svenska Handelsbanken	900,000,000	CDF	181
Barclay's bank PLC	840,000,000	CDF	27

RP = repurchase agreements; CDF = foreign certificates of deposit; CDUS = domestic certificates of deposit.

Exhibit 1: Panel B

Date: 8/31/08



Principal amount $64,154,120,000
Number of securities 333
Average maturity 67 days
Portfolio-weighted maturity 67 days

Issuer (top 10 and ties)	Principal	Type of security	Average maturity
Dexia bank	8,200,000,000	FCP	49
Belmont funding LLC	1,775,000,000	ABCP	37
Chesham finance LLC	1,750,000,000	ABCP	66
Ebbets funding LLC	1,750,000,000	ABCP	47
Crown point capital	1,734,000,000	ABCP	42
Westpac banking corp	1,584,000,000	FCP	55
Elysian funding LLC	1,550,000,000	ABCP	27
Concord minutemen capital	1,532,000,000	ABCP	61
Curzon funding LLC	1,500,000,000	ABCP	65
Societe generale	1,500,000,000	FCP	30

ABCP = asset-backed commercial paper; FCP = financial commercial paper.

Exhibit 2 Monthly commercial paper outstanding in ABCP and FCP.

Each text box provides Reserve Primary's position in ABCP and FCP at the time indicated by the arrow.

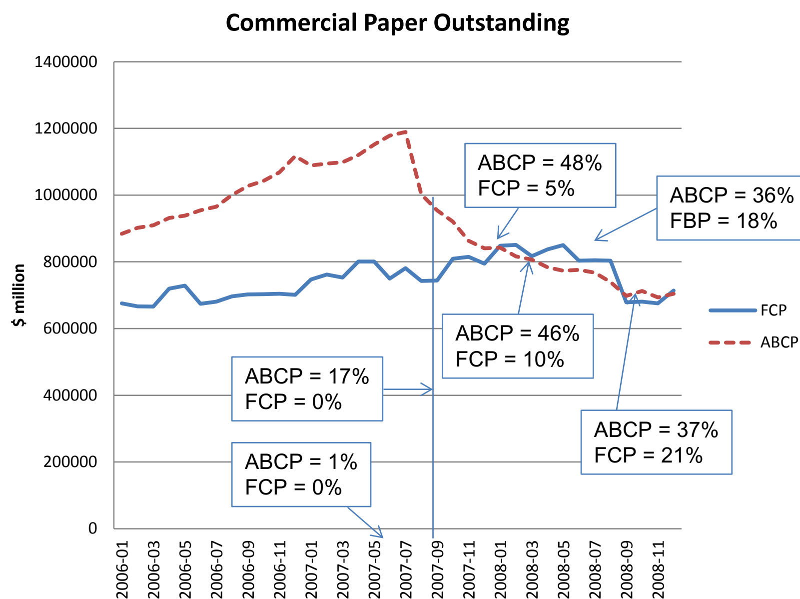


Exhibit 3 Sponsors support attributable to Lehman bankruptcy.

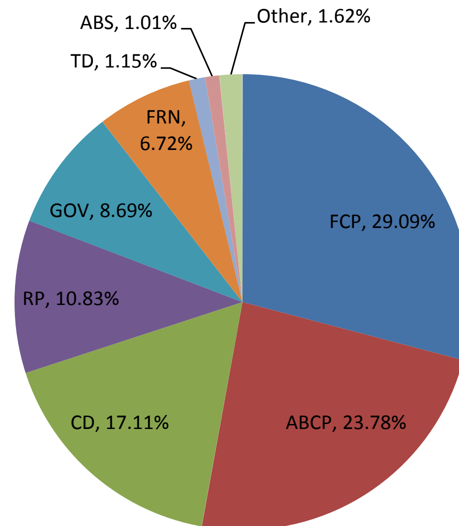
Name	Net assets	Exposure to Lehman	Percent of net assets in Lehman	Sponsor	Percent of sponsor support	Current status
Columbia cash	$51,272,062,847	$400,000,000	0.78%	Bank of America	1.21%	Merged
RiverSource cash	4,979,461,053	40,000,000	0.80	Ameriprise	0.70	Merged
RiverSource short-term cash	3,219,920,983	122,000,000	3.79	Ameriprise	1.61	Merged
Dreyfus basic money market	1,294,928,683	45,000,000	3.48	BNY	2.77	Live
Dreyfus cash management	16,253,381,995	97,200,000	0.60	BNY	0.42	Merged
Dreyfus liquid assets	5,704,779,587	125,000,000	2.19	BNY	1.29	Live
Dreyfus world dollar	699,731,482	20,000,000	2.86	BNY	2.2	Live
Financial square prime obligations	56,144,072,681	140,000,000	0.25	Goldman Sachs	0.18	Live
Evergreen institutional money market	16,149,165,433	309,189,000	1.91	Wells Fargo	1.83	Merged

Exhibit 3 (*Continued*)

Name	Net assets	Exposure to Lehman	Percent of net assets in Lehman	Sponsor	Percent of sponsor support	Current status
Evergreen money market	7,137,274,482	110,000,000	1.54	Wells Fargo	1.70	Merged
Evergreen prime cash management	7,831,993,901	155,000,000	1.98	Wells Fargo	0.84	Merged
ING money market	390,084,330	2,750,000	0.70	ING	0.47	Live
Mount vernon securities lending prime	14,356,365,000	40,000,000	0.28	U.S. Bank	0.24	Live
Russell money market	8,423,590,000	328,000,000	3.89	Northwestern mutual	4.00	Live
Reserve primary	64,536,697,287	785,000,000	1.22	None	n.a.	Liquidated

Note: The list of money market funds with sponsor support is from Comment (2012, Table 2). We also re-produce the Exposure to Lehman and the Percentage of Sponsor Support from Comment's Table 2. Net Assets for the funds are from Morningstar. The authors generated the Percentage of Net Assets in Lehman, the Sponsor and the Current Status.

Exhibit 4



Note: The portfolio mix in this exhibit is a weighted average of the portfolios of the 14 MMFs with Sponsor's support listed in Exhibit 3.

Notes

[1] See, Fortune Magazine, *Their Wildest Dreams*, Erik Calonius, August 16, 1999, http://money.cnn.com/magazines/fortune/fortune_archive/1999/08/16/264297/index.htm, accessed 3/26/13. Henry Brown died in 2008.

[2] Technically, the fund can have an NAV no lower than 99.5¢ which is rounded up to a dollar.

[3] To date, there are two acknowledged instances of breaking the buck: (1) in 1994, when Community Bankers U.S. Government Money Market Fund was liquidated at 94 cents because of large losses in derivatives; and (2) the liquidation of Reserve Primary.

[4] See, Akay *et al.* (2012) for a discussion of the original Rule 2a-7 and its amendment in January of 2010.

[5] As reported in (Chapter 20, p. 356) *The Financial Crisis Inquiry Report*, National Commission on the Causes of the Financial and Economic Crisis in the United States, January, 2011, U.S. Government Printing Office, Washington, D.C.

[6] Complaint, SEC v. Reserve Management Company Inc., Reserve Partners Inc., Bruce Bent Sr., Bruce Bent II, and The Reserve Primary Fund (S.D.N.Y. May 5, 2009), p. 12 (para. 35); "Fidelity, BlackRock, Dreyfus, Reserve Make Big Gains Past 12 Months," Crane Data News Archives, September 12, 2008.

[7] Reported in A Money-Fund Manager's Fateful Shift by Steve Stecklow and Diya Gullapalli, Wall Street Journal, December 8, 2008.

[8] Ibid.

[9] The number of days to maturity of a money market security and thus the average maturity of a money market fund would seem to be a straightforward number. However, under the original rule 2a-7 (in force at this time) the days to maturity were malleable. For example, interest rate reset dates on floating rate notes and auction dates on auction rates securities were allowed as maturity dates under the rule. Thus, money market funds wishing to take extra risk could hold long-term instruments with short-term reset dates.

[10] The event most often identified (Taylor and Williams, 2009) as the beginning of the financial crisis is the August 9, 2007 announcement by BNP Paribas that it had temporarily halted redemptions from three of its funds. Quoting the BNP press release on that day, "(t)he complete evaporation of liquidity in certain market segments of the U.S. securitization market has made it impossible to value certain assets fairly regardless of their quality or credit rating." A timeline of the financial crisis developed by the Federal Reserve Bank of St. Louis lists 10 items prior to this announcement, but none would be considered a major trigger of the financial crisis. The timeline is available at http://timeline.stlouisfed.org/index.cfm?p=timeline.

[11] The benchmark for the spread is the average yield on 30-day non-financial CP across the quarter. We use 30-day non-financial CP because Griffiths *et al.* (2011) find that this rate is the rate least altered by the financial crisis. Typically, T-bill yields would be a good benchmark, but T-bill yields were significantly lowered, relative to other short-term rates, during the crisis due to flight to quality.

[12] The ABCP market was at the center of the financial crisis and declined from about $1.2 trillion outstanding in the month prior to when BNP halted redemption to about $700 billion by the time Lehman went bankrupt.

[13] The increase in spread is due, in part, to the benchmark yield falling more quickly than the portfolio yield. Note that the portfolio has an 83-day average maturity which delayed the decline in portfolio yield for one quarter in a falling rate environment.

[14] Op. cit. Interview with FCIC on March 25, 2010.

[15] Unfortunately, Form N-Q does not provide any data on the identity of fund investors.

[16] Commencing on September 30, 2008 Dexia Bank (Reserve Primary's largest holding) received bailouts of €6.4 billion and was the first casualty of the 2011 European sovereign debt crisis.

[17] To put this into perspective, assets under management at the Reserve family of money market funds grew from about $4 billion in the mid-1990s to $18 billion in 2002. By July 2008, Reserve had $125 billion in assets under management. *Note*: the Reserve family of funds had more than one MMF, so the Reserve family had $125 billion under management while the Reserve Primary Fund had $67 billion.

[18] www.bloomberg.com op.cit.

[19] For a detailed description of the financial crisis, see The Financial Crisis Inquiry Report, National Commission on the Causes of the Financial and Economic Crisis in the United States, January, 2011, U.S. Government Printing Office, Washington, D.C.

[20] Lehman Brothers Holdings Inc. (Chapter 11) Bankruptcy/Corporate Restructuring Solutions, available at www.lehman-docket.com.

[21] For a discussion of credit default swaps during the financial crisis in general, and Lehman's credit default swaps, in particular, see Stulz (2010).

[22] This is where the opacity of Lehman and its relation with the shadow banking system adversely affected Reserve Primary. In normal market conditions, the values of the assets and liabilities of an investment bank are well understood. However, the market was aware of Lehman's role in securitization of mortgages and in trading credit derivatives, both highly opaque markets. Accordingly, the market could not value Lehman's assets and therefore was unwilling to purchase any of Lehman's liabilities (commercial paper and medium term notes) from Reserve Primary. Court documents indicate that Reserve Primary actually broke the buck 5 hours earlier (at 11 a.m. not 4 p.m. as originally stated in media reports). The MutualFundWire.com November 26, 2008. According to the Financial Crisis Inquiry Commission, Primary Reserve management valued the Lehman paper at 80 cents on the dollar at the close of business on September 15.

[23] This section draws from Sleep-at-night-money Lost in Lehman Lesson Missing $63 billion, Bob Ivry, Mark Pittman and Christine Harper, www.bloomberg.com, September 8, 2009.

[24] We have examined several large fund prospectuses from before and after the crisis. The redemption process is discussed before the crisis. However, after the crisis the process is discussed in more detail and is almost a boilerplate presentation.

[25] Putnam closed its Prime Money Market Fund on September 18 and 1 week later sold its assets to Pittsburgh-based Federated Investors.

[26] Reported by Rep. Paul Kanjorski (D) (PA-11), Capital Markets Subcommittee Chair in an interview on C-SPAN Washington Journal, January 28, 2009. See http://www.youtube.com/watch?v=pD8viQ_DhS4. It is not known where Rep. Kanjorski obtained this information other than from a private congressional briefing.

[27] At the point in time of the Lehman bankruptcy, Reserve Primary was a family of funds with 12 constituents: 11 institutional funds and one retail fund. We will use the label Reserve Primary to describe this set of 12 funds, since these 12 funds hold the same mix of assets.

[28] McCabe *et al.* (2012) cite research by the Federal Reserve Bank of Boston that shows that between 2007 and 2010 that 47 MMFs benefitted from either a direct cash contribution from a sponsor or a sponsor purchase distressed asset. In nine of these 47 interventions, the support exceeded 1% of assets under management.

[29] The one other reason was the MMF exchanged $70 million of Lehman notes for $70 million of SunTrust bank notes. SunTrust bank was the fund sponsor.

[30] Moody's Investor Services (2012) provides another source for sponsor's support and provides results similar to Comment (2012).

[31] We include Goldman Sachs in the count of commercial banks because it quickly converted to a deposit taker to gain access to FDIC insurance after the Lehman bankruptcy.

[32] "Bruce Bent told everybody he was safer than anybody else, but looking back he was the same as everybody else," said Mark Schild, president of Beech Hill Securities Inc. in Millburn, New Jersey, who had clients invested in the fund. "Other funds would have broken the buck, but they all had big institutions to feed them money. Reserve didn't." *Sleep-at-night-money Lost in Lehman Lesson Missing $63 billion*, Bob Ivry, Mark Pittman and Christine Harper, www.bloomberg.com September 8, 2009.

[33] Other funds suffering similar losses were propped up by their sponsors. On Monday, Wachovia's asset management unit, Evergreen Investments, announced that it would support three Evergreen mutual funds that held about $540 million in Lehman paper. On Wednesday, BNY Mellon announced support for various funds that held Lehman paper, including the $22 billion Institutional Cash Reserves fund and four of its trademark Dreyfus funds. BNY Mellon would take an after-tax charge of $425 million because of this decision. Over the next 2 years, 62 money market funds—36 based in the United States, 26 in Europe—would receive such assistance to keep their funds from breaking the buck.

[34] The MutualFundWire.com, Thursday October 18, 2011.

[35] While this move may have been unexpected at the time, it is not unique. Blackwell *et al.* (2012) show that during the market turmoil in the summer of 2011 that the five largest Prime Institutional MMFs experienced monthly redemptions that average in excess of 80% of the funds' net assets. Redemptions peaked in August of 2011 with redemptions averaging just under 105% of net assets. Note that redemptions are not equal to net cash flows.

[36] The jury determined that there was not enough evidence for recklessness although it found Mr. Bent II liable on one claim of negligence for his role in communicating with investors. The Wall Street Journal On-Line, November 12, 2012.

[37] Primary Fund-In Liquidation Update, July 29, 2011.

[38] The MutualFundWire.com op.cit.

[39] Reserve's Bent Honored Among 'Visionaries' After Fund Collapse, By Christopher Condon, August 02, 2011 12:01 AM EDT. www.bloomberg.com.

[40] In 2001, Paul A. Samuelson, the 1970 Nobel laureate in economic science, said in a speech that Mr. Brown and Mr. Bent also deserved the Nobel (as reported in the New York Times, Bruce Weber, August 14, 2008, see http://www.nytimes.com/2008/08/15/business/15brown.html?_r=0, accessed 3/26/13). On December 13, 2010, the Bent's were awarded the *Lump of Coal Award* by *Marketwatch* columnist Chuck Jaffee. The award recognizes fundsters for "misguided, bumbling, offensive, disingenuous, reprehensible or just plain stupid" actions. The MutualFundWire.com op. cit.

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