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SECURITIZATION WITHOUT RISK TRANSFER

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ABSTRACT

We analyze asset-backed commercial paper conduits which played a central role in the early phase of the financial crisis of 2007-09. We document that commercial banks set up conduits to securitize assets while insuring the newly securitized assets using credit guarantees. The credit guarantees were structured to reduce bank capital requirements, while providing recourse to bank balance sheets for outside investors. Consistent with such recourse, we find that banks with more exposure to conduits had lower stock returns at the start of the financial crisis; that during the first year of the crisis, asset-backed commercial paper spreads increased and issuance fell, especially for conduits with weaker credit guarantees and riskier banks; and that losses from conduits mostly remained with banks rather than outside investors. These results suggest that banks used this form of securitization to concentrate, rather than disperse, financial risks in the banking sector while reducing their capital requirements.

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Securitization was traditionally meant to transfer risks from the banking sector to outside investors and thereby disperse financial risks across the economy. However, in the period leading up to the financial crisis of 2007-09, banks increasingly devised securitization methods that allowed them to concentrate risks on their balance sheets which eventually led to the largest banking crisis since the Great Depression.

In this paper, we analyze one form of securitization, namely asset-backed commercial paper conduits (henceforth, conduits), as an example of how banks exposed themselves to such risks. Conduits are structured purpose vehicles set up by large banks. Conduits typically hold medium- to long-term assets claims, such as mortgages, which are financed by issuing short-term asset-backed commercial paper. Similar to regular banks, conduits thus exhibit a significant maturity mismatch between assets and liabilities.

As shown in Figure 1, before the financial crisis asset-backed commercial paper was an important funding source for commercial banks growing from US$650 billion in January 2004 to US$1.2 trillion in June 2007. However, the rise in asset-backed commercial paper came to an abrupt end in August 2007. On August 9, 2007, the French bank BNP Paribas halted withdrawals from three funds invested in mortgage-backed securities and suspended calculation of net asset values.[5] Even though defaults on mortgages had been rising throughout 2007, the suspension of withdrawals had a

[5] The announcement read: "[T]he complete evaporation of liquidity in certain market segments of the US securitization market has made it impossible to value certain assets fairly regardless of their quality or credit rating […] Asset-backed securities, mortgage loans, especially subprime loans, don't have any buyers […] Traders are reluctant to bid on securities backed by risky mortgages because they are difficult to sell on […] The situation is such that it is no longer possible to value fairly the underlying US ABS assets in the three above-mentioned funds." (Source: "BNP Paribas Freezes Funds as Loan Losses Roil Markets," Bloomberg.com, August 9, 2008).

profound effect on the asset-backed commercial paper market. Apparently investors in asset-backed commercial paper, primarily money market funds, became concerned about the collateral backing asset-backed commercial paper and stopped refinancing maturing asset-backed commercial paper. As a result, as shown in Figure 2, the interest rate spread of overnight asset-backed commercial paper over the Federal Funds rate increased from 10 basis points to 150 basis points within one day of the announcement. Subsequently, the market experienced the modern-day equivalent of a bank run and asset-backed commercial paper outstanding dropped from $1.2 trillion in August 2007 to $833 billion in December 2007.

Our analysis shows that the crisis in the asset-backed commercial paper market had a profoundly negative effect on commercial banks because banks had insured outside investors in asset-backed commercial paper. The reason is that banks had provided credit guarantees to conduits, which required banks to pay off maturing asset-backed commercial paper independently of underlying asset values. These guarantees were explicit legal commitments to repurchase maturing asset-backed commercial paper in case of disruptions to liquidity in the market for such paper, not a voluntary form of implicit recourse.[6] The guarantees were mostly structured as "liquidity enhancements", a design that would help reduce their regulatory capital requirements to at most a tenth of capital required to hold for on-balance sheet assets. For the majority of conduits, the credit guarantees were strong enough to cover all possible losses of outside investors. For a minority of conduits, the credit guarantees were weaker and required banks to cover only a share of the losses.

[6] However, there was some scope for implicit recourse in the case of weaker credit guarantees.

We establish these findings using a hand-collected panel dataset on the universe of conduits from January 2001 to December 2008. We document and describe the structure of the credit guarantees that effectively created recourse from conduits back to bank balance sheets. We refer to conduits as securitization *without* risk transfer because outside investors would suffer losses only if the credit guarantees provided by the banks and the value of the conduit assets were both insufficient to repay the asset-backed commercial paper. Hence, this form of securitization did not transfer the risks of the securitized assets risk from banks to outside investors.

Consistent with the motive for setting up conduits being one of "regulatory arbitrage", we find that most credit guarantees were structured as liquidity enhancements to avoid bank's regulatory requirements while exposing banks to the same risks as on-balance sheet financing. In fact, we show that conduit sponsors other than commercial banks (which among financial institutions are subject to the most stringent capital requirements) were far less likely to use such structures. Also, we note that banks based in countries such as Spain and Portugal that do not allow such regulatory arbitrage do not sponsor conduits. These results suggest, and indeed we document, that the effective leverage of commercial banks was significantly larger than that implied by their on-balance sheet leverage or their capitalization from a regulatory standpoint.

In our empirical analysis, we test whether conduits were a form of securitization without significant risk transfer and find three main empirical results. First, we show that commercial banks with larger exposure to conduits had larger declines in stock returns at the start of the financial crisis on August 9, 2007. An increase in conduit exposure (measured as the ratio of asset-backed commercial paper to bank equity) from 0% to

100% (e.g., moving from Wells Fargo to Citigroup) reduced stock returns by 1.5 percentage points in a three-day window around the start of the financial crisis. The effect of conduit exposure on stock returns increases to 2.9 percentage points when we expand the event-window to one month. The result is robust to using alternative measures of conduit exposure and controlling for a large set of observable bank characteristics. We also show that there is no relationship between conduit exposure and stock returns in the pre-crisis period.

Second, we use a novel conduit-level data set to study daily issuances and spreads of asset-backed commercial paper both before and during the financial crisis. We find that conduits with weaker credit guarantees have a larger decline in issuances and a larger increase in spreads after the start of the financial crisis. This finding is robust to controlling for unobservable time-invariant conduit characteristics and unobservable time-variant sponsor characteristics. We further find that the results are stronger for riskier banks (as measured by credit default swap spreads), which suggests that the differential effect across different types of credit guarantees is determined by the financial strength of the sponsor and that credit guarantees are an important part of conduits' ability to issue asset-backed commercial paper after the start the financial crisis.

Third, we examine the extent of realized risk transfer by analyzing whether investors could rely on the credit guarantees offered by financial institutions during the crisis. We take the perspective of an investor that was holding asset-backed commercial paper at the start of the crisis and examine whether the investor suffered losses by not refinancing maturing asset-backed commercial paper. Using announcement data from Moody's Investors Services, we identify all conduits that defaulted on asset-backed

commercial paper in the period from January 2007 to December 2008. We find that all investors in conduits with strong credit guarantees were repaid in full. We find that investors in conduits with weak credit guarantees suffered small losses. In total, only 2.5% of asset-backed commercial paper outstanding as of July 2007 entered default in the period from July 2007 to December 2008. Hence, most of the losses on conduit assets remained with sponsoring banks. Assuming a loss rate of 10%, we estimate that commercial banks suffered losses of $102 billion on conduit assets.

These results raise the question why banks used conduits for the purpose of securitization. We note that asset-backed commercial paper is different from other forms of securitization, such as mortgage-backed securities, in which most of assets' credit risk is transferred to other investors. Instead, conduits are similar to on-balance sheet financing because the conduit assets' credit risk effectively remains with the bank. The main difference between on-balance sheet financing and financing via conduits is that conduit assets are considered off- balance sheet for the purpose of capital regulation and therefore banks need to hold far less regulatory capital against assets in conduits relative to assets on the balance sheet.

Finally, we emphasize that all of our evidence on the performance and effects of conduits is necessarily ex post. It is possible that ex ante the risks of credit guarantees were ignored by bank management due to poor risk management that did not keep pace with that of financial engineering, or ineffective corporate governance, or simply short-termism – phenomena that may have been the result of deeper underlying causes such as increased competition in banking activities, resulting erosion of margins and franchise values, and the moral hazard due to government guarantees such as deposit insurance and

the too-big-to-fail doctrine. Investigating these underlying causes is an important question for future work. It is to be noted, however, that the lack of ex-post risk transfer coupled with the ex-ante structure of credit guarantees that allowed close to zero capital requirements is highly suggestive of leverage-seeking or capital-reducing incentives on parts of commercial banks.

The remainder of this paper is organized as follows. Section 2 presents the related literature. Section 3 discusses the institutional background. Section 4 presents the data and our main empirical results. Section 5 analyzes the incentives of banks to set up conduits. Section 6 concludes.

2. Related literature

Gorton and Souleles (2005), Gorton (2008), Brunnermeier (2009), and Kacperczyk and Schnabl (2009) provide examples of maturity transformation outside the regulated banking sector. Our focus, in contrast to theirs, is to provide an in-depth analysis of the structure of asset-backed commercial paper conduits: how risk transfer was designed to take place through conduits and how it materialized and contributed to the start of the financial crisis of 2007-09.

Ashcraft and Schuermann (2008) present a detailed description of the process of securitization of subprime mortgages, of which conduits were one component. Nadauld and Sherland (2008) study the securitization by investment banks of AAA-rated tranches – "economic catastrophe bonds" as explained by Coval et al. (2008) – and argue that the change in the SEC ruling regarding the capital requirements for investment banks spurred them to engage in excessive securitization. Nadauld and Sherland (2008) view the banks

as warehousing these risks for further distribution whereas Shin (2009) argues that banks were concentrating highly-leveraged risk exposures (given the low capital requirements) by so doing.

Our view in this paper is more along the lines of Shin (2009), Acharya and Richardson (2009), and Acharya and Schnabl (2009a), that banks were securitizing without transferring risks to outside investors, and in particular, conduits were a way of taking on systemic risk of the underlying pool of credit risks. In an analysis focused on the economic causes of the increasing propensity of the financial sector to take such risks (in one class of conduits – the "credit arbitrage" vehicles), Arteta et al. (2008) provide evidence consistent with government-induced distortions and corporate governance problems being the root causes (see also the arguments in Calomiris (2009)). Covitz et al. (2009) use data on asset-backed commercial paper and show that the decline in securitized assets was driven by both market-wide factors and program fundamentals.

Our results on the difficulty in rolling over asset-backed commercial paper and the rise in their spreads are somewhat akin to the analysis of the run on the repo market by Gorton and Metrick (2009). They document that a counterparty risk measure for the banking sector as a whole, the "LIB-OIS" spread, explained over time the variation in the credit spreads of a large number of securitized bonds and the rise in repo haircuts, that is, the difference between the market value of an asset and its secured borrowing capacity. However, there are important differences between our "laboratory" and theirs. While conduits resemble repo transactions to some extent, the presence of explicit credit guarantees in conduits establishes a direct linkage between the ability to issue commercial paper and the guarantees provided by the sponsor. We can therefore test

directly for the impact of the guarantees on commercial paper issuance and spreads using variation across and within conduit sponsors over time.

3. Institutional Background

3.1. Conduit Structure

Figure 3 illustrates the typical conduit structure. A conduit is set up by a sponsoring financial institution (henceforth, sponsor). The sole purpose of a conduit is to purchase and hold financial assets from a variety of asset sellers. The conduit finances the assets by selling asset-backed commercial paper to outside investors such as money market funds or local governments.

Conduits typically exhibit a significant maturity mismatch. Most of the conduit assets are medium- to long-term assets with maturities of three to five years. Most of the conduit liabilities are asset-backed commercial paper with a maturity of 30 days or less. Conduits thus regularly roll over their liabilities and use proceeds from new issuances of asset-backed commercial paper to pay off maturing asset-backed commercial paper.

Most conduits minimize their credit risk by holding a diversified portfolio of high quality assets. Typically, they are restricted to purchasing AAA-rated assets or unrated assets of similar quality. Some conduits exclusively purchase unrated assets originated by their sponsoring financial institutions. Other conduits mostly purchase securitized assets originated by other financial institutions. Many conduits combine the two strategies by purchasing both securitized and unsecuritized assets from several financial institutions.

Outside investors consider asset-backed commercial paper a safe investment for three reasons. First, the pool of conduit assets is used as collateral to secure the asset-backed commercial paper. Second, the conduit's sponsor provides credit guarantees to the conduit, which ensures that the sponsor repays maturing asset-backed commercial paper in case the conduit is unable to repay itself. Third, asset-backed commercial paper is very short-term, so that investors can easily liquidate their investment by not rolling over maturing asset-backed commercial paper.

Conduits can generate significant risks for the sponsor. The sponsor's credit guarantees typically covers the conduit's roll-over risk, which is the risk that a conduit cannot refinance maturing commercial paper, possibly because of a deterioration of conduit asset values. In that case, the sponsor has to assume the losses from lower asset values, because under the credit guarantee sponsors are required to repurchase assets at face value or repay asset-backed commercial paper at par value. In exchange, the sponsor usually receives the entire conduit's profit.

From an incentive perspective, the use of credit guarantees to align risk and rewards within the sponsor is consistent with the optimal allocation of control rights under asymmetric information. Sponsors often use conduits to purchase assets originated by their customers or by themselves and may be better informed about asset quality than outside investors. The use of credit guarantees thus avoids the incentive problem inherent in other forms of securitization, in which the asset originator transfers most of the risks associated with the assets to outside investors. Instead credit guarantees ensure that sponsors have strong incentives to screen the conduit's asset purchases (e.g. see Ramakrishnan and Thakor (1984), Calomiris and Mason (2004) and Keys et al. (2009)).

The credit guarantees are also important because they ensure that asset-backed commercial paper qualifies for the highest available rating from accredited national rating agencies. In turn, the high ratings ensure that money market funds are legally permitted to invest in asset-backed commercial paper (Kacperczyk and Schnabl (2009)).

Conduit sponsors use four different types of credit guarantees which provide different level of insurance to outside investors. The four types of guarantees, ranked from strongest to weakest, are full credit guarantees ("full credit"), full liquidity guarantees ("full liquidity"), extendible notes guarantees ("extendible notes"), and guarantees arranged via structured investment vehicles ("SIV"). We briefly describe the structure of each credit guarantee.

Full credit guarantees are guarantees that require the sponsor to pay off maturing asset-backed commercial paper independent of the conduit assets' value. Full liquidity guarantees are similar to full credit guarantees with the main difference being that the sponsor only needs to pay off maturing asset-backed commercial paper if conduits assets are not in default. In theory, full liquidity guarantees can expire before the asset-backed commercial matures, namely if the conduit assets are in default. In practice, however, full liquidity guarantees provide the same strength as full credit guarantees because the definition of asset default is chosen such that the asset-backed commercial paper matures before the assets are declared in default.

For example, default of unrated assets is usually a function of a slow-moving variable such as a delinquency rate. Hence, if outside investors expect that conduits assets may default in the future, they stop refinancing maturing asset-backed commercial paper. As we show below, throughout the first year of the financial crisis, asset-backed

commercial paper supported by full liquidity guarantees was always repaid in full prior to the expiration of the full liquidity guarantees.

Extendible notes guarantees are similar to full liquidity guarantees with the main difference being that the conduit issuer has the discretion to extend maturing commercial paper for a limited period of time (usually 60 days or less). By extending the maturity of the commercial paper, it is more likely that the conduits assets are in default before the commercial paper matures. From the investor's viewpoint, extendible notes guarantees are therefore riskier than full liquidity guarantees.

SIV guarantees are also similar to full liquidity guarantees with the main difference being that SIV guarantees only cover a share of the conduit liabilities (usually around 25%). In exchange, conduits with SIV guarantees issue longer-maturity debt such as medium-term notes and subordinated capital. Since SIV guarantees only cover some of a conduit's liabilities, we consider SIV guarantees as providing partial insurance to outside investors.

The partial retention of risk, as in the case of extendible notes and SIVs guarantees, is consistent with security design models. In contrast, lack of any risk transfer, as in the case of full credit and full liquidity conduits is at odds with such models unless the underlying assets are mostly all of low quality, an unlikely scenario especially when these conduits were set up. While the desire to get asset-backed commercial paper to be rated highly could explain why sponsor banks provide substantial guarantees to conduits, we explain below that reducing capital requirements explains why they are primarily structured in the form of full liquidity guarantees.

3.2. Capital Requirements

Bank regulators have developed extensive regulation to deal with risks from off-balance sheet exposure such as conduits. Since almost all conduits were sponsored by banks based in the United States and European countries, we focus on bank regulation in these countries.

In the United States, bank regulators historically made a distinction between full credit and full liquidity guarantees. Full credit guarantees were considered to be equivalent to on-balance sheet financing. Hence, assets covered by full credit guarantees required the same regulatory capital charges as assets on the balance sheet. In contrast, full liquidity guarantees were considered to be of lower risk and required no capital charges.

In 2001, bank regulators in the United States started a formal review of its regulatory treatment of full credit and full liquidity guarantees. The review was triggered by the bankruptcy of the large energy company Enron, which had sponsored off-balance sheet vehicles similar to conduits. In response, some observers suggested that conduits should have capital charges similar to on-balance sheet financing, independent of whether they were covered by full credit or full liquidity guarantees. Regulators discussed this issue for two years and, as shown in Figure 1, total asset-backed commercial paper remained stable during that period.

In late 2003, the Financial Accounting Standard Board issued a directive which required commercial banks to consolidate special purpose vehicles in which it was the main beneficiary. This new directive implied that sponsors had to consolidate conduits to which they provided credit guarantees. In late 2004, a consortium of bank regulators,

namely the Office of the Comptroller of the Currency, the Federal Reserve Board, the Federal Deposit Insurance Corporation, and the Office of Thrift Supervision, declared asset-backed commercial paper conduits as being exempted from this directive. Under the exemption, assets in conduits were not considered assets for the purpose of calculating capital requirements. Instead, bank regulators required that banks had to hold capital at a conversion factor of 10% against the amount covered by full liquidity guarantees. This implied that regulatory charges for conduit assets were 90% lower than regulatory charges for on-balance sheet financing (Gilliam (2005)). As shown in Figure 1, asset-backed commercial paper grew rapidly after the exemption was issued.

In Europe, most countries had similar capital requirements as in the United States until 2004. Full credit guarantees had full regulatory charges, but full liquidity guarantees had no capital charges. The only exceptions were Spain and Portugal which required full capital charges for both full credit and full liquidity guarantees (Acharya and Schnabl, 2009b).

The main difference between the United States and Europe was that European banks started to adopt International Financial Reporting Standards (IFRS) in the early 2000s. IFRS, contrary to U.S. General Accepted Accounting Principles (GAAP), do not recognize asset transfers to conduits as a true sale. As a result, European banks were required to consolidate conduits on their balance sheets. However, most European regulators did not update capital regulation following IFRS. Hence, for the purpose of computing regulatory requirements and risk weighted assets, conduits were considered off-balance sheet and European banks did not have to hold any capital against conduit assets.

Another difference between the United States and European countries was that European bank regulators were in the process of adopting the Basel II framework (U.S. commercial banks were still operating under Basel I). Under the Basel II standardized approach, the capital requirements for conduit assets increase from 0% to 20% relative to on-balance sheet financing. Moreover, Basel II assumes lower risk weights for AAA-rated securities, which reduces the level of regulatory charges for both off-balance sheet and on-balance sheet financing. At the time of financial crisis, several European banks had adopted Basel II rules, while others were still operating under Basel I. Importantly, both Basel I and Basel II rules allowed for "regulatory arbitrage" of capital requirements, although it was smaller under the new regime.

3.3. Market Statistics

Panel A of Table 1 shows the ten largest conduits ranked by asset-backed commercial paper outstanding as of January 1, 2007. Nine out of ten conduits are structured with full liquidity guarantees, which is consistent with the regulatory arbitrage motive. We note that most conduits hold AAA-rated assets originated in the United States or the United Kingdom and that most conduits are diversified across several asset classes, with the main ones being residential mortgages and asset-backed securities.

Panel B of Table 1 shows the ten largest sponsors ranked by the guaranteed amount of asset-backed commercial paper outstanding as of January 1, 2007. In the United States, the largest sponsor is Citigroup with conduit assets of $92.7 billion. For comparison, Citigroup's regulatory capital (Tier 1 Capital) is $90 billion. In Europe, the largest sponsor is ABN Amro with $68 billion of conduits assets, which is twice the size

of its regulatory capital (ABN Amro later merged with Royal Bank of Scotland). All sponsors are large multinational banks based in the United States and European countries.

Table 2 provides summary statistics for all conduits authorized to issue asset-backed commercial paper as of January 1, 2007. Panel A shows that there are 301 conduits with total paper outstanding of $1,236 billion. The average conduit size is $4.1 billion with a standard deviation of $5.1 billion. Regarding credit guarantees, 61% of asset-backed commercial paper is covered by full liquidity guarantees, 13% is covered by full credit guarantees, 18% is covered by extendible notes guarantees, and 7% is covered by SIV guarantees.

The largest conduit type is multiseller conduits with $548 billion in asset-backed commercial paper. Multiseller conduits purchase assets from more than one seller. The assets are typically not securitized and the sellers are often clients of the sponsor. The main asset types held by multiseller conduits are trade receivables (15%), securities (12%), auto loans (11%), credit card receivables (10%), and commercial loans (9%). The second-largest type is credit arbitrage conduits with $213 billion in asset-backed commercial paper. Credit arbitrage conduits usually purchase securitized assets from many sellers. The main asset types held by arbitrage conduits are residential mortgage loans (26%), collateralized loan obligations and collateralized bond obligations (21%), commercial mortgage loans (12%), and commercial loans (11%). The third-largest type is single-seller conduits with $173 billion in asset-backed commercial paper. Single-seller conduits are often used by mortgage originators to warehouse assets before they are securitized. Most asset-backed commercial paper is issued in U.S. dollars ($922 billion)

and Euro ($219 billion). The remainder is issued in Yen, Australian dollars, and New Zealand dollars.

Panel B of Table 2 presents summary statistics for all sponsors as of January 1, 2007. We define a sponsor as a single consolidated company and aggregate asset-backed commercial paper at the holding level. In total, there are 127 sponsors, each of which, on average, sponsors $9.7 billion of asset-backed commercial paper. The largest sponsor type is commercial banks, which sponsor $911 billion of asset-backed commercial paper. The second largest type is structured finance groups with $156 billion in asset-backed commercial paper. Contrary to commercial banks, structured finance groups usually do not have the financial resources to provide credit guarantees. Instead they purchase credit guarantees from other financial institutions. Unfortunately our data do not contain information to identify the provider of credit guarantees to conduits of structured finance groups. Other large sponsor types are mortgage lenders ($76 billion), investment managers ($18 billion) and investment banks ($11 billion).

In terms of location, the majority of conduits are sponsored by financial institutions based in the United States with $491 billion of asset-backed commercial paper. A large number of sponsors are based in Germany and the United Kingdom with asset-backed commercial paper of $204 billion and $195 billion, respectively. The remaining $347 billion are sponsored by financial institutions based in other countries, including financial institutions based in Australia, Belgium, Canada, France, Netherlands, and Japan.

In Table 3 we provide a breakdown of credit guarantees by sponsor type. We find that more than 74% of conduits sponsored by commercial banks had full liquidity

guarantees. In contrast, 6% of conduits sponsored by structured finance groups had full liquidity guarantees. Similarly, other sponsor types are also far less likely to provide full liquidity guarantees to conduits. This evidence is consistent with the regulatory arbitrage motive because, as described above, commercial banks has a stronger incentive to reduce capital requirements using this specific structure, whereas the regulation typically does not apply to other sponsor types.

We also note that the geographic distribution of sponsors is consistent with the regulatory arbitrage motive. As mentioned above, bank regulators in Portugal and Spain had the same capital requirements for assets on the balance sheet and conduit assets. Interestingly, we find that banks located in these two countries do not sponsor asset-backed commercial paper conduits.

4. Empirical Analysis

4.1. Data

We use several different data sources for the analysis in this paper. For the first part of the empirical analysis, we use ratings reports from Moody's Investors Service for the period from January 2001 to March 2009. During this period, Moody's Investors Service rated 938 conduits. The rating reports are typically three to five pages and contain information on conduit sponsor, conduit type, conduit assets, credit guarantees, and a verbal description of the conduit. Moody's Investors Service publishes the first report when a conduit is first rated and subsequently updates the reports annually. For some larger conduits, Moody's Investors Service also publishes monthly monitoring reports. Monthly reports are typically one page and comprise information on conduit

size, credit guarantees, and conduit assets. In addition, Investors Service publishes a quarterly spreadsheet that summarizes basic information on all active conduits.

To construct our data set, we start with the universe of conduits collected from Moody's Investors Service's quarterly spreadsheets. We merge conduits that have more than one funding operation (79 out of 9536 observations). We drop asset-backed commercial paper issued by collateralized debt obligations because their credit guarantees are not comparable to the rest of the sample (292 out of 9536 observations).

For each conduit, we aggregate asset-backed commercial paper at level of the consolidated financial company (e.g., we aggregate paper sponsored by Citibank South Dakota and Citibank New York). We use data from Bankscope and Osiris to identify sponsors. Once we identify a potential match, we verify the information using the company website. If we cannot identify a sponsor via Bankscope or Osiris, we conduct an internet search.

We construct a panel of the 300 largest banks as of January 2007 using the Bankscope database. If a consolidated company and its subsidiaries have more than one entry in Bankscope, we only keep the consolidated company. We use the ISIN identifier to match Bankscope data to share price data and stock return data from Datastream. If a bank does not have an ISIN identifier, we verify with the company website that the bank is not listed on a stock exchange. We then match the Bankscope data to the Moody's Investors Service's data.

For the second part of the empirical analysis, we use a proprietary data set on all asset-backed commercial paper transactions conducted in the United States from January 2007 to February 2008. The data set contains 777,758 primary market transactions by

349 conduits over 292 trading days. The data are provided by the Depository Trust and Clearing Corporation (DTTC), the agent that electronically clears and settles directly- and dealer-placed commercial paper. For each transaction, DTCC provides the identity and industry of the issuer, the face and settlement values of the transaction, and the maturity of the security.

Using the DTCC data, we compute prices and quantities for asset-backed commercial paper. We compute overnight spreads as the yield on asset-backed commercial paper minus the federal funds target rate. We calculate the conduit-level weekly growth as the percentage change in asset-backed commercial paper. We merge the DTCC data set with the Moody's Investors Service data set.

For the third part of the empirical analysis, we use Moody's Investors Service Weekly Announcement Reports of rating downgrades from January 2007 to December 2008. We identify all conduits that were downgraded or withdrawn during the analysis period. For all such conduits, we search for an affirmative statement by Moody's Investors Service that all outside investors were repaid prior to the downgrade or withdrawal. If there is no such affirmative statement we use announcements by the sponsor or other rating agencies to determine whether investors were repaid. If we do not find an affirmative statement that all investors were repaid, we assume that the conduit entered default. We note that this coding procedure may overestimate the extent of investor liquidation because investors may have been repaid without an affirmative announcement by either the sponsor or the rating agencies.

4.2. Effect of Conduit Exposure on Sponsor Stock Returns

This section analyzes whether banks with higher conduit exposure experienced lower stock returns at the start of the financial crisis. The difficulty in testing this hypothesis is that the financial crisis also affected banks in other ways, some of which may be correlated with conduit exposure. Hence, if we observe that banks with higher conduit exposure have lower returns, then this result may be driven by other bank activities that negatively affect stock prices and are correlated with conduit exposure.

To address this identification issue, we focus on the start of the crisis in the asset-backed commercial paper market on August 9, 2007. We believe this provides a good setting to identify the impact of conduit exposure for two reasons. First, the financial crisis arguably started with the announcement of difficulties in the subprime mortgage market. As shown in Figures 1 and 2, starting on August 9, 2007, investors drastically reduced refinancing of maturing asset-backed commercial paper and, as a result, overnight spreads jumped from 10 basis points to 150 basis points. Hence, it is unlikely that the event study is confounded by other events that happened just prior to August 9, 2007. Second, our analysis focuses on the narrow three-day window around August 9, 2007. This short event window reduces the likelihood that the results may be confounded by other events that happen around the same time.

We start by examining observable characteristics of banks with and without conduit exposure. We restrict our sample to banks with assets of $5 billion or more as of January 1, 2007, because only these banks had the financial strength to support conduits (our results are robust to including smaller banks). We further restrict our analysis to commercial banks based in Europe and the United States and to banks for which share

price data is available. We choose this restriction because some countries outside the United States and Europe (in particular Canada) allowed for differently structured credit guarantees which are not comparable.

Table 4 shows the distribution of banks by conduit exposure. We measure conduit exposure as asset-backed commercial paper outstanding relative to equity capital as of January 1, 2007. We sort banks into three groups: banks without conduits, banks with low conduit exposure, and banks with high conduit exposure. Consistent with our main hypothesis, we find that stock returns were lower for banks with higher conduit exposure. In fact, the data suggest that stock returns monotonically decrease in conduit exposure.

Columns (3) and (4) of Table 4 show that banks with low conduit exposure and banks with high conduit exposure are fairly similar in observable characteristic such as total assets and equity. The main difference is that banks with low conduit exposure have slightly higher equity ratios and slightly more short-term financing than banks with high conduit exposure. Also, banks with low conduit exposure are more likely to be located in the United States than banks with high conduit exposure.

To control for difference in observable characteristics, we estimate the baseline specification:

$$R_i = \alpha + \beta ConduitExp_i + \gamma X_i + \varepsilon_i$$

where R_i is the cumulative stock return of bank i computed over the three-day period from August 8, 2007, to August 10, 2007, $ConduitExp_i$ is bank i's conduit exposure, X_i are bank i's observable characteristics as of January 1, 2007, and ε_i is a bank-specific

error term. We estimate this specification using robust standard errors to allow for correlation across error terms.

Table 5 presents the results. Column (1) shows that an increase in conduit exposure from 0% to 100% (e.g., Wells Fargo to Citibank) reduces the stock return during the three-day event window by 2.6 percentage points. Column (2) controls for banks size using the natural logarithm of assets and the natural logarithm of equity. The coefficient on conduit exposure decreases to 1.4 percentage points but remains statistically significant. Column (3) adds controls for the equity ratio and the result remains unchanged. Columns (4) and (5) add control variables for funding sources such as the share of deposit funding and the share of short-term debt funding and the results are unaffected. Column (6) adds indicator variables for the country of the sponsoring institution's headquarters. Again, the coefficient of conduit exposure is unaffected and remains statistically significant.

We interpret these results as evidence that banks with higher conduit exposure were more negatively affected by the crisis in the asset-backed commercial paper market. The coefficient is probably a lower bound of the impact, because investors may have underestimated the severity of the downturn or may not have been fully aware of the (relatively opaque) credit guarantees provided to conduits. Also, investors may have anticipated some of the losses because of prior announcements about losses on subprime assets.

To ensure that the results are not driven by outliers, we construct an alternative measure of exposure. We compute the mean exposure of all banks with positive exposure to conduits and divide the banks in two groups: banks with low exposure

(below mean) and banks with high exposure (above mean). We estimate the baseline specification using indicator variables for banks with low exposure and bank with high exposure and in unreported results find qualitatively and quantitatively similar effects. We also drop outliers in terms of conduit exposure and banks with less than $50 billion in assets and our results are qualitatively and qualitatively unchanged.

Our results rely on the identifying assumption that there is no omitted variable that is correlated with conduit exposure and that directly affects stock returns. We think this assumption is plausible because we use to a tight estimation window to isolate the impact of the crisis in the asset-backed commercial paper market. To check the robustness of this assumption, we also estimate the base-line specification for the pre-period. We use the results from this estimation to assess whether conduit exposure is correlated with the outcome variables in the absence of a disruption in the asset-backed commercial paper market.

Table 6 presents the results using a window of 15 trading days before and 15 trading days after the event date. We compute the cumulative stock return in the three-day window around each day and estimate the baseline specification using the full set of controls. Column (2) reports the coefficients on conduit exposure and Column (3) reports the standard errors of the coefficients. In the pre-period, all coefficients are close to zero and statistically insignificant. Hence, there is no evidence that conduit exposure is correlated with stock returns in absence of a disruption in the asset-backed commercial paper market. In the post-period, we find five dates with a significant effect of conduit exposure on stock returns. This finding suggests that stock returns of high exposure banks were more correlated *after* the disruption in the asset-backed commercial paper

market. One possible interpretation of this result is that investors continued to revise their expectation about the negative impact of conduit exposure after the start of the financial crisis.

We also examine the relation of conduit exposure and stock returns in the months prior to August 2007. For each month from January 2007 to August 2007, we estimate the same set of regressions as in Table 4 including all controls. Table 7 present the results. We find no statistically significant relationship between conduit exposure and stock returns from January 2007 to July 2007. However, in the month of the crisis in the asset-backed commercial paper market, August 2007, we find a negative and statistically significant effect of conduit exposure on stock returns after controlling for the full set of observables. The coefficient is twice as large as the coefficient in Table 4. Again, this finding suggests that investors revised their expectation of the negative effect of conduit exposure on stock returns upwards for several days after the start of the financial crisis. However, we caution our interpretation because the estimation is over a longer event window and therefore may be confounded by other factors.

4.3. Impact of Credit Guarantees on Spreads and Issuance

As shown in Figure 1, asset-backed commercial paper declined dramatically after the start of the financial crisis on August 9, 2007. By the end of year, the asset-backed commercial paper market was roughly 30 percent smaller than it was at its peak in July. Importantly for our analysis, the extent of the decrease varied substantially by type of credit guarantee. Figure 4 shows that asset-backed commercial paper covered by extendible guarantees or SIV guarantees decreased significantly more than asset-backed

commercial paper covered by full credit and full liquidity guarantees. Similarly, Figure 5 shows that the overnight spread on asset-backed commercial paper covered by extendible guarantees and SIV guarantees increased more than the spread on asset-backed commercial paper covered by full credit and full liquidity guarantees.[7]

Our hypothesis is that credit guarantees (full credit or full liquidity) are necessary for sponsor banks to obtain highest rating on ABCP of conduits. If this were true, then conduits with such guarantees should face lower rollover risk during the crisis compared to extendible notes and SIVs which had weaker guarantees. To test this impact of credit guarantees more formally, we compute issuances and spreads of overnight asset-backed commercial paper both before and after the start of the financial crisis.

We restrict our sample to the period from January 2007 to February 2008. We choose this period because it captures the main decline in asset-backed commercial paper but does not include later events that may confound our analysis (e.g., Bear Stearns merger, Lehman bankruptcy). We restrict the sample to conduits sponsored by commercial banks because we lack data on the provider of credit guarantees for other conduits. We further restrict our sample to banks for which there is data on CDS spreads (The main results are stronger if we include banks without CDS spreads).

Table 8 presents summary statistics for spreads and growth rates before and after the start of the financial crisis. We find that asset-backed commercial paper decreased for all categories after the start of the financial crisis, but the decrease is stronger for conduits with weaker guarantees. For example, conduits with extendible notes

[7] We focus on overnight spreads because most newly issued ABCP has maturities of 1 to 4 days. According to data from the Federal Reserve Board, roughly 60 percent of newly issued ABCP in the U.S. has maturities of one to four days prior to the crisis. Our results are similar when considering one-month spreads (one month is the second most frequent maturity after overnight).

guarantees went from a weekly growth rate of 0.2% before August 2007 to a negative growth rate of 12.5% after August 2007; in contrast, conduits with full liquidity guarantees went from a weekly growth rate of 0.01% before August 2007 to a negative growth rate of 3.4% after August 2007.

Similarly, overnight spreads increased after the start of the financial crisis for all types of guarantee, but it increased more for conduits with weaker guarantees. For example, conduits with SIV guarantees went from paying the Federal Funds rate for issuing overnight paper before the August 2007 to paying 72 basis points over the Federal Funds rate after August 2007; by contrast, conduits with full liquidity guarantees went from paying the Federal Funds rate before August 2007 to paying 43 basis points over the Federal Funds rate after August 2007. [8]

Next, we test whether the patterns on issuance and spreads by type of guarantee are statistically significant and robust to controlling for unobservable sponsor and conduit characteristics. Our baseline specification is:

$$\Delta CP_{it} = \alpha + \beta Guarantee_j + \gamma After_t * Guarantee_j + Sponsor_k + Time_t + \varepsilon_{it}$$

where ΔCP_{it} represents the log change in the face value of commercial paper outstanding of conduit *i* in week *t*. $Guarantee_j$ is a fixed effect by type of guarantee. $After_t$ is an indicator variable that equals one after the start of the crisis (after August 9, 2007) and zero before the crisis. $Sponsor_k$ and $Time_t$ represent fixed effects by sponsor and by week, respectively. We also estimate regression in which we control for conduit fixed effects $Conduit_i$ and sponsor-time fixed effects $Sponsor_{kt}$.

[8] We note that the summary statistics contain more observations for overnight spreads than growth rates because spreads are reported daily but growth rates are reported weekly. We further note that the summary statistics on overnight spreads comprise fewer conduits than the summary statistics for weekly growth rates because some conduits only issue commercial paper with maturities longer than overnight.

We are primarily interested in the coefficient γ on the interaction of $After_t$ and $Guarantee_j$, which captures the average change in the growth of commercial paper outstanding by credit guarantee after the start of the financial crisis. We cluster standard errors at the sponsor level to allow for the correlation of error terms within sponsors.

If the financial crisis makes investors more concerned about risks in conduits, we expect the interactions between dummies for weaker guarantees and the $After_t$ indicator to be more negative than those for stronger guarantees. Furthermore, if full credit and full liquidity support provide the same level of protection for investors during the crisis, we expect the interaction between the dummy for full credit support with the $After_t$ dummy to be statistically insignificant. Together these hypotheses are aimed at uncovering whether credit guarantees were important for outside investors to roll over maturing asset-backed commercial paper.

Column (1) in Table 9 reports the results of estimating our baseline specification. The significant coefficient on the interaction between the $After_t$ indicator and the dummies for programs with extendible notes and SIVs suggest that asset-backed commercial paper decreased more for conduits with weaker guarantees compared to conduits with stronger guarantees. We note that we include sponsor fixed effects and therefore we compare conduits with different guarantees for the *same* sponsor (i.e., we control for time-invariant unobservable sponsor characteristics). As shown in column (2), the results are similar when we replace sponsor-fixed effects with conduit-fixed effects. The insignificant dummy on the interaction of the after dummy and full credit guarantees suggests that full liquidity and full credit support are statistically undistinguishable after the start of the financial crisis.

In Column (3), we add the full set of interactions of sponsor and time fixed effects to the regression. Hence, the fixed effects control for all unobserved time variation at the sponsor level and the coefficients are identified off only variation within a sponsor across conduits at a given point in time. We find that the coefficients are similar in sign and magnitude but not statistically significant. However, we find it reassuring that our results yield very similar results after controlling for unobserved variation at the sponsor level.

An alternative measure of the strength of the guarantee is the riskiness of the sponsor as measured, for example, by the sponsor CDS spread. We expect that the decrease in asset-backed commercial paper of conduits with weaker credit guarantees is more pronounced if the sponsor is risky. We test this hypothesis by adding sponsor CDS spreads and their two-way interactions with the dummies for type of guarantee and the $After_t$ indicator to the baseline specification.

Columns (4) to (6) of Table 9 report the results. We find a negative and statistically significant effect on the interaction of sponsor CDS spreads with weaker guarantees. This finding suggests that issuance is indeed determined by the strength of the effective guarantee. We note that the result is robust to including conduit fixed effects, sponsor fixed effects, and sponsor-time fixed effects.

We also estimate the impact of credit guarantees on overnight spreads of asset-backed commercial paper. Again, our baseline specification is:

$$Spread_{it} = \alpha + \beta Guarantee_j + \gamma After_t * Guarantee_j + Sponsor_k + Time_t + \varepsilon_{it}$$

where $Spread_{it}$ is the overnight spread (1 to 4 days of maturity) over the Federal Funds rate on new issues by conduit *i* on day *t*. All right-hand side variables have the same

interpretation as in the issuance regression, but time-dependent variables are now measured daily.

Columns (1) to (3) of Table 10 show that, after controlling for sponsor fixed-effects, conduit-fixed effects, and sponsor-time fixed effects, conduits with SIV guarantees have significantly higher spreads after the start of the crisis than other credit guarantees. We also find a positive effect for extendible note guarantees, but the coefficients are not always statistically significant. Columns (4) to (6) add sponsor CDS spreads and their two-way interactions. We find that the increase in spreads for extendible guarantees and SIV guarantees is more pronounced for conduits with riskier sponsors, as measured by the sponsor CDS spread. The insignificant dummy for full credit support suggests that investors price full credit and full liquidity similarly after the start of the financial crisis.

One possible concern with this analysis is that credit guarantees may be correlated with unobservable characteristics that also affect spreads and issuance after the start of the financial crisis. This may be the case if stronger credit guarantees cover assets which perform better during the financial crisis. To the best of our knowledge, most conduits were highly diversified but we cannot control directly for asset composition due to lack of data. However, Moody's Investors Service provides a classification according to investment type, which groups conduits that follow similar investment strategies. In particular, we want to use this classification to distinguish between conduits that invest primarily in assets originated by their own clients (multiseller conduits) and conduits that invest in securitized assets often originated by other banks (credit arbitrage conduits).

To ensure the robustness of our results, we therefore estimate the issuance and spread regressions by conduit type. As shown in Table 2, multiseller conduits and credit arbitrage conduits are the two largest conduit types and represent 62% of asset-backed commercial paper outstanding as of January 2007. We estimate spreads and issuance regressions separately. We note that multiseller conduits primarily use full liquidity, full credit, and extendible notes guarantees and arbitrage conduits primarily use full liquidity and SIV guarantees. We therefore focus our analysis on the main credit guarantees for each conduit type.

We report the main result in Table 11. We focus on regressions with conduit fixed effects and sponsor-time fixed effects. We do not report regression with sponsor fixed effects because they yield qualitatively and quantitatively similar results as regressions with conduit fixed effects. Similarly, we do not report results for regressions with interactions of CDS prices because they yield similar results as above.[9]

For multiseller conduits, Columns (1) and (2) show that extendible notes conduits experience a stronger decrease in commercial paper growth rates after the start of the financial crisis than conduits with full liquidity guarantees or full credit guarantees. For credit arbitrage conduits, Columns (3) and (4) show that conduits with SIV guarantees have larger declines than conduits with full liquidity guarantees. Columns (5) to (8) find similar results for the spread regressions. Among multiseller conduits, conduits with extendible notes guarantees have larger spreads than conduits with full liquidity guarantees or full credit guarantees and, among credit arbitrage conduits, conduits with SIV guarantees have higher spreads than conduits with full liquidity guarantees after the

[9] The results are available upon request from the authors.

start of the financial crisis. Most coefficients are statistically significant except in some of the specifications with sponsor-time fixed effects. Overall, these results suggest the effect of credit guarantees on issuance and spreads is robust for conduits with similar investment strategies.

In summary, we find that after the start of the financial crisis conduits with weaker guarantees decreased issuance more and paid higher spreads than conduits with stronger guarantees. These patterns are stronger for weaker sponsors as measured by CDS prices, suggesting that quantities and prices in the asset-backed commercial paper market are indeed highly correlated with the strength of the sponsoring banks. Also, the patterns suggest that the full credit guarantees and full liquidity guarantees were an important part of rendering asset-backed commercial paper essentially risk-free from the point of view of investors.

4.4. Realized Losses of Outside Investors

This section examines the extent of realized risk transfer by analyzing whether investors were repaid after the start of the financial crisis. We take the perspective of an investor that was holding asset-backed commercial paper at the start of the crisis and examine whether the investor suffered losses by not refinancing maturing asset-backed commercial paper. We test the performance of credit guarantees using Moody's Investors Service announcement data from January 2007 to December 2008. Since all conduits are rated, Moody's Investors Service always issues an announcement if a conduit fails to pay off maturing paper or if a conduit exits the market.

Table 12 presents the results on the realized performance of credit guarantees. Column (1) shows asset-backed commercial paper outstanding per credit guarantee in July 2007. Columns (2) to (4) show the value-weighted percentage in three categories: conduits that were closed down and repaid all maturing asset-backed commercial paper before December 2008, conduits that remained active and repaid all maturing commercial paper up to December 2008, and conduits that have failed to repay maturing asset-backed commercial paper and entered default by December 2008.

The table shows that not a single conduit covered by full credit or full liquidity guarantees defaulted by December 2008. In contrast, 7.4% of conduits covered by extendible notes guarantees and 16.7% of conduits covered by SIV guarantees defaulted by December 2008, respectively. Regarding the sponsor type, we find that conduits sponsored by structured finance firms and mortgage companies were significantly more likely to enter default than conduits sponsored by commercial banks. Overall, we note that 97.5% of outside investors in asset-backed commercial paper were fully repaid.

We also estimate bank losses on conduits. Losses depend on the loss rate on conduit assets and unfortunately there is no publicly available information with respect to loss rates on these assets. The AAA-tranche of ABX-index suggests that the value of collateralized mortgage obligations backed by subprime mortgages dropped by up to 60 percent in months after the start of the financial crisis. The losses on conduit assets are likely to be significantly smaller because most conduits were diversified across asset classes. We therefore assume more conservative loss rates of 5% and 15%. Under this assumption, we estimate total losses on conduit assets of $68 billion and $204 billion, respectively. The estimated losses for outside investors are $1.8 billion and $30.4 billion

respectively. Consistent with the lack of risk transfer, this analysis shows that most of the losses were borne by sponsors rather than outside investors. However, the level of the estimated losses is only suggestive because we lack the data to compute actual losses.

5. Benefits to banks of securitization without risk transfer

The empirical analysis shows that banks suffered significant losses because conduits were unable to roll over maturing asset-backed commercial paper. This raises the question of how large was the benefit to banks from by setting up conduits.

We can assess the benefits to banks by quantifying how much profit conduits yielded to banks from an ex-ante perspective using a simple back-of-the-envelope calculation. Assuming a risk weight of 100% for underlying assets, banks could avoid capital requirements of roughly 8% by setting up conduits relative to on-balance sheet financing. We assume that banks could finance debt at close to the riskless rate, which is consistent with the rates paid on asset-backed commercial paper before the start of the financial crisis. Further assuming an equity beta of one and a market risk premium of 5%, banks could reduce the cost of capital by 8%*5%=0.004 or 40 basis points by setting up conduits relative to on-balance sheet financing.

It is difficult to estimate the profits generated by conduits because only a few banks report revenues from conduits. For example, Deutsche Bank reports in its annual report in December 2007 that conduits generated fees of Euro 6 million relative to a total commitment of Euro 6.3 billion. Similarly, Bank of New York Mellon reports in December 2006 revenues of $3 million relative to a commitment of $3.2 billion (Arteta et

al., 2008). Assuming that conduits have no costs and revenues are equal to profits, banks earned about 10 basis points on conduit assets.

Comparing this cost and benefit of conduits, it seems clear that conduits would not have been profitable if banks had been required to hold equity against their assets in conduits. In fact, banks would have made a loss of 30 basis points on each dollar invested. However, given that banks were not required to hold equity, they could earn a "profit" of 10 basis points. Conduits were thus a relatively low-return activity but offered a way for banks to attract money-market savings and increase bank size without increasing regulatory capital.

Table 13 lists the 30 largest conduit sponsors. We find that missing capital - the additional capital if conduit asset had been on bank balance sheet - was on average 6.1% of total equity or about $68 billion in total across banks. This is not necessarily a large amount of equity capital, but it masks considerable heterogeneity across banks as the proportion of missing capital ranges from 1.7% to 79.9% of capital levels. The bank with the largest exposure, Sachsen Landesbank, was the first large bank to be bailed out on 17 August 2007 because it was unable to provide the credit guarantees it had extended to its conduits. Other banks with large exposure such as Westdeutsche Landesbank and ABN Amro (later bought by Royal Bank of Scotland) also suffered large losses due to recourse from conduits and had to be bailed out. Hence, for some smaller banks the conduit activities were in fact large enough to wipe out the entire bank capital. For lager banks, conduit activities were small enough to withstand the losses on conduit assets, but these banks were weakened as the financial crisis continued.

In summary, we point out that an ex-ante capital requirement of 8% against conduit assets would not have been sufficient to cover all possible losses from conduits when the assets declined in value. However, the key observation is that a full capital charge would have been sufficient to discourage banks from setting up conduits in the first place.

6. Conclusion

In this paper we analyze asset-backed commercial paper conduits and show how the structure of risk-sharing in these conduits implies recourse back to bank balance-sheets. We find that outside investors who purchased asset-backed commercial paper had little loss even when collateral backing the conduits deteriorated in quality, supporting our main finding that conduits were a form of securitization without risk transfer. We also find that the stock price deterioration of banks at the start of the financial crisis was linked to the extent of their conduit exposure relative to equity capital. Once the crisis broke out, asset-backed commercial paper spreads rose and issuance fell, and more so where guarantees were weaker and sponsoring banks were weaker.

Our analysis makes it clear that from an economic standpoint conduits are unregulated banks that operate in the shadow banking world, but with recourse to regulated entities, mainly commercial banks, that have access to government safety net. Our results also indicate that when these unregulated banks do not have such recourse (extendible notes and SIVs), they struggle to survive a systemic crisis. While some may interpret this finding to justify the accordance of government safety net to all those parts of the shadow banking world that perform maturity mismatch like banks, the bigger

lesson in our view is that the shadow banking world needs to be brought under the purview of prudential regulations.

In particular, the structure of credit guarantees to asset-backed commercial paper conduits was designed by commercial banks precisely to arbitrage regulatory capital requirements. Such possibilities – whereby government-insured banks effectively operate at higher leverage by putting assets off-balance sheet but granting them recourse – deserve regulatory scrutiny, especially when they operate at a scale that conduits did.

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Figure 1: Asset-backed Commercial Paper Outstanding

This figure shows total asset-backed commercial paper outstanding in the U.S. market from January 2004 to April 2009. The figure is based on weekly data published by the Federal Reserve Board.

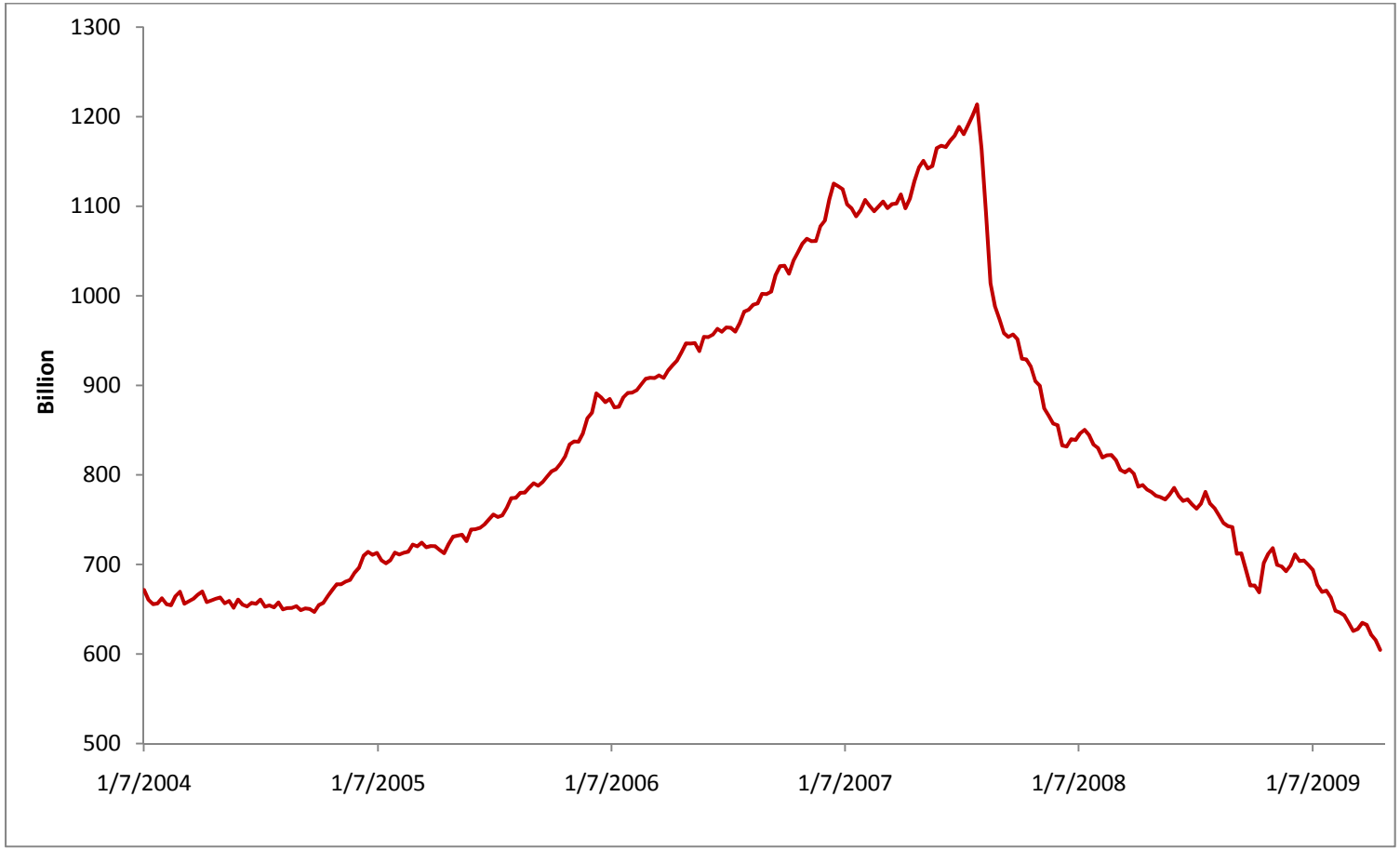

Figure 2: Asset-Backed Commercial Paper Spread

This figure shows the spread of overnight asset-backed commercial paper over the Federal Funds rate from January 2007 to December 2008. The figure is based on market data published by the Federal Reserve Board.

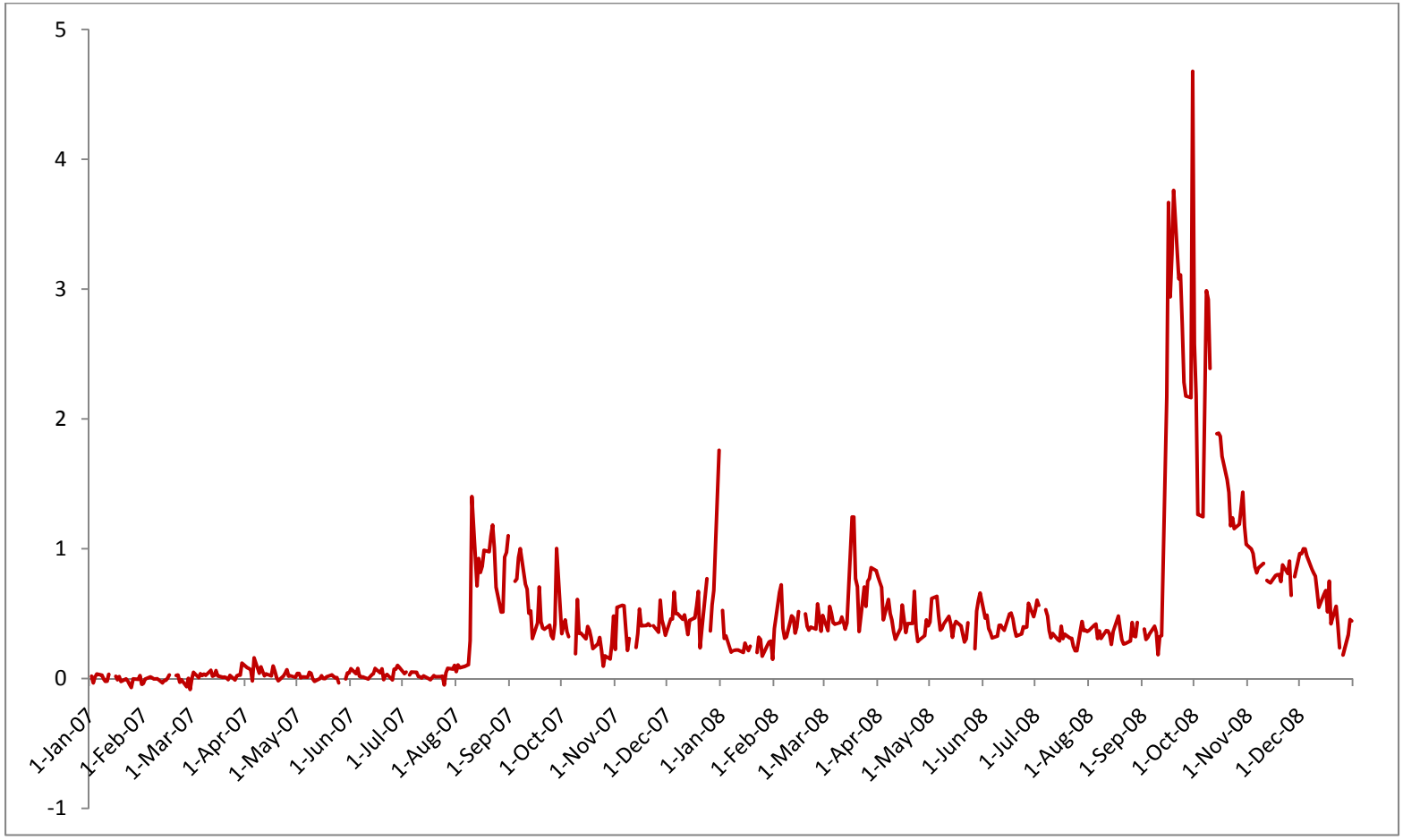

Figure 3: Conduit Structure

This figure illustrates how a conduit is related to its sponsors, outside investors, and asset sellers.

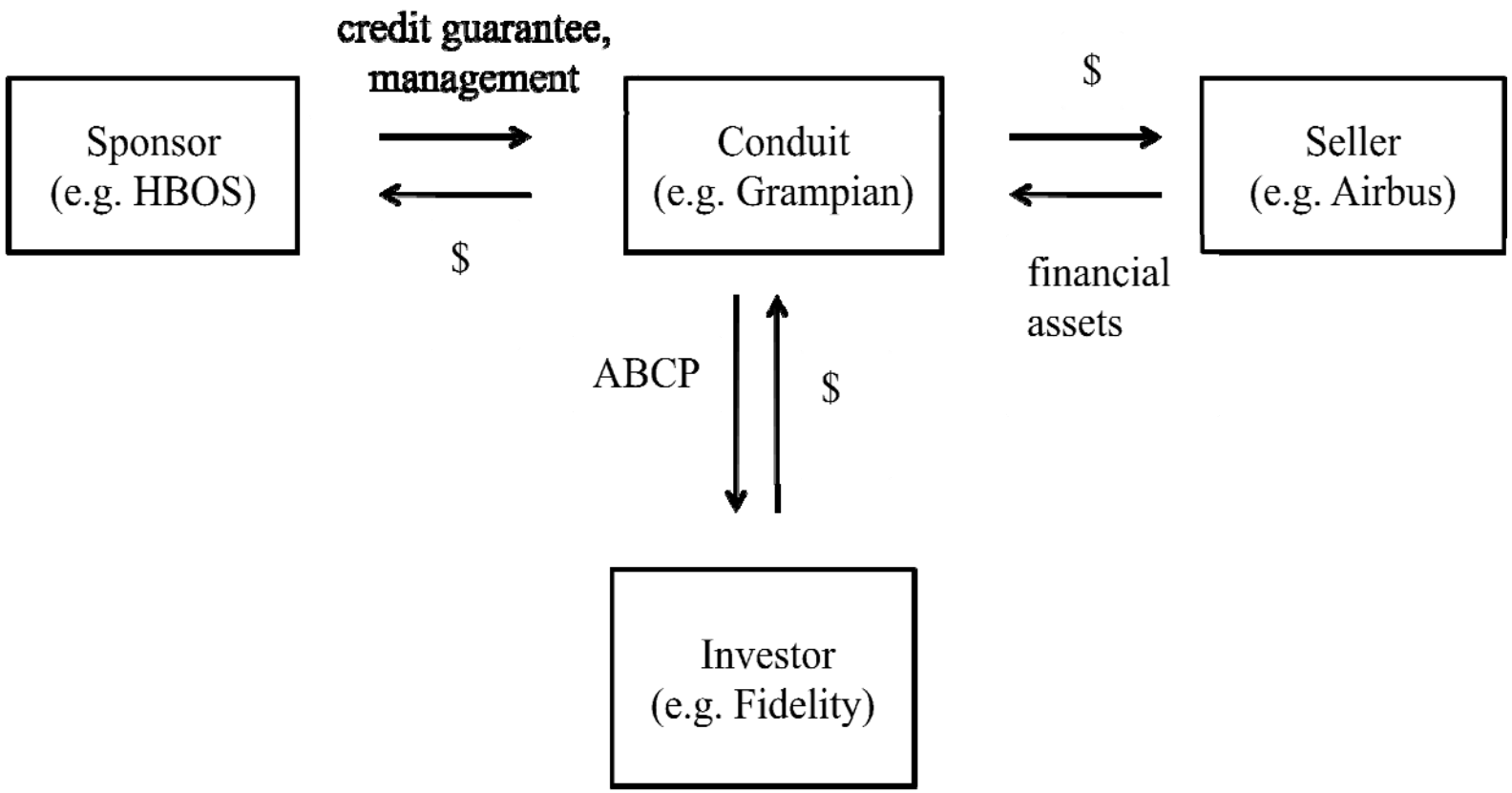

Figure 4: Asset-backed Commercial Paper Outstanding by Credit Guarantee

This figure shows total asset-backed commercial paper outstanding in the period from January 2004 to June 2009 by type of credit guarantee. The figure is based on quarterly data reports from Moody's Investors Service.

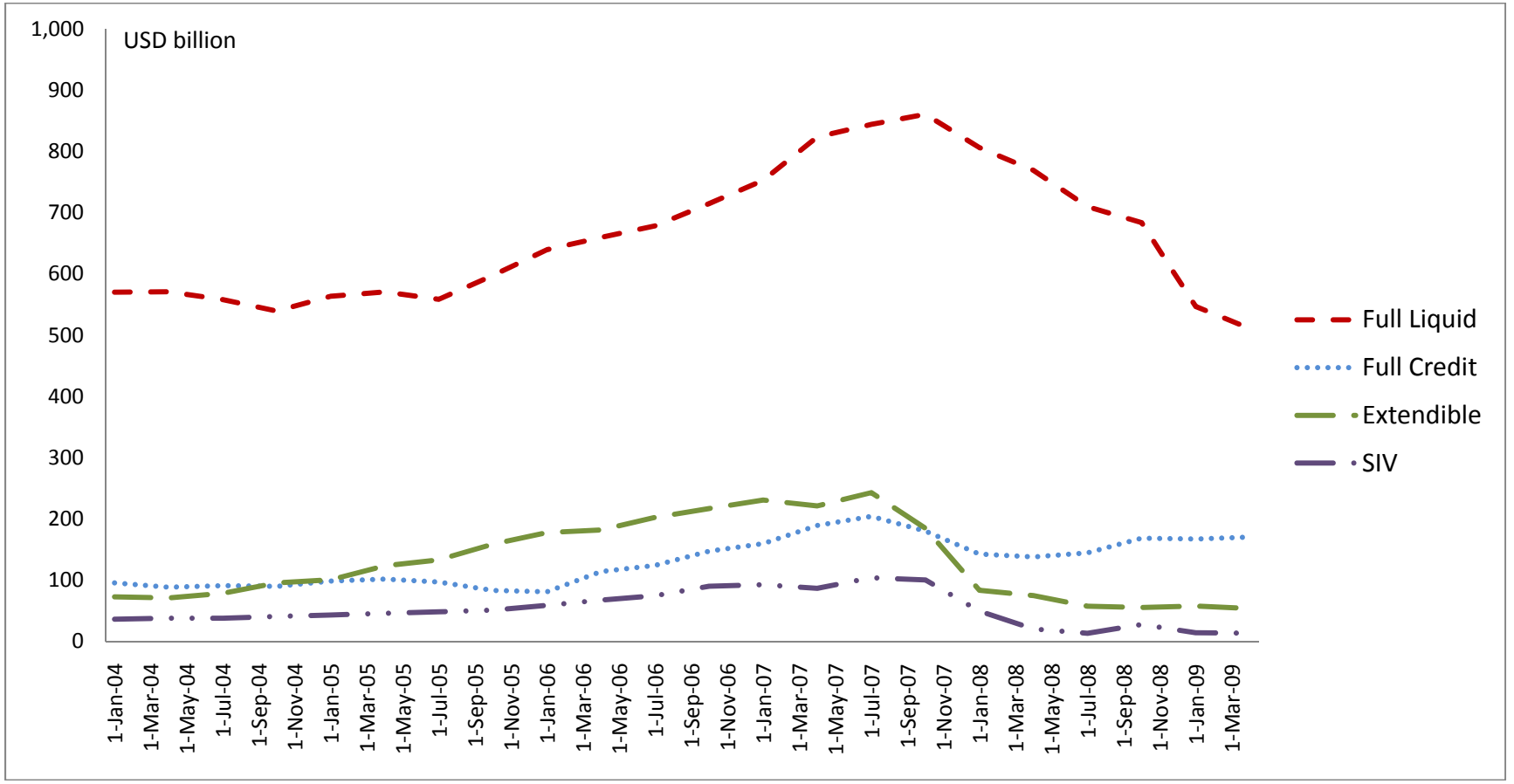

Figure 5: Asset-backed Commercial Paper Outstanding by Credit Guarantee

This figure shows total asset-backed commercial paper outstanding from April 2007 to December 2007 by the type of credit guarantee (indexed to July 25=100). The figure is based on weekly data from DTCC and reports from Moody's Investors Service.

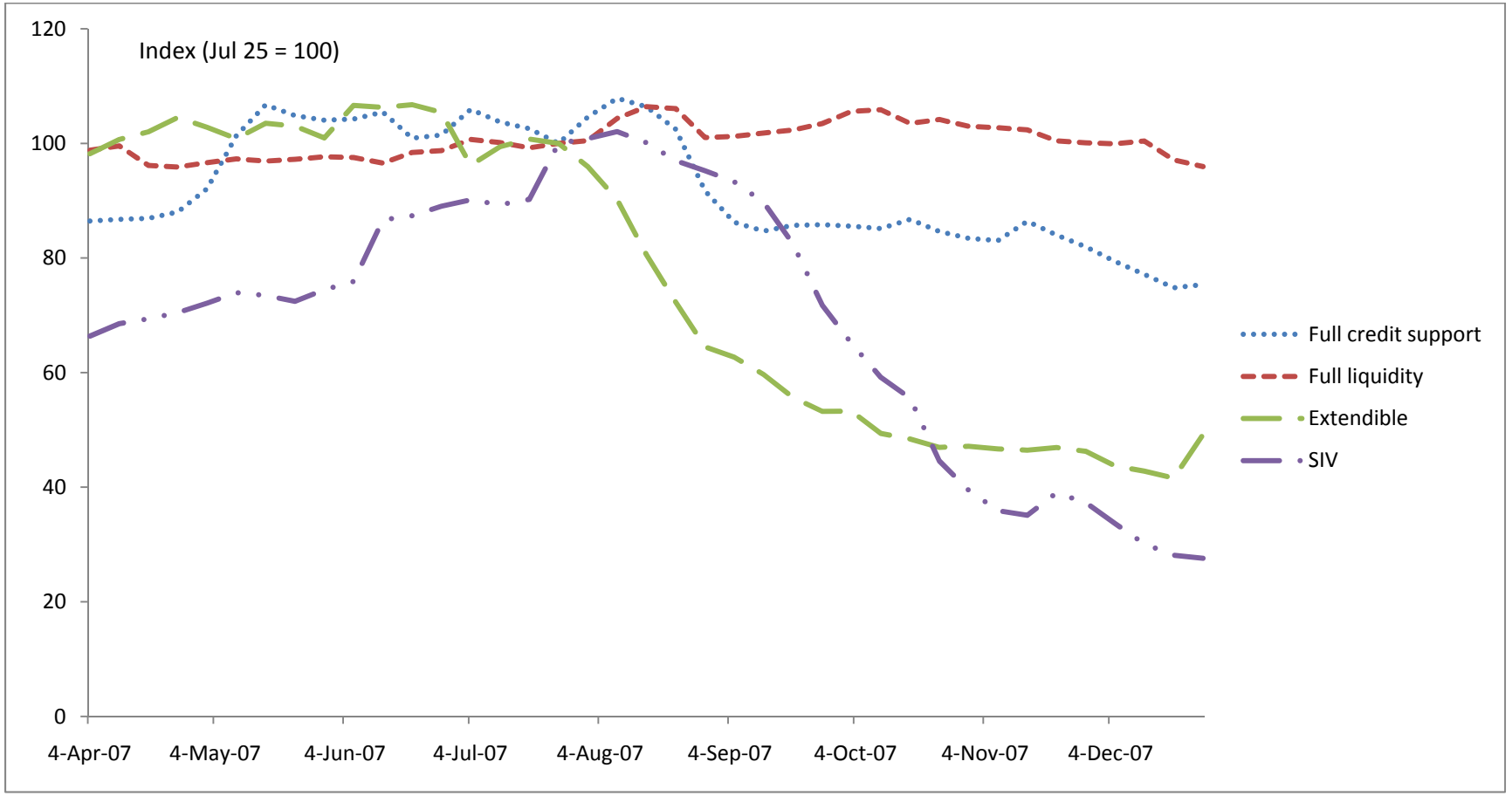

Figure 6: Asset-backed Commercial Paper Spreads by Credit Guarantee

This figure shows the spread of overnight asset-backed commercial paper over the Federal Funds rate from July to September 2007 by type of credit guarantee. The figure is based on weekly data from DTCC and reports from Moody's Investors Service.

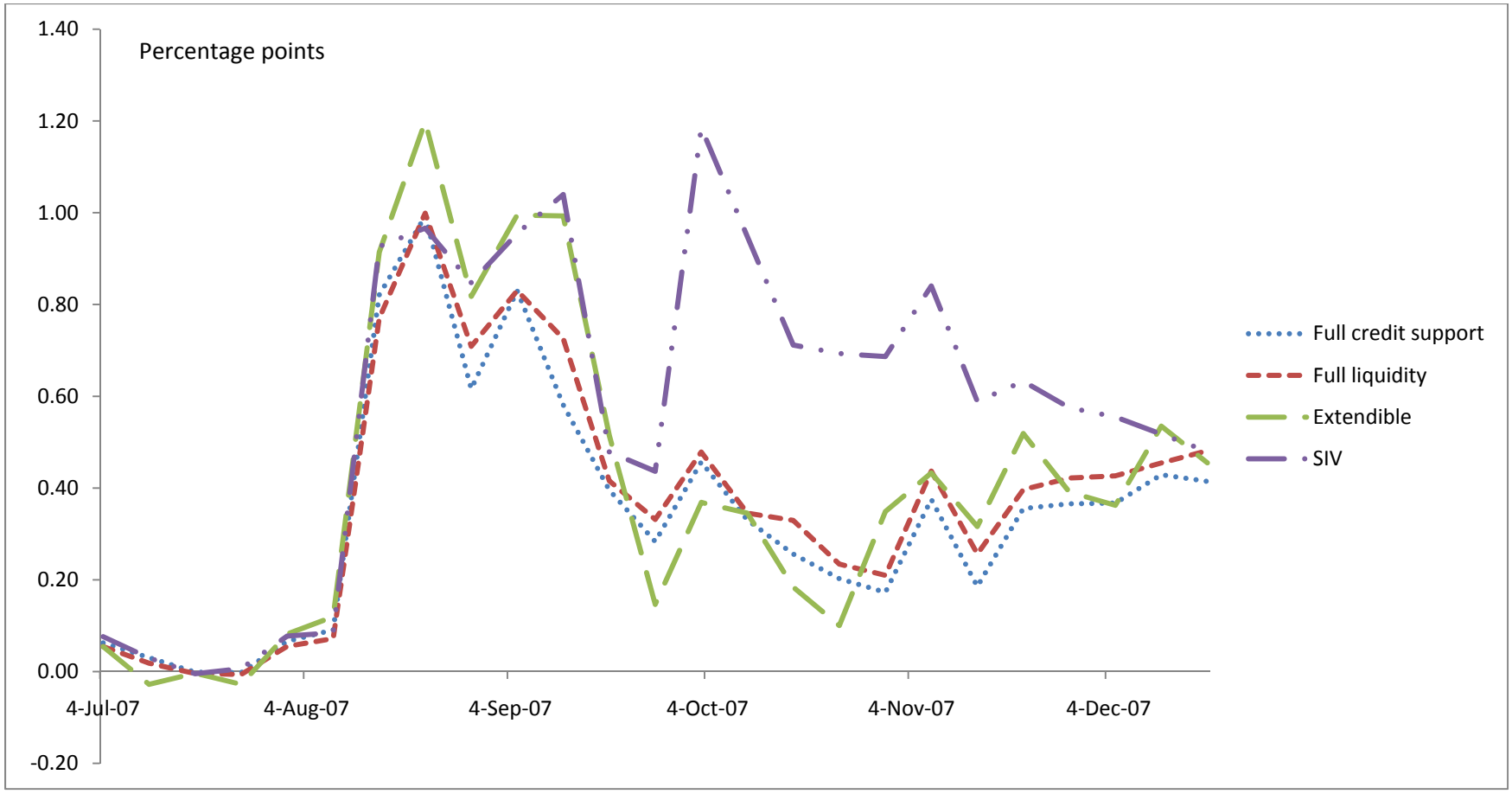

Table 1: Conduits and Sponsors

This table shows the ten largest conduits and sponsors as of 1/1/2007. The sample is restricted to bank-sponsored conduits. The information is collected from Moody's Rating Reports and Bankscope. "ABCP (bn)" denotes asset-backed commercial paper outstanding per conduit and sponsor, respectively. "Asset Origin," "Asset Rating," and "Asset Type" denote characteristics of the main asset class owned by a conduit.

Panel A: Ten Largest Conduits

Program Name	Sponsor	ABCP (bn)	Guarantee	Asset Origin	Asset Rating	Asset Type (Share %)
Grampian Funding	HBOS	37.9	Full Liquidity	United States	AAA	Residential Mortgages (36%)
Amstel Funding	ABN Amro	30.7	Full Liquidity	Netherlands	AAA	CDO/CLO (84%)
Scaldis Capital	Fortis Bank	22.6	Full Liquidity	United States	AAA	Asset backed securities (77%)
Sheffield Receivables	Barclays	21.4	Full Liquidity	n.a.	NR	Mortgages (43%)
Morrigan TRR	Hypo Public	18.9	Full Credit	n.a.	n.a.	Bonds (51%)
Cancara Asset	Lloyds	18.8	Full Liquidity	Great Britain	AAA	Residential Mortgages (43%)
Solitaire Funding	HSBC	18.5	Full Liquidity	United States	AAA	Residential Mortgages (45%)
Rhineland Funding	IKB	16.7	Full Liquidity	United States	AAA	CDO/CLO (95%)
Mane Funding	ING	13.7	Full Liquidity	n.a.	AAA	Asset backed securities (91%)
Atlantis One	Rabobank	13.5	Full Liquidity	United States	NR	Commercial Loans (100%)

Panel B: Ten Largest Sponsors

Sponsor	Country	ABCP (bn)	Assets (bn)	Tier 1 Capital (bn)	ABCP/Tier1 (%)	Tier1 Ratio (%)
Citigroup	United States	92.7	1,884.3	90.9	102.0%	8.6%
ABN Amro	Netherlands	68.6	1,300.0	31.2	219.5%	8.5%
Bank of America	United States	45.7	1,459.7	91.1	50.2%	8.6%
HBOS Plc	Great Britain	43.9	1,161.7	44.0	99.7%	8.1%
JP Morgan	United States	42.7	1,351.5	81.1	52.7%	8.7%
HSBC	Great Britain	39.4	1,860.8	87.8	44.9%	9.4%
Deutsche Bank AG	Germany	38.7	2,070.0	31.0	125.0%	8.5%
Société Générale	France	38.6	1,260.2	98.3	39.3%	7.8%
Barclays Plc	Great Britain	33.1	1,956.7	45.2	73.2%	7.7%
Rabobank	Netherlands	30.7	732.9	34.8	88.3%	10.7%

Table 2: Market Summary Statistics

This table includes all conduits that were rated by Moody's Investors Service as of 1/1/2007. Panel A shows summary statistics by conduit. "# Conduits" denotes the number of conduits and sponsors, respectively. "Risk Transfer" refers to the credit guarantees provided by the sponsor. "Conduit Type" is conduit type as provided by Moody's Investors Service. "Currency" is the issuing currency of the conduit. Panel B aggregates conduits by sponsor. "Sponsor Type" denotes the type of sponsoring institution. "Country of Origin" denotes the headquarters of the sponsoring institution.

	Panel A: Conduits			
	Total		Per Conduit	
	# Conduits	Size (bn)	Mean	Std.
All Conduits	301	1,236.2	4.1	(5.1)
Risk Transfer				
Full Liquidity	163	752.9	4.6	(5.7)
Full Credit	55	159.9	2.9	(4.6)
Extendible Notes	55	230.9	4.2	(4.5)
SIV	28	92.6	3.3	(3.4)
Conduit type				
Multi-Seller	139	548.4	3.9	(4.4)
Securities Arbitrage	36	214.2	6.0	(8.4)
Single-Seller	62	173.5	2.8	(4.0)
Other	64	300.0	4.7	(5.0)
Currency				
USD	233	973.0	4.2	(4.6)
EURO	33	220.0	6.7	(8.4)
Other	35	43.2	1.2	(1.6)
	Panel B: Sponsors			
	Total		Per Sponsor	
	# Sponsors	Size (bn)	Mean	Std.
All Programs	127	1,236.2	9.7	(14.7)
Sponsor type				
Commercial Banks	67	911.4	13.6	(17.6)
Structured Finance	19	155.8	8.2	(13.7)
Mortgage Lender	18	75.5	4.2	(5.8)
Investment Manager	5	17.6	3.5	(3.3)
Investment Banks	4	11.0	2.7	(2.2)
Other	14	64.8	4.6	(6.2)
Country of Origin				
United States	67	491.8	7.3	(14.7)
Germany	15	204.1	13.6	(11.6)
United Kingdom	10	195.7	19.6	(17.0)
Other	35	344.5	9.8	(14.4)

Table 3: Asset-backed Commercial Paper by Sponsor Type and Credit Guarantee

This table includes all conduits that were rated by Moody's Investors Service as of 1/1/2007. The 'Total' shows total asset-backed commercial paper outstanding as of 1/1/2007 per type of sponsor. The 'Credit Guarantee' shows the breakdown of asset-backed commercial paper by type of credit guarantee.

	Total		Credit Guarantee			
	# Sponsors	Size (bn)	Full Liquidity	Full Credit	Extendible	SIV
Commercial Banks	64	911.4	74.2%	10.9%	8.6%	6.3%
Structured Finance	19	155.8	7.0%	37.2%	34.7%	21.1%
Mortgage Lender	18	75.5	14.3%	0.0%	82.8%	2.9%
Investment Manager	5	17.6	0.0%	1.3%	98.7%	0.0%
Investment Banks	4	11.0	54.9%	0.0%	45.1%	0.0%
Other	14	64.8	74.8%	2.3%	22.9%	0.0%

Table 4: Event Study Summary Statistics

This table shows summary statistics by conduit exposure. We sort banks in three groups: bank with no conduit exposure, banks with low conduit exposure, and banks with high conduit exposure. We restrict the sample to commercial banks that (i) are among the 300 largest financial institutions, (ii) are located in the Europe or the United States, and (iii) have share price data available. We measure 'Stock Return' as the total stock return in the three-day window from August 8,2007, to August 10, 2007, 'Exposure' is the asset-backed commercial paper outstanding relative to equity, 'Log Assets' is the natural logarithm of assets, 'Log Equity' is the natural logarithm of equity, 'Equity Ratio' is equity as share of assets, 'Share Deposits' is deposits as share of assets, and 'Share Short-Term Debt' is short-term debt as share of assets. All variables are measured as of January 1st, 2007. 'United States' is an indicator variable whether a bank is headquartered in the United States.

		Conduit Exposure		
Sample:	All	No	Low	High
	(1)	(2)	(3)	**(4)**
Stock return Aug 8th - Aug 10th	-0.004	0.007	-0.028	-0.046
	(0.052)	(0.055)	(0.024)	(0.026)
Conduit Exposure	0.169	0.000	0.248	1.199
	(0.532)	0.000	(0.131)	(1.155)
Log(Assets)	3.961	3.154	6.379	6.325
	(2.284)	(1.987)	(1.077)	(1.280)
Log(Equity)	1.355	0.670	3.671	3.025
	(2.043)	(1.832)	(0.877)	(1.161)
Equity Ratio	0.091	0.101	0.076	0.043
	(0.099)	(0.111)	(0.038)	(0.026)
Share Deposits	0.602	0.63	0.530	0.504
	(0.208)	(0.223)	(0.112)	(0.145)
Share Short-Term Debt	0.073	0.050	0.122	0.167
	(0.084)	(0.050)	(0.117)	(0.129)
US Indicator Variable	0.542	0.613	0.400	0.250
	(0.501)	(0.490)	(0.507)	(0.452)
N	107	80	15	12

Table 5: Effect of Conduit Exposure on Stock Returns (August 8, 2007 – August 10, 2007)

This table shows the effect of conduit exposure on stock return. We restrict the sample to commercial banks that (i) are among the 300 largest financial institutions (ii) are located in the Europe or the United States, and (iii) have share price data available. The dependent variable is the total stock return over the three-day period from August 8, 2007 to August 10, 2007. We measure 'Conduit Exposure' as asset-backed commercial paper relative to equity. Columns (2) to (6) include control variables for the ratio of short-term assets to debt, the ratio of equity to assets, log(Assets) and log(Equity). All control variables are measured as of January 1, 2007. Column (6) includes fixed effects for Germany, Great Britain, and the United States. Robust standard errors are in parentheses below coefficients. * significant at 5%; ** significant at 1%

	Dependent Variable: Stock Return					
	(1)	(2)	(3)	(4)	(5)	(6)
Conduit Exposure	-0.026	-0.014	-0.011	-0.013	-0.014	-0.015
	(0.007)**	(0.004)**	(0.003)**	(0.003)**	(0.003)**	(0.004)**
Log(Assets)		-0.007	-0.022	-0.024	-0.027	0.005
		(0.005)	(0.008)**	(0.008)**	(0.009)**	-0.015
Log(Equity)		-0.004	0.012	0.013	0.015	-0.016
		(0.007)	(0.009)	(0.009)	(0.009)	(0.015)
Equity-Assets Ratio			-0.099	-0.103	-0.137	-0.006
			(0.029)**	(0.031)**	(0.037)**	(0.065)
Share Short Term Debt				0.066	0.063	0.039
				(0.041)	(0.041)	(0.042)
Share Deposits					-0.027	-0.017
					(0.017)	(0.026)
Constant	0.000	0.033	0.079	0.082	0.111	0.036
	(0.005)	(0.015)*	(0.025)**	(0.026)**	(0.032)**	(0.042)
Country FE	N	N	N	N	N	Y
Observations	107	107	107	107	107	107
R-squared	0.068	0.277	0.289	0.297	0.303	0.359

Table 6: Conduit Exposure and Stock Return Around Market Freeze (+/- 15 Trading Days)

This table shows the effect of conduit exposure on stock returns for the period around the event date of August 9, 2007. For each day, we construct the window one day before and one day after and compute the stock return over the three-day period. We estimate the same regression as in Table 5 using the full set of controls. We report the estimated coefficient and standard error for the conduit exposure variable.

Trading Days +/- Event Date	Conduit Exposure Coefficient	Standard Error
-15	0.007	(0.004)
-14	-0.005	(0.006)
-13	-0.009	(0.006)
-12	-0.006	(0.005)
-11	0.001	(0.003)
-10	0.009	(0.006)
-9	0.001	(0.004)
-8	-0.002	(0.004)
-7	-0.006	(0.007)
-6	-0.001	(0.007)
-5	-0.001	(0.007)
-4	0.001	(0.007)
-3	0.002	(0.005)
-2	-0.001	(0.005)
-1	-0.009	(0.006)
0	-0.015	(0.004)**
1	-0.005	(0.004)
2	0.000	(0.002)
3	-0.010	(0.005)*
4	-0.022	(0.010)*
5	-0.020	(0.012)
6	-0.009	(0.012)
7	0.001	(0.010)
8	0.000	(0.003)
9	0.003	(0.003)
10	0.005	(0.007)
11	0.008	(0.003)**
12	0.000	(0.002)
13	-0.003	(0.004)
14	-0.010	(0.004)*
15	-0.006	(0.002)**

Table 7: Conduit Exposure and Stock Return in Months before Start of Financial Crisis (January to August 2007)

This table shows the effect of conduit exposure on stock return in the months before the start of the financial crisis. We restrict the sample to commercial banks that (i) are among the 300 largest financial institutions, (ii) are located in the Europe or the United States, and (iii) have share price data available. The dependent variable is the total stock return for the month indicated at the top of each column. We measure 'Conduit Exposure' as bank-sponsored ABCP outstanding relative to equity. All columns include control variables for the ratio of short-term assets to debt, the ratio of equity to assets, log(Assets), and log(Equity), and geographic controls. All control variables are measures on 1/1/2007. Robust standard errors are in parentheses below coefficients. * significant at 5%; ** significant at 1%

	Dependent Variable: Stock Return							
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Exposure	0.008	-0.006	0.003	-0.005	0.004	0.006	0.014	-0.029
	(0.012)	(0.005)	(0.005)	(0.009)	(0.010)	(0.008)	(0.011)	(0.009)**
Log(Assets)	-0.026	-0.03	-0.033	-0.005	-0.042	-0.012	-0.037	-0.006
	(0.024)	(0.018)	(0.023)	(0.024)	(0.021)	(0.021)	(0.032)	(0.025)
Log(Equity)	0.033	0.031	0.029	0.02	0.043	0.01	0.043	-0.002
	(0.024)	(0.018)	(0.024)	(0.023)	(0.021)*	(0.022)	(0.031)	(0.026)
Equity-Assets Ratio	-0.058	-0.117	-0.134	0.016	-0.2	0.105	-0.098	-0.058
	(0.120)	(0.082)	(0.099)	(0.112)	(0.110)	(0.078)	(0.172)	(0.115)
Share Short Term Debt	-0.036	-0.081	0.096	0.078	-0.064	0.064	0.012	0.029
	(0.044)	(0.041)	(0.050)	(0.072)	(0.090)	(0.048)	(0.071)	(0.106)
Share Deposits	-0.053	-0.013	-0.005	-0.021	-0.055	0.071	0.057	0.008
	(0.036)	(0.028)	(0.035)	(0.046)	(0.052)	(0.056)	(0.086)	(0.052)
Constant	0.08	0.092	0.168	0.04	0.149	-0.077	0.082	0.009
	(0.067)	(0.051)	(0.059)**	(0.066)	(0.059)*	(0.050)	(0.092)	(0.068)
Country FE	Y	Y	Y	Y	Y	Y	Y	Y
Observations	107	107	107	107	107	107	107	107
R-squared	0.648	0.337	0.376	0.522	0.301	0.196	0.295	0.258

Table 8: Asset-backed Commercial Paper Summary Statistics

This table shows summary statistics for asset-backed commercial paper conduits before and after the crisis of August 2007. The sample is restricted to the period from January to August 8, 2007 (Before) and the period from August 9, 2007 to February 2008 (After). "ABCP Growth" is the weekly log change in commercial paper outstanding by conduit. "ABCP Spread" is the spread of overnight commercial paper over the Federal Funds rate in percentage points. For both variables, we show means and standard deviations (in parentheses) for the full sample and by type of credit guarantee.

	Issuances			Spread		
	All	Before	After	All	Before	After
All	-0.017	0.001	-0.038	0.225	0.012	0.448
	(0.174)	(0.095)	(0.232)	(0.352)	(0.099)	(0.381)
By risk transfer						
Full Liquidity	-0.012	0.000	-0.026	0.229	0.010	0.448
	(0.140)	(0.083)	(0.183)	(353)	(0.091)	(0.381)
Full Credit	-0.003	0.004	-0.011	0.194	0.025	0.384
	(0.210)	(0.129)	(0.269)	(0.326)	(0.155)	(0.362)
Extendible	-0.036	0.001	-0.110	0.359	0.017	0.639
	(0.271)	(0.120)	(0.429)	(0.436)	(0.081)	(0.407)
SIV	-0.053	0.010	-0.114	0.190	0.022	0.756
	(0.214)	(0.097)	(0.271)	(0.346)	(0.040)	(0.323)
Observations	8,487	4.535	3,952	19,649	10,023	9,626
Conduits	129	122	123	106	95	91

Table 9: Effect of Credit Guarantee on Asset-backed Commercial Paper Issuance

This table shows the effect of credit guarantees on issuance. The dependent variable is the weekly log change in asset-backed commercial paper outstanding. "Full Credit," "Extendible Notes," and" SIV" are indicator variables for the type of credit guarantee. The indicator variable "After" denotes the months after the crisis. "CDS" is the CDS Spread of the sponsor. All Columns include week fixed effects. Column (1) and (3) include sponsor fixed effects. Column (2) and (4) include conduit fixed effects. Columns (3) and (4) include all two-way interactions of "Sponsor CDS". Standard errors in brackets are clustered at the sponsor level. * significant at 10%; ** significant at 5%; *** significant at 1%

	(1)	(2)	(3)	(4)	(5)	(6)
Full credit x After	0.016	0.021	0.009	0.039	0.05	0.036
	(0.016)	(0.020)	(0.028)	(0.029)	(0.038)	(0.061)
Extendible notes x After	-0.089*	-0.132**	-0.036	-0.016	-0.057	-0.109*
	(0.046)	(0.057)	(0.038)	(0.038)	(0.059)	(0.056)
SIV x After	-0.095*	-0.104**	-0.109	-0.048	-0.064**	-0.065
	(0.054)	(0.051)	(0.071)	(0.031)	(0.031)	(0.046)
CDS x Full credit x After				-0.102	-0.123	-0.174
				(0.059)	(0.092)	(0.140)
CDS x Extendible x After				-0.110**	-0.07	0.136
				(0.047)	(0.054)	(0.122)
CDS x SIV x After				-0.201***	-0.212**	-0.195*
				(0.070)	(0.086)	(0.110)
Constant	-0.069***	1.495***	-0.013***	-0.051*	1.497***	-0.014***
	(0.012)	(0.021)	(0.002)	(0.027)	(0.021)	(0.003)
Observations	8487	8487	8487	8487	8487	8487
Time-fixed effects?	Yes	Yes	No	Yes	Yes	No
Sponsor-fixed effects?	Yes	No	No	Yes	No	No
Sponsor-time-fixed effects?	No	No	Yes	No	No	Yes
Conduit-fixed effects?	No	Yes	No	No	Yes	No
R-squared	0.054	0.098	0.336	0.06	0.104	0.337

Table 10: Effect of Credit Guarantee on Asset-backed Commercial Paper Spreads

This table shows the effect of credit guarantees on asset-backed commercial paper spreads. The dependent variable is the asset-backed commercial paper spread on overnight commercial paper in the primary market. The explanatory variables are defined the same way as in Table 9. Column (1) and (3) include sponsor fixed effects. Column (2) and (4) include conduit fixed effects. Columns (3) and (4) include all two-way interactions of "Sponsor CDS". Standard errors shown are clustered at the sponsor level. * significant at 10%; ** significant at 5%; *** significant at 1%

	(1)	(2)	(3)	(4)	(5)	(6)
Full credit x After	-0.028	-0.013	-0.03	0.025	0.03	-0.049
	(0.068)	(0.071)	(0.145)	(0.094)	(0.081)	(0.190)
Extendible notes x After	0.133	0.198*	0.128	-0.118	0.011	-0.067
	(0.099)	(0.108)	(0.123)	(0.075)	(0.172)	(0.105)
SIV x After	0.347***	0.265***	0.395***	0.295	0.201	0.451**
	(0.091)	(0.082)	(0.087)	(0.209)	(0.170)	(0.196)
CDS x Full credit x After				-0.266***	-0.049	0.005
				(0.093)	(0.202)	(0.110)
CDS x Extendible notes x After				0.634***	0.3	0.334***
				(0.202)	(0.184)	(0.117)
CDS x SIV x After				0.123	0.169	-0.193
				(0.435)	(0.337)	(0.437)
Constant	0.406***	0.208***	0.227***	0.402***	0.212***	0.227***
	(0.075)	(0.023)	(0.008)	(0.072)	(0.023)	(0.007)
Observations	19,649	19,649	19,649	19,649	19,649	19,649
Time-fixed effects?	Yes	Yes	No	Yes	Yes	No
Sponsor-fixed effects?	Yes	No	No	Yes	No	No
Sponsor-time-fixed effects?	No	No	Yes	No	No	Yes
Conduit-fixed effects?	No	Yes	No	No	Yes	No
R-squared	0.786	0.853	0.892	0.788	0.854	0.893

Table 11: Effect of Credit Guarantees on Issuance and Spreads by Conduit Type

This table shows the effect of credit guarantees on asset-backed commercial paper spreads separately for multiseller conduits and securities arbitrage conduits. The dependent variables are the weekly growth in asset-backed commercial paper outstanding and the daily spread on overnight commercial paper in the primary market. The explanatory variables are defined the same way as in Table 9. Columns (1), (3), (5), and (7) includes conduit fixed effects and time-fixed effects. Columns (2), (4), (6), and (8) include sponsor-time fixed effects. Standard errors shown are clustered at the sponsor level. * significant at 10%; ** significant at 5%; *** significant at 1%

	Issuance				Spreads			
	Multiseller		Arbitrage		Multiseller		Arbitrage	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Full credit x After	0.051	0.095			0.044	-0.088***		
	(0.039)	(0.075)			(0.119)	(0.001)		
Extendible notes x After	-0.194**	-0.162*			0.186	0.378***		
	(0.084)	(0.080)			(0.118)	(0.001)		
SIV x After			-0.119**	-0.029			0.211***	0.091
			(0.049)	(0.028)			(0.048)	(0.074)
Constant	0.185***	-0.016**	-0.121***	-0.014	0.230***	0.227***	0.271***	0.375***
	(0.039)	(0.006)	(0.008)	(0.014)	(0.010)	(0.003)	(0.024)	(0.008)
Observations	2476	2476	1263	1263	7192	7192	1441	1441
Time-fixed effects?	Yes	No	Yes	No	Yes	No	Yes	No
Sponsor-time-fixed effects?	No	Yes	No	Yes	No	Yes	No	Yes
Conduit-fixed effects?	Yes	No	Yes	No	Yes	No	Yes	No
R-squared	0.107	0.493	0.220	0.627	0.863	0.944	0.897	0.99

Table 12: Estimated Losses for Sponsors and Outside Investors

This table shows the ex-post risk transfer by credit guarantee. "Pre-crisis" denotes total asset-backed commercial paper outstanding as of 7/1/2007. Post-crisis denotes the value-weighted share that is "Active" (conduit continues to issue), "Repaid" (conduit closed and repaid investors), and "In Default" (Conduit closed and investor not repaid). "Estimated losses" estimates the losses of sponsor and outside investors assuming a recovery rate on conduit assets of 95% and 85%, respectively.

	Pre-Crisis	Post-Crisis			Estimated Loss (bn)			
					Recovery Rate: 95%		Recovery Rate 85%	
	ABCP (bn)	Active	Repaid	In Default	Sponsor	Investor	Sponsor	Investor
All	1,395.5	76.6%	20.8%	2.5%	68.0	1.8	204.0	30.0
Risk Transfer								
Full Liquidity	844.0	87.9%	12.1%	0.0%	42.2	0.0	126.6	0.0
Full Credit	204.2	70.9%	29.1%	0.0%	10.2	0.0	30.6	0.0
Extendibles	243.1	47.0%	45.5%	7.4%	11.2	0.9	33.7	15.4
SIV	104.1	65.7%	17.7%	16.6%	4.3	0.9	13.0	14.7
Sponsor Type								
Commercial Bank	1,035.6	83.0%	16.4%	0.6%	51.5	0.3	154.4	5.3
Structured Finance	199.2	58.1%	36.4%	5.5%	9.4	0.6	28.2	9.4
Mortgage Lender	60.2	44.5%	40.2%	15.3%	2.5	0.5	7.6	7.8
Other	100.4	63.3%	24.4%	8.9%	4.6	0.4	13.7	7.6

Table 13: Missing Capital

This table lists the 30 largest banks sponsors of ABCP as of 1/1/2007. For each bank, we compute the required capital assuming ABCP requires a capital charge of 8%, i.e. ABCP*0.08=Total, expressed in billions of US dollars.. We also compute the 'missing capital' as a share of a bank's equity. We measure equity as Tier 1 Capital. If a bank does not report Tier 1 Capital, we multiply shareholder equity with the average Tier 1/equity shareholder ratio of banks that report both shareholder equity and Tier 1 ratio.

			Missing Capital	
Name	Tier 1	ABCP	Total	%
Citigroup Inc	90.9	92.672	7.4	8.2%
ABN Amro Holding NV	31.2	68.575	5.5	17.6%
Bank of America Corporation	91.1	45.691	3.7	4.0%
HBOS Plc	44.0	43.9	3.5	8.0%
JP Morgan Chase & Co.	81.1	42.714	3.4	4.2%
HSBC Holdings Plc	87.8	39.426	3.2	3.6%
Deutsche Bank AG	31.0	38.736	3.1	10.0%
Société Générale	29.4	38.639	3.1	10.5%
Barclays Plc	45.2	33.07	2.6	5.9%
Mitsubishi UFJ Financial Group	68.5	32	2.6	3.7%
Rabobank Nederland	34.8	30.773	2.5	7.1%
WestLB AG	9.5	29.946	2.4	25.1%
ING Groep NV	54.3	26.417	2.1	3.9%
Dresdner Bank AG	18.7	23.191	1.9	9.9%
Fortis	16.4	22.596	1.8	11.0%
Bayerische Landesbank	15.8	22.352	1.8	11.3%
Bayerische Hypo-und Vereinsbank AG	14.1	22.263	1.8	12.6%
State Street Corporation	24.1	21.855	1.7	7.2%
Crédit Agricole S.A.	6.5	19.48	1.6	24.1%
Hypo Real Estate Holding AG	4.5	18.931	1.5	33.4%
Lloyds Banking Group Plc	6.1	18.782	1.5	24.6%
Countrywide Financial Corporation	25.2	18.305	1.5	5.8%
GMAC LLC	15.4	17.539	1.4	9.1%
Royal Bank of Scotland	75.2	15.847	1.3	1.7%
Royal Bank of Canada RBC	52.3	15.602	1.2	2.4%
Bear Stearns Companies LLC	19.1	13.845	1.1	5.8%
KBC Group	22.9	12.606	1.0	4.4%
Sachsen Landesbank	1.3	12.528	1.0	79.9%
BNP Paribas	62.3	11.647	0.9	1.5%
Bank of Montreal	45.3	11.528	0.9	2.0%
Total	1,124.0	861.5	68.9	6.1%