Shadow Banks, Money Market Funds, and Regulation: How Much is Too Much?

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ABSTRACT

This paper examines the development of the shadow banking sector in the US leading up to the global financial crisis of 2007-2008. Shadow banking, or nonbank financial intermediation, consists of credit intermediation that takes place outside of the traditional banking sector. This can include off-balance sheet operations at banks and finance holding companies as well as operations at other nonbank financial companies. The paper reviews how shadow banking emerged as a result of regulatory arbitrage and the search for higher returns before considering how it contributed to the buildup of systemic risk leading up to the crisis. It specifically examines the role of money market funds (MMFs) in supporting shadow banking. Finally, it engages with the reforms that emerged in the US in the wake of the crisis, concluding that more regulation is not necessarily the solution and advocating for a more holistic strategy geared towards oversight and supervision.

INTRODUCTION

The term “shadow banking” emerged in the financial vernacular in the wake of the 2007-2008 global financial crisis due to the role nonbank financial institutions played in the credit boom leading up to the crisis. Despite its nefarious name, shadow banking rather benignly consists of forms of credit intermediation that take place outside of the traditional banking sector. It can support economic activity by providing a valuable alternative source of credit for many firms and households (Federal Reserve Bank of New York, 2012). By diversifying their clients’ financing options, shadow banking activities facilitate competition between credit providers, which can produce credit solutions better tailored to individual actors’ needs (Financial Stability Board, 2020). Like banks, shadow bank entities perform services that include maturity, credit, and liquidity transformations; but unlike banks, they do not receive explicit or direct access to central bank liquidity or public sector credit guarantees—namely, traditional banks’ lender of last resort and their access to deposit insurance (Federal Reserve Bank of New York, 2012).

Such drawbacks, while excluding shadow banks from the stringent capital and liquidity requirements traditional banks must meet—thus creating opportunities for regulatory arbitrage—create a large potential for the shadow banking system to accumulate risk and run into liquidity problems. Since shadow banking entities rely on short-term maturity transformation, as banks do, they can also experience “runs”, which are an inherent risk for any entity engaged in liquidity and maturity transformation. However, not only do shadow banks lack the liquidity and credit guarantees that banks receive in order to mitigate the risk of runs, but they also do not receive the same oversight and regulation that discourages banks from engaging in risky activities in the first place. Also like the banking system, a run can create contagion risk and support procyclicality in the system by providing plentiful credit in good times but a smaller supply in bad times when people need it the most (Financial Stability Board, 2017).

This paper will focus on the development of the shadow banking activities in the US that contributed to buildup of systemic risk leading up to the Global Financial Crisis (GFC), specifically examining the role of money market funds in supporting these operations. It will mostly refer to the narrower definition of nonbank financial intermediation (which we will call “shadow banking activities”) that emerged with the transformation of the US banking system from a credit-risk intensive process to a market-risk intensive, wholesale funded, and fee-based process (Federal Reserve Bank of New York, 2012). The change in the system gave rise to entities that benefited from regulatory arbitrage to create new means of credit provisioning in and around the traditional banking system. After reviewing the system that emerged in the runup to the crisis, the paper will examine the particular role of money market mutual funds (MMFs) in this system. Finally, it will engage with the US reforms that emerged in the wake of the crisis before evaluating their efficacy and identifying their drawbacks.

SHADOW BANKING: WHAT IS IT AND WHY IS IT A PROBLEM?

The shadow banking system thrives off the extra returns offered by the lack of regulation in more opaque corners of the financial sector. Shadow banking activities conducted by both entities close to the banking system, like off-balance sheet operations at banks and finance holding companies, and those further removed, like hedge funds and finance companies or insurance companies and pension funds, can generate risk that might spillover into the regular banking system (Financial Stability Board, 2017). As a result, a wide variety of operations might qualify as shadow banking activities, including asset-backed commercial paper channels, structured in-
investment vehicles (SIVs), credit hedge funds, money market mutual funds, securities lenders, limited-purpose finance companies (LPFCs) and government-sponsored enterprises (GSEs).

“The shadow banking system thrives off the extra returns offered by the lack of regulation in more opaque corners of the financial sector.”

The New York Federal Reserve divides such operations into four categories, defining shadow banking as any form of credit intermediation that is implicitly enhanced by official guarantees (debt issued or guaranteed by government-sponsored entities, reliant on the taxpayer), indirectly enhanced by official guarantees (off-balance sheet activities of depository institutions like credit card loan commitments and lines of credit to conduits), indirectly and implicitly enhanced by official guarantees (bank-affiliated hedge funds, money market mutual funds, securities lending activities of custodian banks), or unenhanced by official guarantees (securities lending activities of insurance companies, pension funds and certain asset managers that don’t have access to official liquidity channels) (Federal Reserve Bank of New York, 2012). Looking at the system a different way, we can also divide shadow banking activities between those conducted by GSEs, like Fannie Mae and Freddie Mac; “internal” shadow banking operations that emerged among domestic US banks conducting off-balance sheet securitization and using asset-management techniques that let financial holding company (FHC)-affiliated banks lend with less capital; “external” shadow banking operations that take advantage of funding and maturity transformation of structured credit assets from offshore financial centers and Europe, in addition to the US; and the “parallel” banking system that includes nonbank finance companies and asset-backed securities intermediaries driven by specialization and comparative advantage over regular banks. After the GFC, the majority of shadow banking activities outside those performed by GSEs exist in the parallel sub-system, since many of the “internal” and “external” sub-systems relied on pre-GFC economic and regulatory conditions (Federal Reserve Bank of New York, 2012). This paper will focus on those internal shadow banking activities that amplified the crisis in the US, as well as the means of facilitating shadow banking across all four types, and the reforms enacted in the wake of the GFC to mitigate the accumulation of risk in such activities.

THE BUILDUP OF RISK

The internal shadow banking system emerged as a result of regulatory arbitrage in the 30 years preceding the GFC. Before this shift, banks operated as low return-on-equity (RoE) entities that originated, held, and funded loans through the use of deposits until they reached maturity. With the transformation, the FHC-affiliated banks could become high RoE entities by originating, warehousing, and securitizing loans that they then distributed to other entities or retained in their own off-balance sheet asset management vehicles (Federal Reserve Bank of New York, 2012). Of course, such off-balance sheet liabilities did not factor into these banks’ calculations of capital requirements or liquidity requirements, at least not before the GFC. As a result, through off-balance sheet securitization and asset management techniques, FHC-affiliated banks could lend with less capital than would have been required had they kept the loans on their balance sheets, thus carving out a higher RoE. More specifically, the bank subsidiary, underneath the FHC, would originate the loan, warehouse and accumulate these off-balance sheet loans in a conduit managed by a broker-dealer subsidiary. These loans rely on wholesale funding markets like money market funds (MMFs)—importantly, a less liquid form of funding that is supposedly enhanced by the liquidity of the bank behind the operation. The broker-dealer subsidiary then securitizes the loans and transfers them into a special purpose vehicle (SPV), which is the off-balance sheet structure of the loan. Finally, the safest tranches of structured credit assets receive funding in another off-balance sheet asset-backed securities intermediary, such as a structured investment vehicle (SIV) (Federal Reserve Bank of New York, 2012).

Whereas a traditional bank originates, funds, and manages the risks of its loans all on its own balance sheet, shadow banking activities evidently involve increasingly complex credit intermediation channels. In addition to the bank subsidiary, many loans and mortgages in the US would pass through a network of broker-dealers, asset managers, and other vehicles, all under the FHC umbrella. And instead of receiving funding through deposits, they would rely on other short-term funding options like MMFs and commercial paper (Federal Reserve Bank of New York, 2012). Increasingly opaque credit channels make it more difficult for liquidity to find its way through the system when it comes under stress. In other words, the bank subsidiary is the only actor with access to deposit insurance and liquidity channels through the Federal Reserve discount window, but the other entities involved in the loan process take just as large risks without as direct of a backstop, since they do not have easy access to these services. Plus, due to the interconnectedness of the system, the risk incurred by shadow banking activities in turn amplifies risk throughout the entire system and creates more opportunities for contagion (Financial Stability Board, 2017).

A CLOSER LOOK AT MMFS

Short-term funding, namely that offered by MMFs, played a large role in building up off-balance sheet risk and accelerating the financial crisis in September of 2008. Generally considered of high credit quality, MMFs invest in instruments like commercial paper, repurchase agreements, and US Treasuries (Gelzinis, 2019). However, even though MMFs invest in these short-term debt instruments (making them more susceptible to roll-over risk) MMF shares are redeemable on demand. Since they intend to maintain a stable net asset value (NAV), MMFs can give investors the impression of the same safety as holding demand deposits—but the federal government does not guarantee MMFs with deposit insurance (Financial Stability Board, 2017). In other words, MMF investors can redeem their shares on demand by selling them back to the fund, but without a government guarantee behind their “deposit”. By calling their shares, investors redeem at per share NAV, which reflects the value of the fund’s assets minus its liabilities. Because MMFs usually managed to maintain a stable NAV of $1 per share
before the GFC, investors felt they could treat MMFs as a safe alternative to bank deposits. MMFs let them diversify their holdings. If the NAV falls below $1, the MMF is said to “break the buck,” which can cause panic among investors. They worry the fund could suffer further losses, so a run-like scenario ensues where investors hurry to withdraw their shares, only increasing the likelihood the fund suffers further losses (Congressional Research Service, 2020).

Given the instrumental role MMFs played in funding the interconnected shadow banking activities examined above, the Lehman Brothers Holding Inc.’s filing for bankruptcy on September 15, 2008 caused major problems for the MMF that held Lehman-issued debt. The next day, the prominent Reserve Primary Fund had no choice but to write off its Lehman debt, causing its per share NAV to drop from $1 to $0.97. In other words, the fund broke the buck, triggering a run in money markets as investors worried that other MMFs would break the buck as well (Congressional Research Service, 2020). Note that the run is what deposit insurance in the normal banking system should prevent from occurring by dissuading depositors of the need to withdraw all of their money for fear the bank would become insolvent, when it is really just illiquid. Traditional banks’ capital and liquidity buffers also guard against this. Since preventing the run greatly lowers the probability that the bank becomes insolvent in the first place, such preventative measures are top priority for bank regulators—but the MMFs aren’t regulated like banks. Within a week of the Lehman bankruptcy, investors redeemed about $300 billion from various MMFs—taking 14% out of the industry. At the Reserve Primary Fund alone, a $62 billion money market fund, investors called about $40 billion in just two days. Holding about 40% of outstanding commercial paper in 2008, the MMF retreat caused companies that issued short-term debt to be shut out of credit markets. MMFs’ role in city and municipal short-term debt markets caused a similar problem as these entities also had to find other sources of short-term funding (Perspectives on Money, 2012). Finally, the money market run put pressure on broker-dealers, who were conducting highly interconnected credit intermediation between many market participants, since they relied on short-term funding solutions like MMFs (Financial Stability Board, 2017). In this way, the run in money markets amplified the credit crunch occurring throughout the financial system at the beginning of the crisis, reflecting the pitfalls of MMFs’ lack of government backstops that might have discouraged a run in the first place.

**IMMEDIATE RESPONSE AND SUBSEQUENT REFORMS**

In an attempt to slow down the redemptions and ease short-term funding markets, in September 2008 the Treasury Department explicitly guaranteed the $1.00 share price for more than $3 trillion worth of MMF shares (Perspectives on Money, 2012). However, the crisis made it clear that the MMF industry needed reform to discourage such large redemptions from occurring in the future. In 2010, the Securities and Exchange Commission (SEC) adopted initial measures meant to reduce the risks of MMF portfolios. The Commission reduced maturity periods, raised credit standards, and put liquidity requirements in place to fortify MMFs’ abilities to meet redemptions. It also mandated the MMFs report more information about their portfolio to the public. According to SEC chairman Mary L. Schapiro’s 2012 testimony before the Senate Committee on Banking, Housing, and Urban Affairs, the reforms supposedly helped the MMFs handle a three week period in June 2011 in which investors called in about $100 billion worth of shares; nevertheless, she points out that these redemptions occurred over a longer period, were of a smaller magnitude, and did not occur in tandem with losses in fund portfolios (Perspectives on Money, 2012). In other words, the 2011 episode did not prove the efficacy of the initial reforms. It is also worth noting that the reform did not require funds to comply with the new expectation to be able to process transactions at prices other than the stable NAV until October 31, 2011 (Money Market Fund Reform). We might see this rule change reflected in Figure 1, which shows a large drop in the total value of US MMFs once they began conducting transactions below the stable NAV shortly before 2012. This might be the result of lower NAVs or less MMF activity overall.

**Figure 1. Total Absolute Market Value of All Holdings of US Money Market Funds (2011-2021).** Note. Original figure; data compiled in the Board of Governors of the Federal Reserve’s historical data on Money Market Funds: Investment Holdings Detail

In 2014, additional reforms to NAV pricing helped to address some remaining weaknesses. This generation of regulation relies on the division of MMFs into three categories: municipal, which are the most creditworthy and invest in securities backed by the US government; and prime, which are investments into corporate debt, certificates of deposits, repurchase agreements, and other corporate instruments. MMFs can also be divided between retail, which means they are held by individual investors, and institutional, which means they are held by organizations. After further review in July 2014, the SEC required all institutional prime and institutional municipal MMFs to float their NAV, as opposed to keeping a stable value, in order to more accurately reflect the market value of the fund (Congressional Research Service, 2020). In other words, MMFs began to buy and sell their shares using the market value of the fund’s assets, theoretically making investors more accustomed to changes in share prices and less likely to call in their shares all at once (Perspectives on Money, 2012). Government and retail MMFs could still use a stable NAV (Congressional Research Service, 2020), and the SEC saved the final compliance date for funds to reclassify as prime or government and for prime funds to float their NAVs until October 14, 2016 (2014 Money Market Fund Reform Frequently
Asked Questions). Likely as a result, in the period between passing the regulation in 2014 and the new distinctions between government and prime coming into effect in 2016, we see a shift in the share that government vs prime funds make up in the market. The greater share of prime funds suggests a greater share of MMFs investing in riskier securities like corporate debt rather than “safer” government securities. However, the addition of prime funds’ floating NAV might also have caused a distortion in the value of prime vs government funds. Finally, some of the shift from government to prime might also be the result of some MMFs reclassifying from government to prime.

The SEC also allowed MMF boards to impose redemption fees up to 2% and redemption gates up to ten days for all non-government MMFs in order to discourage the magnitude and frequency of redemptions, which should help guard against a run. Finally, the SEC reform created macroprudential stress testing requirements for MMFs. These require the funds stress test their ability to maintain 10% weekly liquid assets and minimize the volatility of their principal in the face of hypothetical stress scenarios presented by the SEC. MMFs must demonstrate they can withstand challenges like short-term interest rates rising, certain portfolio security positions downgrading or going into default, and widening spreads in a number of different sectors (Congressional Research Service, 2020).

When it comes to evaluating the new regulation, the Financial Stability Board (FSB) asserts in its 2017 shadow banking assessment that these reforms have helped to lower the vulnerabilities of MMFs and repurchase agreements (Financial Stability Board, 2017). For instance, Figure 3 shows a decrease in the maturity of US MMFs since the early 2010s. This would increase their resilience to liquidity risks since a shorter maturity makes these short-term instruments easier to call in. We see a runup in days until maturity before the 2016 compliance deadline, but otherwise maturity length shows a downward trend with cyclicality we might attribute to the business cycle. This decline has helped contribute to the overall decline in shadow banking activities that contributed to the GFC (Financial Stability Board, 2017).

Additional measures to address the shadow banking sector in the US, which go beyond the scope of this MMF-focused paper, include the establishment of the Financial Stability Oversight Council, specifically tasked to identify and address financial stability threats, in part through its authority to designate a nonbank financial firm as a systemically important financial institution (SIFI) subject to enhanced supervisory and regulatory standards (Gelzinis, 2019). Nevertheless, after an initial drop in the wake of the GFC, MMFs across what the FSB terms the 21+ Euro area Group have grown even larger than their peak in the runup to the crisis (see Figure 4). In fact, collective investment vehicles subject to runs, including credit hedge funds, real estate funds, as well as MMFs, have also grown since the GFC. Finance companies and broker-dealers, who make use of short-term debt instruments like MMFs, have also maintained their high leverage, continued to engage in some maturity transformations, and grown in terms of market size (see Figures 5 and 6) (Financial Stability Board, 2017). On one hand, these trends suggest that the types of shadow banking activities that contributed to the GFC are still major players in today’s financial system, potentially paving the way for future liquidity crunches. On the other hand, the financial system might prefer that shadow banking activity remain in these “known” and now lightly regulated entities, rather than finding new, “unknown” credit intermediaries that regulators do not know to watch for.
CONCLUSION: UNFINISHED BUSINESS?

By definition, shadow banking activities emerge in those portions of the financial sector that can escape direct supervision and prudential standards put in place by regulatory authorities. As a result, bank-like capital and liquidity requirements imposed on one type of credit intermediary should, by the logic of arbitrage, shift market activity to parts of the financial sector not required to bear as high costs in order to hold reserves. The large size of “other” shadow banking activities that the FSB has not identified hints at the potential for market activity to shift to such unknown entities if the known entities come under tighter regulation (see Figure 7). Compared to the total assets of all commercial banks in the US, which follows a steadier growth pattern over the last 20 years (see Figure 8), the dramatic increase in the size of the shadow banking sector of the 21+ Euro Group suggests that traditional understandings of nonbank financial services are failing to capture innovation in the shadow banking sector. In other words, it is not a coincidence that innovations are occurring on the frontiers of regulatory reach and are attracting more capital if they are able to deliver higher yields (at least in good times). The same logic explains how the shifting of loans to off-balance sheet asset management vehicles, which in part relied on short-term funding provided by MMFs, helped turn FHCs into high RoE entities by allowing them to avoid such regulatory requirements. However, in addition to the obvious proposition that more regulation drives activity (particular innovation like that likely captured by Figure 7) to less-regulated areas of the banking sector, regulation also drives activity into less supervised areas of the banking sector. In other words, in spite of the continued growth of shadow banking activities, more regulation is not necessarily the answer, especially if it drives activity from “known” entities—like FHCs’ off-balance sheet activities that supervisors know to keep an eye on—to “unknown” entities like those in Figure 7 that are harder for supervisors to observe.

Regarding the specific case of MMFs, regulatory authorities might still consider additional measures. While the FSOC designation authority should enhance regulatory standards imposed on the largest and most systemically important shadow banks that might rely on money markets, their weakened authority under the Trump administration casts doubts on their ability to effectively designate and supervise these interconnected entities. Additional regulatory options include subjecting prime MMFs to capital buffer requirements that would theoretically guard against large-scale defaults. However, an ability to absorb large defaults would require such a large and costly buffer that returns on MMFs would become comparable to default free securities (Lewis, 2015). Not only would such regulation defeat the whole reason behind holding MMFs, but it would also likely shift investors to other, unregulated types of credit intermediaries.

Given the large size of shadow banking activities that already fall into the “other” category, a more holistic strategy geared towards oversight and supervision, rather than merely regulation, might be more suited to shadow banking. This would involve supervisors regularly assessing a variety of metrics, including the maturity of these various instruments, which gives information about liquidity risks, and, in the context of MMFs, the relative sizes of prime (which are riskier) vs government (safer) MMF markets. Since

![Figure 5. Finance Companies in the 21+ Euro Group (2002-2018). Note. Original figure; data compiled in 2019 FSB Global Monitoring Report on Non-Bank Financial Intermediation](image1)

![Figure 6. Broker- Dealers in the 21+ Euro Group (2002-2018). Note. Original figure; data compiled in 2019 FSB Global Monitoring Report on Non-Bank Financial Intermediation](image2)

![Figure 7. Other (Unidentified) Shadow Banking Activities in the 21+ Euro Group (2002-2018). Note. Original figure; data compiled in 2019 FSB Global Monitoring Report on Non-Bank Financial Intermediation](image3)
gauging risk in a market is so difficult, it is better that supervisors have the data to assess known entities rather than push innovating entities out of their vision with too much regulation. Less regulation would not push these innovators out, and rather leave them in plain sight of the supervisor. A process of monitoring and subsequently regulating only the largest and most systemically important entities theoretically guards against the dangers of contagion spreading to unprepared, highly interconnected actors. Restraint towards smaller shadow banking activities still preserves the higher returns that keeps them in the shadows, without running as great a risk of pushing activity into unknown territory—it is a matter of choosing the known shadows over the unknown shadows, so long as the known shadows are easier to monitor.

REFERENCES


Figure 1. Total Assets, All US Commercial Banks (2000-2020). Note: Figure obtained from FRED Economic Data, Federal Reserve Bank of St. Louis