

# The SEC's Attempted Use Of Money Market Mutual Fund Shadow Prices To Control Risk Taking By Money Market Mutual Funds

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## ABSTRACT

*One of the major advantages of money market mutual funds as a short term cash investment vehicle is that they are always purchased and sold for \$1 per share. That constant \$1 share price is maintained, despite the obvious fact that the funds' holdings are frequently changing value, through a permissive SEC regulation that entitles money funds to value their portfolio securities at amortized cost rather than market value. At the same time, funds have always monitored their true market value in what is referred to as the funds' "shadow price", disclosed on a semi-annual basis. Starting in December, 2010, the SEC ordered money funds to publish their shadow prices monthly in hopes that investors would take notice and provide market discipline to money funds that failed to keep the funds' market value sufficiently close to \$1 per share. The expressed intention of the SEC was that investors would restrain money market fund managers from taking undue risks.*

*This study analyzes whether the SEC's strategy is working. By assessing the relationship between money market funds' shadow prices and subsequent changes in net assets, the authors can look for evidence of whether the market is performing the function the SEC intends. The authors have examined monthly disclosures of shadow prices and asset changes for over 100 money market funds since the funds commenced reporting. Through a series of linear regression analyses, the authors have found no relevant correlation between money funds' shadow prices and investor activity.*

*The ramifications of this lack of correlation are potentially significant, particularly now as financial regulators are concerned that money fund holdings of European banks might transmit the current credit deterioration in Greece to U.S. markets. The SEC and other financial regulators are counting on disclosure of shadow prices as a tool to avoid the kind of risk taking that ultimately contributed to the credit market freeze experienced in 2008. If that tool is, in fact, not working, the SEC may be obliged to attempt alternative strategies. The authors discuss the policy implications of their findings.*

**Keywords:** Money Market Mutual Funds; Money Market Mutual Fund Shadow Prices

## INTRODUCTION

*M*oney market mutual funds are not a particularly glamorous sector of the financial universe. They are a collection of short term, highly rated investments designed to keep investors' funds safe and liquid while earning interest at a rate slightly higher than what might be available from commercial bank accounts. They are ultimately creatures of the Securities and Exchange Commission (SEC), only able to exist because of special rules designed to enable their key feature – always trading at \$1 per share. However, over the last

four decades, money market funds have grown to such a size and have become so integrated into the financial system that they have become instrumental to the U.S., and the global, economy. Money market funds now have the ability to pose substantial systemic risk. That risk became highly visible in the wake of the Lehman Brothers failure in 2008 when a single money market fund “broke the buck” and was unable to redeem its shares at \$1. The result of that one money fund failure was a short term credit market in chaos.

Of all the financial markets in the United States, the short term credit market, of which money funds are now such an essential part, is the market the economy can least afford to fail. Without access to short term credit, banks are unable to fund their balance sheets, investment banks are unable to carry inventory, and industrial companies lack the cash to make payroll or purchase products. Not surprisingly, U.S. financial regulators reacted strongly to the events of 2008 and the SEC quickly promulgated a raft of new regulations designed to forestall the recurrence of such an event.

One of the new regulatory requirements that came in the wake of the 2008 market freeze was a requirement for money market mutual funds to disclose the true net asset value of their shares – their “shadow price”- to the SEC on a monthly basis. The SEC would then disclose each fund's shadow price to the public on its EDGAR database after a 60 day delay. The new rule was designed to coopt the market into providing discipline to money market fund managers. Investors are expected to withdraw money from funds that allow their shadow price to decline too far below \$1 and to instead invest in funds that maintain a higher shadow price. This buying and selling pressure from investors is intended to translate into less risk taking by money fund managers.

The study described in this article is designed to explore whether the SEC's strategy is working. The authors have collected data on over 100 money market mutual funds since the SEC began disclosing the information in early 2011. The study uses a series of linear regression analyses to determine if there is a correlation between a money fund's published shadow price and subsequent changes in total assets. In other words, the analyses are designed to detect if there is an overall pattern of investors withdrawing money from funds that allow their shadow price to drop below \$1. To capture different possibilities of when investors may, in fact, learn of a fund's shadow price and how far that shadow price must drop before investors begin to withdraw their money, a number of different regressions have been performed and are described within the body of the article.

## **HISTORY OF MONEY MARKET MUTUAL FUNDS**

In 1971, the mutual fund industry launched a creative new investment product that would allow individual investors to gain access to the short term, institutional credit market (Brennan, 2009). Money market mutual funds invested exclusively in short term, high quality money market instruments, diversified their portfolios to reduce credit risk, and maintained short weighted average maturities to reduce interest rate risk. The result was an attractive alternative to commercial bank accounts that, while uninsured, minimized credit risk and afforded higher rates of return (Nocera, 2009).

What made the product possible, however, was a permissive rule under the Investment Company Act of 1940, Rule 2a-7 (17 CFR § 270.2a-7, n.d.). Rule 2a-7 allowed money funds to price their shares consistently at \$1 even though the true value of the shares fluctuated fractions of a cent up and down as the value of the funds' investment portfolios changed due to interest rate changes and credit events. Rule 2a-7, however, had an important limitation. It made the fixed \$1 pricing only available to money market funds whose true share price (or shadow price) remained within ½ of one cent of \$1 per share, or between \$0.995 and \$1.005. (Rule 2a-7(c)). Any deviation between the shadow price and \$1 per share greater than ½ of one cent would require the Board of Trustees of the fund to take immediate corrective action, such as floating the fund's share price, suspending redemptions or liquidating the fund. (Rule 2a-7(c)(8)(ii)(B)).

Deviating from \$1 per share by more than ½ of one cent or “breaking the buck”, as it is called, was anathematic to money market funds. Investors valued them as a cash substitute and neither individual investors nor corporate cash managers had any interest in a money market fund that might deviate from that \$1 per share price. The Financial Stability Oversight Council in its 2011 report stated, “In particular, institutional investors, which currently account for about two-thirds of assets under management in MMF's, exhibit extreme aversion to absorbing

even small losses.” (Financial Stability, n.d.). Investment managers, accordingly, invested their money fund portfolios so as to avoid any prospect of breaking the buck and in a number of past instances have stepped in to bail out their money funds when unforeseen circumstances brought them to that point (Norris, 1994).

### **THE FAILURE OF LEHMAN BROTHERS AND WHY SHADOW PRICES ARE NOW MORE FREQUENTLY PUBLISHED**

For decades, money market mutual funds enjoyed a secure place in the investment world. Money market fund assets grew from \$292 billion in 1986 to \$3.8 trillion in 2008 before declining to \$2.8 trillion in 2010 (2011 Investment Company Institute Fact Book, 2011). Unlike many securities types, where regulation is focused primarily on disclosure of risks, money market funds have also been regulated on the safety and soundness of the funds' investment portfolios. That regulatory strategy appears to have paid off as during the entire period from 1971 to 2008, only one money market fund ever broke the buck. That fund, the Community Bankers US Government Fund, failed in 1994 due to investments in adjustable rate derivatives and investors ultimately received 96 cents on the dollar for their investment (Condon, 2008). Both retail investors and corporate treasurers viewed money market funds as secure vehicles for short term savings and for transactional cash holdings. It was not until 2008 that financial regulators seriously confronted the systemic risk posed by money market funds.

In September of 2008, Lehman Brothers Holdings Inc., the fourth largest investment bank in the United States, succumbed to declining asset values and filed for bankruptcy. Lehman's failure caused major ripples through the global financial markets (Sterling, 2009). The Dow Jones Industrial Average declined from 11,421.99 to 8,451.19 from September 12, 2008 to October 10, 2008 (Dow Jones, n.d.). Banks in particular were hard hit. Many had exposure to Lehman Brothers either as a trading counterparty or as a creditor. Because no one knew exactly who had what exposure, lending among banks, the lifeblood of the financial markets, declined precipitously (Mollenkamp, Whitehouse, Hilsenrath, & Dugan, 2008). The short term credit markets themselves froze with no one willing to lend for fear of placing their funds with the entity that would turn out to be the next domino in the chain (Rethinking Lehman, 2008).

Money market funds were an integral part of the meltdown. Investors were concerned that their money fund might have exposure to Lehman Brothers and could, at any moment, announce that it had broken the buck. Fund managers experienced net redemptions of over \$120 billion between September 10 and September 17, 2008 (ICI, n.d.). Money fund managers themselves were extremely nervous about investing their assets and sought the safety of Treasury securities. Money funds eschewed commercial paper and certain industrial companies reportedly lost access to the short term cash markets (Mollenkamp, *et al.*, 2008). Ultimately, the Treasury and the Federal Reserve stepped in to free up the market. The Treasury provided the Temporary Guarantee Program for Money Market Funds which guaranteed shareholder investments in any money market fund that participated in the program (Report of the President's Working Group, 2010, p12). The Federal Reserve provided the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility which provided funds to commercial banks to purchase asset-backed commercial paper from money funds (Report of the President's Working Group, 2010, p12-13). In the course of the dislocation, one money market fund (the Reserve Primary Fund) lost sufficient value that it broke the buck (Waggoner, 2008).

Financial regulators reacted dramatically to the Reserve Primary Fund failure. The President's Working Group on Financial Markets proposed a broad restructuring of money fund regulation which is still working its way through the political process (Smith, 2011). Current options under discussion include forcing all money funds to price their shares at net asset value rather than the \$1 fixed price, providing an emergency liquidity facility for money funds, and converting money funds with stable share prices to special purpose banks (Report of the President's Working Group, 2010). The SEC acted more quickly, making several amendments to Rule 2a-7 effective as of May, 2010. The amended Rule increases money funds' liquidity requirements and credit quality standards, decreases the maximum weighted average maturity of funds from 90 days to 60, and provides for additional reporting (Regulatory Advisory, n.d.).

One of the most important reporting requirements promulgated after 2008 was the new rule for shadow price reporting. Shadow prices are a form of net asset value calculation. All the assets owned by the money market

mutual fund are priced at current market value and totaled. Any debts of the fund (usually little or none) are deducted from the total assets and the net assets of the fund are divided by the number of shares outstanding (Pricing, 2011). Because money market funds tend to own well known, highly liquid securities, the potential for mispricing money market funds is less evident than it would be for other types of mutual funds that own more exotic, less liquid holdings.

Prior to 2010, money market funds reported their shadow price to the SEC twice a year (ICI-04 Frequently Asked Questions, n.d.). The new regulation requires that starting in December, 2010, money market funds would report their shadow prices to the SEC monthly on Form N-MFP. The SEC would then publish those shadow prices on EDGAR, its own web site, after a 60 day delay (Regulatory Advisory, n.d.).

The express purpose of this disclosure is to bring discipline to money market fund managers. “Finally, the new rules impose requirements to disclose portfolio holdings and mark-to-market (shadow) NAV, which gives the SEC a window on MMF activity and helps investors impose strong market discipline.” (Financial Stability, n.d.). The U.S. financial regulators assume that investors who see their fund's shadow price drop too far below \$1.00 will begin to redeem their shares. Investor redemptions would be priced at \$1 per share and would concentrate the losses on the remaining shareholders until eventually the fund's shadow price dropped below \$0.995 and the shareholders still in the fund at that time would bear the loss. Leary of being one of the investors in the money market fund when its shadow price finally dropped below \$0.995, investors would tend to redeem at the first sign of trouble. Money market fund managers wishing to avoid that kind of investor stampede would manage the fund in such a way as to keep the shadow price at or near \$1.00. Funds that maintained a shadow price consistently at \$1 or above might even draw additional investor money, resulting in a larger fund and more fee income for the fund manager.

## **DATA AND METHODOLOGY**

The purpose of this study is to determine whether the shadow price disclosure requirements are serving their purpose. Are investors reacting to changes in shadow pricing by withdrawing funds from money market funds whose shadow price falls below \$1? The study uses a series of linear regression analyses to determine the correlation between shadow price disclosure and investor activity.

Because monthly shadow prices only began to be disclosed by the SEC in 2011, the data set for analysis is limited in terms of the number of monthly iterations. The study, however, includes ample data points by incorporating data from 106 funds in the analysis. The funds included represent approximately \$825 billion dollars in net asset value or approximately 30% of all money market mutual fund assets. The data for the study is deemed to be reliable as it was sourced directly from the SEC's EDGAR database. That data in EDGAR is provided by the mutual fund companies, themselves, to the SEC with substantial penalties available for funds which fail to make accurate reports.

The study tracks shadow prices as of November 30, 2010, to August 31, 2011, and changes in assets for that same period. As a first pass at the analysis, shadow prices were compared to changes in assets occurring between 60 and 90 days after the shadow price was established. Measuring the change in assets between 60 and 90 days after the shadow price is established allows for the SEC's 60 day delay in publication and then allows investors 30 days in which to react to the published shadow price.

It is possible, however, that information with respect to shadow prices might reach the market before 60 days after the shadow price is established. Some mutual fund companies might, intentionally or unintentionally, release shadow pricing data to the public before the SEC publishes the information on EDGAR. This might be particularly true for institutional funds and especially if there were negative news that caused investors to need reassurance as to the soundness of the fund. To capture that possibility, a second pass at the analysis measured the correlation between shadow prices and investor activity for the month immediately following the establishment of the price. Finally, in order to capture both effects, a third analysis measured the correlation between shadow prices and investor activity for the full 90 days following the establishment of the price.

It can be argued that one should not see significant correlation between shadow price and investor activity unless and until the shadow price falls below \$1. Certainly before then investors would have less motivation to respond to a fund's shadow price. The regression analyses were therefore run separately on only those fund months with shadow prices \$1 and above (about seventy percent of the overall data points) and for those fund months with shadow prices below \$1 (about thirty percent of the overall data points).

Occasionally fund managers will amend their total assets reported after the initial disclosure is made by the SEC. In order to protect the integrity of the analyses, these changes would require that the regressions be run either with the amended data or with the data as initially reported. The authors determined to analyze the data both ways, running the regressions with the initially reported data and with the data as amended, and found that the amendments were insignificant to the outcome of the analysis. There were no significant changes in R squared values in any of the regressions using initially reported total assets versus amended assets.

## **FINDINGS**

Overall, using the methodology and data described above, the study found no meaningful correlation between shadow prices and investor activity, either immediately after the shadow price was established or after the information was made public by the SEC. There was a slight increase in correlation between shadow prices and investor activity as shadow prices declined below \$1 but the relationship never reached a level where it could be considered statistically significant.

The first series of regressions compared each fund's shadow price to changes in net assets of the fund for the 30 day period beginning 60 days after the date the shadow price was established. The 60 day delay is to account for the time the SEC holds the shadow price information before releasing it to the public. The 30 days immediately following that 60 day delay, should, in theory, reflect investors' first opportunity to react to the fund's shadow price. The regression was run separately for all funds in the study for all months available (approximately 940 data points), and then separately for only those fund months in which the shadow price was \$1 and above (approximately 660 data points) and for only those fund months in which the shadow price was under \$1 (approximately 280 data points).

The results of the first series of regressions for all funds in all months regardless of shadow price was an R squared value of 0.000207383, providing essentially no predictive value. The R squared for fund months \$1 and above was 0.000153054, even lower than for all funds. The R squared for fund months with shadow prices under \$1 was 0.002114269, over ten times higher than the R squared value for all funds but still not a significant correlation.

The second series of regressions considered whether investors might have other means of attaining shadow price information other than waiting for the SEC's disclosure, 60 days after the price is established. Many mutual fund companies, for instance, provide significant information about their money market funds on their own web sites. This disclosure sometimes includes a current list of fund holdings on a significantly more timely basis than the shadow prices reported by the SEC. Investors might be able to determine an approximate shadow price for their money market funds using those holdings reports, or other sources inside or outside the fund company. To capture that possibility, the second series compared each fund's shadow price to changes in net assets of the fund for the 30 days immediately after the date the shadow price was established. Like the first series, these regressions were run for all fund months, and separately for fund months with shadow prices \$1 and over and fund months with shadow prices under \$1.

The result of the second series of regressions for all funds in all months was an R squared value of 0.000180798. The R squared for fund months \$1 and over was 0.000175787, and the R squared for fund months under \$1 was 0.005372188. The fact that this final R squared is slightly higher than the R Squared value for fund months with shadow prices under \$1 after the SEC imposed 60 day delay could theoretically lend credence to the notion that investors have access to shadow price information outside of the SEC's disclosure regime. The correlations, however, are still so tiny as to make it impossible to draw any such conclusions based on the data.



The final series of regressions sought to capture both effects, the effects of investor activity both before and after the SEC publicly disclosed each fund’s shadow price. To that end, the third series compared each fund’s shadow price to changes in net assets of the fund for the 90 days immediately after the date the shadow price was established. Again, the regressions were run using three different data sets, for all fund months regardless of shadow price, for fund months with shadow prices \$1 and over, and fund months with shadow prices under \$1.

The result of the third series of regressions for all funds in all months was an R squared value of 0.000731864. The R squared for fund months \$1 and over was 0.000167943, and the R squared for fund months under \$1 was 0.015100403. This final regression represents the highest correlation found in the study but as it only provides a 1.5% predictive value it still fails to demonstrate any reasonable correlation between shadow prices and investor activity.

**Summary Of Regression Analyses Results**

	R-Squared		
	All	\$1 and Over	Under \$1
Shadow price versus investor activity after SEC disclosure	0.000207383	0.000153054	0.002114269
Shadow price versus investor activity before SEC disclosure	0.000180798	0.000175787	0.005372188
Shadow price versus investor activity before and after SEC disclosure	0.000731864	0.000167943	0.015100403

**THE IMPLICATIONS FOR MONEY MARKET FUND REGULATION**

The implications of the lack of correlation found between shadow price disclosures and investor activity are potentially significant from a regulatory policy point of view. Financial regulators have a philosophical preference for allowing markets to discipline financial institutions. Financial regulation in the U.S. relies heavily on market forces to reward firms that perform well and punish firms that do not. One of the major criticisms of the banking deposit insurance regime is that it creates a moral hazard by encouraging depositors to patronize the riskiest institutions (who tend to pay the highest rates) (McCoy, 2007). Because bank depositors enjoy the protection of federal deposit insurance, they need not fear losing their deposits and therefore fail to provide discipline to the banking industry. This study, however, indicates that money fund investors are not presently providing discipline to money fund advisors despite the absence of a government insurance program during the period of the study. It would instead provide evidence that investors have already succumbed to the moral hazard of believing that money market funds are not subject to risk of loss.

It is possible that investors did not provide the hoped for discipline during the period of the study because it was not needed. The study captures only the first few months of the SEC’s strategy being in operation and during that period there was not a Lehman Brothers-type failure to motivate investors to discipline their fund managers. Nonetheless, the time frame of the study was a period in which money market funds were often in the news. The financial media published a number of stories about the financial crisis in Greece and its possible negative effect on money market funds through major French banks that are both lenders to Greece and borrowers from money market funds. (Tudor, 2011), (Farrell, 2011), (Coy, 2011), (Crane & Holding 2011). If there were a period in which headline risk would cause an investor to investigate the safety of their money market funds, the period of the study should qualify.

It also is possible that as a particular fund’s shadow price fell closer to \$0.995 (the point at which the fund would break the buck) the market would take notice and investors would begin to withdraw funds in substantial volumes. The lowest shadow price recorded in the data for the study was \$0.9983. One could certainly imagine investors being more motivated to withdraw their money as a fund’s shadow price reached \$0.997 or \$0.996. Even if a data point at that level had existed in the data analyzed by the study, the effect of investor activity in that one fund could have been severely muted by the size of the sample analyzed. The authors have presumed, however, that the SEC’s goal is not to cause troubled funds to break the buck more quickly, but rather to provide a broad based

market discipline favoring funds that tend to maintain higher shadow prices. It is that broad based discipline that the study indicates is currently absent.

Without the assistance of the market to help discipline money market fund advisors, the SEC's obvious alternative might be to shoulder more of that burden through regulatory activity. Money market funds may need to be more frequently examined, more carefully monitored or more tightly constrained. The drawback of such an approach, of course, is that it sets the regulator and the industry in a state of perpetual conflict. The regulatory enterprise is also grossly understaffed and underfunded in terms of resources compared to the industry. In a speech given on January 27, 2010, Commissioner Aguilar made the point that the industry has grown from one fund in 1971 to over 750 funds and over \$3 trillion in assets with very little growth over that same period in SEC staff responsible for regulating money market funds (Aguilar, 2010). The result can be one in which the SEC finds itself forever behind in a race to control the creativity of the industry seeking to take on a preferred level of risk without incurring the regulatory cost.

A possible alternative to applying more regulatory pressure might be to make a more clear call for investor discipline by making shadow prices more public, more quickly. Retail investors are unlikely to check the SEC's EDGAR database before purchasing a money market fund and even institutional investors might see this as an inefficient use of time and resources when the investment is likely to be very short term and the shadow price information available is already over 60 days out of date. If, instead, investors were able to access a fund's shadow price with less delay (perhaps 30 days or even in real time) and if funds were required to publish the shadow price on their own web sites within that time period, it might conceivably result in a greater correlation between shadow prices and investor activity.

Such a possible revision to the rule would involve a delicate balance as shadow prices that are too recent and too obvious might generate the kind of investor stampede that the rules are intended to avoid. If, however, financial regulators are interested in applying market discipline to money fund risk taking it appears they are going to have to make it less effort with greater rewards to the market. The results of the study indicate that the risk/reward criteria for harnessing the market's activity have not yet been satisfied.

## **CONCLUSIONS**

This study is an example of how sometimes the absence of notable results is, itself, noteworthy. Notwithstanding the variety of regressions run by the authors, the results remain the same. The data provides no indication of a correlation between money fund shadow prices and changes in fund total assets. Interesting, because the entire reporting regime was instigated to create such a correlation. One could argue that the study is too longitudinally limited to detect the correlation but if that is true it cannot be helped. The study captured data for all months available. The study would have to be repeated at a future date to determine if more months of data would make a difference.

The results of the study are potentially troubling from a regulatory policy perspective. If indicative of the investing public's fundamental attitude regarding money market mutual funds, the results suggest that market discipline is unavailable as a risk control device. If the SEC maintains its policy goal of further limiting risk taking by money fund managers it will either have to provide greater incentives to investors to supply that discipline or it will have to resort to means other than market forces. Either approach is available to the SEC. What may not be available is to do nothing. The potential systemic risk to the economy from money market funds has become too large to ignore.

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NOTES