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Loss Potential and Disclosures Related to Credit Derivatives – A Cross-Country Comparison of Corporate Bond Funds under U.S. and German Regulation

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Abstract

This study analyzes the loss potential arising from investments into CDS for a sample of large U.S. and German mutual funds. Further, it investigates whether the comments funds make on CDS use in periodic fund reports are consistent with the disclosed CDS holdings. For several funds in the U.S., the potential losses arising from selling CDS protection are almost as high as net assets, while in Germany, this potential can be even higher. Regarding the information funds provide to investors about their use of CDS, the results of the study suggest that comments on CDS contained in periodic reports are often unspecific and sometimes misleading. Thus, investors might have to analyze portfolio holdings in order to learn about the true investment behavior of funds. For instance, in Germany, funds that use more short than long CDS often state that they only use long CDS for hedging purposes. Based on the results, it seems advisable that regulators in both countries tighten rules restricting the speculative use of derivatives by funds to a reasonable level, as well as implement more standardized disclosure policies.

JEL-Classification: G11, G15, G23, G28

Key Words: Mutual funds, leverage, derivative, credit default swaps, disclosure

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1 Introduction

Can funds default solely due to their investments in derivatives? How accurate is the information funds provide to investors about their derivative use? In recent years, highly regulated market participants, including mutual funds, were heavily exposed to risk via derivatives. The majority of corporate bond funds in the U.S. that sold more credit default swaps (CDS) protection than they bought suffered severe losses compared to funds that predominantly bought CDS protection during the 2007-2009 financial crisis (Adam and Guettler (2014)). The Oppenheimer Champion Income Fund nearly collapsed in 2008 because of speculative investments into CDS and faced lawsuits concerning inadequate disclosure.[1] These developments follow from the fact that CDS are not only used for hedging, but also for implementing risky investment strategies that potentially create either high returns or losses. For instance, whenever a fund sells protection via CDS, it effectively adds leverage to its portfolio, because it is exposed to the notional amount of the swaps beyond its total net assets.

This study analyzes the loss potential of CDS holdings at U.S. and German funds along with the CDS related disclosure under the regulation existing during the time period of the 2007-2009 financial crisis. The goal of this study is to determine whether investors in both countries should worry about funds potentially taking extensive risks via derivatives and misinforming the public about their investments. Although mutual funds are highly regulated in both countries, they can implement speculative strategies by selling CDS, which undermines the effectiveness of investor protection offered by regulation.[2] From the European side, this study focuses on mutual funds distributed in Germany as they follow EU-wide regulation[3] and have been allowed to use credit derivatives since 2004. In addition, mutual funds in Germany are obliged to list the cumulated amounts of individual securities sold within the period in annual and semi-annual reports. These data provide unique insights into fund activities within the period. On the contrary, U.S. funds only report the overall portfolio turnover rate.

The purpose of this study is threefold. First, I empirically analyze the level of CDS use and the potential for realizing losses via CDS for a sample of U.S. and German corporate bond funds under the

[1] See "Recovering Oppenheimer Champion Fund Losses" and "Oppenheimer Champion Income Fund Lawsuits" [http://www.oppenheimerfundfraud.com/id3.html, http://www.youhavealawyer.com/blog/2009/04/16/oppenheimer-champion-income-fund-lawsuits/, respectively, visited on 08.09.2012].

[2] Managers, especially those of poorly performing funds (but not exclusively), often face strong incentives to increase the riskiness of their funds as their salary (and position) depends on the development of a fund's assets. It is well documented that managers succeeding in fund tournaments and fund family tournaments attract more inflows from investors and support from a fund family (e.g., Brown, Harlow, and Starks (1996), Chevalier and Ellison (1997), Taylor (2003), Kempf and Ruenzi (2008), and Kempf, Ruenzi, and Thiele (2009)).

[3] German regulation is based on the UCITS Directive 85/611/EEC, which also applies to public investment funds in other EU countries.

regulation existing during the financial crisis. Second, based on period-end and within-period data, which are only available for German funds, I investigate to which extent end-of-period CDS holdings are representative of a fund's investment behavior during the period. Third, I examine the accuracy of the information funds provide to investors about their CDS policies.

Although many rules are related to the use of derivatives, funds have a high level of flexibility when designing their investment strategies under both U.S. and German regulation: According to Gałkiewicz (2014), U.S. and German funds might increase their derivative investments up to the point at which it is possible for them to default solely due to derivatives. Thus, losses generated by the Oppenheimer Champion Income Fund in 2008, which were largely due to its CDS positions and reached almost 80% of its value, were in accordance with the existing regulatory limits on derivative use.

Given the high regulatory flexibility, it is interesting to empirically investigate the actual CDS holdings and disclosures of mutual funds. I analyze the 30 largest U.S. and German corporate bond funds (as determined by total net asset value (TNA) in 2004) included in the CRSP and BVI databases as they have the widest investor base.[4] Annual and semi-annual U.S. filings are obtained from the SEC, while German reports are directly provided by the funds. From these reports, I collect data on the funds' net assets as well as the notional and market values of CDS.

The results show that between 2004 and 2010, the use of long and short CDS positions (buying and selling CDS protection) was extensive and increased over time for funds in both countries. However, German funds, which have been allowed to use CDS only since 2004, had significantly higher and more varying CDS positions (measured by CDS notional amounts as a fraction of a fund's TNA) than their U.S. counterparts, especially after EU regulation took full effect in Germany in 2007. As indicated by the negative CDS net notional amounts (long – short positions) at period end, both U.S. and German funds often took on more risk via CDS than they hedged. This was especially pronounced during the 2007-2009 financial crisis where the CDS market peaked (BIS Quartely Review (2004, 2013)). For example, the highest (unrealized) reported loss due to CDS at reporting date equaled -8.10% (-1.63%) of TNA for U.S. (German) funds during the crisis. This is substantial given that corporate bond funds generated returns between -2.82% and 2.97% during the same time period (Adam and Guettler (2014)). According to U.S. regulation, which measures the loss potential of selling CDS protection by the sum of notional amounts, potential losses reached up to 93.82% of TNA for U.S. funds (127.04% of TNA for German funds) during the crisis. Even if the potential losses are

[4] I thank Lehmann and Stehle (2013) for kindly providing me with the data on TNA for German funds.

measured more conservatively by negative CDS net notional amounts, they still reached up to 58.54% of TNA for U.S. funds (93.19% of TNA for German funds) during this time. This further implies that direct leverage restrictions, which limit bank borrowing to 10% and 33.3% of a fund's TNA in Germany/the EU and the U.S., respectively, can be circumvented. Funds can inflate overall leverage by using derivatives, such as CDS, to levels above the value of their net assets. Furthermore, even if the size of the CDS holdings of U.S. and German funds are in line with regulation, it remains unknown to which extent these holdings are used by funds for speculation. Evidence from this study shows that investors could, in the worst case, lose their entire investment due to a fund's exposure to CDS. Thus, it might be worthwhile to tighten rules restricting the speculative use of derivatives by funds to a reasonable level in both countries (which should be determined by the regulator in the best interest of the majority of mutual fund investors). The majority of U.S. and German funds, which keep levels of long and short CDS measured by notional amounts below 15% of their net assets, would not be affected by this change. Tighter rules could, however, prevent potentially high losses due to outliers in the mutual fund industry.[5] Additionally, future research should shed light on the determinants of within-country variations in derivative use and relate them to cross-country variations.

In their reports, German funds are obliged to list the cumulated amounts of individual securities sold within the last period (including derivatives). By analyzing within-period data for German funds, I find that the purchases and sales of CDS observable from one period-end to the other only explained a fraction (37.34%) of the average (or 32.72% of the median) of aggregate CDS purchases and sales implied by period-end and within-period data. Overall, the above evidence suggests that management undertakes many undetectable round-trip CDS trades (purchases followed by sales or the other way around) within a period. This is concerning given the fact that almost half of the observed cumulative amounts of CDS traded over the course of a period (either small amounts turned over frequently or large amounts turned over infrequently) were higher than a fund's average CDS holdings as implied by period-end data. Interestingly, some funds repeatedly traded CDS in the second half of the calendar year between 2007 and 2010. However, definite conclusions about speculation require information about the portfolio holdings of funds and a wider database.

Finally, I analyze the information funds provide to investors about their CDS use. The mandatory CDS related comments provided in the notes of U.S. fund reports were very comprehensive compared to the almost nonexistent, voluntary report comments of German funds. The comparison of comments in annual and semi-annual fund reports with CDS holdings reveals that all CDS strategies mentioned

[5] The new regulation of over-the-counter (OTC) derivatives implemented via the Dodd-Frank Act (2010) in the U.S., and AIFMD (2011) and EMIR (2012) in Germany address the potential for counterparty risk to arise through derivative use, which was already strictly regulated for mutual funds by various issuer-oriented rules (Gałkiewicz (2014)).

by U.S. funds in their reports were in line with actual CDS holdings positions. However, there were rarely concrete statements about a fund's CDS related strategies. For example, funds pursuing short CDS strategies for non-hedging purposes often only stated to use long and short CDS for a wide range of purposes. By contrast, German funds seldom commented on their credit derivative holdings. The rare voluntary comments were of general nature and often even misleading. For instance, funds using more short CDS than long CDS often stated to use long CDS for hedging purposes only. An optimal regulation should prevent investors from reading unspecific information.

My analysis reveals potential risks allowed by mutual fund regulation in the U.S. and Germany with respect to derivative transactions. In the U.S., the potential for realizing losses by selling CDS protection might become almost as high as a fund's TNA, while in Germany, it is sometimes even higher. Furthermore, this high level of flexibility to use CDS allows funds to circumvent the existing strict direct leverage regulation. Finally, I show that the comments funds make about their CDS policies are vague and thus, investors have to analyze portfolio holdings in order to learn about their real investment behavior. This is of significant importance to regulators and investors alike. Since (mostly unsophisticated) investors all around the world expect a high level of protection from regulation, investment and disclosure strategies pursued by mutual funds should be intensively monitored by regulators and stronger regulation should be considered.

A large body of literature focuses on the measurement and sources of mutual fund performance, which goes back to Sharpe (1966) and Jensen (1968). In the last two decades, this stream of literature was extended in the U.S. by the studies of Carhart (1997), Daniel, Grinblatt, Titman, and Wermers (1997), Wermers (2000), Chen, Hong, Huang, and Kubik (2004), Ingersoll, Spiegel, Goetzmann, and Welch (2007), Mamaysky, Spiegel, and Zhang (2008), Comer, Boney, and Kelly (2009), Chen, Ferson, and Peters (2010). Most prominent in Germany are the more recent studies of Kaserer and Pfau (1993), Scherer (1994), Kielkopf (1995), Steiner and Wittrock (1994), Reichling and Trautmann (1997), Griese and Kempf (2003), Stotz (2007), and Lehmann and Stehle (2013). Most of these studies show that, on average, mutual funds underperform the market.

This study relates to the emerging literature on the purpose and the extent of derivative use by mutual and hedge funds (e.g., Koski and Pontiff (1999), Johnson and Yu (2004), Almazan, Brown, Carlson, and Chapman (2004), Marin and Rangel (2006), Chen (2011), Aragon and Martin (2012), Cici and Palacios (2013), and Adam and Guettler (2014)). These studies compare the performance and risk characteristics of funds using derivatives with those of nonusers. Most of the mutual fund studies find sporadic evidence that the use of derivatives affects the performance and/or the risk of the

funds using them. For example, lower fund performance of derivative users compared to nonusers is reported for Canadian domestic equity funds (Johnson and Yu (2004)), for several categories of Spanish funds (Marin and Rangel (2006)), and for U.S. equity mutual funds writing put options (Cici and Palacios (2013)). A few authors (Mahieu and Xu (2007), Minton, Stulz, and Williamson (2009), Hirtle (2009) and Van Ofwegen, Verschoor, and Zwinkels (2012)) have studied the use of CDS by banks. Mahieu and Xu (2007) and Minton, Stulz, and Williamson (2009) presume that only a small fraction of loans are hedged by banks via CDS, while Van Ofwegen, Verschoor, and Zwinkels (2012) find higher insolvency risks at European financial institutions using credit derivatives. However, detailed information about the purpose of using derivatives is lacking as empirical observations and data availability are limited. This study contributes to this stream of literature by providing first evidence for the extent of CDS use by German corporate bond funds and analyzing the level of potential losses from CDS use for U.S. and German corporate bond funds.

I also add to the extensive amount of literature on corporate and financial firm disclosure. The nature of corporate disclosure is summarized in Healy and Palepu (2001) and Beyer, Cohen, Lys, and Walther (2010).[6] While much of the literature focuses on developing theoretical frameworks that explain observed patterns in corporate disclosure policies and providing tests for market efficiency hypotheses associated with the theory of asymmetric information, Healy and Palepu (2001) state that regulation may be necessary for reasons other than correcting an inefficient supply through the provision of information in a Pareto-optimal sense. Referring to studies by Leftwich (1980), Watts and Zimmerman (1986) and Beaver (1998), Healy and Palepu (2001) note that the protection of individual "unsophisticated" investors may as well provide an explanation for prevailing regulation levels. Furthermore, Healy and Palepu (2001) argue that this reasoning shifts the normative grounds for regulation from an efficiency point of view to a wealth redistribution perspective. Indeed, there is evidence that regulators are far more concerned about the latter aspect than financial theory might be willing to acknowledge. Various SEC publications (e.g., SEC Staff report (1994), and SEC Letter to the GCotICI (2010)) provide evidence of the importance of the derivative strategies and disclosure policies of mutual funds, especially after times of crisis. My study therefore contributes to this less explored area of disclosure research. In particular, my paper is similar to the more recent empirical literature on risk disclosure of public companies (e.g., Hodder, Koonce, and McAnally (2001), Kajueter and Winkler (2003), Beretta and Bozzolan (2004), Lajili and Zeghal (2005), Linsley and Shrives (2006), CFA Report (2011), and CFA Report (2013)), insurance companies (e.g., Hoering and Gruendl (2011), and Malafronte, Porzio, and Starita (2013)), and banks (e.g., Hodder (2002), Linsley and Shrives

[6] This stream of literature goes back to the seminal contributions of Jensen and Meckling (1976) and Myers and Majluf (1984), who emphasize the role of asymmetric information in a corporate finance context.

(2005), Perignon and Smith (2008), and Schlueter, Hartmann-Wendels, Weber, and Zander (2013)). This study shows that deficiencies in disclosure, which are observable for public companies and financial institutions, are also observable for U.S. and German corporate bond funds. To the best of my knowledge, there are no studies that analyze the investment and reporting behavior of German funds with regard to CDS use.

The rest of the paper proceeds as follows. Section 2 discusses CDS related strategies. Section 3 presents the objectives of the study based on U.S and German regulation of mutual fund leverage and derivative holdings. Section 4 presents the data and section 5 analyzes the CDS use and the information funds provide to investors about their CDS policies. Finally, section 6 concludes.

2 CDS Related Strategies

CDS are the main form of credit derivatives and can be viewed as default insurance on loans or bonds (Duffie (1999)). For protection, a buyer (seller) pays (receives) a premium until the time of the credit event, or the maturity date of the contract (whichever is first). If a defined credit event occurs, the buyer receives the insured notional amount of a bond from the seller (after subtracting the recovery value of the bond); if a triggering event does not take place, the buyer pays the premium until maturity. Due to the fact that selling CDS protection generates high implicit leverage (at low premiums), it is suitable to implement risky investment strategies, which might lead to significant losses. Funds buy and sell various types of CDS that can be classified as single-name CDS (CDS on individual corporate or sovereign bonds), and multi-name CDS (CDS indices, CDS on bond indices and asset-backed securities). Depending on the constellation, the following CDS strategies are classified either as hedging or investment strategies predetermined to gain additional exposure to credit risk.[7]

In the case of bought CDS (protection buyer, long position), one can distinguish between at least four strategies: First, buying CDS on a specific underlying bond without having the underlying bond in the portfolio (naked long CDS) is probably a bet on the deterioration of the creditworthiness of a company. This strategy is speculative in nature and exposes the fund to counterparty risk. Second, buying CDS on an underlying in a portfolio is probably a way to hedge against a value loss of the bond caused by its deteriorating credit quality.[8] Third, simultaneously buying a bond and CDS on the respective bond can be perceived as a way to exploit temporary spread differences in the CDS market and the bond market, which are due to mispricing or differing counterparty and liquidity risks. Buying

[7] See Adam und Guettler (2014).

[8] Buying CDS on an underlying position that is highly correlated with a bond in the portfolio would be an additional way to hedge against a value loss of the bond, while a high volatility in bought CDS positions could imply speculative strategies.

CDS at a lower spread than implied by the bond spread (CDS basis = CDS spread – bond spread) and assuming no default of the counterparty, would be a so-called "negative basis trade" or a way to realize arbitrage gains.[9] Fourth, buying CDS at low levels and selling them at high levels of credit risk premia (credit market timing) is a way to exploit interest rate changes over time.[10] In the case of corporate bond funds, one could have bought CDS before the financial crisis of 2007 to 2009 and sold them during the crisis for a gain. Alternatively, funds can buy or sell CDS to offset previously sold or bought CDS positions on exactly the same securities (with the same notional amount, coupon, and maturity) to close existing positions.

For the case of sold CDS (protection seller, short position), two additional strategies should be mentioned: First, selling CDS and investing the notional amount into Treasuries would synthesize a bond or index, e.g., to diversify the portfolio. Additionally, this investment strategy could be the only way, or a cheaper way, to acquire a specific bond depending on market conditions.[11] Second, a levered bond position is created by selling CDS without increasing Treasuries, which is significantly riskier than a regular, unlevered bond position (in addition to its total net assets, the fund is subject to investment exposure on the notional amount of the swaps). If the CDS underlying positions are different from the other holdings, gaining additional exposure could help diversify the portfolio. Nevertheless, this strategy is speculative in nature.

It is not possible to distinguish between the above mentioned CDS strategies in detail because aggregate CDS positions are examined without analyzing the CDS underlying positions and without matching them to the portfolio positions of individual funds. However, based on aggregate long and short CDS data at the fund level, it is possible to estimate whether CDS were largely used for hedging or for gaining exposure (e.g., Adam and Guettler (2014)). In the following, I distinguish between long and short CDS strategies applied for hedging or for non-hedging purposes whenever possible.

3 Mutual Fund Leverage and Derivative Regulation and the Objectives of the Study

According to Gałkiewicz (2014), funds in both countries can keep derivatives with a notional amount higher than the value of a fund's net assets. Thus, depending on the types of derivatives used, funds

[9] See Oehmke and Zawadowski (2013) and "Get Positive Results With Negative Basis Trades" [http://www.investopedia.com/articles/trading/08/negative-basis-trades.asp#axzz2Io8W8UVf, visited on 15.12.2012].
[10] See Adam und Guettler (2014).
[11] It could also be a way to bypass issuer oriented rules in the U.S. that, like the diversification rule, restrict a fund's investments into securities of one issuer to 5% of a fund's TNA. Bonds and CDS would usually be accounted for at market values under this rule, with the latter having a much smaller value, while having the same characteristics when used in combination with Treasury securities to synthesize bonds. See SEC Concept Release on Derivatives (2011).

in both countries can reach the point at which the default is theoretically possible solely due to their investments into derivatives, e.g., by investing into short CDS with a notional amount equal to (and in Germany/the EU, even higher than) the value of a fund's net assets. For example, funds could sell CDS protection written on, e.g., asset-backed securities (ABS), with a notional amount equal to the amount of their net assets (the other investments of a fund are ignored for the moment). If the underlying positions come under economic pressure (as was the case during the last financial crisis), bond funds will be required to pay the notional amount (minus any recovery values of the underlying positions of the CDS) to their contract counterparties. Thus, depending on the engagement of funds in short CDS as measured by the notional amount and on the size of the recovery values, unfortunate circumstances could destroy a large part, or even the entire value of the fund (Gałkiewicz (2014)).

In particular, the U.S. and German/EU regulatory frameworks differ in how they regulate the use of derivatives and leverage by funds. In the U.S., bank borrowing is restricted to 33% of a fund's net assets, while in Germany it is restricted to 10% of a fund's net assets, which is the only form of direct leverage available to them. However, they can implicitly create a similar effect to explicit borrowing (direct leverage) by investing into derivatives or engaging into securities-lending transactions[12] (indirect leverage). For example, a fund can create implicit leverage equal to the notional amount[13] by selling protection via CDS (short position), which is comparable to borrowing the notional amount from a bank and investing it in the principal of a bond. Funds that build high positions in derivatives could create extensive leverage that eventually lead to liquidity problems and drive them into default. Thus, independent from the limits on direct leverage, U.S. and German funds face limits on derivative use. In the U.S., funds, in general, have to earmark portfolio securities or keep offsetting positions as collateral for all potential obligations to a third party created in their portfolio by securities-lending transactions and derivatives. These include e.g., futures, forwards, written options, and short CDS. Theoretically, under U.S. regulation a fund could, at most, sell protection via CDS with a notional amount equal to the value of its net assets and earmark all its portfolio securities as collateral. In Germany/the EU, the potential market risk of a fund, in general, can be doubled by derivative use (as measured by the Value-at-Risk determined at 99% confidence level).[14] Similarly, a fund might sell CDS protection with a notional amount equal to (or even higher than) the value of its net assets as long as its VaR is less than twice as high as a VaR of a comparable fund without derivatives.[15] Thus, by using

[12] E.g., if a fund enters into a repurchase agreement it hands over some of its securities to the counterparty of the transaction and gets instead cash, which is comparable to a collateralized loan.

[13] For derivatives, the notional amount usually reflects the scale of a position with reference to some underlying asset and shows the volume traded during a period of time (McDonald (2009)).

[14] The U.S. approach would be comparable to determining the potential 100%-portfolio loss via VaR. See Gałkiewicz (2014).

[15] Since mid-2011, in addition to the relative VaR, an "absolute" VaR can be calculated (at the 99% confidence level for a 20-(previously 10)-business-day holding period using parameters from previous year). The new VaR measure is subject to an

derivatives, such as short CDS, a fund can create additional leverage in order to circumvent the more strict restrictions on direct leverage. However, once a credit event specified under the CDS contract happens, funds are required to pay the notional amount to the counterparty and receive the defaulted bond (or the amount decreased by the cash equivalent of a bond's recovery value); therefore, they might become illiquid due to extensive leverage. As a consequence of the flexibility provided by regulation, it is possible for funds in both countries to lose a large part of their value due to investments in derivatives, such as CDS, alone.[16] The new regulation decided on in 2009 at the G-20 member states meeting in Pittsburgh does not address these issues as it mainly focuses on restricting the potential for counterparty risk to arise through derivative use. In fact, this kind of exposure was already strictly regulated for mutual funds by various issuer-oriented rules (Gałkiewicz (2014)).

Given this hypothetical flexibility, I investigate whether the largest funds in both countries, which have the highest number of investors, expose themselves to potentially high losses via selling CDS protection.

Furthermore, after crises that are related to derivative use, regulators usually prefer to tighten disclosure rules in order to protect investors instead of restricting derivative use directly (e.g., SEC Staff report (1994), CFA Report (2011), and CFA Report (2013)). Against this background, the subsequent analyses might give insight into how effective this kind of protection is when CDS and corporate bond funds are considered. According to the Investment Company Act (ICA) of 1940, U.S. funds are required to inform investors about derivative use in statements of incorporation (Form N-1A), prospectuses, Statements of Additional Information (SAIs), and periodic reports.[17] The statement of incorporation contains information about a fund's intention to use derivatives, while the prospectus comprises information about a fund's current use of derivatives (or alternatively, its intention to use derivatives). The SAI includes general detailed descriptions of a fund's (or a fund family's) derivatives handling (by type), while the report comments describe the derivative strategies applied by a fund together with a brief derivative handling (by type). By contrast, German funds are only required to inform investors about potential derivative use in the terms of the contract contained in the extended prospectuses. However, comments on derivative use in the terms of the

"absolute" limit of 20% of the value of the fund. Since mid-2011, UCITS funds also have to hold sufficient liquid funds for cash settled derivatives and the underlying position or sufficient liquid funds for physically settled derivatives (if the underlying asset is highly liquid and can be purchased on the market at any time). However, the exact amount is up to discretion.

[16] For the information contained in this paragraph, refer to Gałkiewicz (2014), CIL/KAGB [2013], Derivative Order/DerivateV (2011), CESR Guidelines (2010), SEC Concept Release on Derivatives (2011), ICA (1940), SEC Release 10666 (1979).

[17] Funds in the U.S. often face specific internal restrictions on derivative use as suggested for equity funds by Almazan, Brown, Carlson, and Chapman (2004).

contract largely follow the general wording of the law. Additional simplified prospectuses issued to the public in the EU provide general information about a fund's investment strategy without explicitly referring to derivatives; since mid-2011, they are known as the more standardized Key Investor Information Documents (KIIDs).[18] Compared to the U.S., the public reports of German funds contain only a brief description of a fund's investment strategy during a specific period (including voluntary comments on derivative strategies applied by a fund). Moreover, all CDS policies pursued by funds in both countries should be in line with their type and investment strategy as stated in the prospectuses (and also statements of incorporation in the U.S. or the terms of contract in Germany/the EU).

Given that the disclosures of U.S. funds are more extensive than those of German funds, I analyze whether the descriptions contained in the annual and semi-annual fund reports were consistent with the disclosed CDS holdings. In particular, I investigate whether the comments funds make about their CDS policies allow readers of the reports to assess the extent CDS are used for hedging, speculation, or non-speculative purposes (e.g., replicating securities).

An empirical analysis of the level of CDS use and of the disclosures by funds allows this study to assess whether prevalent restrictions on derivative use are protecting investors from potentially significant losses and the accuracy of information funds provided to investors about their derivative policies. This might reveal a need to modify existing regulation in order to better protect investors – many of whom might not be aware about the possibility of a fund losing a large share of its portfolio due to derivative holdings.

4 Data

4.1 Data Description

In order to investigate CDS holdings and disclosures, the analysis focuses on semi-annual and annual reports of the largest U.S. and German corporate bond funds[19] from 01.07.2004 to 31.12.2010 (13 periods). The sample period starts in 2004 because prior to 2004, German funds were not allowed to use CDS and since 2004, U.S. mutual funds are required to disclose their portfolio holdings (with derivatives) on a quarterly basis. However, since German bond funds only report semi-annually, I only consider the U.S. semi-annual and annual reports, which provide investors with the most

[18] In addition, since 2011, the German regulator BaFin requires mutual funds to report their derivative strategies separately from the public reports and directly to the BaFin (Derivative Order/DerivateV (2011)). See Gałkiewicz (2014).

[19] The term "German funds" refers to funds distributed to investors in Germany. However, some of the sample funds are legally incorporated in Luxemburg where the new regulation was implemented in 2002 (and took full effect in 2004).

comprehensive explanations of a fund's investment strategy. The U.S. reports are either downloaded directly from the SEC webpage or via the EDGARpro database, while German reports are directly provided by the investment companies upon request. In addition, I analyze some prospectuses and Statements of Additional Information (SAI). To determine the sample of funds, I follow Adam and Guettler (2014) by excluding money market funds, treasury funds, municipal funds, mortgage funds, index funds, and fund reports after a merger occurred[20] from the sample. The U.S. funds belong to the following Lipper fund classes: corporate debt funds A-rated, corporate debt funds BBB-rated, short investment grade, short-intermediate investment grade, intermediate investment grade, multi-sector income, and high current yield funds. For the results to be interesting for a wide group of investors and comparable to previous research, the study analyzes the 30 largest corporate bond funds, as determined by TNA, that are included in the CRSP Survivor-Bias-Free U.S. Mutual Fund Database as of the end of the second quarter of 2004.[21] This results in a total of 389 reports.

Table 1 contains the names of the top 30 U.S. corporate bond funds as of the second quarter of 2004 and their respective TNA. The largest fund in the sample is the Total Return Fund of the PIMCO fund family with a TNA of $73 billion, while the smallest fund in the sample is the Sanford C. Bernstein Fund's Intermediate Duration Portfolio with a TNA of $2.7 billion. The study includes periods in which U.S. funds use CDS, thus, the final sample contains 192 reports.

Bond funds distributed in Germany are grouped based on the BVI-Classification[22]: fixed income funds investing mainly in Euro; fixed income funds investing mainly in German issuers (both may be combined with the sub-classes of short-term bond funds, middle-term bond funds, and long-term bond funds); fixed income funds with variable investments; and fixed income funds, corporate bonds. The German sample is restricted to funds that mainly hold investments in the Euro-Area (U.S. funds focus on U.S. investments). Additionally, fixed maturity funds and funds only invested in money market instruments and government securities are removed to make the sample as comparable as possible to the U.S. sample. Some reports are missing, but they are expected to only have a minor impact on data quality since most of the funds don't hold CDS around the missing dates.[23]

[20] The Evergreen Core Bond Fund merged with another funds in July 2010. Thus, the last report is not considered.

[21] An exact matching of the sample starting date was not possible due to data constraints. Thus, U.S. funds are classified as of June 30, 2004, while German funds as of December 31, 2004.

[22] See BVI Classification [http://www.bvi.de/fileadmin/user_upload/Statistik/BVI_Abkürzungsverzeichnis.pdf, visited on 24.01.2013], p. 1, 11, 16. The BVI was set up in the year 1970 as "Bundesverband Deutscher Investment-Gesellschaften" (German Federal Association of Investment Companies) and is currently known (since 2005) under the name "Bundesverband Investment und Asset Management e.V." (German Federal Association of Investment and Asset Management). All companies represented in Germany, except some small or foreign companies, are members; 99% of overall funds' TNA is represented by this association. See BVI Jahresbericht 2008, p. 18. According to Lehmann and Stehle (2013) 90% to 95% of all investment funds distributed in Germany are captured by this database.

[23] Two funds only report annually (top30de, No. 20, 25). Additionally, one report is missing for 2010 for fund No. 25 (however, the fund does not use CDS before 2010). Moreover, three reports are missing for fund No. 14 (for the 31.03.2006,

Additionally, some prospectuses (the simplified one and the comprehensive one) and terms of contract are analyzed. Since the reports of Allianz PIMCO Euro Bond Total Return Fund (that would be ranked by TNA as place 16) are not available, I include the next fund, resulting in a total of 361 reports from the 30 largest German bond funds. In general, the reports of funds distributed to the German public should be accessible via the "Online Bundesanzeiger", but unfortunately only a few reports can be found on this webpage. Since the study focuses only on German funds using CDS (at period end or within period), the final sample contains 114 reports. End-of-period CDS holdings are provided in 106 of the reports, and the cumulated amounts of CDS turned over within the period are given for an additional 49 of them. Furthermore, the amount of CDS turned over within the half-years are reported for 8 cases without showing any CDS positions at the end of the period. In the 192 U.S. and 114 German fund reports, I search for details regarding CDS positions (i.e., CDS notional amounts of bought and sold positions, market values of CDS and a fund's TNA) in the schedule of portfolio holdings. For the purposes of this study, I aggregate positions at the fund-quarter level and convert Euro amounts into U.S. dollar using the exchange rate for the respective reporting date.

Table 2 presents the 30 largest funds (as measured by a fund's TNA at the end of 2004 in the BVI database) distributed in Germany (from now on referred to as German funds). The largest German fund in the sample is the dit-Euro Bond Total Return of the Allianz Global Luxemburg fund family with a TNA of $6.3 billion. The smallest fund is the Deka-CorporateBond Euro with a TNA of $0.591 billion. As seen in **Table 1** and **2**, the 30 largest U.S. and 30 largest German funds significantly differ in terms of size. All U.S. funds are at least four times larger than their German counterparts. This might have an effect on the size of the derivative holdings, which is expected to be higher for larger funds due to cost saving arguments (Koski and Pontiff (1999)).

4.2 Variable Definition

In order to perform the analyses specified in section 3, two proxies are determined to gain insight into the lowest and highest potential fund loss due to CDS (i.e., for the case that all short CDS are triggered and the recovery value of the underlying positions is equal to zero[24]): the notional amount from CDS short positions and the CDS net notional amount. This potential fund loss shows what a

31.03.2009, 31.03.2010; however, the fund does not use CDS before 2007). Furthermore, two reports are missing for 2007 for fund No. 10 (however, the fund does not use CDS before 2010), and two reports are missing for fund No. 15 (for the 31.03.2009 and 31.03.2010, however, this fund does not use CDS around those dates). The following funds merged with another funds, thus, as in Adam and Guettler (2014), reports after the merge dates are not considered (top30de, No. 3 on 19.03.2010, No. 12 on 23.04.2010, No. 22 on 09.04.2010, No. 23 on 16.04.2010, No. 24 on 31.03.2008).

[24] In reality, these potential obligations would be partially offset by any recovery values of the referenced debt obligation. However, this assumption is made following U.S. regulation.

fund can lose in addition to the potential 100% of TNA loss it can suffer from other portfolio investments.

The size of the CDS net notional amount (CDS net notional) and notional amount from short CDS positions (short CDS positions) are good approximations for determining the size of potential future obligations arising out of CDS use by funds. According to U.S. regulation, short CDS positions reflect the highest level of potential future obligations (future undiscounted payments) a fund must cover. In the absence of long CDS, and if short CDS are used for speculation only, the potential future obligations from CDS indicate the highest possible fund losses over and above its potential losses from other portfolio securities. Additionally, CDS net notional is used, which is a more conservative measure of potential obligations and assumes a fund's long and short CDS positions offset each other. However, it should be noted that the sample funds seldom hold long and short CDS positions on exactly the same securities to cancel existing positions in terms of notional amount, coupon, and maturity. Regarding leverage regulation, long CDS reflect, in general, negative leverage because a using long CDS is equivalent to shorting a bond and investing the notional value of the CDS into Treasury securities. Thus, this proxy also reflects the amount of indirect leverage a fund keeps. The size and direction of the CDS net notional allows an estimation about whether CDS were largely used for hedging (+) or for gaining exposure (-), as suggested by Adam and Guettler (2014). When construing these measures of potential fund obligations, it is implicitly assumed that all short CDS underlying positions could simultaneously fall under economic pressure even if they comprise CDS written on various single- and multi-name references. To some extent, this was the case during the 2007-2009 financial crisis.

5 Results

First, I investigate the level of CDS use and the potential for realizing losses via CDS for U.S. and German corporate bond funds under current regulation. Second, based on period-end and within-period CDS data, which are only available for German funds, I investigate to which extent the former are representative of a fund's investment behavior within the period. Third, I analyze the information funds provide to investors about their CDS policies in both countries.

5.1 CDS Use and Potential to Realize Losses via CDS in the U.S. and Germany

CDS were held by 19 out of the 30 sample U.S. funds in 192 half-years between the end of 2004 and 2010 and by 19 out of the 30 sample German funds in 106 half-years across the same time period as

indicated by period-end data. Additionally, 13 German funds list the amount of cumulated CDS notionals sold within the period in 57 half-years in their reports. In the U.S., the number of CDS users increased from 11 in the second half of 2004 to 17 funds in the second half of 2007, and then decreased to 13 funds in 2010. Likewise, the number of CDS users in Germany increased from 1 in the second half of 2004 to 15 funds in the second half of 2007 and first half of 2008 before it started to vary between 9 and 13 funds after 2008 (**Figure 1**). Funds in both countries usually held many CDS contracts, which were partly written on single-name corporate (and seldom sovereign) references and partly on multi-name indices such as iTraxx or CDX. As shown in **Table 3** and **4**, the sum of all CDS positions (long and short CDS) held by U.S. funds over the entire sample period was on average 7.84% of TNA ($1,181 mio.), compared to 17.33% of TNA ($175 mio.) in Germany.[25] The largest CDS positions within the observation period were held by the U.S. Fidelity Short-Term Bond Fund (129.09% of TNA or $33,778 mio.) and Deka-CorporateBond Euro (160.89% of TNA or $592 mio.).[26] **Figure 2** shows that the total size of the CDS positions increased from an average of 2.28% in 2004 to 4.58% of TNA in 2010 for U.S. funds and from 1.56% to 9.65% for German funds during the same time period. At the beginning of 2007, after the new EU-wide regulation was fully implemented by the funds registered in Germany, CDS positions increased significantly. Especially after the initiation of CDS use, the average percentage observable for German funds was higher than for U.S. funds. Given the fact that German funds did not have prior experience using CDS, this trend is surprising. While U.S. funds reduced their overall CDS positions after the height of the crisis in the second half of 2008, German funds continued to hold substantial CDS positions until mid-2009.

Figure 3 distinguishes between long CDS (protection bought) and short CDS (protection sold) positions as related to a fund's TNA. German funds maintained significantly larger CDS long and short positions than U.S. funds, except in the second half of 2008 where U.S. funds had larger short CDS positions. While U.S. funds started to successively reduce their CDS positions, German funds began to build significant short positions again in 2010. Additionally, U.S. funds also reduced long positions after 2007 and 2008 when credit risk premia were the highest, while German funds first increased their long CDS positions before reducing them in 2010. **Figure 4** graphs the CDS net positions (long – short) over time, measuring the fund's net exposure to credit risk compared to the credit risk premium (measured by the yield difference between BBB-rated debt and Treasury securities). The

[25] I report the mean values of CDS for the sample of funds that used CDS, which changes over the selected time period. The mean and median values as presented in **Figures 2** to **4** often differ by a large amount, which is due to outliers. Thus, some average figures overemphasize trends in general CDS use. However, for the purposes of this study, it is more important to estimate what is potentially possible under current regulation, i.e., the results obtained for the extreme cases are of large importance. The analysis of extreme cases shows the shortcomings of mutual fund regulation and a potential lack of protection for corporate bond fund investors.

[26] These percentages reflect the potential leverage from CDS defined under EU law as the sum of CDS notional amounts (CESR Guidelines (2010)).

CDS net position for both countries were persistently negative, with the exception of German funds in the second half of 2009. Overall, there were no significant differences between the average net strategies pursued by funds in both countries (**Table 5**), which were net short until the end of 2008 when the credit risk premium rose significantly. Hence, in the worst case scenario, if funds used short CDS as a speculative tool (and not for synthesizing bonds) during the financial crisis, this strategy could have led to substantial losses due to the large increase in credit risk premia during this time (see **Figure 4**).[27] The above results are in line with those of Adam and Guettler (2014) who find that U.S. corporate bond funds are net sellers of CDS, implying that managers, on average, do not use CDS to hedge credit risk.[28]

One cannot determine the effect changes in CDS use have on a fund's risk and performance profile without taking into account parallel changes in asset allocation or changes in the overall investment strategy of a fund.[29] However, the market (fair) value of CDS (unrealized depreciation/appreciation) shows how much a fund's TNA was negatively/positively affected by CDS contracts at a specific reporting date. This accounting value is more than ten times smaller than the CDS notional amount. As shown in **Table 4**, the average unrealized value for U.S. funds equaled -0.25% of TNA with the highest value of -8.10% of TNA observable in the second half of 2008. The values are lower for German funds: The average unrealized value equaled -0.10% of TNA with the highest value of -1.63% of TNA observable in the first half of 2009. Given the average return of 0.54% for U.S. corporate bond funds between 2004 and 2010 (Adam and Guettler (2014)), the highest and average unrealized losses in fund value due to CDS observable at reporting date were substantial for both countries.

Although definite conclusions about speculation require access to the portfolio holdings of funds, the current data on CDS allow the analysis of the potential for realizing losses via CDS beyond the potential 100% of TNA loss the fund can suffer from other portfolio investments. As **Table 4** shows, the mean (median) short CDS positions of U.S. funds equaled 5.47% (2.03%) of TNA for the entire sample period. **Figure 3** shows that short CDS positions increased over time from an average of 1.46% of TNA in 2004 to 3.68% in 2010, with a peak of 15.14% in the second half of 2008. As shown in **Table 6**, the largest short CDS positions of the top30us funds no. 14 and 24 reached 93.82% and 61.66% of

[27] In 2009, when the credit risk premia were falling, German funds went net long. From the perspective of a speculative strategy (market timing), it would have been better to stay net short during this time. The net short exposure of German funds increased only in 2010, which might have been a beneficial speculative strategy because of falling credit risk premia. In 2009 and 2010, U.S. funds successively reduced their CDS holdings while keeping an almost constant net exposure to credit risk. From the perspective of a speculative strategy, they might have benefitted from staying net short during this time, but not necessarily from the reductions.

[28] The authors further show that U.S. funds pursuing net short CDS strategies during the crisis had alphas, which were 51-80 basis points lower per month than these of funds that were net long.

[29] Recent research provides evidence that sold CDS are mostly perceived as a risk increasing tool: For example, Van Ofwegen, Verschoor, and Zwinkels (2012) give evidence that banks sell CDS to increase their risk exposure.

TNA, respectively, indicating that if CDS were used for speculative purposes only (not for synthesizing bonds in combination with Treasury securities), potential additional losses from short CDS exposure could have been as high as 93.82% and 61.66% of TNA for these two funds. However, the majority of U.S. funds held moderate short CDS positions that did not exceed 15% of their TNA and did not lead to negative net CDS positions higher than 15% of their TNA. For U.S. funds, the mean (median) CDS net notional equaled -3.10% (-1.32%) of TNA for the entire sample period (**Table 4**). The average negative CDS net notional increased over time with a remarkable peak of -9.89% in the second half of 2008 and was persistently negative, which indicates that U.S. funds took on more risk than they hedged (see **Figure 4**). As shown in **Table 6**, for most of the U.S. funds the CDS net notional ranged from ca. 12% to -15% of TNA. However, for two funds (top30us no. 14 and 24) the negative net notional (and indirect leverage) reached a value of 58.54% and 54.46%, respectively. By looking into the periodic reports, one can observe that these funds were highly diversified (one of them included "diversified"[30] into its name to attract investors with this feature) and that it might have been beneficial for them to use many short CDS for synthesizing bonds or indices. Indeed, discussions with practitioners confirm that many funds kept higher cash positions in their portfolios (especially those facing higher outflows) during the crisis and used short CDS to increase their exposure to individual names and the market. Nevertheless, if CDS were used by these two funds only for speculative purposes, losses from CDS net exposure could have been as high as 58.54% and 54.46% of TNA.

As **Table 4** shows, the mean (median) short CDS positions of German funds equaled 10.91% (5.09%) of TNA for the entire sample period. **Figure 3** shows that the average short CDS position increased over time with a peak of 20.95% in the first half of 2008. As opposed to U.S. funds, several other German funds presented in **Table 7** (top30de no. 1, 8, 12, and 14) sometimes kept a relatively high amount of short CDS, ca. 40% of TNA, which led to negative net positions in CDS (and indirect leverage) of around 30% of TNA at reporting date. Again, since these funds are generally required by law to be highly diversified (CESR Guidelines (2010)), it might have been beneficial for them to use many short CDS for synthesizing bonds or indices. However, if CDS were used only for speculative purposes, a German fund's loss from short CDS exposure could have been up to 127.04% of TNA – 1.35 times higher than for an individual U.S. fund. The largest short CDS position of 127.04% of TNA of top30de fund no. 30 occurred in the first half of 2008. For German funds, the mean (median) CDS net notional equaled -4.48% (-1.46%) of TNA for the entire sample period (**Table 4**). The average negative CDS net notional increased over time with a peak of -12.94% in the first half of 2008 (**Figure 4**). As shown in **Table 5,** there were significant differences in CDS use between U.S. and German

[30] U.S. funds are generally required by law to be diversified with regard to security issuers (SEC Concept Release on Derivatives (2011)).

funds, except for the net exposure from CDS. However, these differences might be partially driven by the first occurrence of higher CDS amounts at German funds during the time of the crisis when the size of the CDS market peaked. The CDS net notional ranged from 21.22% to -93.19% of TNA with the largest negative net notional (top30de fund no. 30) being 1.6 times higher than for individual U.S. funds. Thus, if CDS were only used for speculative purposes (not for synthesizing bonds), a German fund's loss from CDS net exposure could have been as high as 93.19% of TNA (vs. 58.54% of TNA for an individual U.S. fund).

Figure 5 and **6** compare the Deka-CorporateBond Euro Fund's (top 30de fund no. 30) and the Putnam Diversified Income Trust's (top30us fund no. 14) CDS long and short positions together with their half-year returns between 2004 and 2010. These funds used large amounts of short CDS (127.04% and 93.82% of TNA, respectively) in the middle of the crisis and decreased the amounts shortly afterwards. Although the levels of indirect leverage of 93.19% and 58.54% of TNA, respectively, created this way were in line with existing regulation, one can only speculate why these funds used such high levels of CDS. From a credit market timing perspective, increasing short CDS positions until the middle (Deka-CorporateBond Euro) and the end (Putnam Diversified Income Trust) of the crisis such that they surpassed multiple times the size of long CDS at times when the level of credit risk premia was increasing (**Table 4**), possibly led to losses (Adam and Guettler (2014)). A large part of the short CDS could have been used to increase the riskiness of the fund (and its potential to gain or lose) above the usual level as well.[31] In the second half of 2008, DekaCorporate Bond Euro Fund rapidly decreased its short CDS and kept positions of less than 5% of its TNA in short CDS once performance recovered. A similar pattern is observable for Putnam Diversified Income Trust. Its short CDS peaked in the second half of 2008 and gradually decreased in 2009 to less than 5% of its TNA once performance recovered. This indicates that this U.S. fund might have sold CDS protection primarily to synthesize regular bonds and to add risk. This is evidence that funds are able to circumvent direct leverage restrictions, which limit bank borrowing to 10% and 33.3% of a fund's TNA in Germany/the EU and the U.S., respectively. Funds in both countries can inflate overall leverage by using derivatives, such as CDS, to levels that lie above the value of funds' net assets. This high level of flexibility was not originally envisaged by regulators and might not be in the best interest of investors.

The above findings show that the potential realizable losses from CDS might be higher than a fund's net assets in Germany, while in the U.S., they might be almost as high as a fund's TNA. The case of the

[31] Funds might also have entered into short CDS to earn the premium on sold insurance in order to hide their bad performance around the crisis. However, because of rising credit risk premia, the unrealized loss from short CDS at that time would possibly negatively affect the value of a fund's net assets. Long CDS entered into by a fund in the pre-crisis period could have, if not cancelled before, positively impacted the value of a fund's net assets during the crisis.

Oppenheimer Champion Income Fund, which lost 80% of TNA largely due to CDS use, shows that potential loss from derivatives can materialize. Thus, irrespective of how unlikely it is that all CDS underlying positions fall under economic pressure simultaneously, it might be worthwhile to reconsider the flexibility funds have under current regulation. To better protect unsophisticated investors from potentially significant losses due to derivative transactions, the potential future obligations from derivatives used for speculation could be restricted to a reasonable level below a fund's TNA, as suggested by Gałkiewicz (2014). Based on the empirical results, one can see that stronger restrictions on the use of the CDS would not affect the majority of U.S. or German funds. Stronger restrictions would rather benefit the mutual fund industry as a whole because they could prevent potentially high, and long-lasting, losses due to outliers.

Furthermore, the observed cross- and within-country variations in CDS use might be the outcome of different regulatory regimes and/or fund characteristics, such as membership in a fund family, size, age, expense ratio, turnover ratio, investment style, management structure, and manager characteristics. For example, Koski and Pontiff (1999), Johnson and Yu (2004), and Marin and Rangel (2006) find that the use of derivatives is correlated with fund related variables, such as size, age, asset turnover and membership in a fund family for a sample of U.S., Canadian, and Spanish mutual funds, respectively. Further research should shed light on the within-country variations and relate them to cross-country variations.[32] The trends in CDS use are in line with the findings of Adam and Guettler (2014). I contribute to this literature by providing insights into the investment behavior of German funds with regard to CDS and by analyzing the level of potential losses and indirect leverage of U.S. and German corporate bond funds due to CDS use.

5.2 Representativeness of CDS holdings of German Funds Reported at Period End

One of the main disadvantages of using semi-annual CDS holdings data is that round-trip trades occurring within half of a year (i.e., the purchase and sale of CDS – or the other way around – that take place between two consecutive reporting dates) are missed. However, gains and losses generated by CDS holdings within the reporting period could have already affected the fund's TNA via the realized gains and losses position. In this case, German data, which specify the level of fund activity within the reporting period, provide additional insights compared to U.S. data. The German reports comprise an initial and second schedule of portfolio holdings; the second schedule shows all

[32] Adam and Guettler (2014) compare the risk and return profiles of U.S. funds using CDS with those of nonusers around and during the financial crisis, while controlling for various fund characteristics. Although beyond the scope of this paper, determining the risk and return profiles of German funds using CDS (at period end and within period) and comparing them to U.S. results could provide new insights about the investment strategies of funds.

transactions closed within the reporting period, including the cumulated CDS sales (reflected by the sum of long and short CDS notional and often by the individual long and short CDS).[33] Analyzing how active funds are in trading CDS within a half-year helps clarify to which extent end-of-period CDS holdings are representative of a fund's investment behavior within the period.

In order to approximate CDS turnover and examine the number of missed trades, I focus on a subsample of 13 German funds that report cumulated within-period sales of CDS in 57 periods.[34] The aggregate sales of CDS capture the decrease in CDS holdings between the past and present reporting dates (i.e., sales of CDS) and within-period CDS trades where purchases are followed by sales. However, one erroneous observation[35] is deleted. Thus, for the final sample consisting of 56 observations, I define an approximated (volume based) CDS turnover ratio and, because turnover ratio data are not available for German funds, a variable showing missing trades. **Figure 1** shows that the number of German funds reporting within-period CDS increased from 1 in 2005 to 8 at the end of 2007 before it started to vary between 5 and 8 funds afterwards. This corresponds to the development of the number of funds reporting the use of CDS at period-end, suggesting that some funds repeatedly used CDS in the second half of the calendar year.

Following the common definition of the fund turnover ratio[36], an approximated CDS turnover ratio is constructed as the ratio of the minimum of aggregate sales or aggregate purchases of CDS (measured by the notional) and the average of present and past end-of-period CDS notional of a fund. In order to determine the approximated CDS turnover, I first calculate the aggregate purchases of CDS of a fund by adding the aggregate sales of CDS to the difference in CDS notional between present and past reporting date.[37] The final approximated CDS turnover ratio reflects the minimum of aggregate sales or aggregate purchases of CDS of a fund scaled by its average CDS notional (the CDS turnover is missing for five observations because the average CDS notional is zero). Lastly, I create a variable showing the missing trades in percentage of aggregate CDS by subtracting the period-end difference

[33] Funds originating in other EU countries, such as Luxemburg, are not all required by law to list derivatives in this schedule.
[34] Notice that 12 out of 13 funds report at 49 period ends corresponding CDS holdings and thus, without knowing about the existence of within-period data, one would have to rely on 49 instead of 57 observations. However, to fully exploit the information contained in within-period data, I include zeros for the 8 missing period-end values for which aggregate (within-period) sales of CDS are available to account for the fact that these funds are CDS users during those periods.
[35] In this case, the decrease in CDS notional amounts between past and present reporting dates was higher than the respective amount of aggregate (within-period) sales of CDS.
[36] The annual fund turnover ratio is defined as the minimum of either aggregate sales or aggregate purchases of securities divided by the average 12-month TNA of the fund. See CRSP Guide (2012). Mutual funds use the exact timing and prices at which purchases and sales of securities take place when computing turnover. A turnover estimated based on, e.g., monthly data, is less precise than daily estimates because the transaction prices are approximated by the average price over the month. See Elton et al. (2010).
[37] The difference is negative whenever the CDS notional decreases from the past to the present reporting date.

in CDS notional (the absolute value) from either the aggregate sales or purchases (whichever value is higher) and dividing the entire expression by the respective aggregate sales or purchases.

Table 8 presents the distribution of the period-end difference in CDS notional, aggregate purchases of CDS, aggregate sales of CDS (within-period), the (approximated) CDS turnover ratio and the missing trades for the 56 observations. Differences in these estimates result from missing round-trip CDS transactions over the half-year. Additionally, for a smaller subsample of 43 observations (for which within-period data on long and short CDS are available), the fraction of aggregate purchases of long CDS out of aggregate purchases of CDS is determined. The increase of CDS, implied by period-end data, ranged up to $818 mio., while the decrease of CDS was generally smaller and reached $577 mio. The aggregate CDS purchases ranged from ca. $0.5 mio. to $8,151 mio. and aggregate CDS sales from ca. $4 mio. to $8,186 mio. The CDS turnover was, on average, around 6.73 times higher than a fund's average CDS holdings implied by period-end data. The median (75th-percentile) CDS turnover was around 0.94 (4.20) times higher than a fund's average CDS holdings. The variation in this number was large, with the highest CDS turnover being 140 times higher than a fund's average CDS holdings, indicating a high level of heterogeneity across portfolios in terms of CDS use. Thus, almost half of the observed cumulative amounts of CDS traded over the course of a period (either frequently turned over in smaller amounts or infrequently in higher amounts) were higher than a fund's average CDS holdings as implied by period-end data.

The variable missing trades shows that changes in CDS holdings implied by period-end data, on average, reflect 37.34% of aggregate CDS trades derived from period-end and within-period data. For observations that equal to or lie above the median, between 67.28% and 100% of aggregate CDS trades remain undetected; 100% of aggregate CDS are unobserved whenever a fund undertakes round-trip CDS trades without showing any CDS on reporting date. Additionally, **Figure 7** shows the development of the median missing CDS trades over time. A high fraction of aggregate CDS trades not explained by period-end differences was observable in every second half of the year between 2007 and 2010. As shown in **Figure 1**, the number of funds reporting CDS within-period also increased in every second half of the year between 2007 and 2010, suggesting that some funds undertook many round-trip CDS trades in the second half of the year. The reasons for this timing remain unclear.[38]

As shown in **Table 9**, 39 of the 56 period-end differences in CDS notional were positive, indicating an increase of CDS by funds, and 17 were negative, suggesting a decrease of CDS in the respective half-

[38] These funds might use CDS for portfolio rebalancing or window-dressing at year end (Elton et al. (2010)).

years. Interestingly, the aggregate sales and purchases of funds that decreased CDS in the respective period were higher than the aggregate sales and purchases of funds that increased CDS in the respective period for the entire sample. At the same time, a smaller fraction of missing trades was observable for funds that decreased CDS over the course of the period, as compared to funds that increased CDS. This indicates that funds decreasing CDS trade higher amounts of CDS less frequently (keep the CDS positions in their portfolios for a longer time period). By contrast, funds that increased CDS in the respective period undertook more CDS trades (purchases and sales or sales and purchases of CDS) within-periods that remained undetected. This shows that these funds either frequently turned over small amounts of CDS, which could have been in line with their investment strategy (e.g., short-term orientation), or misrepresented actual CDS holdings at period end because funds using CDS mainly for non-speculative reasons (e.g., hedging or synthesizing bonds), would keep these positions open in their portfolios for a longer time period.

The aggregate (within-period) sales of individual long and short CDS are known for a smaller subsample of 43 fund-half-years. Based on this additional information, it is observable that funds that increased CDS in the respective period (for median values, not average values) increased more long CDS than short positions. Funds that decreased CDS during the same time period decreased more short CDS than long positions (both for average and median values). However, definite conclusions about the purpose of CDS use require the portfolio holdings of funds and a wider database.

Overall, almost half of the observed cumulative amounts of CDS sold between the two consecutive reporting dates were higher than a fund's average CDS holdings, as implied by period-end data. The above evidence further suggests that management undertook many round-trip CDS trades (purchases followed by sales or the other way around) within periods that remained undetected, with some funds trading CDS repeatedly in the second half of the calendar year. In particular, funds that increased CDS undertook more undetectable round-trip CDS trades than the funds that decreased CDS during the same time period. Thus, either these funds frequently turned over small amounts of CDS following their general investment policy or misrepresented CDS holdings at period end. Further examination of these issues might be a promising field for further research.

5.3 The Comparison of Disclosed CDS Holdings and Report Comments of Funds

The derivative and leverage policies of mutual funds are important for regulators, especially when it comes to adequate disclosure by market participants, as indicated by various SEC publications (e.g., SEC Staff report (1994), SEC Letter to the GCotICI (2010) and SEC Concept Release on Derivatives

(2011)). This study examines the CDS related risk information disclosures in annual and semi-annual reports of U.S. and German funds to check whether the long and short CDS holdings aggregated at the fund level are consistent with the comments in the annual and semi-annual reports of funds at the same reporting date. The direct comparison of comments and CDS positions provides insight into one aspect of the investment behavior and disclosure policy of U.S. and German corporate bond funds. Furthermore, this demonstrates the usefulness of the information disclosed to the investors.

The studies of Hodder, Koonce, and McAnally (2001), Beretta and Bozzolan (2004), Lajili and Zeghal (2005), together with the newest CFA Reports (2011) and (2013), show that the disclosure of risk by public companies is often of limited use to shareholders due to the lack of uniformity, clarity, and quantification. Furthermore, not only the quantity, but also the content, determines the quality of disclosures. Hoering and Gruendl (2011) report that there are still large inter-insurer and inter-cultural differences in risk disclosure, while Malafronte, Porzio, and Starita (2013) find that the annual reports of insurers are difficult to read. Regarding the disclosures of mutual funds, the SEC letter to the General Counsel of the Investment Company Institute (2010) stresses that there is a wide variety of derivative disclosures, ranging from highly abbreviated "to lengthy, often highly technical, disclosures that detail a wide variety of potential derivative transactions without explaining the relevance to the fund's investment operations."[39] Additionally, the SEC highlights that risks faced by funds should be explained in connection with the respective derivative strategies. The SEC is concerned about the descriptions, which often give the impression that a fund faces high exposure when it actually does not, and vice versa.[40] For example, the Oppenheimer Champion Income Fund was blamed by the public for its generic, boilerplate disclosure.

Given the differences in disclosure regulation between both countries (presented in section 3), I focus on annual- and semi-annual fund report comments in order to compare stated CDS strategies with disclosed CDS holdings between 2004 and 2010.

5.3.1 The Nature of CDS Related Comments Disclosed by U.S. Funds

All U.S. funds are required to comment on their holding positions, including various derivative positions, in the notes section of their reports. The **Appendix** contains an example of comments on CDS provided by a U.S. fund. In addition, the majority using CDS (12 out of 19) irregularly indicated the use of derivatives and associated risks in the section of the report that contains a short discussion of fund performance. For the purpose of this study, I only focus on the comments on CDS use in the

[39] SEC Letter to the GCotICI (2010), p. 2-3.
[40] See SEC Letter to the GCotICI (2010), p. 3-4.

report notes. In general, notes were shorter from 2004 to 2007 than from 2008 to 2010. Between 2004 and 2007, funds always provided a short technical definition of CDS, some comments on valuation (mark to market), and short remarks on the strategies behind CDS use. Starting in 2008, the information content within the notes became higher due to the increase in explanatory notes on the technical functioning of different CDS types and on various risks associated with CDS use. Additionally, the notes often provided more detailed information regarding a fund's CDS strategies, the amount at risk, and triggering events. This observable change was due to an amendment to the FAS 133[41], which requires more extensive disclosure. In particular, the amendment requires funds to state the nature and the terms of derivatives, give reasons for entering into those instruments, specify events that require the seller to perform under a contract, and describe the current status of the payment/performance risk with regard to the contract. Moreover, funds have to post information about the highest potential amount that the fund could be liable for as a contract seller, the fair value of the contract, and the nature of any recourse provisions/assets held either as collateral or by third parties.

As discussed in section 2, funds enter into long CDS and short CDS for various purposes. Beyond offsetting existing long CDS positions, funds may use CDS selling protection to gain exposure to risk by timing credit markets and creating levered or unlevered bond positions. Over and above hedging portfolio risks, funds may use CDS buying protection to perform negative basis trades or to time credit markets. All 19 funds that use CDS commented on their holdings in 192 half-years. These comments on CDS were in line with the disclosed CDS holdings because almost all of the funds stated that they entered into CDS contracts to buy or sell protection on an underlying position – this general comment formulation justifies every CDS strategy applied by a fund for any purpose. Funds rarely made concrete and specific statements about CDS related strategies. In particular, the 13 funds that did not have long CDS, i.e., they pursued short CDS strategies for non-hedging purposes, stated to buy and sell CDS for a wider range of purposes in 53 out of 192 half-years (not reported). Only two funds stated and actually only used short CDS in 17 half-years. Surprisingly, while not having short CDS, i.e., pursuing long CDS strategies, 4 out of the 19 funds that used CDS stated to buy and sell CDS for a wider range of purposes in 7 out of 192 half-years. Only one fund stated and actually only used long CDS in 2 half-years. Furthermore, the CDS comments of funds belonging to one fund family (i.e., PIMCO, Fidelity, Vanguard) were close to identical. This is in line with the SEC observation that

[41] See FASB Staff Position No. FAS 133-1 and FIN 45-4, "Disclosures about Credit Derivatives and Certain Guarantees: An Amendment of FASB Statement No. 133 and FASB Interpretation No. 45." The amendment extends the interpretation of FASB Statement No. 133 ("FAS 133"), "Accounting for Derivative Instruments and Hedging Activities", and the FASB Interpretation No. 45 ("FIN 45"), "Guarantor's Accounting and Disclosure Requirements for Guarantees, Including Indirect Guarantees of Indebtedness of Others." See FASB ASC 815-10 (2009).

comments are often prepared for a particular fund family and not for a specific fund (SEC Letter to the GCotICI (2010)). Thus, U.S. funds could have been more specific about their CDS strategies in 60 out of 192 half-years. These findings further indicate that funds only pursuing short CDS strategies, which are associated with non-hedging activities, give the impression of using long and short CDS for a wider range of purposes. It remains unclear whether they do this intentionally or unintentionally.

As previously mentioned, the quantity of information provided in the notes has increased since 2008. For example, starting in 2008, the information content within the notes increased for PIMCO and Vanguard funds. This is primarily due to the increase in explanatory notes on the technical functioning of different CDS types (e.g., distinguishing between CDS on corporate or sovereign bonds, indices and asset-backed securities) and on the fund's CDS strategies. Although extensive information is provided, no new insights are generated regarding the strategic use of CDS, as previously criticized by the SEC.

Moreover, it is often directly (or indirectly) stated that CDS are priced according to the mark to market standard, although the potential obligations amount to the notional value for sold CDS. However, funds can mention the latter information in the footnotes of the respective portfolio holdings or in the notes, while not necessarily giving the overall notional amount of short CDS. For example, starting in 2009, Fidelity funds mention that the notional amount describes the highest potential loss that can occur due to sold CDS as well as provide an absolute amount and a fraction of the net asset value put at risk during a specific period (see the **Appendix**). The figures were in line with disclosed CDS notional amounts observed in the data. Additionally, since the second half of 2009, Fidelity Funds give the precise amount of net collateral pledged as well as the amount that should be paid beyond that point (assuming all contracts are triggered).[42] This last piece of information is only provided by some funds within the notes, while other funds usually mention the amount of collateral pledged of the respective positions in the footnotes to the portfolio holdings.

Overall, the previous analyses reveal that fund comments could be improved in the interest of the investors. For example, it seems to be useful if funds provide information about derivative use and possible consequences within the performance discussion at the beginning of the reports in addition

[42] The 2010 semi-annual report for Fidelity Intermediate Bond Fund states: "The total notional amount of all credit default swaps open at period end where the Fund is the seller of protection amounted to $4,324 representing 0.1% of net assets. Credit default swaps are considered to have credit-risk contingent features since they require payment by the seller of protection to the buyer of protection upon the occurrence of a defined credit event. The total value of credit default swaps in a net liability position as of period end was $(3,656). The value of assets posted as collateral, net of assets received as collateral, for these swaps was $2,907. If a defined credit event had occurred as of period end for swaps in a net liability position, the swaps' credit-risk-related contingent features would have been triggered and the Fund would have been required to pay $4,324, less the value of the swaps' related reference obligations." Report (Notes), p. 34-35.

to the notes section. Reducing and standardizing the very extensive CDS related comments, e.g., regarding the details about the functioning of CDS from contract initiation to termination could also be a valuable improvement. Avoiding the use of unspecific statements about a fund's CDS related strategies could also benefit investors because funds only pursuing short CDS strategies (for non-hedging purposes) often – intentionally or unintentionally – report to use long and short CDS for a wider range of purposes. Furthermore, mentioning the highest aggregate notional amount that could be due in a specific period because of sold CDS (as a fraction of the TNA) as well as the precise amount of net collateral pledged and additional necessary payments if all contracts are triggered within the notes might be an improvement for a potential investor. The existence and mandatory application of a compact and standardized template for CDS related text that incorporates the above features, which are already required by law, could increase understanding, and the value of information.

Altogether, these results confirm many former SEC findings (SEC Letter to the GCotICI (2010)) with regard to the lengthy, highly technical, and unspecific disclosure policies of mutual funds. They further highlight that the disclosures of U.S. funds and public companies (e.g., Beretta and Bozzolan (2004), Lajili and Zeghal (2005), CFA Reports (2011) and (2013)) similarly lack uniformity, clarity, and overemphasize quantity over quality of reporting. Although there is a lot of information given, the value of this information for the reader should be evaluated by further research and regulators.

5.3.2 The Nature of CDS Related Comments Disclosed by German Funds

Opposed to U.S. fund reports, the public reports of German funds contain only a brief description of a fund's investment strategy during the specific period and occasionally whether CDS are used for "hedging" and/or "investment purposes" (e.g., for synthesizing a bond or for speculating). From an investor's perspective, it is important to know whether German funds that voluntarily comment on their CDS holdings do so truthfully. For the sample of German funds, only 9 out of the 19 that used CDS directly commented on CDS use in 25 out of 106 half-years (23.58%). As shown in **Figure 8**, the number of funds commenting on CDS use increased from 1 fund in the second half of 2006 to 6 funds in 2010. Four funds that used CDS suggest that they never used credit derivatives.

As reported in **Table 10**, German funds that commented on CDS use had significantly higher CDS holdings (as related to a fund's TNA) at the end of reporting period than funds that did not comment on CDS. In particular, the short CDS positions are significantly higher for funds that commented on CDS use, indicating that the funds that were higher exposed to risk provided additional information to investors. However, comments were not always in line with the disclosed CDS holdings: **Figure 8**

shows that 3 out of 9 funds suggested hedging with CDS in 8 out of 25 (32%) half-years, while pursuing both long and short CDS strategies for a wider range of purposes. In all of these cases, short CDS positions were always high and, in 6 cases, even significantly outweighed long CDS positions at the respective period ends. This indicates a heightened fund exposure to risk, whereas the funds reported to hedge with CDS. These misleading statements are summarized in **Table 11**, where the 8 misleading CDS comments (author's translation) are compared to relevant CDS holdings on the particular reporting date. By looking at the comments around the highlighted periods, I found that they differed from those highlighted as misleading (not reported). Additionally, although these 3 funds stopped commenting on CDS use, they did not stop using CDS (2 of the 3 funds also used CDS before they started to comment on them for the first time). For those particular cases, one cannot rule out the possibility that funds intentionally wanted to misguide investors.

By contrast, U.S. funds that did not use long CDS often reported to buy and sell CDS for a wider range of purposes in 53 out of 192 half-years. In Germany, only 2 out of the 9 funds that did not use long CDS stated to buy and sell CDS for a wider range of purposes in 2 out of 25 half-years. By contrast, for funds that did not have short CDS, i.e., pursued long CDS strategies, 2 out of 9 stated to buy and sell CDS in 3 out of 25 half-years for a wider range of purposes (in the U.S., 7 out of 192 half-years). Moreover, one fund stated to only use short CDS (associated with non-hedging purposes) even though it used long CDS positions in 2 half-years. Only one fund stated and actually used long CDS in 2 half-years. In total, German funds made 8 misleading statements and could have been more specific about their CDS strategies in 7 additional cases out of 25 half-years (in the U.S., the issue of unspecific comments occurred in 60 out of 192 half-years). The comments in the extended prospectuses (terms of contract) were also very general or strictly followed the wording of the law. Thus, based on the report comments on derivatives, investors could have only guessed about the way funds distributed in Germany used financial instruments during this time period. All proposals for improvements to U.S fund disclosure policies made in the previous subsection should also be considered by regulators for EU-wide fund disclosure policies.

Although different levels of transparency with respect to the information provided to investors are observable in both countries, analyses performed for U.S. and German corporate bond funds show the high level of flexibility that funds have when commenting on their derivative strategies, which may misguide investors. The results suggest that investors have to analyze portfolio holdings in order to learn about the true investment behavior of funds because CDS comments are often unspecific or misleading. In the interest of investors around the world (particularly unsophisticated ones), who

expect a high level of protection from regulation, U.S. and German/EU regulators should monitor the investment and disclosure strategies pursued by mutual funds more intensively.

6 Conclusion

This study analyzes the level of potential losses from CDS holdings at U.S. and German corporate bond funds together with the CDS related disclosures during the financial crisis of 2007-2009 under the regulation existing at that time. In particular, I investigate whether the potential risks associated with the use of CDS are properly reflected in the information provided to investors in the annual and semi-annual reports of funds in the U.S. and Germany. The goal is to determine whether investors need to worry about funds potentially taking extensive risks through the use of CDS and misinforming the public about their CDS policies. From prior research (e.g., Gałkiewicz (2014)), it is known that funds in the U.S. and Germany face high levels of flexibility. Depending on the types of derivatives used, funds in both countries can reach a point at which default is theoretically possible solely due to their investments into derivatives, e.g., by investing into short CDS with a notional amount equal to (and in Germany/the EU even higher than) the value of a fund's net assets.

In general, CDS use was extensive and increased over time for both U.S. and German funds between 2004 and 2010. Although less experienced in using CDS, German funds had higher and more varying CDS positions on the individual fund level since 2007. Especially noticeable is the fact that U.S. and German funds stayed net short and kept the highest levels of CDS selling protection during the middle of the financial crisis and thus, likely further increased their overall risk during this time period. For some funds in the U.S., the potential for realizing losses via CDS selling protection, as determined by the sum of notional amounts (following U.S. law), was almost as high as a fund's TNA, while in Germany, this potential was sometimes even higher than a fund's TNA. Thus, funds are able to circumvent the direct leverage restrictions, which limit bank borrowing to 10% and 33.3% of TNA in Germany/the EU and the U.S., respectively, by using derivatives, such as CDS, and inflate overall leverage to levels that lie above the value of net assets. This is cause for concern as the high level of flexibility was not originally envisaged by regulators and might not be in the best interest of investors. Although definite conclusions about speculation require the portfolio holdings of funds, this study shows that the prevalent regulation might not sufficiently protect investors from extreme losses.

The additional analysis of the CDS trading activity of German funds between two consecutive reporting dates highlights that the purchases and sales of CDS observable from one period-end to the next explain approximately one third of the aggregate CDS purchases or sales implied by period-end and within-period data. In this regard, a high level of heterogeneity across funds is observable. This

suggests that period-end data overlooks many round-trip CDS trades (purchases followed by sales or the other way around) undertaken by management.

Regarding the analysis of information funds provide about their CDS use, the results suggest that investors have to analyze portfolio holdings in order to learn about the true investment behavior of funds in both countries because comments on CDS contained in the periodic reports are often unspecific and even sometimes misleading. For instance, in Germany, funds that sold more CDS protection than they bought often stated to only buy CDS protection for hedging purposes.

Based on the aforementioned results, it seems advisable that regulators in both countries tighten rules restricting the speculative use of derivatives by funds to a reasonable level, as well as implement more standardized disclosure policies. Stronger restrictions on the speculative use of derivatives would not affect the majority of U.S. or German funds, but could benefit the mutual fund industry as a whole by preventing potentially high, and long-lasting, losses due to outliers. Overall, the analyses presented document potential limitations of mutual fund regulation in the U.S. and Germany/the EU with respect to CDS and highlight the existence of high risks. Given the potential harmful impacts on investors, as witnessed during the financial crisis, these findings are of significant importance for regulators and investors alike.

Appendix

An example of CDS related comments in a U.S. fund report

The following Quote presents an excerpt from the notes part of the annual report from August 31, 2010 of the Fidelity Intermediate Bond Fund:

“The Fund entered into credit default swaps as a seller to gain credit exposure to an issuer and/or as a buyer to provide a measure of protection against defaults of an issuer. The issuer may be either a single issuer or a "basket" of issuers. Periodic payments are made over the life of the contract provided that no credit event occurs. For credit default swaps on most corporate and sovereign issuers, credit events include bankruptcy, failure to pay, obligation acceleration or repudiation/moratorium. For credit default swaps on asset-backed securities, a credit event may be triggered by events such as failure to pay principal, maturity extension, rating downgrade or write-down. For credit default swaps on asset-backed securities, the reference obligation described represents the security that may be put to the seller. As a seller, if an underlying credit event occurs, the Fund will either pay the buyer an amount equal to the notional amount of the swap and take delivery of the reference obligation or underlying securities comprising an index or pay a net settlement amount of cash equal to the notional amount of the swap less the recovery value of the reference obligation or underlying securities comprising an index. The notional amount of credit default swaps is included in the Schedule of Investments and approximates the maximum potential amount of future payments that the Fund could be required to make if the Fund is the seller and a credit event were to occur. The total notional amount of all credit default swaps open at period end where the Fund is the seller amounted to $3,990 representing .08% of net assets." Report (Notes), p. 36-37

Figure 1: The development of the number of U.S. and German corporate bond funds reporting the use of CDS between 2004 and 2010

This figure shows the development of the number of U.S. (US) and German (DE) corporate bond funds that report using CDS at period end and the number of German funds that report using CDS within period between 2004 and 2010. Out of the 30 funds from each country (60 total), 19 funds report using CDS at some point between 2004 and 2010 – 192 times in the U.S. and 106 times in Germany. Additionally, 13 German funds report using CDS occurring within period at some point in the time between 2004 and 2010 (for a total of 57 times). Source: CRSP, BVI, SEC, Bundesanzeiger.

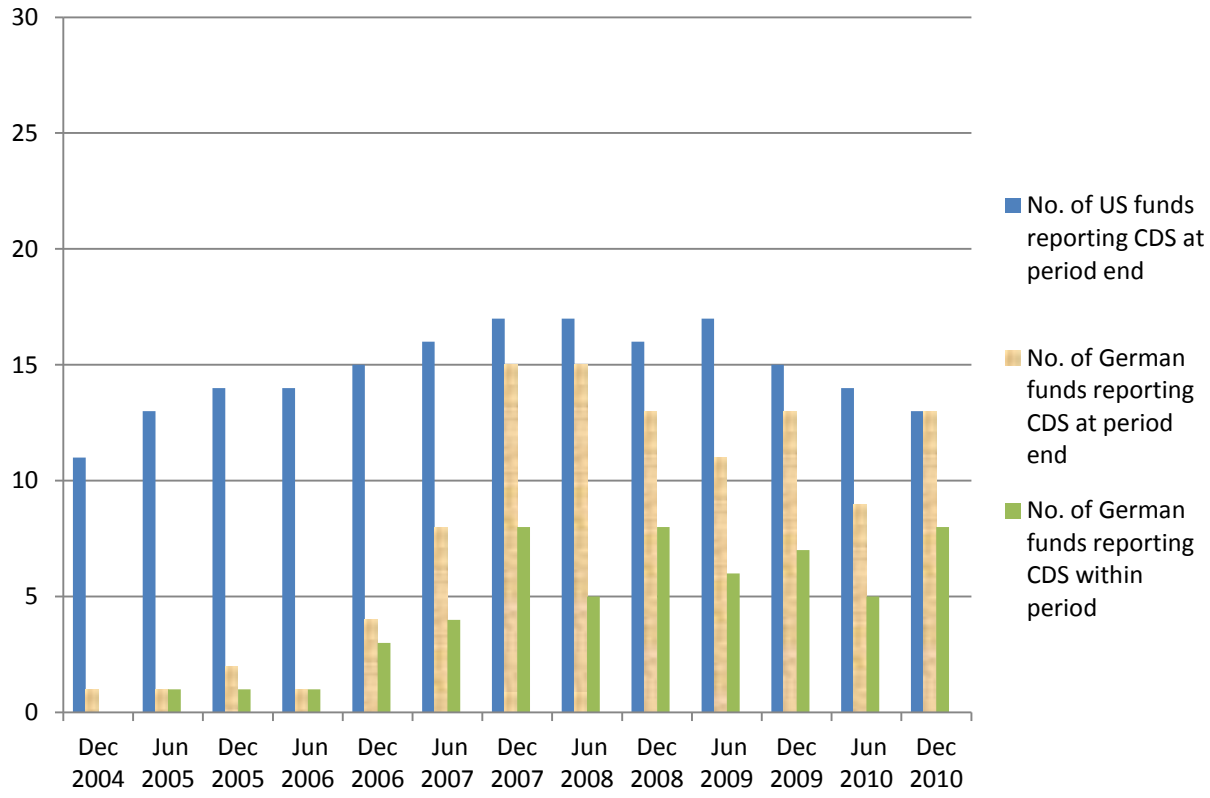

Figure 2: The development of total CDS positions of U.S. and German funds that report using CDS between 2004 and 2010

This figure shows the average total notional amount of all CDS outstanding divided by total net assets at a particular period end for U.S. and German corporate bond funds. The respective median (md) positions are represented by dotted lines. Source: CRSP, BVI, SEC, Bundesanzeiger.

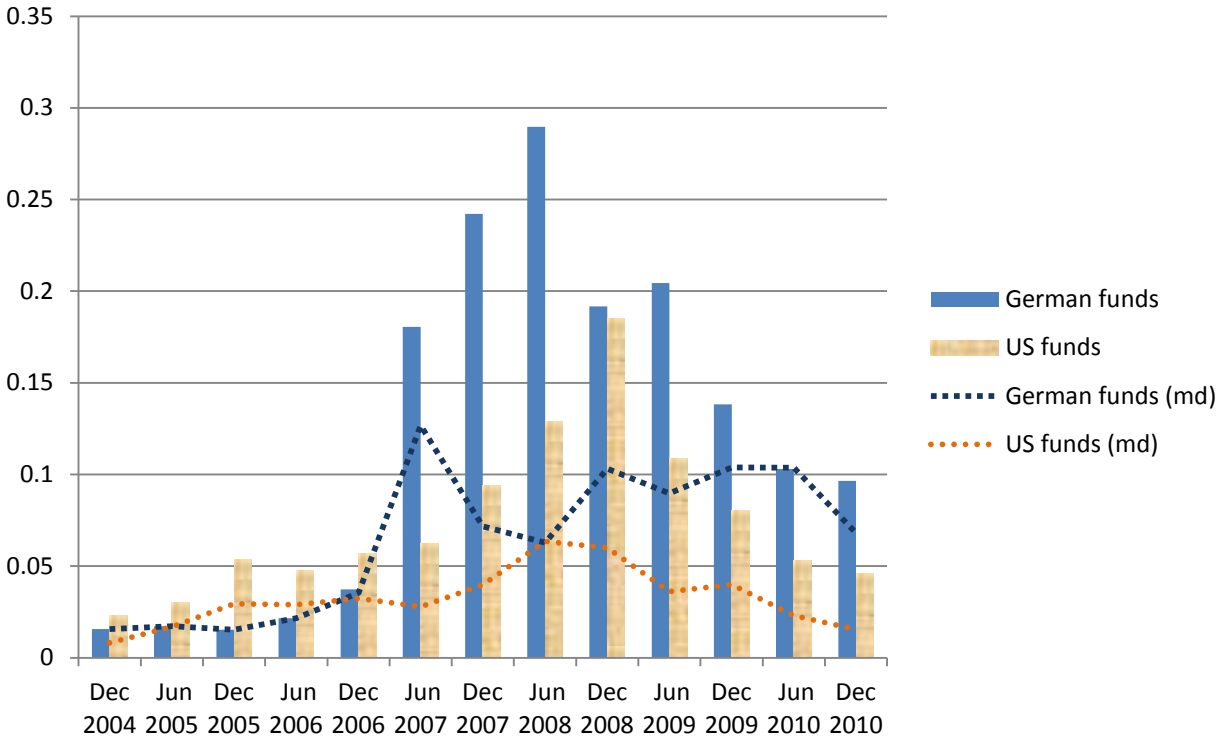

Figure 3: The development of long and short CDS positions of U.S. and German corporate bond funds between 2004 and 2010

This figure shows the development of the average CDS long and short positions at a particular period end for U.S. and German funds. CDS notional amounts are normalized by the fund's total net asset value (TNA). The respective median (md) positions are represented by dotted lines.

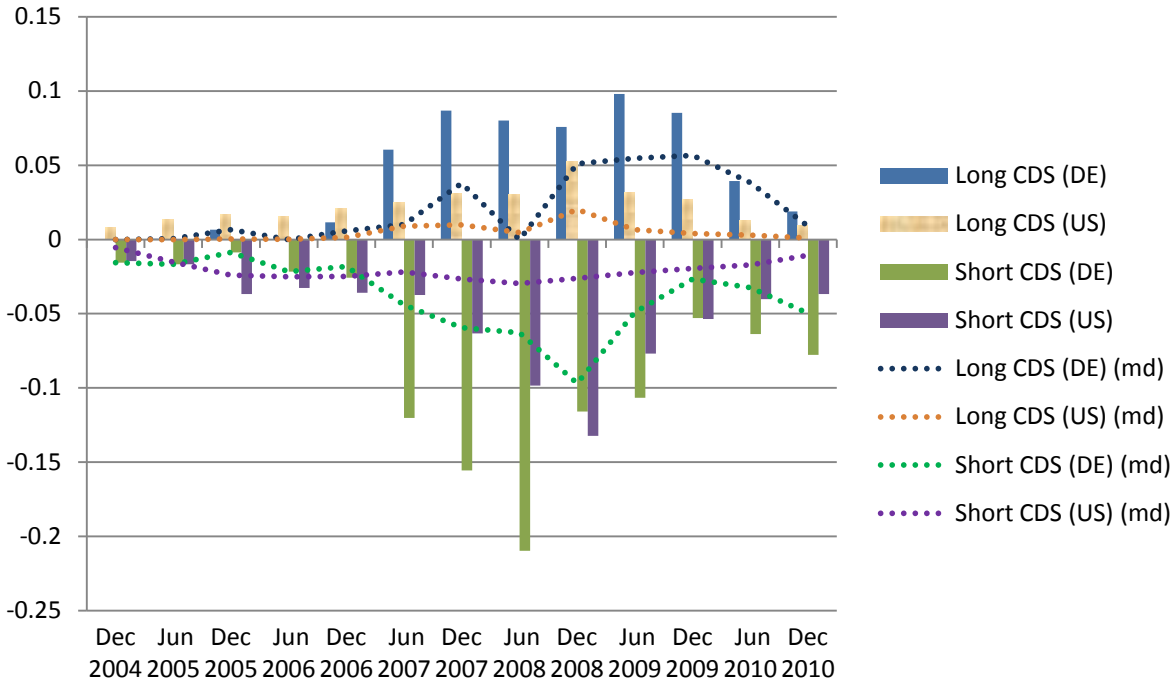

Figure 4: The development of the net CDS positions of U.S. and German corporate bond funds and the credit risk premium

This figure presents the development of the average CDS net notional positions (long CDS – short CDS) as a fraction (frac.) of a fund's TNA for U.S. and German CDS users and the level of the general credit risk premium represented by BBB yield – Treasury yield between 2004 and 2010 at a particular period end. The respective median (md) positions are represented by dotted lines.

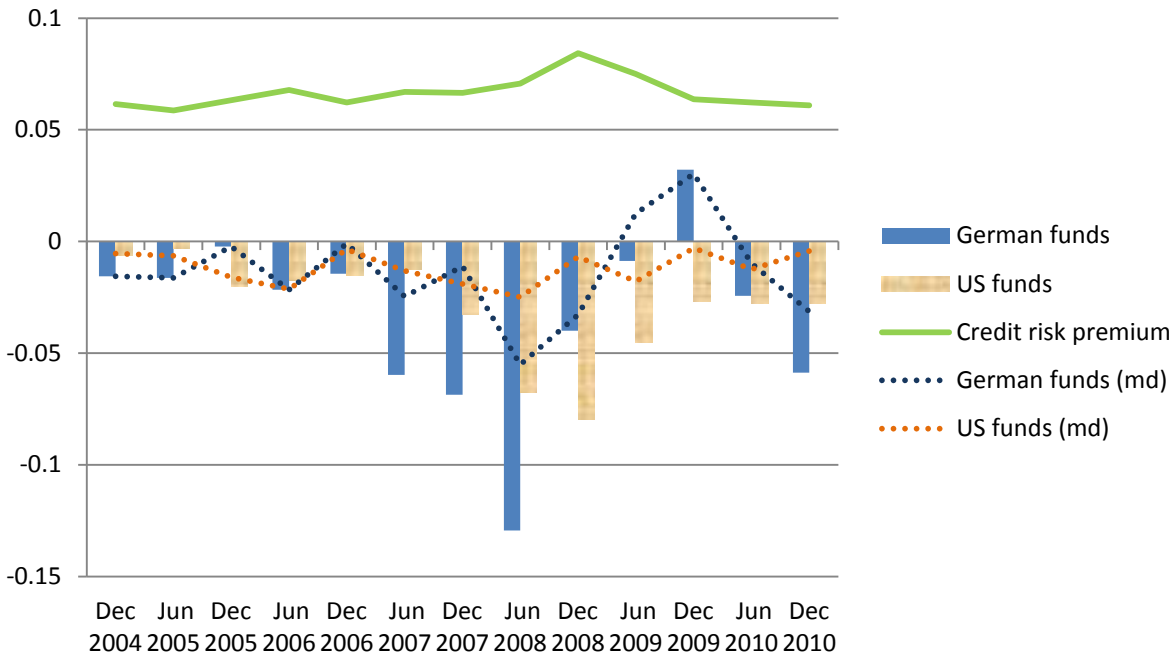

Figure 5: The development of long and short CDS positions and half-year returns of Deka-CorporateBond Euro (top30de fund no. 30)

This figure shows the development of the Deka-CorporateBond Euro fund's CDS long and short positions at a particular period end together with its half-year returns between 2004 and 2010. CDS notional amounts are normalized by the fund's total net assets.

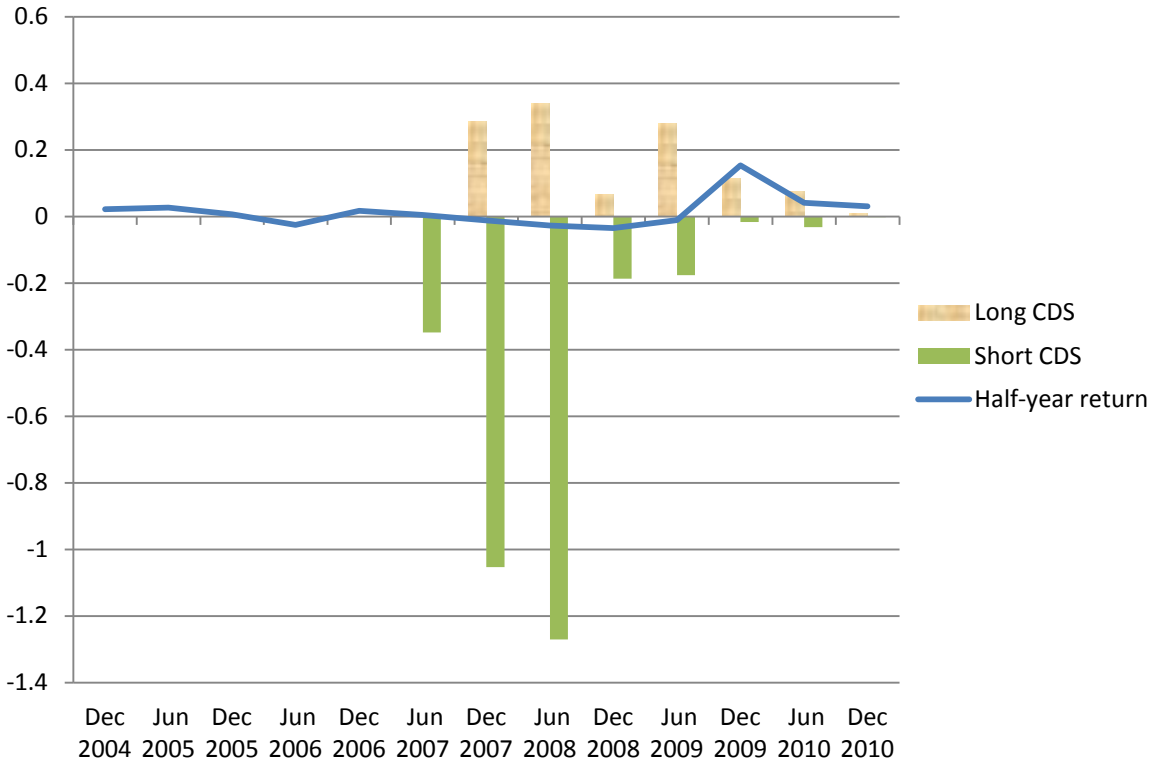

Figure 6: The development of long and short CDS positions and half-year returns of Putnam Diversified Income Trust (top30us fund no. 14)

This figure shows the development of the Putnam Diversified Income Trust's CDS long and short positions at a particular period end together with its half-year returns between 2004 and 2010. CDS notional amounts are normalized by the fund's total net assets.

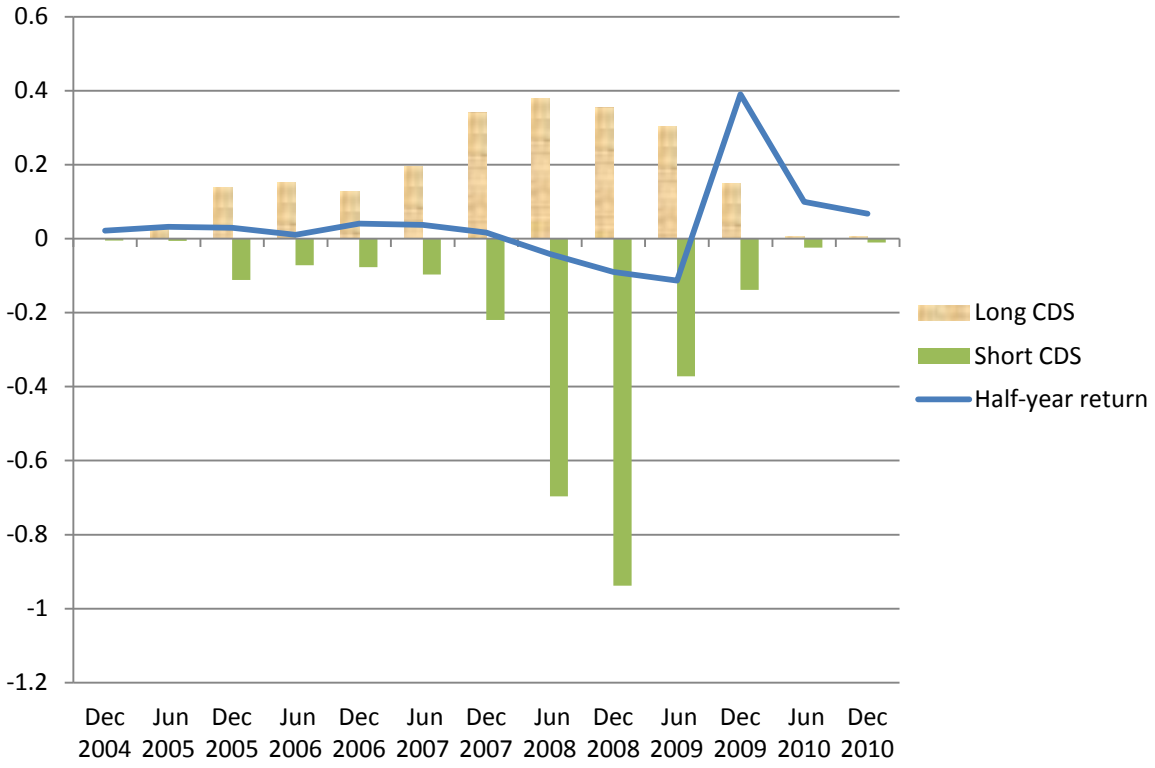

Figure 7: The development of the median number of missing CDS trades of German funds over time

This figure shows the development of the median number of missing CDS trades as a fraction of aggregate CDS of German funds that report using CDS within period between 2004 and 2010.

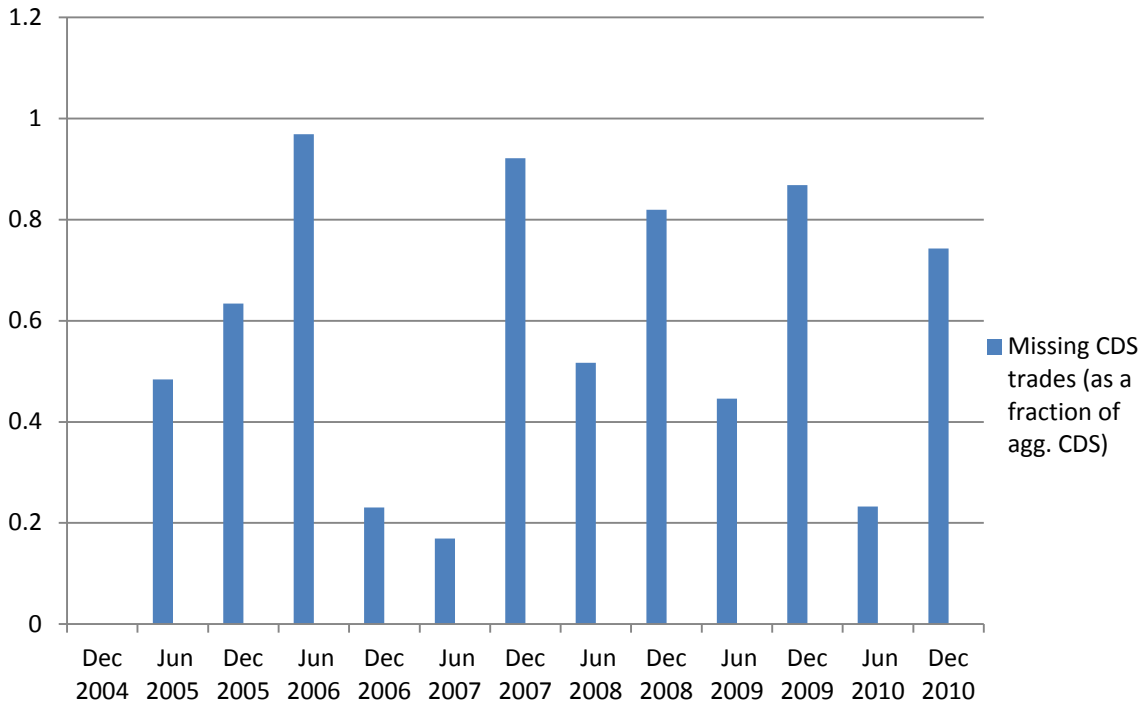

Figure 8: The development of the number of CDS comments and misleading CDS comments of German funds between 2004 and 2010

This figure shows the development of the number of CDS comments and misleading CDS comments of German funds reporting CDS at period end between 2004 and 2010.

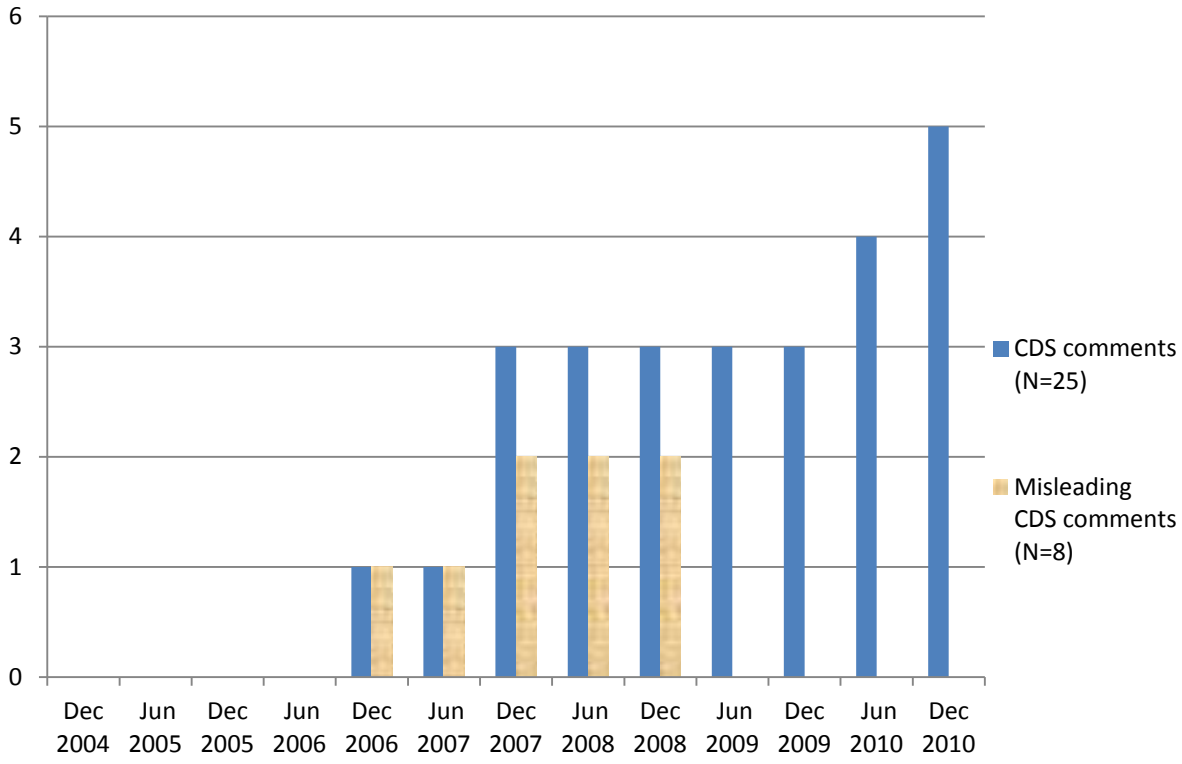

Table 1: The largest U.S. funds (top30us) as measured by TNA on June 30, 2004 (CRSP)

No.	Fund family name: Fund name	TNA in mio. $
1	PIMCO Funds: Pacific Investment Management Series: Total Return Fund	73,202.1
2	Vanguard Fixed Income Securities Funds: Vanguard Short-Term Corporate Fund	17,751.5
3	Bond Fund of America, Inc	17,620.6
4	PIMCO Funds: Pacific Investment Management Series: Low Duration Fund	14,469.9
5	American High-Income Trust	8,895.6
6	Vanguard Fixed Income Securities Funds: Vanguard High-Yield Corporate Fund	8,743.3
7	Lord Abbett Bond-Debenture Fund, Inc	8,211.8
8	Pioneer High Yield Fund, Inc	7,664.5
9	Fidelity Commonwealth Trust: Fidelity Intermediate Bond Fund	6,774.7
10	PIMCO Funds: Pacific Investment Management Series: High Yield Fund	6,759.0
11	Dodge & Cox Income Fund	6,629.0
12	Oppenheimer Strategic Funds Trust: Oppenheimer Strategic Income Fund	6,181.8
13	Fidelity Fixed-Income Trust: Fidelity Investment Grade Bond Fund	5,732.3
14	Putnam Diversified Income Trust	5,533.0
15	Fidelity Fixed-Income Trust: Fidelity Short-Term Bond Fund	5,044.6
16	Intermediate Bond Fund of America	5,039.4
17	Evergreen Select Fixed Income Trust: Evergreen Core Bond Fund	4,517.3
18	Vanguard Fixed Income Securities Funds: Vanguard Long-Term Corporate Fund	4,444.0
19	Vanguard Fixed Income Securities Funds: Vanguard Intermediate-Term Corporate Fund	4,225.9
20	MainStay Funds: MainStay High Yield Corporate Bond Fund	4,225.7
21	Fidelity Summer Street Trust: Fidelity Capital & Income Fund	4,148.9
22	SEI Institutional Managed Trust: Core Fixed Income Portfolio	3,949.2
23	T Rowe Price High Yield Fund, Inc	3,897.0
24	Western Asset Funds, Inc: Western Asset Core Plus Bond Portfolio	3,431.0
25	Putnam High Yield Trust	2,938.0
26	Franklin High Income Trust: AGE High Income Fund	2,849.0
27	AXP Diversified Bond Fund, Inc	2,816.7
28	Fidelity Fixed-Income Trust: High Income Fund	2,785.9
29	Calvert Fund: Calvert Income Fund	2,776.5
30	Sanford C Bernstein Fund, Inc: Intermediate Duration Portfolio	2,691.1

Table 2: The largest German funds (top30de) as measured by TNA on December 31, 2004 (BVI)

No.	Fund family name: Fund name	TNA in mio. $
1	Allianz GI Lux: dit-Euro Bond Total Return	6,303.1
2	DEKA: RenditDeka	6,166.6
3	DWS: DWS Vermögensbildungsfonds R	4,521.0
4	ACTIVEST LUXEMBOURG S.A.: Activest TotalReturn	3,521.7
5	DWS: DWS Select-Rent	2,837.4
6	DIT: dit-Allianz Rentenfonds	2,707.2
7	DIT: DIT-EURO RENTENFONDS >>K<<	2,662.3
8	UIL S.A.: UniEuroKapital Corporates A	1,855.3
9	DWS S.A.: DWS Euro-Bonds (Medium)	1,817.1
10	GERLING INVESTMENT: Gerling Rendite Fonds	1,680.1
11	DekaLux-Bond	1,451.4
12	DWS S.A.: DWS Euro-Corp Bonds	1,449.5
13	DIT: dit-Allianz Mobil-Fonds	1,425.4
14	UNION S.A.: UniEuroRenta Corporates	1,263.8
15	UNION S.A.: UniPlusKapital DM (Lux)	1,254.4
16	DEKA: DekaTresor	997.2
17	Ring-Rentenfonds DWS	921.9
18	DIT-EURO RENTENFONDS	919.4
19	MEAG EuroRent	875.6
20	UIP: UniEuroRenta	873.5
21	DWS Inrenta	840.5
22	DWS Invest Euro Bonds (Short) FC	761.1
23	DWS Euro-Bonds (Short)	747.4
24	Union Investment Lux.: UniEuroKapital II	746.7
25	UIP: UniEuroRenta Absolute Return	710.5
26	WestAM: Mundo I Invest	709.7
27	MEAG ProRent	702.5
28	FRANKFURT-TRUST: Basis-Fonds I	664.0
29	DWS Euro-Bonds (Long)	596.4
30	Deka-CorporateBond Euro	591.8

Table 3: Summary statistics

This table reports summary statistics for the total net asset value (TNA), CDS notional (sum of long and short positions), long CDS notional, short CDS notional, CDS net notional (long – short positions), and the unrealized value change in mio. $ of German and U.S. funds that reported using CDS in a particular half-year between 2004 and 2010. 19 out of the 30 U.S. funds report using CDS 192 times, and 19 out of the 30 German funds report using CDS 106 times.

Country	Variable	N	mean	sd	min	p25	p50	p75	max
Germany	TNA (in mio. $)	106	1,627	1,928	239	673	1,002	1,600	10,383
	CDS notional (in mio. $)	106	175	230	1	42	96	230	1,383
	Long CDS notional (in mio. $)	106	75	161	0	0	33	99	1,169
	Short CDS notional (in mio. $)	106	100	123	0	15	59	141	562
	CDS net notional (in mio. $)	106	-25	172	-458	-94	-17	23	1,079
	Unrealized value change (in mio. $)	106	0	3	-8	-1	0	0	14
	CDS use	106	1	0					
USA	TNA (in mio. $)	192	16,076	34,457	781	4,515	7,005	10,134	252,184
	CDS notional (in mio. $)	192	1,181	3,657	1	62	221	668	33,778
	Long CDS notional (in mio. $)	192	289	1,001	0	0	17	163	11,118
	Short CDS notional (in mio. $)	192	893	2,937	0	32	156	483	31,059
	CDS net notional (in mio. $)	192	-604	2,425	-28,341	-358	-88	-4	393
	Unrealized value change (in mio. $)	192	-25	127	-1,172	-8	0	1	252
	CDS use	192	1	0					
Total	TNA (in mio. $)	298	10,936	28,511	239	1,331	4,624	7,760	252,184
	CDS notional (in mio. $)	298	823	2,975	1	52	149	405	33,778
	Long CDS notional (in mio. $)	298	212	815	0	0	22	125	11,118
	Short CDS notional (in mio. $)	298	611	2,387	0	21	102	303	31,059
	CDS net notional (in mio. $)	298	-398	1,967	-28,341	-225	-38	1	1,079
	Unrealized value change (in mio. $)	298	-16	102	-1,172	-3	0	0	252
	CDS use	298	1	0					

Table 4: Summary statistics

This table reports summary statistics for CDS notional (sum of long and short positions), long CDS notional, short CDS notional, CDS net notional (long – short positions), and the unrealized value change as a fraction of a fund's total net asset value (TNA) (in %) of German and U.S. funds that report using CDS in a particular half-year between 2004 and 2010. 19 out of the 30 U.S. funds report using CDS 192 times, and 19 out of the 30 German funds report using CDS 106 times.

Country	Variable	N	mean	sd	min	p25	p50	p75	max
Germany	CDS notional (in % of TNA)	106	17.33%	25.05%	0.05%	2.96%	7.86%	21.75%	160.89%
	Long CDS notional (in % of TNA)	106	6.43%	9.12%	0.00%	0.00%	1.93%	10.37%	41.04%
	Short CDS notional (in % of TNA)	106	10.91%	18.50%	0.00%	1.38%	5.09%	12.16%	127.04%
	CDS net notional (in % of TNA)	106	-4.48%	14.94%	-93.19%	-7.49%	-1.46%	2.18%	21.22%
	Unrealized value change (in % of TNA)	106	-0.10%	0.28%	-1.63%	-0.11%	-0.03%	0.00%	0.50%
USA	CDS notional (in % of TNA)	192	7.84%	15.75%	0.02%	0.87%	2.95%	7.67%	129.09%
	Long CDS notional (in % of TNA)	192	2.37%	5.65%	0.00%	0.00%	0.36%	2.18%	37.71%
	Short CDS notional (in % of TNA)	192	5.47%	11.12%	0.00%	0.48%	2.03%	5.96%	93.82%
	CDS net notional (in % of TNA)	192	-3.10%	7.95%	-58.54%	-3.51%	-1.32%	-0.08%	11.92%
	Unrealized value change (in % of TNA)	192	-0.25%	0.83%	-8.10%	-0.16%	0.00%	0.01%	0.68%
Total	CDS notional (in % of TNA)	298	11.21%	20.05%	0.02%	1.50%	4.17%	10.96%	160.89%
	Long CDS notional (in % of TNA)	298	3.81%	7.33%	0.00%	0.00%	0.50%	3.60%	41.04%
	Short CDS notional (in % of TNA)	298	7.40%	14.40%	0.00%	0.73%	2.50%	7.55%	127.04%
	CDS net notional (in % of TNA)	298	-3.59%	10.95%	-93.19%	-4.97%	-1.40%	0.05%	21.22%
	Unrealized value change (in % of TNA)	298	-0.19%	0.69%	-8.10%	-0.14%	-0.01%	0.01%	0.68%

Table 5: T-test for differences in means of CDS holdings of U.S. and German funds

This table reports the results of the t-test for differences in means of CDS holdings of U.S. and German bond funds that report using CDS in a particular half-year between 2004 and 2010. Panel A provides results for the following variables: CDS notional (sum of long and short positions), long CDS notional, short CDS notional, CDS net notional (long – short positions), and the unrealized value change expressed in absolute dollar terms, while Panel B reports results for the same variables expressed as a fraction of a fund's total net asset value (TNA). The last column reports p-values of Levene's test for the equality of group variances. *, **, and *** indicate statistical significance at the 10%, 5%, 1% level. Standard errors are presented in brackets.

Variable	German funds	U.S. funds	Difference	(d_se)	Levene's test (p-value)
Panel A: Variables in mio. $					
TNA (in mio. $)	1,626.6800	16,076.2200	-14,449.5400***	(2493.7600)	(0.0000)
CDS notional (in mio. $)	174.6153	1,181.0810	-1,006.465***	(246.8322)	(0.0000)
Long CDS notional (in mio. $)	74.6085	288.5282	-213.9197***	(73.9182)	(0.0003)
Short CDS notional (in mio. $)	100.0068	892.5524	-792.5456***	(212.2812)	(0.0000)
CDS net notional (in mio. $)	-25.3983	-604.0242	578.6259***	(175.8362)	(0.0007)
Unrealized value change (in mio. $)	-0.4031	-24.5986	24.1955***	(9.1378)	(0.0000)
Panel B: Variables as a frac. of TNA					
CDS notional (as a frac. of TNA)	0.1733	0.0784	0.0950***	(0.0269)	(0.0000)
Long CDS notional (as a frac. of TNA)	0.0643	0.0237	0.0406***	(0.0097)	(0.0000)
Short CDS notional (as a frac. of TNA)	0.1091	0.0547	0.0544***	(0.0197)	(0.0003)
CDS net notional (as a frac. of TNA)	-0.0448	-0.0310	-0.0138	(0.0156)	(0.0000)
Unrealized value change (as a frac. of TNA)	-0.0010	-0.0024	0.0014**	(0.0007)	(0.0012)

Table 6: Summary statistics for individual top30us funds listed in Table 1

This table reports summary statistics for short CDS notional and CDS net notional (long – short positions) as a fraction of a fund's total net asset value (in %) of U.S. funds that report using CDS in a particular half-year between 2004 and 2010.

Top30us	Variable	N	mean	sd	p50	p75	max	Variable	N	mean	sd	p50	min	max
1	Short CDS (in % of TNA)	13	4.99%	3.69%	4.80%	7.14%	12.32%	Net notional (in % of TNA)	13	-3.03%	3.45%	-1.61%	-11.24%	0.09%
2	Short CDS (in % of TNA)	13	1.15%	0.71%	1.35%	1.54%	2.31%	Net notional (in % of TNA)	13	-0.97%	0.94%	-1.35%	-2.31%	0.42%
4	Short CDS (in % of TNA)	13	5.31%	3.76%	3.90%	7.96%	13.19%	Net notional (in % of TNA)	13	-4.66%	3.65%	-3.08%	-13.11%	-0.42%
7	Short CDS (in % of TNA)	4	0.17%	0.13%	0.20%	0.27%	0.27%	Net notional (in % of TNA)	4	-0.04%	0.17%	0.00%	-0.27%	0.13%
9	Short CDS (in % of TNA)	13	1.69%	1.14%	1.79%	2.51%	3.66%	Net notional (in % of TNA)	13	-1.69%	1.14%	-1.79%	-3.66%	-0.08%
10	Short CDS (in % of TNA)	13	8.89%	4.51%	9.22%	11.94%	15.69%	Net notional (in % of TNA)	13	-6.57%	3.73%	-7.06%	-12.44%	0.23%
12	Short CDS (in % of TNA)	11	4.36%	4.61%	2.28%	10.42%	11.56%	Net notional (in % of TNA)	11	-1.86%	5.48%	-0.03%	-10.28%	6.33%
13	Short CDS (in % of TNA)	13	2.51%	1.28%	2.67%	2.96%	5.42%	Net notional (in % of TNA)	13	-1.82%	1.63%	-1.52%	-5.37%	0.42%
14	Short CDS (in % of TNA)	13	21.30%	29.08%	9.72%	22.01%	93.82%	Net notional (in % of TNA)	13	-4.60%	19.50%	1.11%	-58.54%	11.92%
15	Short CDS (in % of TNA)	13	1.96%	2.75%	1.70%	2.09%	10.57%	Net notional (in % of TNA)	13	-1.93%	2.73%	-1.70%	-10.50%	-0.02%
17	Short CDS (in % of TNA)	5	3.24%	2.59%	3.26%	5.33%	6.26%	Net notional (in % of TNA)	5	-0.06%	6.71%	-2.02%	-5.80%	11.11%
18	Short CDS (in % of TNA)	4	5.51%	0.94%	5.18%	6.04%	6.89%	Net notional (in % of TNA)	4	-5.40%	0.92%	-5.08%	-6.74%	-4.69%
19	Short CDS (in % of TNA)	13	0.36%	0.20%	0.37%	0.49%	0.73%	Net notional (in % of TNA)	13	-0.22%	0.12%	-0.20%	-0.39%	-0.03%
22	Short CDS (in % of TNA)	11	1.82%	1.49%	1.93%	2.73%	4.95%	Net notional (in % of TNA)	11	0.22%	1.11%	-0.01%	-2.08%	1.76%
23	Short CDS (in % of TNA)	8	0.46%	0.30%	0.43%	0.64%	0.97%	Net notional (in % of TNA)	8	-0.36%	0.52%	-0.43%	-0.97%	0.80%
24	Short CDS (in % of TNA)	13	22.37%	16.95%	16.77%	30.25%	61.66%	Net notional (in % of TNA)	13	-16.35%	16.22%	-12.71%	-54.46%	0.62%
25	Short CDS (in % of TNA)	11	1.73%	1.35%	1.86%	2.92%	3.79%	Net notional (in % of TNA)	11	-1.24%	1.31%	-0.54%	-3.43%	-0.01%
27	Short CDS (in % of TNA)	5	0.09%	0.15%	0.00%	0.10%	0.36%	Net notional (in % of TNA)	5	0.42%	0.35%	0.51%	0.00%	0.75%
30	Short CDS (in % of TNA)	3	0.95%	1.64%	0.00%	2.84%	2.84%	Net notional (in % of TNA)	3	1.19%	3.50%	2.84%	-2.84%	3.56%
Total	Short CDS (in % of TNA)	192	5.47%	11.12%	2.03%	5.96%	93.82%	Net notional (in % of TNA)	192	-3.10%	7.95%	-1.32%	-58.54%	11.92%

Table 7: Summary statistics for individual top30de funds listed in Table 2

This table reports summary statistics for short CDS notional, and CDS net notional (long – short positions) as a fraction of a fund's total net asset value (in %) of German funds that report using CDS in a particular half-year between 2004 and 2010.

Top30de	Variable	N	mean	sd	p50	p75	max	Variable	N	mean	sd	p50	min	max
1	Short CDS (in % of TNA)	13	7.75%	10.52%	2.40%	7.55%	36.66%	Net notional (in % of TNA)	13	-0.93%	13.99%	-0.74%	-34.87%	20.18%
2	Short CDS (in % of TNA)	8	1.01%	0.94%	1.24%	1.50%	2.58%	Net notional (in % of TNA)	8	2.69%	3.37%	3.90%	-2.58%	6.12%
3	Short CDS (in % of TNA)	1	0.00%	.	0.00%	0.00%	0.00%	Net notional (in % of TNA)	1	3.78%	.	3.78%	3.78%	3.78%
4	Short CDS (in % of TNA)	1	1.23%	.	1.23%	1.23%	1.23%	Net notional (in % of TNA)	1	-1.23%	.	-1.23%	-1.23%	-1.23%
5	Short CDS (in % of TNA)	2	1.58%	0.21%	1.58%	1.73%	1.73%	Net notional (in % of TNA)	2	-1.58%	0.21%	-1.58%	-1.73%	-1.44%
6	Short CDS (in % of TNA)	6	7.95%	5.45%	5.59%	12.95%	16.41%	Net notional (in % of TNA)	6	-5.95%	6.12%	-5.37%	-14.76%	3.03%
7	Short CDS (in % of TNA)	6	3.47%	2.27%	3.37%	5.44%	6.60%	Net notional (in % of TNA)	6	-3.47%	2.27%	-3.37%	-6.60%	-0.90%
8	Short CDS (in % of TNA)	8	15.16%	13.25%	13.45%	23.54%	38.91%	Net notional (in % of TNA)	8	-6.50%	10.80%	-1.26%	-28.21%	1.52%
9	Short CDS (in % of TNA)	7	10.53%	1.27%	10.85%	11.47%	12.16%	Net notional (in % of TNA)	7	-10.53%	1.27%	-10.85%	-12.16%	-8.28%
10	Short CDS (in % of TNA)	1	0.37%	.	0.37%	0.37%	0.37%	Net notional (in % of TNA)	1	-0.37%	.	-0.37%	-0.37%	-0.37%
11	Short CDS (in % of TNA)	7	2.31%	2.38%	1.20%	5.21%	5.40%	Net notional (in % of TNA)	7	3.83%	6.60%	4.26%	-5.40%	10.38%
12	Short CDS (in % of TNA)	7	31.95%	14.24%	37.08%	43.10%	46.91%	Net notional (in % of TNA)	7	-10.34%	17.49%	-14.04%	-27.61%	21.22%
13	Short CDS (in % of TNA)	8	8.08%	8.58%	5.67%	10.13%	27.05%	Net notional (in % of TNA)	8	1.84%	5.57%	2.96%	-8.44%	9.21%
14	Short CDS (in % of TNA)	8	13.30%	14.24%	8.47%	23.22%	39.89%	Net notional (in % of TNA)	8	-3.30%	9.36%	-0.78%	-24.05%	7.22%
16	Short CDS (in % of TNA)	3	1.65%	0.64%	1.47%	2.36%	2.36%	Net notional (in % of TNA)	3	-1.65%	0.64%	-1.47%	-2.36%	-1.12%
18	Short CDS (in % of TNA)	3	5.33%	7.28%	2.36%	13.62%	13.62%	Net notional (in % of TNA)	3	-4.60%	8.13%	-2.36%	-13.62%	2.18%
20	Short CDS (in % of TNA)	4	0.03%	0.05%	0.00%	0.05%	0.11%	Net notional (in % of TNA)	4	1.41%	2.77%	0.08%	-0.07%	5.57%
23	Short CDS (in % of TNA)	5	7.65%	1.63%	7.49%	8.87%	9.69%	Net notional (in % of TNA)	5	-7.65%	1.63%	-7.49%	-9.69%	-5.93%
30	Short CDS (in % of TNA)	8	38.59%	49.58%	18.16%	70.09%	127.04%	Net notional (in % of TNA)	8	-24.04%	40.62%	-5.72%	-93.19%	10.32%
Total	Short CDS (in % of TNA)	106	10.91%	18.50%	5.09%	12.16%	127.04%	Net notional (in % of TNA)	106	-4.48%	14.94%	-1.46%	-93.19%	21.22%

Table 8: Summary statistics for aggregate CDS, CDS turnover and missed trades of German funds from period-end and within-period CDS data

This table reports summary statistics for the differences in CDS notional implied by period-end data, aggregate purchases and sales of CDS, CDS turnover, and missed trades implied by period-end and within-period CDS data of German bond funds. The variable period-end difference in CDS notional (in mio. $) shows the difference in CDS holdings between the present and the past reporting dates. The aggregate sales CDS notional (in mio. $) reflects the aggregate within-period CDS sales reported by funds, while the aggregate purchases CDS notional (in mio. $) presents the aggregate purchases of CDS determined as the sum of the respective period-end difference in CDS notional and aggregate sales CDS notional. The aggregate sales of long CDS (as a fraction of aggregate sales CDS) presents the fraction of the aggregate sales CDS notional explained by aggregate sales of long CDS reported by funds in 43 periods, while the aggregate purchases of long CDS (as a fraction of aggregate purchases CDS) reports the fraction of the aggregate purchases CDS notional explained by the aggregate purchases of long CDS, both of which are scaled by the respective aggregate purchases or sales CDS notional. The CDS turnover ratio (as a fraction of average CDS notional) reflects the minimum of aggregate sales or purchases of CDS scaled by the average present and past period CDS notional of the fund. The missing trades (as a fraction of aggregate CDS) show the fraction of the higher of aggregate sales or purchases of CDS not explained by the period-end difference in CDS notional.

Germany

Variable	N	mean	sd	min	p25	p50	p75	max
Period-end difference in CDS notional (in mio. $)	56	23.5408	183.5515	-577.5111	-20.1476	7.7089	91.4164	818.1523
Aggregate purchases CDS notional (in mio. $)	56	705.1489	1,593.5419	0.5392	43.4869	162.6237	519.4897	8,151.6802
Aggregate purchases of long CDS (as a frac. of agg. purchases CDS)	43	0.4452	0.3623	0.0000	0.0387	0.5353	0.7472	1.0000
Aggregate CDS sales notional (in mio. $)	56	681.6081	1,585.1466	3.9510	26.5422	115.6641	501.2390	8,186.6416
Aggregate sales of long CDS (as a frac. of agg. sales CDS)	43	0.4630	0.3804	0.0000	0.0000	0.5074	0.8095	1.0000
CDS turnover ratio (as a frac. of average CDS notional)	51	6.7317	20.7798	0.0248	0.3997	0.9379	4.2000	140.0000
Missed trades (as a frac. of agg. CDS notional)	56	0.6266	0.3292	0.0205	0.2745	0.6728	0.9556	1.0000

Table 9: Summary statistics for aggregate CDS, CDS turnover, and missed trades of German funds from period-end and within-period CDS data categorized by an increase or decrease in CDS observable at period ends

This table reports the summary statistics for the same variables as in Table 8 (for variable definitions please refer to Table 8), but distinguishes between half-years where increases or decreases in CDS are observable from the past to the present period end between 2004 and 2010.

Germany

Variable	N	mean	sd	min	p25	p50	p75	max
Increase in CDS from the past to the present period end								
Positive Period-end difference in CDS notional (in mio. $)	39	91.9121	145.3785	0.0000	5.1926	53.3732	124.6234	818.1523
Aggregate purchases CDS notional (in mio. $)	39	574.8107	1,367.0104	9.3534	58.7928	172.4753	375.8271	7,691.8169
Aggregate purchases of long CDS (as a frac. of agg. purchases CDS)	29	0.4784	0.3567	0.0000	0.1099	0.6022	0.7472	1.0000
Aggregate CDS sales notional (in mio. $)	39	482.8986	1,323.5661	3.9510	24.0985	60.0127	212.8005	7,567.1934
Aggregate sales of long CDS (as a frac. of agg. sales CDS)	29	0.4955	0.3804	0.0000	0.0909	0.5618	0.8095	1.0000
Missed trades (as a frac. of agg. CDS notional)	39	0.6543	0.3177	0.0816	0.2982	0.7074	0.9647	1.0000
Decrease in CDS from the past to the present period end								
Negative Period-end difference in CDS notional (in mio. $)	17	-133.3108	167.5813	-577.5111	-169.2292	-63.6070	-25.7500	-6.3877
Aggregate purchases CDS notional (in mio. $)	17	1,004.1601	2,038.2583	0.5392	7.0403	92.4582	1,026.1670	8,151.6802
Aggregate purchases of long CDS (as a frac. of agg. purchases CDS)	14	0.3766	0.3777	0.0000	0.0000	0.4030	0.6509	1.0000
Aggregate CDS sales notional (in mio. $)	17	1,137.4709	2,039.5431	11.7768	73.6050	288.1200	1,246.6478	8,186.6416
Aggregate sales of long CDS (as a frac. of agg. sales CDS)	14	0.3957	0.3856	0.0000	0.0000	0.4521	0.6666	1.0000
Missed trades (as a frac. of agg. CDS notional)	17	0.5631	0.3558	0.0205	0.1988	0.6377	0.8683	0.9957

Table 10: T-test for differences in means of CDS holdings of German funds that comment on CDS use versus those that do not comment

This table shows the results of the t-test for differences in means of the following end-of-period variables for German funds that comment on CDS use versus those that do not comment: CDS notional (sum of long and short positions), long CDS notional, short CDS notional, CDS net notional (long – short positions), unrealized value change (expressed as a fraction of a fund's total net asset value (TNA)), and the TNA in million $. The last column reports the p-values of Levene's test for the equality of group variances. *, **, and *** indicate statistical significance at the 10%, 5%, 1% level respectively. Standard errors are presented in brackets.

Germany

Variable	No comments (N=81)	CDS comments (N=25)	Difference	(d_se)	Levene's test (p-value)
TNA (in mio. $)	1,855.3420	885.8165	969.5250***	(258.7690)	(0.0049)
CDS notional (as a frac. of TNA)	0.1274	0.3221	-0.1947**	(0.0543)	(0.0000)
Long CDS notional (as a frac. of TNA)	0.0489	0.1143	-0.0654***	(0.0200)	(0.3740)
Short CDS notional (as a frac. of TNA)	0.0785	0.2079	-0.1293*	(0.0406)	(0.0000)
CDS net notional (as a frac. of TNA)	-0.0297	-0.0936	0.0639	(0.0338)	(0.0000)

Table 11: Misleading report comments on CDS of German funds

This table shows the misleading report comments on CDS and compares it to the fund's TNA (in $), long CDS notional, and the short CDS notional at the respective reporting date (both expressed as a fraction of a fund's TNA). Number (No.) refers to individual top30de funds listed in Table 2.

No.	Date	CDS comments	TNA	Long CDS / TNA	Short CDS / TNA
8	30.09.2007	The management used various hedging instruments (so-called credit derivatives) to decrease the risks from the overall market and individual positions. (p. 96)	1,210,245,700	0.0818	0.2623
8	31.03.2008	The management used various hedging instruments (so-called credit derivatives) to decrease the risks from the overall market and individual positions. (p. 78)	916,274,126	0.1070	0.3891
12	31.12.2006	(The management) could further decrease the credit risks from corporate bonds and the variation in return differences as related to government bonds by using financial derivatives in the form of Credit Default Swaps. (p. 14)	746,608,621	0.0000	0.0670
12	30.06.2007	Beyond that, (the management) could further decrease the credit risks from corporate bonds and the volatility of the return differences as related to government bonds by using financial derivatives in the form of CDS (Credit Default Swaps). (p. 14)	633,766,370	0.1183	0.3945
12	31.12.2007	Besides, the management could further decrease the credit risks from corporate bonds and the volatility of their risk premia by using financial derivatives in the form of Credit Default Swaps (CDS). (p. 17)	300,107,097	0.1638	0.4310
12	30.06.2008	Beyond that, (the management) could further decrease the credit risks from corporate bonds and the volatility of the return differences as related to government bonds by using financial derivatives in the form of CDS (Credit Default Swaps). (p. 18)	246,019,541	0.3238	0.3063
12	31.12.2008	The management used financial derivatives in the form of Credit Default Swaps (CDS) to decrease the credit risks from corporate bonds in the portfolio. (p. 17)	209,893,332	0.1677	0.3708
13	30.11.2008	In the area of corporate bonds, we concentrated on the financial sector and used instruments to hedge against default of payments (Credit-Default-Swaps). (p. 1)	506,718,005	0.1364	0.1331

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