Interaction of Funding Liquidity and Market Liquidity – Evidence from the German Stock Market

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Abstract

In this paper, we provide empirical evidence that tighter funding liquidity of financial institutions generates negative spill-overs to the market liquidity in equity markets. Using a unique dataset covering the depth of the order book for stocks traded on XETRA we are able to calculate on a daily basis the transaction costs of a roundtrip (i.e. simultaneous buy and sell orders) of the average trade size in a specific stock. We match this comprehensive market liquidity measure for each stock with the CDS of banks that act as market makers (the designated sponsors) for the respective stock. From an aggregate perspective our results confirm a general co-movement of funding liquidity and market liquidity and reveal that the ECB's liquidity injections significantly reduced the dependency of stock markets' liquidity on market makers' funding conditions especially for the most illiquid stocks. The panel analysis also shows that particularly the liquidity of rather illiquid stocks deteriorates as the funding of their sponsors tightens.

Keywords: Liquidity spirals, liquidity crises, funding liquidity, market liquidity
JEL-Classification: E44, E52, G12, G21

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1 Introduction

The recent financial crises has fostered the general perception that banks voluntarily hold too little liquidity either because of moral hazard or because this underinvestment generates negative externalities not taken into account in banks' investment decision.[1] The drain on market liquidity that banks' liquidity shortages might generate is probably the key example of these negative spill-overs.[2] This drain on market liquidity can also give rise to self-enforcing effects. In these 'liquidity spirals', tighter funding liquidity of financial institutions reduces the market liquidity of financial assets, which in turn restraints financial institutions' funding liquidity.[3] In order to contain these liquidity spirals and ensure efficient liquidity holdings various regulatory initiatives, most prominently of course Basel III, are striving to implement tighter liquidity regulation. Thorough evidence particularly on the negative spill-overs of banks' funding liquidity shortages on the liquidity of financial markets is, however, still fairly limited.[4]

In this paper we provide empirical evidence for the interaction between banks' funding liquidity constraints and the market liquidity in the German stock market. More precisely, we study the relation between the refinancing conditions of designated sponsors (market makers) of specific stocks traded on Xetra and the liquidity of the respective stock for the period July 1, 2005 to December 3, 2010.[5] As the key measure for market makers' liquidity constraints we use their respective short-run credit default swap (CDS) spreads which allow to capture on a high frequency bank specific refinancing conditions in money markets.[6] Our measure for stock market liquidity is based on the Xetra Liquidity Measure (XLM) which we obtained from Deutsche Börse. This measure reflects the depth of the order book for each stock and reports the transaction costs for a roundtrip (i.e. a simultaneous buy and sell order) of a given size. Thus, this comprehensive liquidity measure comprises the market impact as well as the impact on the bid-ask-spread

[1] See, for example, Acharya, Shin, and Yorulmazer (2010), Farhi and Tirole (2012) for the former and Farhi, Golosov, and Tsyvinski (2009) and Allen, Carletti, and Gale (2009) for the latter argument.

[2] The general idea of negative externalities of fire-sales resulting from liquidity shortages goes back to Shleifer and Vishny (1997). Fecht (2004) models this effect in the context of banks' liquidity crisis. Vayanos and Wang (2009) survey various links among the two markets in a unified framework.

[3] See Gromb and Vayanos (2002) and Brunnermeier and Pedersen (2008) for theoretical models making this point. Gorton and Metrick (2012) document such a self-enforcing effect for the U.S. repo market during the recent financial crisis.

[4] Comerton-Forde, Hendershott, Jones, Moulton, and Seasholes (2010) show that inventories and earnings of market makers in stock markets have an impact on stock market liquidity. Östberg and Nyborg (2010) provide empirical evidence that tighter money markets reduce the liquidity of stock markets.

[5] In order to be accepted for continuous trading in the Xetra trading system or as a component of different indices, stocks with an insufficient level of liquidity require at least one designated sponsor, i.e. a bank or a securities firm admitted, which is obliged to provide a minimum market liquidity. Even though being different in some aspects, the role of designated sponsors is conceptually close to the role of market makers in the anglo-american trading systems. Also note that all designated sponsors in our sample were banks.

[6] Michaud and Upper (2008) provide evidence for this.

of a given transaction size. We calculate for each stock the XLM, i.e. the transaction costs, that a roundtrip of the average trade size in this specific stock would have.

First, we analyse the relation between funding liquidity and market liquidity on an aggregate basis. In line with Östberg and Nyborg (2010), we find a strong co-movement of banks' funding liquidity conditions and stock market liquidity which is particularly pronounced for generally very illiquid stocks. Interestingly, after August 2008–when interbank markets froze the impact of the aggregate CDS of market makers on the overall stock market–liquidity declined due to the provision of excess liquidity by the European Central Bank (ECB). Apparently, the ECB's substantial liquidity injections not only decoupled banks' refinancing conditions from their credit risk premium it also loosened the relation between banks' credit risk premium and their liquidity provision to the stock market. Second, we use a dynamic panel ARMA(1,1) model with stock and time fixed effects to study the impact of designated sponsors' funding conditions on stocks' market liquidity on a stock-by-stock basis. Our results reveal that also on the micro level, the refinancing conditions of market makers significantly affect the liquidity of their stocks. Interestingly, we again find that tighter refinancing conditions particularly impair the liquidity of generally rather illiquid stocks, while usually very liquid stocks become relatively more liquid.

Our paper is related to different strands of the literature. Most importantly, it contributes to the literature providing empirical evidence on the interaction of funding liquidity and asset markets. Closest related are Östberg and Nyborg (2010) who compare general fluctuations in funding liquidity (approximated by the difference between the Libor-OIS and Libor-TED spreads) and different indicators of stock market liquidity. In line with the outcomes of our analysis, they find a positive relationship between funding and stock market liquidity on aggregated levels and that this relationship is stronger for illiquid stocks than for liquid ones. In addition, they find flight-to-quality mechanisms to be particularly strong during the financial crisis and thus, in times of (relatively) low liquidity in stock markets. However, their analysis mainly relies on the Amihud measure which is only an imperfect proxy for stock market liquidity. Furthermore, using only aggregate measures of interbank market liquidity they cannot pin down how precisely banks' funding liquidity affects stock market liquidity. They cannot disentangle whether it is only that banks generally cut back their lending and thus, force other market participants to reduce their securities holdings, or whether it is that banks indeed directly reduce their positions held in financial assets. Using our micro level data we are able to provide evidence that indeed the latter effect contributes to the co-movements. Thus, our paper provides thorough empirical evidence for the theoretical effects of funding liquidity on market liquidity proposed by Brunnermeier and Pedersen (2008).

Comerton-Forde et al. (2010) – the second contribution most closely related to our work – are able to address these two issues. First, they use percentage effective spreads to approximate the liquidity costs traders actually face as a more sophisticated liquidity indicator. Second, they use panel data on New York Stock Exchange (NYSE) specialist revenues and inventories. Their results show that effective spreads increase when specialists pile up large positions or make losses on their inventories. Thus, the authors are the first to provide evidence that capital constraints of market makers in specific stocks affect for the stock market liquidity on a stock-specific level. However, revenues and inventory items of specialists are measuring capital constraints rather than liquidity constraints. Consequently, their study does not provide evidence for negative externalities of banks' liquidity shortages and potential liquidity spirals and does not contribute to the discussion about the need for tighter liquidity regulation.

Closely related to our paper is also the work by Chordia (2005), who document a link between micro liquidity, i.e. the liquidity in single securities' markets, and macro liquidity, i.e. the volume of financial flows in the economy.

In a broader context, the impact of monetary announcements on market liquidity, for instance, has been well documented in the past: Fleming and Remolona (1997) and Piazzesi (2005) discover that monetary policies drive bond market liquidity while Fair (2002) reveals similar results for stock markets. More recently, Goyenko, Holden, and Trzcinka (2009) suggest that monetary policies affect stock markets through liquidity fluctuations in bond markets. Likewise, cash flows of investors seem to directly link to price fluctuations in equity markets (Edelen & Warner, 2001; Goetzmann & Massa, 2002; Boyer & Zheng, 2009).

The remainder of this paper is structured as follows. Section 2 describes the institutional setup on Xetra and relates the specificities to the theory at hand. We describe our data in section 3. Then, in a first step of the analysis, we provide descriptive statistics and draw conclusions from a univariate analysis in section 4. Results of the empirical analysis of aggregated, i.e. market-wide liquidity series are reported and interpreted in section 5. In a final step of the analysis, outcomes of the panel regressions are discussed in section 6. We test the robustness of our results in section 7 until finally, section 8 summarises and concludes.

2 Institutional Setup

Xetra is an electronic open limit order book system owned and operated by Deutsche Börse Group AG. Continuous trading takes place between the opening auction at 9.00am and the closing auction at 5.30pm, and it is interrupted by at least one intraday auction at about 1.00pm.[7] The auctions help to concentrate liquidity and thus, enhance the quality of price discovery and control price volatility. Trading members are agent traders, proprietary traders, or liquidity providers (so-called 'designated sponsors'). Since traders

[7]Additional auctions might interrupt the continuous trading e.g. in times of extraordinarily high price volatility.

have direct access to the order book, there is no need for a central market maker.

In order to guarantee a minimum level of immediacy in the execution of orders and thus, in price quality, stock companies who wish to be traded continuously on Xetra require at least one designated sponsors, except their markets are sufficiently liquid. A market is sufficiently liquid if the Xetra Liquidity Measure is smaller than or equal to 100 basis points for an order volume of EUR 25,000, and if the average daily order book volume is larger than or equal to EUR 2.5m. The necessity to engage a designated sponsor is reviewed monthly. In contrast to the XLM values used in the subsequent analysis, levels used for the purpose of this review do not include orders placed by the designated sponsors (cf. the Designated Sponsor Guide for further details). Stocks with a reference market other than Xetra are traded continuously if their XLM is smaller than or equal to 120 basis points, or if their average daily order book volume is above EUR 50,000.

Every Xetra market participant is eligible to become a designated sponsor. While every commitment as a sponsor has to be reported to the Frankfurt Stock Exchange (FWB), stock companies act directly as the principals in the contractual agreement with the sponsors. Sponsors are obliged to act as the counterparty to transactions whenever requested. Their orders are subject to certain quality criteria that must be met: i) the orders do not exceed a maximum spread, ii) the order size is sufficiently large, iii) orders are entered promptly during the auctions, and iv) a minimum level of participation must be met. These requirements may vary among stocks of different average liquidity levels. For this purpose, the stocks which require sponsoring are classified quarterly into three liquidity classes, $LC1$ to $LC3$, with $LC1$ containing the most liquid and $LC3$ containing the most illiquid stocks.

More precisely, it is a general principle that maximum spreads for liquid stocks are smaller (i.e. more strict) than those for illiquid stocks. In addition, they also depend on the price and decrease with an increasing stock price. Precise maximum spreads are defined in the Designated Sponsor Guide and vary between 2.5% and a maximum of 10%. Stocks trading at prices below EUR 1 have a general maximum spread of EUR 0.10. The minimum quote volumes (as the second criterion) for liquidity classes $LC1$ to $LC3$ refer to the number of shares worth EUR 20,000, EUR 15,000 and EUR 10,000, respectively, and they are reviewed weekly.[8] During auctions, designated sponsors are required to enter quotes within the first 60 seconds of a call phase and to maintain their order until price determination. Finally, the sponsors have the obligation to provide quotes at least 90% of the trading time and to participate in 90% of all auctions (except for a minimum participation of 80% in auctions following volatility interruptions).

The sponsors face two types of (daily) quality measurement: A performance report, which addresses all parameters of the minimum requirements, and rating reports on

[8]Minimum numbers of 50, 25, and 10 stocks apply to reduce the risk for high-priced equities while a general maximum of 2,000 shares holds.

each sponsor's performance both in specific stock markets and in total. If a designated sponsor fully meets the above criteria, transaction fees caused by his operations are reimbursed. In case of permanent underperformance, Deutsche Börse Group AG is able to withdraw the admission as a sponsor.

The given institutional setup differs from the model developed by Brunnermeier and Pedersen (2008) who distinguish 'speculators' from 'customers' and give speculators a superordinate role when it comes to setting margins. With customers having a direct access to the Xetra order book, however, spreads on Xetra depend on the behaviour of speculators and customers alike; in fact, their roles are largely congruent. However, given the above order criteria, designated sponsors by definition dominate the margin setting of other market participants. Also, their motivation and aims of trading compare to those of the speculators in the model. With respect to the model setup, we identify only one aspect that is unique to the concept of designated sponsors: Since they have to meet their contractual obligations and because they are unable to exit from these obligations in the short run, their freedom of action might be limited in situations with extraordinarily high order book asymmetries. That is, the interaction between funding and liquidity markets is capped for extreme illiquidity and might dilute our results. This dilution clearly works against our expectations and thus, to our disadvantage. We conclude that looking at designated sponsors is probably the best approach to analysing the funding situation of the (relevant) speculators on a specific market. From an institutional perspective, Östberg and Nyborg (2010) are far less specific than Brunnermeier and Pedersen (2008) so that with respect to their expectations, looking at the German stock exchange is largely unproblematic, too.

3 Data and Key Variables

We use daily data for the for the period between July 1, 2005 and Dec 3, 2010. Our dataset comprises all equities which were traded on Xetra, listed in one of the DAX indices (i.e. DAX, SDAX, MDAX, or TecDAX), and required a designated sponsor for at least 30 trading days in a row. We keep all observations for which we obtain i) the Xetra Liquidity Measure as a proxy for stock market liquidity, and ii) the 3 month credit default swap (CDS) spreads of designated sponsors as proxies for their ease to receive funding.[9]. While we receive historic data on the designated sponsors, closing prices, daily transaction volumes, and the Xetra Liquidity Measure from Deutsche Börse Group AG, data on central bank liquidity balance is publicly available on the ECB homepage[10].

As mentioned above, market liquidity is complex and has different interpretations. For the subsequent analysis, it is most relevant to measure the costs for immediacy in

[9] Due to incomplete data we exclude observations on the following trading days: April 27, 2006; July 11, 2008; May 14, 2010; and August 19, 2010

[10] www.ecb.int.

trading because if increasing, this is what makes traders reduce their activity on the one hand and because it is what designated sponsors primarily control on the other hand. The XLM is a function reporting the roundtrip costs (in basis points) at time t for theoretical orders of different volumes v. Since it include all orders in the order book, it reports the precise price impact for the immediate execution. That is,

$$\begin{aligned} XLM(v)_i &= (x^a_{t,i}(v) + x^b_{t,i}(v)) * 10,000 \\ &= (\frac{(p^a_{t,i} - p^{mid}_{t,i})}{p^a_{t,i}} + \frac{(p^{mid}_{t,i} - p^b_t)}{p^b_{t,i}}) * 10,000 \end{aligned} \tag{1}$$

where $x^{a,b}$ represents the (average) execution costs in basis points for an ask and a bid offer, respectively, including as many layers of the order book as necessary. Further, $p^{a,b}_i$ denotes the ask and bid price of stock i, and $p^{mid} = p^b + \frac{p^a - p^b}{2}$ the midpoint quote. As daily averages of the measure are provided only in a standardised manner for given order volumes between EUR 10,000 and EUR 5,000,000, we calculate the average EUR order size over the observation period, $v^\star$, for each stock i, and subsequently, the weighted mean of the two XLM values for the two closest order sizes reported, $v^{high}_{t,i}$ and $v^{low}_{t,i}$:

$$x_{t,i} = \frac{v^{high}_{t,i} - v^\star_i}{v^{high}_{t,i} - v^{low}_{t,i}} * XLM(v^{high}_{t,i}) + \frac{v^\star_i - v^{low}_{t,i}}{v^{high}_{t,i} - v^{low}_{t,i}} * XLM(v^{low}_{t,i}) \tag{2}$$

This approach is reasonable as we wish to exclude the share of volatility in the XLM values which is induced by changes in the average daily order sizes. As a result, our XLM measures the variation in order book depth for a given, average order size. For the robustness tests in section 7, however, we also calculate $x_{t,i}$ using the monthly averages of the order size $v^\star_{m,i}$. In order to analyse market-wide liquidity fluctuations, we also create the EUR volume-weighted market averages over all x_i for each t.

$$x^{aver.}_t = \frac{\sum_{i=1}^N x_{t,i} v^\star_{t,i}}{\sum_{i=1}^N v^\star_{t,i}} \tag{3}$$

When it comes to the funding liquidity of designated sponsors, we argue that CDS spreads closely mirror the designated sponsors' access to interbank funding markets: The higher the spread, the higher the sponsors' transaction costs and the tighter their funding constraints. We take either the CDS spreads $c^\star_t$ of designated sponsor s or, if a stock i has multiple designated sponsors, the mean of their CDS spreads:

$$c_{t,i} = \frac{\sum_{s_i=0}^n c^\star_{t,s_i}}{n} \tag{4}$$

Analogous to equation 3, we additionally calculate the EUR volume-weighted market average of all $c_{t,i}$ in t, $c^{aver.}_t$. For the interpretation of our results, it is important to note that both $x_{t,i}$ and $c_{t,i}$ are measures of illiquidity.

In order to measure the provision of excess liquidity by the ECB, l_t, we compare the liquidity provided by open market operations and its recent bond purchase program on the one hand with the sum of the current reserve requirements and the net liquidity effect of autonomous factors and the securities market program on the other hand. Since at the end of the monthly maintenance periods, large amounts of liquidity from open market operations are withdrawn from markets overnight, we replace the end-of day values of the last day of each maintenance period by its preceding value. We obtain:

$$l_t = \frac{Open\,Market\,Operations_t + Covered\,Bond\,Purchase\,Programme_t}{Autonomous\,Factors_t + Reserve\,Requirements_t} \tag{5}$$

We test all of our data for unit-roots.[11] For the panel dataset, all tests reject a unit root at high levels of significance. Looking at the aggregated data, results are less homogenous as the Augmented Dickey Fuller test for lag $t-1$ may cannot exclude the presence of a unit root in the series of average CDS spreads. Therefore, we decide to use first differences for the analysis of the aggregated time series in order to guarantee reliable results. Detailed results of all stationarity tests are reported in Table 1.

As mentioned above, we expect liquidity mechanisms to possibly differ among stocks of different long-term liquidities and wish to take a closer look at the effects of the financial crisis on market behaviour. With respect to the first dimension, i.e. for a more precise understanding of the heterogeneity in liquidity effects, we choose an approach similar to Östberg and Nyborg (2010): We classify the cross-sections of our sample into five clusters $g = \{1, 2, \ldots, 5\}$ according to their long-term liquidity. We understand long-term liquidity as the monthly average of $x_{t,i}$, $x^m_{t,i}$. Liquidity group $g_m = 1$ consists of the most liquid and group $g_m = 5$ of the most illiquid quintile of stocks in month m. For the subsequent analysis, we use lagged liquidity group classifications $z_m = g_{m-1}$ to avoid endogeneity issues. Lagging the groups does not seem to induce any major bias to our calculations as transition probabilities among the different groups remain low at all times of the sample (cf. Table 2).

Figure 1 illustrates the dynamics of the cross-sectional averages of the XLM, $x^{aver.}_{t,i}$, and of the CDS spreads, $c^{aver.}_{t,i}$, respectively. In addition, the graph includes the measure for excess liquidity provision by the ECB, l_t. While until approximately summer 2007, three of the variables moderately decrease and volatility is rather low, CDS spreads start to increase significantly in the following. Also, the provision of excess liquidity by the ECB becomes more volatile and the stock market liquidity seems to slightly increase. In the second half of 2008, the graph clearly documents the turmoils of the financial crisis with high levels of funding and market illiquidity and significant signs of ECB intervention. In order to look at the effects of the financial crisis in the subsequent analysis, we

[11] We run Dickey-Fuller tests, Augmented Dickey-Fuller tests, and Philips-Perron tests for all aggregated data varying over t only. We test the panel data for stationarity using the ADF-Fisher test (Maddala & Wu, 1999), the PP-Fisher test (Choi, 2001), and the Im, Pesaran, and Shin (2003) test.

generate descriptives for different subperiods of our sample. We split the sample into a 'Pre-Crisis' period including all observations before August 2007, and a 'Total Crisis' period comprising all observations in the time thereafter. Furthermore, as a significant change in the behaviour of stock market liquidity and ECB intervention seems to set in some time during fall 2008, we additionally distinguish between two phases of the crisis: a first phase from August 2007 until August 2008 (Crisis I), in which funding liquidity shows first signs of extraordinary fluctuations, and a second phase beginning in September 2008 (Crisis II). We obtain an unbalanced panel dataset over $T = 1352$ days and $N = 169$ stocks, with 823 days of crisis. The average number of cross-sections per day is 97.7; the exact development of the sample size is disclosed in figure 2). Even though the number of cross-sections increases slightly before 2009 and decreases sharply thereafter, the variation of the sample size is generally low. Descriptive statistics on the cross-sectional, EUR-volume weighted average of all variables and for all subsamples are reported in Table 3.

4 Descriptives and Univariate Results

Taking a closer look at the descriptives in Table 3 reveals first, preliminary insights into the dynamics of funding and market liquidity. Panel (a) documents that the transaction of an average order from our sample had an expected price impact of 0.253%. In line with the illustrations in Figure 1, market and funding liquidity however seem to fluctuate over time: While before the crisis, an average order would have increased margins by 0.238%, the same order would have increased the bid-ask spread by 0.262% on average during the time period thereafter. This corresponds to an increase of about 10%. Along with an increase of levels, the volatility in stock market illiquidity increases substantially and in particular, during the time after August 2008. Looking at the extremes, it is remarkable to note that the minimum values before and during the (different phases of the) financial crisis vary by only 4.71 basis points while the maximum XLM values during the respective phases vary by 40.77 basis points. These results provide a first indication that liquid and illiquid stocks might have a different exposure to the turmoils of the financial crisis. Looking at the series of CDS spreads, we observe an analogous but stronger increase in the average funding costs from 12.65 basis points to 96.733 basis points. The figures indicate a general co-movement of the time series.

We go further analysing the heterogeneous behaviour of liquid and illiquid stocks and compare the descriptives of liquidity cluster $g = 1$ in Panel (b) with those of cluster $g = 5$ in Panel (c). The difference in means between the pre-crisis observations and the time after August 2008 is clearly smaller than for the overall sample: The aggregate market illiquidity of the most liquid stocks increases from 15.7 basis points to 18.2 basis points, which corresponds to an increase by about 16.3%, while the corresponding means in the illiquid group increase by almost 37.4%. This clearly shows that with the crisis progressing, liquidity levels in extremely liquid and illiquid groups drift apart. We observe a similar development for the medians which grow by 7.4% and 18.7%, respectively. At the same time, we see in Panels (e) and (f) that the ratio of the EUR volume-weighted market average of CDS spreads for groups $g = 1$ and $g = 5$ remains approximately stable over time. The average CDS spreads of designated sponsors active on rather liquid stock markets seems to be slightly above the corresponding averages of sponsors on illiquid markets (except between August 2007 and August 2008). While higher CDS spreads on illiquid markets would induce corrupted outcomes, slight divergences in this case work against our expectations and thus, are largely unproblematic. In total, however, we consider the distribution of sponsors with different funding situations as very homogeneous among the groups; in particular with respect to the large fluctuations of CDS levels. All outcomes obtained from observing the XLM compare to those obtained using Amihud's $ILLIQ$ measure.

In Tables 4 to 6, we report Spearman's correlation coefficients among the most important variables of our analysis. Besides the market average of the Xetra Liquidity Measure for fixed order sizes, $x_{t,i}^{aver.}$, we also look at i) the market average of an XLM value which is calculated using daily averages of order sizes and thus, includes daily variations in the average order sizes of a stock market, $x_{t,i}^{\star}$,and ii) the market average of Amihud's (2002) $ILLIQ$ measures as alternative proxies for market liquidity. The tables show that all three of the variables are positively correlated to the development of the CDS spreads at any time. On a first sight, one could understand this as an indication for the liquidity pull-back hypothesis because the sponsors' ease in funding seems to go alone with higher market liquidity at least on average. With respect to potential heterogeneities among liquid and illiquid stock markets, we see that before the financial crisis, the correlation between market liquidity and CDS spreads in stocks of liquidity group $g = 1$ is only slightly lower than the correlation between CDS spreads and the liquidity of stocks in group $g = 5$. However, we document a strong increase in this difference for the total crisis period. We also observe significant, negative correlation coefficients between the excess liquidity provision by the ECB, l_t, and the XLM values after August 2008. As l_t experienced a strong increase throughout this time, we take this as a sign for positive effects of the ECB policy on stock market liquidity.

5 Aggregated Markets

Before we take a closer look at the microeconomic mechanisms and thus, take advantage of the panel structure of our data, we estimate how strong the average market liquidity over all stocks i depends from the corresponding average of CDS spreads. As before, market averages are EUR-volume weighted among the stock markets, so that we obtain the following, basic ARMA(1,1) regression model

$$\Delta x_t^{aver.} = \alpha \Delta x_{t-1}^{aver.} + \beta u_{t-1} + \gamma \Delta c_t^{aver.} + u_t \qquad (6)$$

where Δ denotes the first differences of the time series. Results are reported in Table

7. As expected, we find that the coefficient of interest, γ, is significantly positive for the full sample and for each of the four phases. Comparing the coefficients obtained from estimating the different subsamples over time in further detail, we see that in the first phase of the crisis from August 2007 until August 2008, the coefficient increases only slightly, before it drops again for the time period after 2008. This decrease reported in Panel (m) is somewhat surprising as neither Brunnermeier and Pedersen (2008) nor the findings of Östberg and Nyborg (2010) specifically suggest such behaviour during times of crises. It shall be noted, however, that the drop in coefficients during the financial crisis does not contradict their works either, because γ remains positive. While the deterioration of the impact may have several reasons, one of them is the aforementioned fact that the sponsors have less freedom of action during times of high illiquidity. Another issue might be related to the increasing volatility of both funding and market liquidity and thus, imprecise results. Finally, we cannot exclude other, unobserved impacts on one or both of the parameters either.

In order to find out more about the deteriorating impact of funding liquidity on market liquidity, we recalculate $x_t^{aver.}$ and $c_t^{aver.}$ for each liquidity group $z_m = g_{m-1}$ and repeat estimating equation 6. The results obtained reveal two important findings: First, the coefficient of interest, γ, is higher for illiquid than for liquid stocks, but for both subsamples significantly positive at almost all times. Only during the period of normal times, i.e. before August 2007, the interaction between the funding situation of sponsors in highly illiquid markets and the respective stock market liquidity fails to be significant. A possible reason might be the fact that high volatility in markets with large informational asymmetries (as it is the case in highly illiquid markets) induces noise, and that this noise has a particular effect as long as margins are generally low, i.e. when liquidity pull-back mechanisms are predicted to be weak. Second, we see that during the financial crisis, the interaction of funding and market liquidity decreases for liquid stocks and increases for illiquid stocks. This observation provides strong support for the liquidity pull-back mechanisms described in the literature, and especially for the hypothesis that the interaction of funding and market liquidity contributes to explain flight-to-liquidity. Furthermore, the observation that the interaction of liquid stocks decreases might help to explain the results of estimating Panel (m).

Beginning in 2007 and especially in the time following the Lehman collapse in September 2008, liquidity in interbank markets has significantly deteriorated (see Figure 1). In order to cushion the impacts on asset markets, central banks on both sides of the Atlantic injected substantial amounts of liquidity into the financial system. While earlier market operations of the central banks had never persisted for a longer time, the provision of excess liquidity after September 2008 had a sustaining effect on financial markets. Therefore, we respecify equation 6 as follows:

$$\Delta x_t^{aver.} = \alpha \Delta x_{t-1}^{aver.} + \beta u_{t-1} + \gamma_1 \Delta c_t^{aver.} + \gamma_2 \Delta l_t + \gamma_3 \Delta c_t^{aver.} \Delta l_t + u_t \qquad (7)$$

The regression results are reported in Table 8 and correspond to the aforementioned outcomes in almost every detail – except for one detail: We observe that throughout the pre-crisis period in Panel (f), coefficient γ_1 is insignificant given $g = 5$. In line with our expectations is the observation that the provision of central bank money has substantial negative effects on the interaction between funding and asset markets after August 2008. That is, the two markets seem to have started uncoupling just as predicted. We argue that this follows from central bank funding substituting parts of the interbank funding market. The intervention of ECB liquidity seems to have a disproportionately large effect on illiquid markets, which might be the result of liquidity programs that involve purchasing distressed, i.e. rather illiquid assets.

The outcome of these estimations allow for two major conclusions: First, stock market liquidity seem to be positively linked to interbank markets during all periods of our sample and consistent with our expectations, this link is strong for illiquid and weak for liquid stocks. Second, central bank intervention interferes with these effects and reduces the illiquidity contagion among the two markets.

6 Panel Regressions

The most basic panel regression equation which describes the interaction between CDS spreads and XLM levels is provided by

$$x_{t,i} = \alpha x_{t-1,i} + \beta u_{t-1,i} + \gamma c_{t,i} + \tau_t + \rho_i + u_{t,i} \tag{8}$$

where again, γ is the coefficient of interest. As in all of the following regressions, we consider stock and time fixed-effects, denoted by ρ_i and τ_t, respectively, after testing their necessity using a straightforward F-test. In this regression, we include all cross-sections from July 1, 2005 until December 3, 2010. Results of estimating equation 8 are reported in Table 9(a) and show, that we are unable to confirm a positive interaction for the total sample portfolio. Since all series are demanded when considering fixed-effects and because we expect the interaction of markets to vary both over time and among stocks with different liquidity properties, this outcome is not surprising. The results let us merely conclude that more sophisticated empirical models are necessary in order to measure the liquidity pull-backs in a panel setup.

Heterogeneity among Stocks

In line with the predictions by Brunnermeier and Pedersen (2008) and Östberg and Nyborg (2010), the analysis of the aggregated liquidity series suggests that flight to quality mechanisms apply. We aim to test how strong the liquidity pull-back hits single parts of the stock market in times of decreasing CDS spreads, and which role flight-to-quality mechanisms play. Therefore, we interact $c_{t,i}$ with each stock's average market liquidity in the $T = 3$ days preceding t, $x_{t,i}^{s=1,T=3}$. We obtain

$$x_{t,i} = \alpha x_{t-1,i} + \beta u_{t-1,i} + \gamma_1 x_{t,i}^{1,3} + \gamma_2 c_{t,i} + \gamma_3 c_{t,i} x_{t,i}^{1,3} + \tau_t + \rho_i + u_{t,i} \tag{9}$$

with $x_{t,i}^{1,3} = \frac{\sum_{k=1}^{3} x_{t-k,i}}{T}$. Regression results are reported in Table 9(b). As $\gamma_3 > 0$ at high levels of significance, we are able to confirm that the less liquid stocks are, the larger is the joint marginal effect of CDS spreads, $\gamma_2 + \gamma_3$, on their market liquidity. The fact that $x_{t,i}^{1,3}$ varies between 1.696 basis points and 1317.810 basis points is able to explain the low value of γ_3. Since $x_{t,i}^{1,3} > 0$ for all t, the negative sign of γ_2 is no final proof but a first indication for liquid stocks to increase in liquidity relative to illiquid stocks and thus, for the flight-to-quality mechanisms predicted.

In order to receive further insights on how different stocks react, we generate four dummy variables $\Psi_{t-1,i}^{z}$, with $\Psi_{t-1,i}^{z_m} = 1$ and $z_m = g_{m-1}$ if in month $m-1$, stock i is in liquidity group $g_{m-1} = \{2, 3, 4, 5\}$ (and $\Psi_{t-1,i}^{z_m} = 0$ otherwise). We obtain:

$$x_{t,i} = \alpha x_{t-1,i} + \beta u_{t-1,i} + \gamma_1 c_{t,i} + \sum_{z=2}^{5} \gamma_z c_{t,i} \Psi_{t,i}^{z} + \tau_t + \rho_i + u_{t,i} \tag{10}$$

As predicted, we find in Table 9(c) that the most liquid quintile of all stocks in our sample experience an increase in market liquidity whenever the CDS spreads of their designated sponsors increase, i.e. their funding liquidity deteriorates. As our data is demeaned over both time and cross-sections again due to the consideration of fixed-effects, the negative sign of coefficient γ_1 denotes a decrease of liquidity in liquidity group $z = 1$ *relative to the average development of XLM levels.* At the same time, we document that the specific effects of less liquid stocks are positive at high levels of significance and increase with z or, in other words, with the illiquidity of stocks. That is, speculators reallocate their trading activity from illiquid to more liquid market segments. It is important to note, that $\gamma_1 + \gamma_z < 0$ for groups $z = \{1, 2, 3\}$ does not reject the hypothesis of co-movement of liquidity levels as time-trends may exist. It only confirms the heterogeneity in effects among the different groups. The overall marginal effect $\gamma_1 + \gamma_z > 0$ is positive given $z = \{4, 5\}$, which corresponds to the least liquid 40% of all stocks. The outcomes and the interpretation are in line with those obtained from the groupwise estimation of equation 6 and help to explain the unsharp outcomes of estimating equation 8.

Financial Crisis

Since we have seen that the financial crisis had a lasting impact on the relationship between funding and market liquidity, we subsequently zoom in on its specific impact on the liquidity pull-back mechanisms in each of our $z = \{1, 2, \ldots, 5\}$ liquidity groups. For this purpose, we add crisis dummy Φ_t^1, which takes the value $\Phi_t^1 = 1$ for the time beginning in September, 2008, and 0 otherwise.

$$x_{t,i} = \alpha x_{t-1,i} + \beta u_{t-1,i} + \gamma_z c_{t,i} + \sum_{z=2}^{5} \gamma_z c_{t,i} \Psi_{t,i}^z + \gamma_{z+5} c_{t,i} \Phi_t^1 + \sum_{z=2}^{5} \gamma_{z+5} c_{t,i} \Psi_{t,i}^z \Phi_t^1 + \tau_t + \rho_i + u_{t,i} \tag{11}$$

As documents Table 9(d), for the time until August 2008, the group-wise effect of contemporaneous CDS spreads on market liquidity is significantly negative again, with positive marginal effects $\gamma_1 + \gamma_z > 0$ for $z = \{4, 5\}$. Even though the coefficients are smaller in magnitude than in the estimation of equation 10, they represent a strong confirmation for the above interpretation: Before the crisis, high-liquidity stocks have a lower exposure to changes in funding markets than low-liquidity stocks. With the specific coefficient for the most liquid stocks during the crisis, γ_6, being negative and $\gamma_{z+5} > 0$ for $z = \{2, 3, 4, 5\}$, we confirm that the heterogeneity of the dependence on funding markets between liquid and illiquid stocks increases during the crisis. This corresponds to our predictions: As long as fluctuations in the funding situation of the designated sponsors are minor, there is speculators have no need to drastically reduce their trading activity, and if so, they start with reducing it in the most illiquid markets (or alternatively, increase the margins on these markets).

7 Robustness

We test the above results with respect to numerous possible challenges. First, we take a closer look at the analysis of aggregated data. In particular, we review the calculation of the market averages. In the above analysis we have focussed the EUR volume-weighted averages because conceptionally, changes in the liquidity of high-volume stocks contribute disproportionately to the overall (market-wide) liquidity. However, if trading volume is heterogeneous for stocks of different liquidity levels, the results obtained from estimating equations 6 and 7 may be biased. Therefore, we calculate the equally-weighted market averages of the XLM levels and CDS spreads, $x_t^{equ.}$ and $c_t^{equ.}$ and repeat the estimation. Tables 10 and 11 report the outcomes. All coefficients are close to those of our first approach using volume-weighted averages in signs and significances. Flight-to-quality mechanisms seem to be even stronger. In total, we conclude that with respect to our hypothesis, the use of volume-weighted averages does not induce any bias that might corrupt our results.

Second, we address possible endogeneity issues which might arise from our empirical model when following the reasoning of Brunnermeier and Pedersen (2008). More precisely, the authors argue that declining market liquidity triggers reciprocal mechanisms causing the funding situation of speculators to deteriorate further when asset market become illiquid. Given that such feedback effects might set in within one day time, c_t could partially depend on x_t. As a consequence, we review the analysis of aggregate market data replacing $\Delta c_t^{aver.}$, $\Delta c_t^{equ.}$, and Δl_t by their lagged values in $t-1$. Results obtained from estimations with EUR-volume weighted market averages are reported in Tables 12 and 13, while results for the equally-weighted market averages are displayed in Tables 14 and 15. Both analyses confirm our observation that the average CDS spreads positively affect the market liquidity measured by the XLM over the whole sample period and, in particular, throughout the financial crisis. Also, the coefficients throughout these periods are significantly larger for the most illiquid quintile of stocks than for most liquid one. All of these outcomes are robust to the consideration of the ECB intervention and possible interactions in signs and significances. The test of lagged EUR-volume weighted market averages, however largely fails to reveal significant coefficients for the time before the financial crisis. We argue that the co-movement of the series is predicted to be particularly weak for rather liquid stocks (which are contribute disproportionately to the results of analysing EUR-volume weighted market averages) and throughout normal times. Significant coefficients in Panel (l) of Tables 12 and 13, which measure the interaction of markets during the dawn of the financial crisis, support this suggestion. Only the coefficients γ_1 in Panel (f) of Tables 14 and 15, do not seem to be consistent with our expectations.

In order to test the outcomes of the above panel analyses against corruption by endogeneity as well, we repeat the panel regressions with lagged CDS spreads. The results in Table 16 are very close to those of the previous estimations and clearly confirm out above findings and conclusions. They also qualify the unexpected outcome of both Panels (f) in the analysis of lagged, equally weighted market averages.

Third, we try to give answer to the question whether changes in the funding liquidity of speculators only take effect on asset markets if they are of permanent nature. Assuming that permanent changes in CDS spreads can be approximated by their $T = 3$ day rolling means, we repeat the panel regressions 8 to 11 replacing c_t with

$$c_{t,i}^{s,T} = \frac{\sum_{k=s}^{T} c_{t-k,i}}{T} \tag{12}$$

of which c_t is a special case given $s = T = 0$. We estimate the regressions for i) $s = 0$ and $T = 3$ and ii) $s = 1$ and $T = 3$ in order to address the aforementioned possibility of endogeneity. Both approaches to calculate the rolling mean also capture possible reaction times which have already been addressed by using lagged CDS spreads. The results of these tests are reported in Tables 17 and 18, respectively, and again, they are notably close to the above results in signs, significances, and even magnitude. We interpret this again as strong support for our hypotheses.

Finally, we challenge the use of the Xetra Liquidity Measure by replacing it with Amihud's (2002) $ILLIQ$ measure as one of the most commonly used proxy parameters. Besides replacing the variables in the analysis, we also re-allocate the universe of stocks in our sample into five groups of stocks with different long-term averages of $ILLIQ$. As before, groups are lagged by one month so that $z = g_{m-1} = \{1, 2, 3, 4, 5\}$, where $z = 1$

comprises the most liquid stocks while $z = 5$ comprises the most illiquid ones. The analyses of the aggregated time series reported in Tables 19 and 20 refer to the EUR-weighted averages of our variables, while Tables 21 and 21 refer to the equally-weighted means. While the former averages provide support for our previous findings for the period of the financial crisis, results of the analysis of the latter series remain largely insignificant. Similarly, we are unable to confirm the uncoupling mechanism induced by the intervention of the ECB after fall 2008. Longing for a reasoning for the weakness of these results, we argue that the outcomes are less clear mainly because the $ILLIQ$ measure is much less precise than the XLM parameter and thus, induces too much noise.

Repeating the panel analysis using $ILLIQ$, we obtain equally weak support. While Table 23 reports results for the contemporaneous interaction, Table 24 documents the outcomes of estimating regressions 8 through 11 using $c_{t,i}^{s,T}$ with $s = 0$ and $T = 3$. Panel (a) shows that a positive interaction fails to be confirmed for the overall sample. As before, Panel (b) indicates that the higher the average level of $ILLIQ$ has been in the three days before t, i.e. $ILLIQ_{t,i}^{s,T}$ with $s = 1$ and $T = 3$, the larger is the impact of the CDS spreads on $ILLIQ$. Taking a closer look at the heterogeneous reaction of stocks in different liquidity groups in Panel (c), we are unable to show that in reaction to a deterioration in funding liquidity, liquid stocks significantly increase in liquidity relative to rather illiquid ones. However, we see that the market liquidity of the most illiquid 40% decreases just as predicted. Panel (d) clearly shows that this interaction is strong enough after August 2008 but fails to be significant for the time before the crisis. Even though the findings derived from the analysis of the $ILLIQ$ measure are weak, it shall be noted that they are completely in line with our predictions and do provide support for the liquidity pull-back hypothesis.

8 Conclusion

We analyse the mechanisms linking the liquidity on funding and asset markets. In particular, we test the hypothesis that tight funding situations cause speculators to reduce their trading activity in order to meet their liquidity requirements. Besides the fluctuations in interbank markets for liquidity, we argue that liquidity provision of central banks may affect this interaction, in particular during times in which central bank intervention is high. In order to decrease the requirements for liquidity holdings, reducing trading in illiquid, i.e. high-margin asset markets is disproportionately more effective for speculators. Therefore, we expect to observe flight-to-liquidity mechanisms when funding markets become tight. That is, market liquidity in liquid and illiquid markets drifts apart, with liquid markets becoming more liquid relative to illiquid ones (et vice versa). Our expectations are consistent with those postulated by Brunnermeier and Pedersen (2008) and Östberg and Nyborg (2010).

We provide evidence in favour of these hypotheses looking at 169 German stocks traded on Xetra and their designated sponsors' funding situation between July 2005 and December 2010. We use daily CDS spreads as a proxy for sponsors' ease to receive financing on the interbank market, and the Xetra Liquidity Measure as a superior measure of true order book depth. In addition to the analysis of aggregated liquidity data, we are able to apply a panel ARMA(1,1) regression model. Our results provide strong support for the above hypotheses, in particular:

(i) On an aggregate level, the liquidity of interbank funding markets co-moves with the liquidity of stock markets. The co-movement is large for illiquid stocks and small for liquid ones. The outcome seems to confirm that speculators decrease their trading activity when funding becomes tight.

(ii) Taking into consideration the activities of the European Central Bank, we show that the interaction mechanisms between interbank markets and stock markets persist. However, we find that the marginal effects on the average stock market liquidity are amended. While for the time before Sept 2008, excess liquidity provided by the ECB remains largely irrelevant for stock market liquidity, we find that the dependency of stocks market liquidity on the liquidity in interbank funding markets decreases with increasing levels of central bank liquidity provision.

(iii) The general co-movement in the liquidity of markets may not be generally observed when using a panel approach with time-fixed effects as time trends are removed. We are able to explain this when taking into consideration the heterogeneity in the long-term liquidity levels among stocks: As the analysis shows, tight funding affects the market liquidity of rather liquid stocks positively while it reduces the liquidity of rather illiquid ones. The outcome evidences flight-to-quality mechanisms triggered by changes in the funding ease of speculators. The finding is robust to changes in the provision of central bank liquidity and all other common impacts due to the time fixed-effects considered.

(iv) The level of heterogeneity in stocks increases over time and is particularly strong during and after the financial crisis of 2008. We interpret this as the effect of increasingly many speculators who face substantial funding constraints and thus, reduce the liquidity provided to stock markets.

Concluding from these findings, we find strong evidence for the liquidity spill-over between interbank funding markets and asset markets. This is in line with the predictions of recent academic research. In addition, the consideration of central bank interventions provides new insights and contributes to understanding these mechanisms. As illustrated by the most recent financial crisis, a profound understanding of market liquidity is crucial for the stability of financial systems and the prosperity of economies. We consider this as the central task of future research.

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Appendix

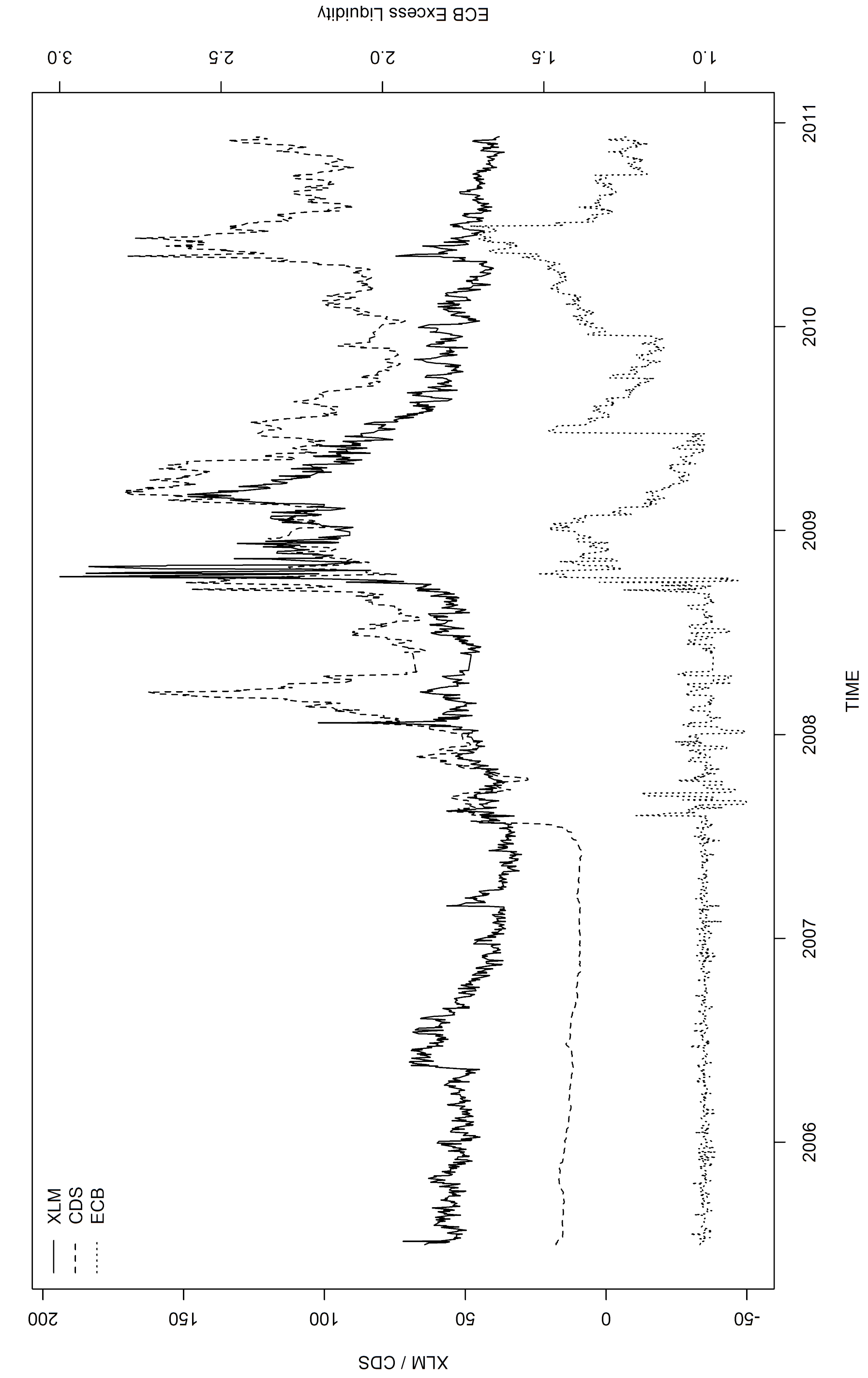

Figure 1: The graph illustrates the dynamics of the aggregated liquidity series at hand. XLM denotes the EUR-volume-weighted market average of the Xetra Liquidity Measure, CDS the according average of CDS spreads, and ECB denotes the measure for excess liquidity provision by the ECB.

Figure 2: Fluctuations in the number of cross-sections over time.

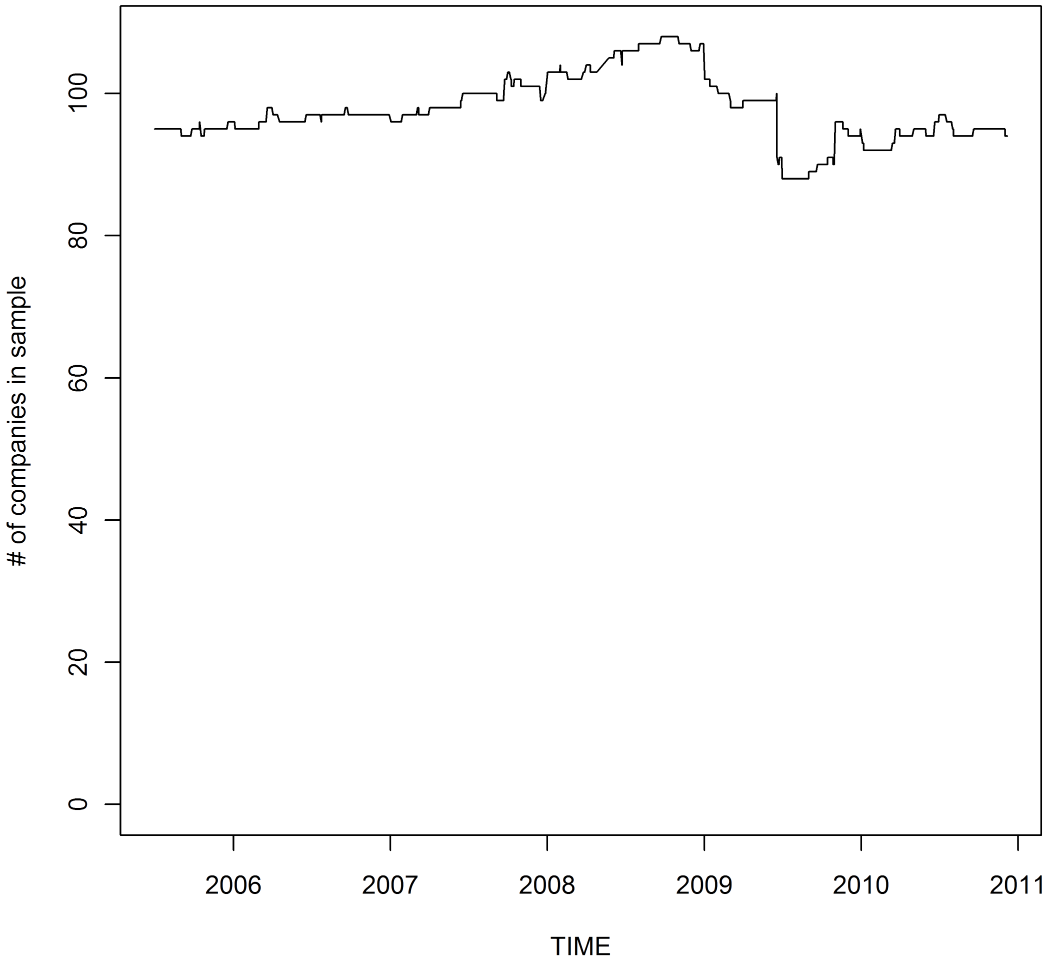

Table 1: Stationarity tests for time series and panel variables. All stationarity tests allow for individual intercepts, superscripts a indicate that the Fisher-PP χ^2 tests additionally allow for individual slopes for the CDS dataset.
$x_{t,i}$ denotes the XLM levels of stock i in t, while $x_{t,i}^{rT}$ describes the rolling mean of XLM levels over the last three days before t. Accordingly, $c_{t,i}$ and $c_{t,i}^{rT}$ denote the contemporaneous levels and the three-day rolling mean of the CDS spreads, respectively, of designated sponsors active in stock market i. EUR-volume weighted market averages of $x_{t,i}$ and $c_{t,i}$ over all i are indexed with "*aver.*", while equally weighted market averages have the index "*equ.*". Δx_t and Δc_t denote the first differences of the respective market aggregates.

	ADF-Fisher (χ^2)	PP-Fisher (χ^2)	Im, Pesaran, & Shin	Dickey-Fuller	Aug. Dickey-Fuller	Phillips-Perron
$x_{t,i}$	2658.04	15396	-37.114			
	(<0.01)	(<0.01)	(<0.01)			
$x_{t,i}^{rT}$	606.343	1393.8	-9.299			
	(<0.01)	(<0.01)	(<0.01)			
$c_{t,i}$	494.675	447.202	-4.605			
	(<0.01)	(<0.01)	(<0.01)			
$c_{t,i}^{rT}$	609.841	445.500^a	-9.100			
	(<0.01)	(<0.01)	(<0.01)			
$x_t^{aver.}$				-6.835	-2.300	-5.217
				(<0.01)	(0.45)	(0.01)
$\Delta x_t^{aver.}$				-49.202	-14.085	-57.481
				(<0.01)	(<0.01)	(<0.01)
$c_t^{aver.}$				-3.216	-2.641	-3.240
				(0.085)	(0.31)	(0.08)
$\Delta c_t^{aver.}$				-31.972	-11.761	-31.664
				(<0.01)	(<0.01)	(<0.01)
$x_t^{equ.}$				-5.443	-1.963	-3.830
				(<0.01)	(0.594)	(0.017)
$\Delta x_t^{equ.}$				-44.204	-13.350	-51.789
				(<0.01)	(<0.01)	(0.010)
$c_t^{equ.}$				-2.786	-2.779	-3.129
				(0.246)	(0.249)	(0.100)
$\Delta c_t^{equ.}$				-27.776	-11.049	-27.049
				(<0.01)	(<0.01)	(0.01)
l_t				-5.610	-3.298	-4.715
				(0.01)	(0.07)	(0.01)
Δl_t				-41.150	-12.875	-43.150
				(<0.01)	(<0.01)	(<0.01)

Table 2: The transition probabilities describe the probability that stocks in group g_{m-1} belong to group g_m one month later.Liquidity groups are based on the XLM and ILLIQ levels, respectively. Group $g_m = 1$ denotes the most liquid quintile of stocks in month m, while group $g = 5$ comprises the most illiquid quintile of stocks. Besides for the full sample period, transition probabilities are calculated separately for the time before August 2007 (Pre-Crisis) and the time thereafter (Total Crisis). In addition, probabilities are calculated for two different phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).

		XLM					ILLIQ				
		$g_m = 1$	$g_m = 2$	$g_m = 3$	$g_m = 4$	$g_m = 5$	$g_m = 1$	$g_m = 2$	$g_m = 3$	$g_m = 4$	$g_m = 5$
Full Sample	$g_{m-1} = 1$	0.994	0.006	0	0	0	0.994	0.006	0	0	0
	$g_{m-1} = 2$	0.006	0.988	0.005	0	0	0.006	0.988	0.005	0	0
	$g_{m-1} = 3$	0	0.006	0.986	0.007	0	0	0.006	0.986	0.007	0
	$g_{m-1} = 4$	0	0	0.007	0.985	0.008	0	0	0.007	0.985	0.008
	$g_{m-1} = 5$	0	0	0	0.007	0.993	0	0	0	0.007	0.993
Pre-Crisis	$g_{m-1} = 1$	0.994	0.006	0	0	0	0.994	0.006	0	0	0
	$g_{m-1} = 2$	0.006	0.988	0.005	0	0	0.006	0.988	0.005	0	0
	$g_{m-1} = 3$	0	0.006	0.986	0.008	0	0	0.006	0.986	0.008	0
	$g_{m-1} = 4$	0	0	0.008	0.983	0.008	0	0	0.008	0.983	0.008
	$g_{m-1} = 5$	0	0	0	0.007	0.992	0	0	0	0.007	0.992
Total Crisis	$g_{m-1} = 1$	0.993	0.006	0	0	0	0.993	0.006	0	0	0
	$g_{m-1} = 2$	0.006	0.988	0.006	0	0	0.006	0.988	0.006	0	0
	$g_{m-1} = 3$	0	0.006	0.986	0.007	0	0	0.006	0.986	0.007	0
	$g_{m-1} = 4$	0	0	0.007	0.985	0.008	0	0	0.007	0.985	0.008
	$g_{m-1} = 5$	0	0	0	0.006	0.993	0	0	0	0.006	0.993
Crisis I	$g_{m-1} = 1$	0.993	0.007	0.001	0	0	0.993	0.007	0.001	0	0
	$g_{m-1} = 2$	0.007	0.986	0.008	0	0	0.007	0.986	0.008	0	0
	$g_{m-1} = 3$	0	0.008	0.984	0.008	0	0	0.008	0.984	0.008	0
	$g_{m-1} = 4$	0	0	0.007	0.983	0.009	0	0	0.007	0.983	0.009
	$g_{m-1} = 5$	0	0	0	0.007	0.992	0	0	0	0.007	0.992
Crisis II	$g_{m-1} = 1$	0.994	0.006	0	0	0	0.994	0.006	0	0	0
	$g_{m-1} = 2$	0.006	0.988	0.005	0	0	0.006	0.988	0.005	0	0
	$g_{m-1} = 3$	0	0.006	0.988	0.007	0	0	0.006	0.988	0.007	0
	$g_{m-1} = 4$	0	0	0.007	0.986	0.007	0	0	0.007	0.986	0.007
	$g_{m-1} = 5$	0	0	0	0.006	0.994	0	0	0	0.006	0.994

Table 3: Descriptive statistics of the liquidity variables for different subsamples. The table reports the total number of observations (N), the mean, the standard error (StdErr), the standard deviation (StdDev), the coefficient of variance (CoV), the median, the minimum (Min), and the maximum observation value (Max). Furthermore, it provides the dates when the minimum and maximum values have been observed. Panels (a) to (c) refer to the descriptives of the Xetra Liquidity Measure, x_t, for all stocks, for the most liquid quintile of all stocks (liquidity group $z = 1$), and for the most illiquid quintile of stocks (liquidity group $z = 5$). Panels (d) though (f) report the above descriptives for the sponsors' CDS spreads, $c_{t,i}$, respectively. Panel (g) and (h) refer to i) the excess liquidity provision of the European Central Bank, l_t, which usually shoud be close to $l = 1$ during normal times, and ii) to Amihud's $ILLIQ$ measure. All panels report statistics for five different phases of the observation period: the time before August 2007 (Pre-Crisis), the time thereafter (Total Crisis), the time from August 2007 until August 2008 (Crisis I), and the time after August 2008 (Crisis II).

		N	Mean	StdError	StdDev	CoV	Median	Min	Date of Min	Max	Date of Max
	Full Sample	1352	25.258	0.211	7.768	0.308	23.722	12.326	2007-04-10	78.013	2008-10-10
Panel (a)	Pre-Crisis	529	23.793	0.179	4.124	0.173	23.942	12.326	2007-04-10	37.242	2006-01-19
$x_{t,i}$	Total Crisis	823	26.199	0.323	9.273	0.354	23.636	13.442	2010-06-18	78.013	2008-10-10
	Crisis I	254	24.848	0.233	3.712	0.149	24.779	17.036	2008-05-23	56.339	2008-01-22
	Crisis II	569	26.803	0.454	10.822	0.404	22.128	13.442	2010-06-18	78.013	2008-10-10
	Full Sample	1351	17.243	0.155	5.689	0.330	16.133	8.025	2007-04-10	57.016	2008-10-10
Panel (b)	Pre-Crisis	528	15.701	0.125	2.867	0.183	15.595	8.025	2007-04-10	24.910	2006-05-25
$x_{t,i}$	Total Crisis	823	18.233	0.235	6.736	0.369	16.752	9.126	2010-10-28	57.016	2008-10-10
$(z = 1)$	Crisis I	254	18.063	0.186	2.963	0.164	17.755	12.415	2008-05-23	42.329	2008-01-22
	Crisis II	569	18.309	0.329	7.857	0.429	15.064	9.126	2010-10-28	57.016	2008-10-10
	Full Sample	1351	110.672	1.277	46.940	0.424	99.742	48.098	2007-05-21	380.976	2008-10-27
Panel (c)	Pre-Crisis	528	90.23	1.02	23.47	0.26	89.92	48.10	2007-05-21	174.00	2005-11-09
$x_{t,i}$	Total Crisis	823	123.787	1.853	53.149	0.429	106.598	48.938	2007-08-08	380.976	2008-10-27
$(z = 5)$	Crisis I	254	87.604	1.218	19.411	0.222	88.531	48.938	2007-08-08	174.404	2008-01-22
	Crisis II	569	139.940	2.324	55.438	0.396	121.104	68.866	2010-10-15	380.976	2008-10-27
	Full Sample	1352	63.834	1.309	48.124	0.754	69.709	8.762	2007-02-28	185.213	2009-03-26
Panel (d)	Pre-Crisis	529	12.650	0.147	3.392	0.268	12.380	8.762	2007-02-28	49.105	2007-07-30
$c_{t,i}$	Total Crisis	823	96.733	1.118	32.081	0.332	95.261	25.802	2007-10-12	185.213	2009-03-26
	Crisis I	254	67.972	1.601	25.524	0.376	66.608	25.802	2007-10-12	157.292	2008-03-17
	Crisis II	569	109.572	1.080	25.773	0.235	106.021	66.238	2010-01-11	185.213	2009-03-26
	Full Sample	1351	63.607	1.311	48.189	0.758	68.613	8.687	2007-06-04	193.557	2009-03-26
Panel (e)	Pre-Crisis	528	12.823	0.146	3.346	0.261	12.556	8.687	2007-06-04	48.666	2007-07-30
$c_{t,i}$	Total Crisis	823	96.187	1.149	32.973	0.343	94.445	24.432	2007-10-15	193.557	2009-03-26
$(z = 1)$	Crisis I	254	66.737	1.614	25.722	0.385	66.772	24.432	2007-10-15	154.325	2008-03-17
	Crisis II	569	109.334	1.123	26.790	0.245	106.223	63.526	2010-01-11	193.557	2009-03-26
	Full Sample	1351	61.549	1.235	45.408	0.738	68.929	7.145	2007-06-06	179.497	2010-06-08
Panel (f)	Pre-Crisis	528	12.477	0.155	3.569	0.286	12.453	7.145	2007-06-06	46.108	2007-07-30
$c_{t,i}$	Total Crisis	823	93.031	1.010	28.966	0.311	92.202	27.542	2007-10-15	179.497	2010-06-08
$(z = 5)$	Crisis I	254	69.355	1.598	25.475	0.367	67.985	27.542	2007-10-15	165.329	2008-03-14
	Crisis II	569	103.600	0.994	23.719	0.229	100.958	63.867	2009-11-13	179.497	2010-06-08
	Full Sample	1352	1.1249	0.0049	0.1801	0.1601	1.0170	0.8708	2007-08-31	1.7287	2010-06-30
Panel (g)	Pre-Crisis	529	1.002804	0.000544	0.012520	0.012485	1.003103	0.948102	2007-01-31	1.047641	2006-06-21
l_t	Total Crisis	823	1.20339	0.00675	0.19353	0.16082	1.19248	0.87078	2007-08-31	1.72867	2010-06-30
	Crisis I	254	1.00259	0.00331	0.05275	0.05262	0.99784	0.87078	2007-08-31	1.21492	2007-08-09
	Crisis II	569	1.29304	0.00687	0.16395	0.12680	1.30048	0.89837	2008-10-03	1.72867	2010-06-30
	Full Sample	1352	0.003109	0.000048	0.001764	0.567346	0.002596	0.000777	2007-04-10	0.012896	2009-01-19
Panel (h)	Pre-Crisis	529	0.0025377	0.0000447	0.0010283	0.4052287	0.0024221	0.0007771	2007-04-10	0.0097832	2006-01-02
$ILLIQ_{t,i}$	Total Crisis	823	0.0034755	0.0000705	0.0020220	0.5817664	0.0027143	0.0009968	2007-10-09	0.0128959	2009-01-19
	Crisis I	254	0.002129	0.000034	0.000542	0.254321	0.002070	0.000997	2007-10-09	0.004509	2007-12-28
	Crisis II	569	0.00408	0.00009	0.00215	0.52690	0.00346	0.00104	2010-06-18	0.01290	2009-01-19

Table 4: Spearman correlation coefficients among all major variables over the full sample period. $x_t^{aver.}$ and $c_t^{aver.}$ denote the EUR-volume weighted market averages of the XLM levels and the CDS spreads, respectively. $x_t^{\star}$ denotes the market average of an alternative XLM measure which assumes daily averages of order sizes to derive the average price impact of trading. The excess liquidity provision by the ECB is described by l_t and $ILLIQ$ refers to the market average of Amihud's (2003) illiquidity measure. Liquidity group $z = 1$ comprises the most liquid stocks, liquidity group $z = 5$ the most illiquid ones. P-values are displayed in parentheses.

		$x_t^{aver.}$	$x_t^{aver.}$	$c_t^{aver.}$	$c_t^{aver.}$	$c_t^{aver.}$	l_t	$x_t^{\star}$	$x_t^{\star}$	$x_t^{\star}$	$ILLIQ_t$
		$z=1$	$z=5$		$z=1$	$z=5$			$z=1$	$z=5$	
$x_t^{aver.}$		0.9439	0.5943	0.2079	0.2117	0.1427	-0.1351	0.8260	0.7501	0.5107	0.5624
		(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
$x_t^{aver.}$	$z=1$		0.5564	0.2745	0.2809	0.2152	-0.1260	0.8366	0.7670	0.6033	0.4623
			(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
$x_t^{aver.}$	$z=5$			0.5891	0.5893	0.5355	0.3794	0.5962	0.6018	0.5729	0.7044
				(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
$c_t^{aver.}$					0.9969	0.9850	0.6167	0.4614	0.4606	0.6788	0.4970
					(0)	(0)	(0)	(0)	(0)	(0)	(0)
$c_t^{aver.}$	$z=1$					0.9860	0.6149	0.4644	0.4619	0.6829	0.4992
						(0)	(0)	(0)	(0)	(0)	(0)
$c_t^{aver.}$	$z=5$						0.6079	0.4024	0.4075	0.6316	0.4579
							(0)	(0)	(0)	(0)	(0)
l_t								0.0386	0.1955	0.2827	0.3363
								(0.156)	(0.000)	(0.000)	(0.000)
$x_t^{\star}$									0.8504	0.7642	0.5682
									(0.000)	(0.000)	(0.000)
$x_t^{\star}$	$z=1$									0.6293	0.5637
										(0)	(0)
$x_t^{\star}$	$z=5$										0.3809
											(0)

Table 5: Spearman correlation coefficients among all major variables before and after August 2007. $x_t^{aver.}$ and $c_t^{aver.}$ denote the EUR-volume weighted market averages of the XLM levels and the CDS spreads, respectively. $x_t^{\star}$ denotes the market average of an alternative XLM measure which assumes daily averages of order sizes to derive the average price impact of trading. The excess liquidity provision by the ECB is described by l_t and $ILLIQ$ refers to the market average of Amihud's (2003) illiquidity measure. Liquidity group $z = 1$ comprises the most liquid stocks, liquidity group $z = 5$ the most illiquid ones. P-values are displayed in parentheses.

			$x_t^{aver.}$ $z=1$	$x_t^{aver.}$ $z=5$	$c_t^{aver.}$	$c_t^{aver.}$ $z=1$	$c_t^{aver.}$ $z=5$	l_t	$x_t^{\star}$	$x_t^{\star}$ $z=1$	$x_t^{\star}$ $z=5$	$ILLIQ_t$
		$x_t^{aver.}$	0.8998	0.7304	0.5970	0.5940	0.6205	-0.0500	0.7917	0.6954	0.3413	0.7336
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.251)	(0.000)	(0.000)	(0.000)	(0.000)
	$z=1$	$x_t^{aver.}$		0.6507	0.5490	0.5538	0.5818	-0.0162	0.7416	0.7335	0.4130	0.6007
				(0.000)	(0.000)	(0.000)	(0.000)	(0.709)	(0.000)	(0.000)	(0.000)	(0.000)
	$z=5$	$x_t^{aver.}$			0.5375	0.5567	0.5716	-0.0539	0.5689	0.4509	0.2760	0.6949
					(0.000)	(0.000)	(0.000)	(0.216)	(0.000)	(0.000)	(0.000)	(0.000)
		$c_t^{aver.}$				0.9804	0.9409	-0.0055	0.3981	0.1767	0.1100	0.6523
						(0.000)	(0.000)	(0.899)	(0.000)	(0.000)	(0.011)	(0.000)
Panel (a)	$z=1$	$c_t^{aver.}$					0.9507	-0.0130	0.4067	0.1977	0.1290	0.6583
Panel (b)							(0.000)	(0.765)	(0.000)	(0.000)	(0.003)	(0.000)
Pre-Crisis	$z=5$	$c_t^{aver.}$						-0.0176	0.4219	0.2164	0.0875	0.6817
								(0.687)	(0.000)	(0.000)	(0.044)	(0.000)
		l_t							-0.0411	-0.0393	-0.0212	-0.0679
									(0.345)	(0.367)	(0.626)	(0.119)
		$x_t^{\star}$								0.7886	0.5384	0.6435
										(0.000)	(0.000)	(0.000)
	$z=1$	$x_t^{\star}$									0.3927	0.4100
											(0.000)	(0.000)
	$z=5$	$x_t^{\star}$										0.1341
												(0.002)
		$x_t^{aver.}$	0.9769	0.6121	0.2555	0.2658	0.0843	-0.2749	0.9246	0.8443	0.8351	0.4986
			(0.000)	(0.000)	(0.000)	(0.000)	(0.016)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	$z=1$	$x_t^{aver.}$		0.5757	0.2434	0.2608	0.0845	-0.3049	0.9002	0.8165	0.8319	0.4316
				(0.000)	(0.000)	(0.000)	(0.015)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	$z=5$	$x_t^{aver.}$			0.6403	0.6373	0.4766	0.2689	0.6251	0.6631	0.6621	0.7095
					(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
		$c_t^{aver.}$				0.9914	0.9491	0.4361	0.3481	0.4627	0.3706	0.5937
						(0)	(0)	(0)	(0)	(0)	(0)	(0)
Panel (b)	$z=1$	$c_t^{aver.}$					0.9511	0.4368	0.3590	0.4634	0.3826	0.6002
Panel (c)							(0)	(0)	(0)	(0)	(0)	(0)
Total Crisis	$z=5$	$c_t^{aver.}$						0.4295	0.1772	0.3002	0.2082	0.4770
								(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
		l_t							-0.2189	-0.0056	-0.1719	0.3151
									(0.000)	(0.873)	(0.000)	(0.000)
		$x_t^{\star}$								0.8778	0.8775	0.5593
										(0)	(0)	(0)
	$z=1$	$x_t^{\star}$									0.7229	0.6310
											(0.000)	(0.000)
	$z=5$	$x_t^{\star}$										0.4710
												(0)

Table 6: Spearman correlation coefficients among all major variables in the first (Aug. 2007 until Aug. 2008) and the second (after August 2008) phase of the financial crisis. $x_t^{aver.}$ and $c_t^{aver.}$ denote the EUR-volume weighted market averages of the XLM levels and the CDS spreads, respectively. $x_t^{\star}$ denotes the market average of an alternative XLM measure which assumes daily averages of order sizes to derive the average price impact of trading. The excess liquidity provision by the ECB is described by l_t and $ILLIQ$ refers to the market average of Amihud's (2003) illiquidity measure. Liquidity group $z = 1$ comprises the most liquid stocks, liquidity group $z = 5$ the most illiquid ones. P-values are displayed in parentheses.

			$x_t^{aver.}$ $z=1$	$x_t^{aver.}$ $z=5$	$c_t^{aver.}$	$c_t^{aver.}$ $z=1$	$c_t^{aver.}$ $z=5$	l_t	$x_t^{\star}$	$x_t^{\star}$ $z=1$	$x_t^{\star}$ $z=5$	$ILLIQ_t$
		$x_t^{aver.}$	0.9205	0.3896	0.3518	0.3337	0.3418	0.1077	0.7524	0.7529	0.4823	0.3052
			(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.087)	(0.000)	(0.000)	(0.000)	(0.000)
	$z=1$	$x_t^{aver.}$		0.3908	0.4191	0.4046	0.4049	0.1059	0.6693	0.7271	0.4399	0.2058
				(0.000)	(0.000)	(0.000)	(0.000)	(0.092)	(0.000)	(0.000)	(0.000)	(0.001)
	$z=5$	$x_t^{aver.}$			0.8013	0.8071	0.7968	0.0752	0.5374	0.0684	0.6575	0.3015
					(0.000)	(0.000)	(0.000)	(0.233)	(0.000)	(0.278)	(0.000)	(0.000)
		$c_t^{aver.}$				0.9962	0.9906	-0.0054	0.5007	0.1133	0.5826	0.2618
						(0.000)	(0.000)	(0.932)	(0.000)	(0.071)	(0.000)	(0.000)
Panel (a)	$z=1$	$c_t^{aver.}$					0.9845	-0.0020	0.4908	0.0937	0.5755	0.2616
Panel (d)							(0.000)	(0.975)	(0.000)	(0.136)	(0.000)	(0.000)
Crisis I	$z=5$	$c_t^{aver.}$						-0.0208	0.4746	0.1130	0.5703	0.2434
								(0.741)	(0.000)	(0.072)	(0.000)	(0.000)
		l_t							0.0170	0.1804	0.0158	-0.0183
									(0.787)	(0.004)	(0.802)	(0.772)
		$x_t^{\star}$								0.5806	0.7226	0.4026
										(0.000)	(0.000)	(0.000)
	$z=1$	$x_t^{\star}$									0.2130	0.1597
											(0.001)	(0.011)
	$z=5$	$x_t^{\star}$										0.2705
												(0.000)
		$x_t^{aver.}$	0.9780	0.9054	0.4175	0.4321	0.1293	-0.2998	0.9248	0.9274	0.8626	0.7787
			(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
	$z=1$	$x_t^{aver.}$		0.8958	0.4347	0.4544	0.1543	-0.2722	0.9042	0.9188	0.8613	0.7374
				(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
	$z=5$	$x_t^{aver.}$			0.4501	0.4513	0.1582	-0.2795	0.8140	0.8432	0.8218	0.7323
					(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
		$c_t^{aver.}$				0.9820	0.8969	-0.0332	0.4610	0.5138	0.4563	0.4517
						(0.00)	(0.00)	(0.43)	(0.00)	(0.00)	(0.00)	(0.00)
Panel (b)	$z=1$	$c_t^{aver.}$					0.9061	-0.0192	0.4827	0.5307	0.4723	0.4711
Panel (e)							(0.000)	(0.647)	(0.000)	(0.000)	(0.000)	(0.000)
Crisis II	$z=5$	$c_t^{aver.}$						0.0459	0.2030	0.2547	0.1757	0.2587
								(0.274)	(0.000)	(0.000)	(0.000)	(0.000)
		l_t							-0.3193	-0.2939	-0.2814	-0.2354
									(0.000)	(0.000)	(0.000)	(0.000)
		$x_t^{\star}$								0.9533	0.8733	0.7768
										(0)	(0)	(0)
	$z=1$	$x_t^{\star}$									0.8289	0.7772
											(0)	(0)
	$z=5$	$x_t^{\star}$										0.6561
												(0)

Table 7: Analysis of market-wide, EUR volume-weighted liquidity aggregates (see equation 6). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{aver.}$ and $\Delta c_t^{aver.}$ denote the first differences of EUR-volume weighted market averages of i) the XLM levels and ii) the contemporaneous CDS spreads, respectively. $\Delta x_{t-1}^{aver.}$ and u_{t-1} refer to the ARMA(1,1) components. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta x_{t-1}^{aver.}$	u_{t-1}	$\Delta c_{t,i}^{aver.}$
	Panel(a)	$z = \{1...5\}$	0.41165***	-0.77620***	0.11589***
			(0.000)	(0.000)	(0.000)
Full Sample	Panel(b)	$z = 1$	0.29000***	-0.69871***	0.09652***
			(0.000)	(0.000)	(0.000)
	Panel(c)	$z = 5$	0.36676***	-0.79609***	0.71533***
			(0.000)	(0.000)	(0.000)
	Panel(d)	$z = \{1...5\}$	0.48431***	-0.89297***	0.18603***
			(0.000)	(0.000)	(0.010)
Pre-Crisis	Panel(e)	$z = 1$	0.43877***	-0.85008***	0.16103***
			(0.000)	(0.000)	(0.005)
	Panel(f)	$z = 5$	0.14437**	-0.76904***	0.22471
			(0.042)	(0.000)	(0.569)
	Panel(g)	$z = \{1...5\}$	0.39628***	-0.74850***	0.11800***
			(0.000)	(0.000)	(0.000)
Total Crisis	Panel(h)	$z = 1$	0.24898***	-0.65740***	0.09725***
			(0.001)	(0.000)	(0.000)
	Panel(i)	$z = 5$	0.43980***	-0.81260***	0.72407***
			(0.000)	(0.000)	(0.000)
	Panel(j)	$z = \{1...5\}$	0.56162***	-0.86697***	0.13539***
			(0.000)	(0.000)	(0.000)
Crisis I	Panel(k)	$z = 1$	0.51784***	-0.86042***	0.10782***
			(0.000)	(0.000)	(0.000)
	Panel(l)	$z = 5$	0.45615***	-0.92484***	0.45472***
			(0.000)	(0.000)	(0.000)
	Panel(m)	$z = \{1...5\}$	0.30412***	-0.68065***	0.11276***
			(0.003)	(0.000)	(0.000)
Crisis II	Panel(n)	$z = 1$	0.03588	-0.48647***	0.09495***
			(0.772)	(0.000)	(0.000)
	Panel(o)	$z = 5$	0.43882***	-0.80535***	0.77019***
			(0.000)	(0.000)	(0.000)

Table 8: Analysis of market-wide, EUR volume-weighted liquidity aggregates including the provision of excess liquidity by the European Central Bank (see equation 7). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{aver.}$ and $\Delta c_t^{aver.}$ denote the first differences of EUR-volume weighted market averages of i) the XLM levels and ii) the contemporaneous CDS spreads, respectively. $\Delta x_{t-1}^{aver.}$ and u_{t-1} refer to the ARMA(1,1) components. Δl_t describes the first differences of the proxy parameter for excess liquidity provision by the European Central Bank. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta x_{t-1}^{aver.}$	u_{t-1}	$\Delta c_{t,i}^{aver.}$	Δl_t	$\Delta c_{t,i}^{aver.} \Delta l_t$
	Panel(a)	$z = \{1...5\}$	0.39241***	-0.77071***	0.12205***	3.73054*	-0.86778***
			(0.000)	(0.000)	(0.000)	(0.050)	(0.000)
Full Sample	Panel(b)	$z = 1$	0.28510***	-0.70528***	0.10013***	2.60394*	-0.59594***
			(0.000)	(0.000)	(0.000)	(0.060)	(0.001)
	Panel(c)	$z = 5$	0.37008***	-0.80644***	0.75632***	8.06339	-4.99195***
			(0.000)	(0.000)	(0.000)	(0.490)	(0.002)
	Panel(d)	$z = \{1...5\}$	0.48185***	-0.89120***	0.19795***	-10.58358	-3.34617
			(0.000)	(0.000)	(0.008)	(0.108)	(0.600)
Pre-Crisis	Panel(e)	$z = 1$	0.42882***	-0.84416***	0.16972***	-1.48852	-6.64359
			(0.000)	(0.000)	(0.004)	(0.767)	(0.170)
	Panel(f)	$z = 5$	0.13827*	-0.76754***	0.14214	-31.77626	31.52909
			(0.053)	(0.000)	(0.722)	(0.438)	(0.172)
	Panel(g)	$z = \{1...5\}$	0.37417***	-0.74411***	0.12341***	4.50384**	-0.85112***
			(0.000)	(0.000)	(0.000)	(0.038)	(0.002)
Total Crisis	Panel(h)	$z = 1$	0.24460***	-0.66901***	0.10024***	2.84896*	-0.58150***
			(0.001)	(0.000)	(0.000)	(0.068)	(0.003)
	Panel(i)	$z = 5$	0.43981***	-0.82181***	0.76392***	10.43915	-4.85208***
			(0.000)	(0.000)	(0.000)	(0.439)	(0.007)
	Panel(j)	$z = \{1...5\}$	0.55043***	-0.86099***	0.13303***	6.88435*	0.05633
			(0.000)	(0.000)	(0.000)	(0.067)	(0.932)
Crisis I	Panel(k)	$z = 1$	0.50878***	-0.85414***	0.10667***	6.43690**	0.14060
			(0.000)	(0.000)	(0.000)	(0.035)	(0.799)
	Panel(l)	$z = 5$	0.46656***	-0.93322***	0.45089***	27.66167*	-2.30513
			(0.000)	(0.000)	(0.000)	(0.079)	(0.287)
	Panel(m)	$z = \{1...5\}$	0.29191***	-0.68920***	0.12077***	3.75384	-0.99317***
			(0.001)	(0.000)	(0.000)	(0.158)	(0.002)
Crisis II	Panel(n)	$z = 1$	0.05949	-0.52942***	0.09879***	1.80004	-0.65110***
			(0.583)	(0.000)	(0.000)	(0.324)	(0.003)
	Panel(o)	$z = 5$	0.43258***	-0.81253***	0.82950***	3.58988	-5.69654**
			(0.000)	(0.000)	(0.000)	(0.841)	(0.012)

Table 9: Results from regressing the XLM levels, $x_{t,i}$, on the contemporaneous CDS spreads, $c_{t,i}$. The values displayed represent the coefficients obtained and their p-values, which are reported in parentheses. Panel (a) through (d) distinguish the results of estimating equations 8 to 11.

x_{t-1} and u_{t-1} denote the ARMA(1,1) components. $x_{t,i}^{1,3}$ denotes the rolling mean of XLM values in the three days preceding t. Φ_t^c denotes the crisis dummy which takes the value $\Phi_t^c = 0$ for the time until August 2008, and $\Phi_t^c = 1$ for the time thereafter. Ψ^z takes the value $\Psi^z = 1$ if stock i was part of liquidity group $z_t = g_{m-1} = \{1, 2, \ldots, 5\}$ in the previous calendar month. Liquidity group $z = 1$ contans the most liquid quintile of stocks and group $z = 5$ the most illiquid one. Stock and time fixed-effects ρ_i and τ_t are considered but remain unreported.

Panels	(a)	(b)	(c)	(d)
x_{t-1}	0.96372***	-0.04903***	0.94813***	0.94423***
	(0)	(0)	(0)	(0)
u_{t-1}	-0.62873***	0.24008***	-0.61332***	-0.60696***
	(0)	(0)	(0)	(0)
$c_{t,i}$	-0.02301	-0.1013***	-0.19397***	-0.11837***
	(0.119)	(0)	(0)	(0.002)
$x_{t,i}^{1,3}$		0.66935***		
		(0)		
$c_{t,i}x_{t,i}^{1,3}$		0.00133***		
		(0)		
$c_{t,i}\Psi_{t,i}^2$			0.0492***	0.03863*
			(0)	(0.07)
$c_{t,i}\Psi_{t,i}^3$			0.13995***	0.0729***
			(0)	(0.002)
$c_{t,i}\Psi_{t,i}^4$			0.26381***	0.14111***
			(0)	(0)
$c_{t,i}\Psi_{t,i}^5$			0.55069***	0.32672***
			(0)	(0)
$c_{t,i}\Phi_t^c$				-0.0902**
				(0.023)
$c_{t,i}\Phi_t^c\Psi_{t,i}^2$				0.01165
				(0.611)
$c_{t,i}\Phi_t^c\Psi_{t,i}^3$				0.07955***
				(0.002)
$c_{t,i}\Phi_t^c\Psi_{t,i}^4$				0.14588***
				(0)
$c_{t,i}\Phi_t^c\Psi_{t,i}^5$				0.29006***
				(0)

Table 10: Analysis of market-wide, equally-weighted liquidity aggregates (see equation 6). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{equ.}$ and $\Delta c_t^{equ.}$ denote the first differences of equally-weighted market averages of i) the XLM levels and ii) the contemporaneous CDS spreads, respectively. $\Delta x_{t-1}^{equ.}$ and u_{t-1} refer to the ARMA(1,1) components. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta x_{t-1}^{equ.}$	u_{t-1}	$\Delta c_{t,i}^{equ.}$
	Panel(a)	$z = \{1...5\}$	0.50415***	-0.80230***	0.37867***
			(0.000)	(0.000)	(0.000)
Full Sample	Panel(b)	$z = 1$	0.36430***	-0.73778***	0.10516***
			(0.000)	(0.000)	(0.000)
	Panel(c)	$z = 5$	0.51594***	-0.84213***	0.86106***
			(0.000)	(0.000)	(0.000)
	Panel(d)	$z = \{1...5\}$	0.33478***	-0.72259***	0.36205***
			(0.001)	(0.000)	(0.003)
Pre-Crisis	Panel(e)	$z = 1$	0.34413***	-0.82274***	0.32635***
			(0.000)	(0.000)	(0.000)
	Panel(f)	$z = 5$	0.24526***	-0.73832***	0.41552
			(0.002)	(0.000)	(0.206)
	Panel(g)	$z = \{1...5\}$	0.51518***	-0.80568***	0.38144***
			(0.000)	(0.000)	(0.000)
Total Crisis	Panel(h)	$z = 1$	0.36532***	-0.72049***	0.10463***
			(0.000)	(0.000)	(0.000)
	Panel(i)	$z = 5$	0.53492***	-0.84837***	0.87626***
			(0.000)	(0.000)	(0.000)
	Panel(j)	$z = \{1...5\}$	0.62861***	-0.86647***	0.30721***
			(0.000)	(0.000)	(0.000)
Crisis I	Panel(k)	$z = 1$	0.65582***	-0.92583***	0.13331***
			(0.000)	(0.000)	(0.000)
	Panel(l)	$z = 5$	0.49551***	-0.87371***	0.52295***
			(0.000)	(0.000)	(0.000)
	Panel(m)	$z = \{1...5\}$	0.50585***	-0.80137***	0.40451***
			(0.000)	(0.000)	(0.000)
Crisis II	Panel(n)	$z = 1$	0.17510	-0.58472***	0.09440***
			(0.108)	(0.000)	(0.000)
	Panel(o)	$z = 5$	0.53863***	-0.85017***	0.98287***
			(0.000)	(0.000)	(0.000)

Table 11: Analysis of market-wide, equally-weighted liquidity aggregates including the provision of excess liquidity by the European Central Bank (see equation 7). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{equ.}$ and $\Delta c_t^{equ.}$ denote the first differences of equally-weighted market averages of i) the XLM levels and ii) the contemporaneous CDS spreads, respectively. $\Delta x_{t-1}^{equ.}$ and u_{t-1} refer to the ARMA(1,1) components. Δl_t describes the first differences of the proxy parameter for excess liquidity provision by the European Central Bank. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta x_{t-1}^{equ.}$	u_{t-1}	$\Delta c_{t,i}^{equ.}$	Δl_t	$\Delta c_{t,i}^{equ.} \Delta l_t$
	Panel(a)	$z = \{1...5\}$	0.48498***	-0.79963***	0.39948***	6.38695	-3.38671***
			(0.000)	(0.000)	(0.000)	(0.167)	(0.000)
Full Sample	Panel(b)	$z = 1$	0.33604***	-0.73342***	0.11260***	1.38869	-1.14012***
			(0.000)	(0.000)	(0.000)	(0.334)	(0.000)
	Panel(c)	$z = 5$	0.49673***	-0.83916***	0.90385***	17.74564	-7.06350***
			(0.000)	(0.000)	(0.000)	(0.162)	(0.000)
	Panel(d)	$z = \{1...5\}$	0.32909***	-0.71946***	0.37437***	-6.62837	-4.01451
			(0.001)	(0.000)	(0.003)	(0.475)	(0.741)
Pre-Crisis	Panel(e)	$z = 1$	0.34408***	-0.82404***	0.34516***	-5.56987	-10.57731*
			(0.000)	(0.000)	(0.000)	(0.216)	(0.091)
	Panel(f)	$z = 5$	0.24711***	-0.74004***	0.46017	8.35222	-13.13435
			(0.002)	(0.000)	(0.195)	(0.749)	(0.718)
	Panel(g)	$z = \{1...5\}$	0.49392***	-0.80222***	0.40150***	7.20716	-3.34472***
			(0.000)	(0.000)	(0.000)	(0.216)	(0.000)
Total Crisis	Panel(h)	$z = 1$	0.33371***	-0.71698***	0.11129***	1.76694	-1.11717***
			(0.000)	(0.000)	(0.000)	(0.297)	(0.000)
	Panel(i)	$z = 5$	0.51335***	-0.84404***	0.91641***	18.22990	-6.93329***
			(0.000)	(0.000)	(0.000)	(0.255)	(0.002)
	Panel(j)	$z = \{1...5\}$	0.61966***	-0.86107***	0.30469***	10.50524*	0.30553
			(0.000)	(0.000)	(0.000)	(0.074)	(0.786)
Crisis I	Panel(k)	$z = 1$	0.63768***	-0.91272***	0.13230***	8.11770**	-0.13335
			(0.000)	(0.000)	(0.000)	(0.011)	(0.824)
	Panel(l)	$z = 5$	0.49162***	-0.87526***	0.51718***	23.81735*	1.21839
			(0.000)	(0.000)	(0.000)	(0.051)	(0.550)
	Panel(m)	$z = \{1...5\}$	0.47760***	-0.79911***	0.44573***	5.85035	-4.16080***
			(0.000)	(0.000)	(0.000)	(0.452)	(0.000)
Crisis II	Panel(n)	$z = 1$	0.17820**	-0.61795***	0.10493***	-0.32877	-1.25490***
			(0.042)	(0.000)	(0.000)	(0.869)	(0.000)
	Panel(o)	$z = 5$	0.50735***	-0.84505***	1.08924***	16.62247	-9.44341***
			(0.000)	(0.000)	(0.000)	(0.440)	(0.001)

Table 12: Analysis of market-wide, EUR volume-weighted liquidity aggregates (see equation 6). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{aver.}$ and $\Delta c_{t-1}^{aver.}$ denote the first differences of EUR-volume weighted market averages of i) the XLM levels and ii) the lagged CDS spreads, respectively. $\Delta x_{t-1}^{aver.}$ and u_{t-1} refer to the ARMA(1,1) components. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta x_{t-1}^{aver.}$	u_{t-1}	$\Delta c_{t-1,i}^{aver.}$
	Panel(a)	$z = \{1...5\}$	0.41081***	-0.79372***	0.03522***
			(0.000)	(0.000)	(0.008)
Full Sample	Panel(b)	$z = 1$	0.30700***	-0.73366***	0.02989***
			(0.000)	(0.000)	(0.002)
	Panel(c)	$z = 5$	0.38993***	-0.81531***	0.35490***
			(0.000)	(0.000)	(0.000)
	Panel(d)	$z = \{1...5\}$	0.49286***	-0.89387***	0.10568
			(0.000)	(0.000)	(0.153)
Pre-Crisis	Panel(e)	$z = 1$	0.42481***	-0.81815***	-0.05017
			(0.000)	(0.000)	(0.346)
	Panel(f)	$z = 5$	0.14230**	-0.76247***	-0.50247
			(0.048)	(0.000)	(0.152)
	Panel(g)	$z = \{1...5\}$	0.40161***	-0.77797***	0.03341**
			(0.000)	(0.000)	(0.027)
Total Crisis	Panel(h)	$z = 1$	0.27597***	-0.71105***	0.03224***
			(0.000)	(0.000)	(0.003)
	Panel(i)	$z = 5$	0.46063***	-0.83179***	0.34365***
			(0.000)	(0.000)	(0.000)
	Panel(j)	$z = \{1...5\}$	0.59027***	-0.91466***	0.03502
			(0.000)	(0.000)	(0.198)
Crisis I	Panel(k)	$z = 1$	0.52766***	-0.89481***	0.03219
			(0.000)	(0.000)	(0.135)
	Panel(l)	$z = 5$	0.45647***	-0.93983***	0.30875***
			(0.000)	(0.000)	(0.000)
	Panel(m)	$z = \{1...5\}$	0.33098***	-0.73021***	0.03459**
			(0.000)	(0.000)	(0.050)
Crisis II	Panel(n)	$z = 1$	0.12312	-0.60182***	0.03604***
			(0.205)	(0.000)	(0.003)
	Panel(o)	$z = 5$	0.46012***	-0.82204***	0.35560***
			(0.000)	(0.000)	(0.003)

Table 13: Analysis of market-wide, EUR volume-weighted liquidity aggregates including the provision of excess liquidity by the European Central Bank (see equation 7). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{aver.}$ and $\Delta c_{t-1}^{aver.}$ denote the first differences of EUR-volume weighted market averages of i) the XLM levels and ii) the lagged CDS spreads, respectively. $\Delta x_{t-1}^{aver.}$ and u_{t-1} refer to the ARMA(1,1) components. Δl_{t-1} describes the lagged first differences of the proxy parameter for excess liquidity provision by the European Central Bank. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta x_{t-1}^{aver.}$	u_{t-1}	$\Delta c_{t-1,i}^{aver.}$	Δl_{t-1}	$\Delta c_{t-1,i}^{aver.}\Delta l_{t-1}$
	Panel(a)	$z = \{1...5\}$	0.41423***	-0.79636***	0.03326**	2.21648	0.22650
			(0.000)	(0.000)	(0.013)	(0.260)	(0.373)
Full Sample	Panel(b)	$z = 1$	0.30732***	-0.73606***	0.03027***	1.26514	-0.01125
			(0.000)	(0.000)	(0.002)	(0.380)	(0.951)
	Panel(c)	$z = 5$	0.38556***	-0.81212***	0.36344***	-9.82891	-0.96918
			(0.000)	(0.000)	(0.000)	(0.418)	(0.556)
	Panel(d)	$z = \{1...5\}$	0.49901***	-0.89622***	0.09564	7.52025	2.58358
			(0.000)	(0.000)	(0.244)	(0.258)	(0.818)
Pre-Crisis	Panel(e)	$z = 1$	0.42642***	-0.81951***	-0.05108	0.27123	1.82125
			(0.000)	(0.000)	(0.337)	(0.957)	(0.818)
	Panel(f)	$z = 5$	0.13464*	-0.76002***	-0.54938	-31.50941	44.55185*
			(0.065)	(0.000)	(0.117)	(0.441)	(0.071)
	Panel(g)	$z = \{1...5\}$	0.40528***	-0.78021***	0.03144**	1.80864	0.23423
			(0.000)	(0.000)	(0.041)	(0.427)	(0.418)
Total Crisis	Panel(h)	$z = 1$	0.27604***	-0.71410***	0.03271***	1.29651	-0.01238
			(0.000)	(0.000)	(0.003)	(0.429)	(0.952)
	Panel(i)	$z = 5$	0.45662***	-0.82772***	0.34858***	-10.35053	-0.59453
			(0.000)	(0.000)	(0.000)	(0.465)	(0.754)
	Panel(j)	$z = \{1...5\}$	0.54320***	-0.88984***	0.03635	5.78748	0.31238
			(0.000)	(0.000)	(0.183)	(0.159)	(0.641)
Crisis I	Panel(k)	$z = 1$	0.48869***	-0.87559***	0.03313	4.10775	0.11158
			(0.000)	(0.000)	(0.124)	(0.218)	(0.841)
	Panel(l)	$z = 5$	0.44995***	-0.93945***	0.31036***	4.98976	-0.31389
			(0.000)	(0.000)	(0.000)	(0.770)	(0.886)
	Panel(m)	$z = \{1...5\}$	0.33473***	-0.72929***	0.03252*	-0.21141	0.16810
			(0.000)	(0.000)	(0.073)	(0.940)	(0.616)
Crisis II	Panel(n)	$z = 1$	0.12227	-0.60169***	0.03637***	-0.32299	-0.03683
			(0.209)	(0.000)	(0.003)	(0.866)	(0.871)
	Panel(o)	$z = 5$	0.44916***	-0.81302***	0.36478***	-16.93970	-1.01534
			(0.000)	(0.000)	(0.004)	(0.372)	(0.675)

Table 14: Analysis of market-wide, equally-weighted liquidity aggregates (see equation 6). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{equ.}$ and $\Delta c_{t-1}^{equ.}$ denote the first differences of equally-weighted market averages of i) the XLM levels and ii) the lagged CDS spreads, respectively. $\Delta x_{t-1}^{equ.}$ and u_{t-1} refer to the ARMA(1,1) components. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta x_{t-1}^{equ.}$	u_{t-1}	$\Delta c_{t-1,i}^{equ.}$
	Panel(a)	$z = \{1...5\}$	0.49276***	-0.81550***	0.20337***
			(0.000)	(0.000)	(0.000)
Full Sample	Panel(b)	$z = 1$	0.37241***	-0.76906***	0.03307***
			(0.000)	(0.000)	(0.003)
	Panel(c)	$z = 5$	0.51079***	-0.84815***	0.60891***
			(0.000)	(0.000)	(0.000)
	Panel(d)	$z = \{1...5\}$	0.35210***	-0.73530***	0.16380
			(0.000)	(0.000)	(0.189)
Pre-Crisis	Panel(e)	$z = 1$	0.39843***	-0.85389***	0.16661***
			(0.000)	(0.000)	(0.003)
	Panel(f)	$z = 5$	0.25371***	-0.74748***	0.21192
			(0.001)	(0.000)	(0.514)
	Panel(g)	$z = \{1...5\}$	0.50015***	-0.81822***	0.20278***
			(0.000)	(0.000)	(0.000)
Total Crisis	Panel(h)	$z = 1$	0.36967***	-0.75643***	0.03078**
			(0.000)	(0.000)	(0.017)
	Panel(i)	$z = 5$	0.52766***	-0.85351***	0.61484***
			(0.000)	(0.000)	(0.000)
	Panel(j)	$z = \{1...5\}$	0.67768***	-0.94807***	0.11171**
			(0.000)	(0.000)	(0.010)
Crisis I	Panel(k)	$z = 1$	0.68452***	-1.00000***	0.04221***
			(0.000)	(0.000)	(0.008)
	Panel(l)	$z = 5$	0.52330***	-0.91601***	0.33541***
			(0.000)	(0.000)	(0.000)
	Panel(m)	$z = \{1...5\}$	0.48641***	-0.80893***	0.22882***
			(0.000)	(0.000)	(0.000)
Crisis II	Panel(n)	$z = 1$	0.23279***	-0.66574***	0.03090**
			(0.006)	(0.000)	(0.035)
	Panel(o)	$z = 5$	0.52850***	-0.85254***	0.71347***
			(0.000)	(0.000)	(0.000)

Table 15: Analysis of market-wide, equally-weighted liquidity aggregates including the provision of excess liquidity by the European Central Bank (see equation 7). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{equ.}$ and $\Delta c_{t-1}^{equ.}$ denote the first differences of equally-weighted market averages of i) the XLM levels and ii) the lagged CDS spreads, respectively. $\Delta x_{t-1}^{equ.}$ and u_{t-1} refer to the ARMA(1,1) components. Δl_{t-1} describes the lagged first differences of the proxy parameter for excess liquidity provision by the European Central Bank. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta x_{t-1}^{equ.}$	u_{t-1}	$\Delta c_{t-1,i}^{equ.}$	Δl_{t-1}	$\Delta c_{t-1,i}^{equ.} \Delta l_{t-1}$
	Panel(a)	$z = \{1...5\}$	0.50563***	-0.81497***	0.19665***	-7.25989	0.68555
			(0.000)	(0.000)	(0.000)	(0.132)	(0.340)
Full Sample	Panel(b)	$z = 1$	0.37050***	-0.77028***	0.03372***	0.96013	-0.03789
			(0.000)	(0.000)	(0.002)	(0.523)	(0.848)
	Panel(c)	$z = 5$	0.51065***	-0.84665***	0.60999***	-7.97210	-0.12704
			(0.000)	(0.000)	(0.000)	(0.541)	(0.948)
	Panel(d)	$z = \{1...5\}$	0.33903***	-0.72485***	0.09195	-2.50872	25.62099
			(0.001)	(0.000)	(0.530)	(0.790)	(0.345)
Pre-Crisis	Panel(e)	$z = 1$	0.39763***	-0.85386***	0.17020***	-1.66597	-1.74120
			(0.000)	(0.000)	(0.005)	(0.721)	(0.895)
	Panel(f)	$z = 5$	0.25194***	-0.74580***	0.16021	-7.70471	14.98988
			(0.001)	(0.000)	(0.687)	(0.769)	(0.810)
	Panel(g)	$z = \{1...5\}$	0.51580***	-0.81809***	0.19541***	-7.72663	0.73769
			(0.000)	(0.000)	(0.000)	(0.206)	(0.406)
Total Crisis	Panel(h)	$z = 1$	0.36871***	-0.75794***	0.03106**	1.05595	-0.00479
			(0.000)	(0.000)	(0.018)	(0.554)	(0.984)
	Panel(i)	$z = 5$	0.52921***	-0.85231***	0.61417***	-8.26231	0.17464
			(0.000)	(0.000)	(0.000)	(0.617)	(0.942)
	Panel(j)	$z = \{1...5\}$	0.65151***	-0.93205***	0.11743**	3.81289	0.92927
			(0.000)	(0.000)	(0.011)	(0.568)	(0.436)
Crisis I	Panel(k)	$z = 1$	0.66774***	-1.00000***	0.04000***	2.67773	-0.52374
			(0.000)	(0.000)	(0.010)	(0.440)	(0.352)
	Panel(l)	$z = 5$	0.50514***	-0.91193***	0.35373***	11.34481	2.27127
			(0.000)	(0.000)	(0.000)	(0.389)	(0.253)
	Panel(m)	$z = \{1...5\}$	0.49452***	-0.80259***	0.22143***	-12.96453	0.39910
			(0.000)	(0.000)	(0.001)	(0.114)	(0.726)
Crisis II	Panel(n)	$z = 1$	0.22162**	-0.66022***	0.03227**	-1.32339	-0.10424
			(0.010)	(0.000)	(0.033)	(0.534)	(0.691)
	Panel(o)	$z = 5$	0.52347***	-0.84839***	0.72402***	-14.41113	-0.95475
			(0.000)	(0.000)	(0.000)	(0.520)	(0.765)

Table 16: Results from regressing the XLM levels, $x_{t,i}$, on the lagged CDS spreads, $c_{t-1,i}$. The values displayed represent the coefficients obtained and their p-values, which are reported in parentheses. Panel (a) through (d) distinguish the results of estimating equations 8 to 11.
x_{t-1} and u_{t-1} denote the ARMA(1,1) components. $x_{t,i}^{1,3}$ denotes the rolling mean of XLM values in the three days preceding t. Φ_t^c denotes the crisis dummy which takes the value $\Phi_t^c = 0$ for the time until August 2008, and $\Phi_t^c = 1$ for the time thereafter. Ψ^z takes the value $\Psi^z = 1$ if stock i was part of liquidity group $z_t = g_{m-1} = \{1, 2, \ldots, 5\}$ in the previous calendar month. Liquidity group $z = 1$ contans the most liquid quintile of stocks and group $z = 5$ the most illiquid one. Stock and time fixed-effects ρ_i and τ_t are considered but remain unreported.

Panels	(a)	(b)	(c)	(d)
x_{t-1}	0.96367***	-0.05389***	0.94928***	0.94532***
	(0)	(0)	(0)	(0)
u_{t-1}	-0.62836***	0.244***	-0.61624***	-0.60984***
	(0)	(0)	(0)	(0)
$c_{t-1,i}$	-0.02274	-0.09321***	-0.18006***	-0.11843***
	(0.125)	(0)	(0)	(0.002)
$x_{t,i}^{1,3}$		0.6813***		
		(0)		
$c_{t-1,i}x_{t,i}^{1,3}$		0.00123***		
		(0)		
$c_{t-1,i}\Psi_{t,i}^2$			0.04749***	0.03422
			(0)	(0.109)
$c_{t-1,i}\Psi_{t,i}^3$			0.12973***	0.05726**
			(0)	(0.018)
$c_{t-1,i}\Psi_{t,i}^4$			0.24692***	0.11462***
			(0)	(0)
$c_{t-1,i}\Psi_{t,i}^5$			0.52026***	0.29046***
			(0)	(0)
$c_{t-1,i}\Phi_t^c$				-0.07476*
				(0.061)
$c_{t-1,i}\Phi_t^c\Psi_{t,i}^2$				0.0148
				(0.519)
$c_{t-1,i}\Phi_t^c\Psi_{t,i}^3$				0.08656***
				(0.001)
$c_{t-1,i}\Phi_t^c\Psi_{t,i}^4$				0.15817***
				(0)
$c_{t-1,i}\Phi_t^c\Psi_{t,i}^5$				0.29869***
				(0)

Table 17: Results from regressing the XLM levels, $x_{t,i}$, on $k = \{0, 1, 2, 3\}$ days rolling means of CDS spreads, $c_{t,i}^{0,3}$. The values displayed represent the coefficients obtained and their p-values, which are reported in parentheses. Panel (a) through (d) distinguish the results of estimating equations 8 to 11.
x_{t-1} and u_{t-1} denote the ARMA(1,1) components. $x_{t,i}^{1,3}$ denotes the rolling mean of XLM values in the three days preceding t. Φ_t^c denotes the crisis dummy which takes the value $\Phi_t^c = 0$ for the time until August 2008, and $\Phi_t^c = 1$ for the time thereafter. Ψ^z takes the value $\Psi^z = 1$ if stock i was part of liquidity group $z_t = g_{m-1} = \{1, 2, \ldots, 5\}$ in the previous calendar month. Liquidity group $z = 1$ contans the most liquid quintile of stocks and group $z = 5$ the most illiquid one. Stock and time fixed-effects ρ_i and τ_t are considered but remain unreported.

Panels	(a)	(b)	(c)	(d)
x_{t-1}	0.96373***	-0.05343***	0.9487***	0.94495***
	(0)	(0)	(0)	(0)
u_{t-1}	-0.62873***	0.24414***	-0.61532***	-0.60937***
	(0)	(0)	(0)	(0)
$c_{t,i}^{0,3}$	-0.02333	-0.09297***	-0.1892***	-0.11832***
	(0.185)	(0)	(0)	(0.005)
$x_{t,i}^{1,3}$		0.68146***		
		(0)		
$c_{t,i}^{0,3} x_{t,i}^{1,3}$		0.00122***		
		(0)		
$c_{t,i}^{0,3} \Psi_{t,i}^2$			0.04976***	0.03665*
			(0)	(0.092)
$c_{t,i}^{0,3} \Psi_{t,i}^3$			0.13854***	0.06454***
			(0)	(0.009)
$c_{t,i}^{0,3} \Psi_{t,i}^4$			0.25855***	0.12839***
			(0)	(0)
$c_{t,i}^{0,3} \Psi_{t,i}^5$			0.53727***	0.31457***
			(0)	(0)
$c_{t,i}^{0,3} \Phi_t^c$				-0.08492*
				(0.057)
$c_{t,i}^{0,3} \Phi_t^c \Psi_{t,i}^2$				0.01446
				(0.536)
$c_{t,i}^{0,3} \Phi_t^c \Psi_{t,i}^3$				0.08819***
				(0.001)
$c_{t,i}^{0,3} \Phi_t^c \Psi_{t,i}^4$				0.15575***
				(0)
$c_{t,i}^{0,3} \Phi_t^c \Psi_{t,i}^5$				0.28923***
				(0)

Table 18: Results from regressing the XLM levels, $x_{t,i}$, on $k = \{1, 2, 3\}$ days rolling means of CDS spreads, $c^{1,3}_{t,i}$. The values displayed represent the coefficients obtained and their p-values, which are reported in parentheses. Panel (a) through (d) distinguish the results of estimating equations 8 to 11.
x_{t-1} and u_{t-1} denote the ARMA(1,1) components. $x^{1,3}_{t,i}$ denotes the rolling mean of XLM values in the three days preceding t. Φ^c_t denotes the crisis dummy which takes the value $\Phi^c_t = 0$ for the time until August 2008, and $\Phi^c_t = 1$ for the time thereafter. Ψ^z takes the value $\Psi^z = 1$ if stock i was part of liquidity group $z_t = g_{m-1} = \{1, 2, \ldots, 5\}$ in the previous calendar month. Liquidity group $z = 1$ contans the most liquid quintile of stocks and group $z = 5$ the most illiquid one. Stock and time fixed-effects ρ_i and τ_t are considered but remain unreported.

Panels	(a)	(b)	(c)	(d)
x_{t-1}	0.96367***	-0.05531***	0.94976***	0.94592***
	(0)	(0)	(0)	(0)
u_{t-1}	-0.62835***	0.24581***	-0.61712***	-0.61094***
	(0)	(0)	(0)	(0)
$c^{1,3}_{t,i}$	-0.02307	-0.0891***	-0.17525***	-0.10646***
	(0.17)	(0)	(0)	(0.01)
$x^{1,3}_{t,i}$		0.68739***		
		(0)		
$c^{1,3}_{t,i} x^{1,3}_{t,i}$		0.00117***		
		(0)		
$c^{1,3}_{t,i} \Psi^2_{t,i}$			0.0451***	0.03087
			(0)	(0.155)
$c^{1,3}_{t,i} \Psi^3_{t,i}$			0.12503***	0.04925**
			(0)	(0.046)
$c^{1,3}_{t,i} \Psi^4_{t,i}$			0.23403***	0.10267***
			(0)	(0)
$c^{1,3}_{t,i} \Psi^5_{t,i}$			0.49826***	0.28054***
			(0)	(0)
$c^{1,3}_{t,i} \Phi^c_t$				-0.08349*
				(0.055)
$c^{1,3}_{t,i} \Phi^c_t \Psi^2_{t,i}$				0.01615
				(0.489)
$c^{1,3}_{t,i} \Phi^c_t \Psi^3_{t,i}$				0.09086***
				(0)
$c^{1,3}_{t,i} \Phi^c_t \Psi^4_{t,i}$				0.15743***
				(0)
$c^{1,3}_{t,i} \Phi^c_t \Psi^5_{t,i}$				0.28459***
				(0)

Table 19: Analysis of market-wide, EUR volume-weighted liquidity aggregates (see equation 6). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta ILLIQ_t^{aver.}$ and $\Delta c_t^{aver.}$ denote the first differences of EUR-volume weighted market averages of i) Amihud's $ILLIQ$ measure and ii) the contemporaneous CDS spreads, respectively. $\Delta ILLIQ_{t-1}^{aver.}$ and u_{t-1} refer to the ARMA(1,1) components. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta ILLIQ_{t-1}^{aver.}$	$\Delta c_{t,i}^{aver.}$
	Panel(a)	$z = \{1...5\}$	-0.83737***	0.00688**
			(0.000)	(0.024)
Full Sample	Panel(b)	$z = 1$	-0.88477***	0.00235**
			(0.000)	(0.012)
	Panel(c)	$z = 5$	-0.80280***	0.33336***
			(0.000)	(0.000)
	Panel(d)	$z = \{1...5\}$	-0.79341***	0.00545
			(0.000)	(0.772)
Pre-Crisis	Panel(e)	$z = 1$	-0.90909***	0.00488
			(0.000)	(0.400)
	Panel(f)	$z = 5$	-0.79315***	0.34584
			(0.000)	(0.292)
	Panel(g)	$z = \{1...5\}$	-0.84094***	0.00685*
			(0.000)	(0.052)
Total Crisis	Panel(h)	$z = 1$	-0.87949***	0.00232**
			(0.000)	(0.028)
	Panel(i)	$z = 5$	-0.80325***	0.33310***
			(0.000)	(0.001)
	Panel(j)	$z = \{1...5\}$	-0.89697***	0.00394
			(0.000)	(0.169)
Crisis I	Panel(k)	$z = 1$	-0.92313***	0.00098
			(0.000)	(0.264)
	Panel(l)	$z = 5$	-0.90471***	0.11669**
			(0.000)	(0.012)
	Panel(m)	$z = \{1...5\}$	-0.83761***	0.00774
			(0.000)	(0.101)
Crisis II	Panel(n)	$z = 1$	-0.87801***	0.00266*
			(0.000)	(0.062)
	Panel(o)	$z = 5$	-0.80293***	0.42184***
			(0.000)	(0.002)

Table 20: Analysis of market-wide, EUR volume-weighted liquidity aggregates including the provision of excess liquidity by the European Central Bank (see equation 7). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta ILLIQ_t^{aver.}$ and $\Delta c_t^{aver.}$ denote the first differences of EUR-volume weighted market averages of i) Amihud's $ILLIQ$ measure and ii) the contemporaneous CDS spreads, respectively. $\Delta ILLIQ_{t-1}^{aver.}$ and u_{t-1} refer to the ARMA(1,1) components. Δl_t describes the first differences of the proxy parameter for excess liquidity provision by the European Central Bank. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta ILLIQ_{t-1}^{aver.}$	$\Delta c_{t,i}^{aver.}$	Δl_t	$\Delta c_{t,i}^{aver.} \Delta l_t$
	Panel(a)	$z = \{1...5\}$	-0.84149***	0.00758**	0.58829	-0.06321
			(0.000)	(0.014)	(0.270)	(0.284)
Full Sample	Panel(b)	$z = 1$	-0.88775***	0.00253***	0.14880	-0.01641
			(0.000)	(0.008)	(0.379)	(0.344)
	Panel(c)	$z = 5$	-0.80727***	0.35861***	3.62695	-2.15382
			(0.000)	(0.000)	(0.784)	(0.207)
	Panel(d)	$z = \{1...5\}$	-0.79362***	0.01081	-3.99568*	-0.97285
			(0.000)	(0.604)	(0.066)	(0.635)
Pre-Crisis	Panel(e)	$z = 1$	-0.90679***	0.00606	-1.51309*	-0.24504
			(0.000)	(0.347)	(0.092)	(0.685)
	Panel(f)	$z = 5$	-0.79310***	0.34479	-6.57343	0.76944
			(0.000)	(0.305)	(0.868)	(0.968)
	Panel(g)	$z = \{1...5\}$	-0.84542***	0.00751**	0.72343	-0.06092
			(0.000)	(0.035)	(0.242)	(0.367)
Total Crisis	Panel(h)	$z = 1$	-0.88262***	0.00246**	0.19296	-0.01428
			(0.000)	(0.022)	(0.314)	(0.468)
	Panel(i)	$z = 5$	-0.80830***	0.35837***	3.95568	-2.16448
			(0.000)	(0.000)	(0.807)	(0.294)
	Panel(j)	$z = \{1...5\}$	-0.89045***	0.00373	0.56050	-0.04385
			(0.000)	(0.204)	(0.380)	(0.596)
Crisis I	Panel(k)	$z = 1$	-0.92205***	0.00097	0.03900	-0.00142
			(0.000)	(0.270)	(0.855)	(0.955)
	Panel(l)	$z = 5$	-0.90354***	0.11458**	1.04291	0.29144
			(0.000)	(0.015)	(0.922)	(0.822)
	Panel(m)	$z = \{1...5\}$	-0.84300***	0.00876*	0.76195	-0.06209
			(0.000)	(0.070)	(0.349)	(0.471)
Crisis II	Panel(n)	$z = 1$	-0.88315***	0.00295**	0.21316	-0.01894
			(0.000)	(0.043)	(0.389)	(0.447)
	Panel(o)	$z = 5$	-0.81192***	0.47375***	4.30041	-3.35145
			(0.000)	(0.001)	(0.843)	(0.218)

Table 21: Analysis of market-wide, equally-weighted liquidity aggregates (see equation 6). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta x_t^{equ.}$ and $\Delta c_t^{equ.}$ denote the first differences of equally-weighted market averages of i) Amihud's $ILLIQ$ measure and ii) the contemporaneous CDS spreads, respectively. $\Delta ILLIQ_{t-1}^{equ.}$ and u_{t-1} refer to the ARMA(1,1) components. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta ILLIQ_{t-1}^{equ.}$	$\Delta c_{t,i}^{equ.}$
	Panel(a)	$z = \{1...5\}$	-0.92896***	0.21332*
			(0.000)	(0.086)
Full Sample	Panel(b)	$z = 1$	-0.88949***	0.00184
			(0.000)	(0.272)
	Panel(c)	$z = 5$	-0.94496***	1.07697**
			(0.000)	(0.045)
	Panel(d)	$z = \{1...5\}$	-0.86553***	0.15823
			(0.000)	(0.460)
Pre-Crisis	Panel(e)	$z = 1$	-0.88820***	0.00866
			(0.000)	(0.411)
	Panel(f)	$z = 5$	-0.88322***	0.55929
			(0.000)	(0.545)
	Panel(g)	$z = \{1...5\}$	-0.92968***	0.21800
			(0.000)	(0.176)
Total Crisis	Panel(h)	$z = 1$	-0.88918***	0.00178
			(0.000)	(0.350)
	Panel(i)	$z = 5$	-0.94568***	1.12080
			(0.000)	(0.110)
	Panel(j)	$z = \{1...5\}$	-0.97269***	0.12157**
			(0.000)	(0.014)
Crisis I	Panel(k)	$z = 1$	-0.90403***	0.00137
			(0.000)	(0.511)
	Panel(l)	$z = 5$	-0.98694***	0.66878***
			(0.000)	(0.002)
	Panel(m)	$z = \{1...5\}$	-0.92983***	0.28040
			(0.000)	(0.234)
Crisis II	Panel(n)	$z = 1$	-0.88612***	0.00210
			(0.000)	(0.413)
	Panel(o)	$z = 5$	-0.94674***	1.44819
			(0.000)	(0.161)

Table 22: Analysis of market-wide, equally-weighted liquidity aggregates including the provision of excess liquidity by the European Central Bank (see equation 7). Panels (a) to (c) report the outcomes of regressions which embrace the full sample period. While the estimation of Panel (a) refers to all stocks in the sample, Panels (b) and (c) refer to liquidity groups $z = 1$ ("liquid" stocks) and $z = 5$ ("illiquid" stocks), respectively. The remainder of panels analogously reports results for the time period before August 2007 (Pre-Crisis) and the time period thereafter (Total Crisis). Furthermore, Panels (j) through (o) additionally distinguish between two phases of the crisis, from August 2007 until August 2008 (Crisis I) and from September 2008 onwards (Crisis II).
$\Delta ILLIQ_t^{equ.}$ and $\Delta c_t^{equ.}$ denote the first differences of equally-weighted market averages of i) Amihud's $ILLIQ$ measure and ii) the contemporaneous CDS spreads, respectively. $\Delta ILLIQ_{t-1}^{equ.}$ and u_{t-1} refer to the ARMA(1,1) components. Δl_t describes the first differences of the proxy parameter for excess liquidity provision by the European Central Bank. The table displays coefficients with their p-values being reported in parentheses.

			$\Delta ILLIQ_{t-1}^{equ.}$	$\Delta c_{t,i}^{equ.}$	Δl_t	$\Delta c_{t,i}^{equ.} \Delta l_t$
	Panel(a)	$z = \{1...5\}$	-0.93049***	0.22152*	20.85013	-1.43330
			(0.000)	(0.081)	(0.342)	(0.571)
Full Sample	Panel(b)	$z = 1$	-0.89764***	0.00254	0.14762	-0.06359**
			(0.000)	(0.129)	(0.614)	(0.039)
	Panel(c)	$z = 5$	-0.94720***	1.09406**	126.35269	-5.71775
			(0.000)	(0.042)	(0.172)	(0.612)
	Panel(d)	$z = \{1...5\}$	-0.86658***	0.23540	-32.41470	-13.29176
			(0.000)	(0.425)	(0.275)	(0.725)
Pre-Crisis	Panel(e)	$z = 1$	-0.88816***	0.01180	-2.46094*	-0.97891
			(0.000)	(0.320)	(0.093)	(0.601)
	Panel(f)	$z = 5$	-0.88486***	1.20465	-105.71557	-100.42501
			(0.000)	(0.389)	(0.412)	(0.549)
	Panel(g)	$z = \{1...5\}$	-0.93120***	0.22359	21.92374	-1.38273
			(0.000)	(0.172)	(0.435)	(0.670)
Total Crisis	Panel(h)	$z = 1$	-0.89901***	0.00242	0.21871	-0.06095*
			(0.000)	(0.200)	(0.510)	(0.079)
	Panel(i)	$z = 5$	-0.94786***	1.12559	131.11352	-5.19523
			(0.000)	(0.107)	(0.267)	(0.720)
	Panel(j)	$z = \{1...5\}$	-0.97209***	0.11843**	-18.89458	-1.76567
			(0.000)	(0.018)	(0.230)	(0.271)
Crisis I	Panel(k)	$z = 1$	-0.89440***	0.00085	0.36109	-0.05239
			(0.000)	(0.700)	(0.435)	(0.436)
	Panel(l)	$z = 5$	-0.98597***	0.66701**	-77.38916	-1.26019
			(0.000)	(0.012)	(0.314)	(0.888)
	Panel(m)	$z = \{1...5\}$	-0.93179***	0.29897	25.41350	-1.92419
			(0.000)	(0.218)	(0.492)	(0.664)
Crisis II	Panel(n)	$z = 1$	-0.89827***	0.00313	0.19246	-0.06361
			(0.000)	(0.224)	(0.647)	(0.151)
	Panel(o)	$z = 5$	-0.94965***	1.54173	140.29782	-9.60229
			(0.000)	(0.139)	(0.363)	(0.642)

Table 23: Results from regressing Amihud's (2002) illiquidity measure, $ILLIQ_{t,i}$, on the contemporaneous CDS spreads, $c_{t,i}$. The values displayed represent the coefficients obtained and their p-values, which are reported in parentheses. Panel (a) through (d) distinguish the results of estimating equations 8 to 11.
x_{t-1} and u_{t-1} denote the ARMA(1,1) components. $ILLIQ_{t,i}^{1,3}$ denotes the rolling mean of the ILLIQ measure in the three days preceding t. Φ_t^c denotes the crisis dummy which takes the value $\Phi_t^c = 0$ for the time until August 2008, and $\Phi_t^c = 1$ for the time thereafter. Ψ^z takes the value $\Psi^z = 1$ if stock i was part of liquidity group $z_t = g_{m-1} = \{1, 2, \ldots, 5\}$ in the previous calendar month. Liquidity group $z = 1$ contans the most liquid quintile of stocks and group $z = 5$ the most illiquid one. Stock and time fixed-effects ρ_i and τ_t are considered but remain unreported.

Panels	(a)	(b)	(c)	(d)
$ILLIQ_{t-1}$	0.97929***	-0.03659	0.97679***	0.9757***
	(0)	(0.545)	(0)	(0)
u_{t-1}	-0.94516***	0.07022	-0.94378***	-0.94301***
	(0)	(0.239)	(0)	(0)
$c_{t,i}$	0.00019	0.00015**	-0.00015	-0.00013
	(0.138)	(0.048)	(0.296)	(0.685)
$ILLIQ_{t,i}^{1,3}$		0.0615***		
		(0.001)		
$c_{t,i}ILLIQ_{t,i}^{1,3}$		0.00037***		
		(0.003)		
$c_{t,i}\Psi_{t,i}^2$			8e-05	3e-05
			(0.391)	(0.863)
$c_{t,i}\Psi_{t,i}^3$			0.00017	6e-05
			(0.126)	(0.778)
$c_{t,i}\Psi_{t,i}^4$			0.00055***	0.00012
			(0)	(0.579)
$c_{t,i}\Psi_{t,i}^5$			0.00127***	0.00018
			(0)	(0.435)
$c_{t,i}\Phi_t^c$				2e-05
				(0.956)
$c_{t,i}\Phi_t^c\Psi_{t,i}^2$				3e-05
				(0.867)
$c_{t,i}\Phi_t^c\Psi_{t,i}^3$				8e-05
				(0.71)
$c_{t,i}\Phi_t^c\Psi_{t,i}^4$				0.00047**
				(0.035)
$c_{t,i}\Phi_t^c\Psi_{t,i}^5$				0.00133***
				(0)

Table 24: Results from regressing Amihud's (2002) illiquidity measure, $ILLIQ_{t,i}$, on $k = \{0,1,2,3\}$ days rolling means of CDS spreads, $c_{t,i}^{0,3}$. The values displayed represent the coefficients obtained and their p-values, which are reported in parentheses. Panel (a) through (d) distinguish the results of estimating equations 8 to 11.
$ILLIQ_{t-1}$ and u_{t-1} denote the ARMA(1,1) components. $ILLIQ_{t,i}^{1,3}$ denotes the rolling mean of the ILLIQ measure in the three days preceding t. Φ_t^c denotes the crisis dummy which takes the value $\Phi_t^c = 0$ for the time until August 2008, and $\Phi_t^c = 1$ for the time thereafter. Ψ^z takes the value $\Psi^z = 1$ if stock i was part of liquidity group $z_t = g_{m-1} = \{1, 2, \ldots, 5\}$ in the previous calendar month. Liquidity group $z = 1$ contans the most liquid quintile of stocks and group $z = 5$ the most illiquid one. Stock and time fixed-effects ρ_i and τ_t are considered but remain unreported.

Panels	(a)	(b)	(c)	(d)
$ILLIQ_{t-1}$	0.97928***	-0.04376	0.97686***	0.97574***
	(0)	(0.467)	(0)	(0)
u_{t-1}	-0.94514***	0.07682	-0.94382***	-0.943***
	(0)	(0.196)	(0)	(0)
$c_{t,i}^{0,3}$	0.00018	0.00016**	-0.00016	-0.00014
	(0.173)	(0.037)	(0.269)	(0.689)
$ILLIQ_{t,i}^{1,3}$		0.11653***		
		(0)		
$c_{t,i}^{0,3} ILLIQ_{t,i}^{1,3}$		0		
		(0.988)		
$c_{t,i}^{0,3}\Psi_{t,i}^2$			8e-05	3e-05
			(0.416)	(0.87)
$c_{t,i}^{0,3}\Psi_{t,i}^3$			0.00016	5e-05
			(0.149)	(0.802)
$c_{t,i}^{0,3}\Psi_{t,i}^4$			0.00048***	0.00011
			(0)	(0.62)
$c_{t,i}^{0,3}\Psi_{t,i}^5$			0.00119***	0.00016
			(0)	(0.486)
$c_{t,i}^{0,3}\Phi_t^c$				1e-05
				(0.987)
$c_{t,i}^{0,3}\Phi_t^c\Psi_{t,i}^2$				4e-05
				(0.863)
$c_{t,i}^{0,3}\Phi_t^c\Psi_{t,i}^3$				8e-05
				(0.703)
$c_{t,i}^{0,3}\Phi_t^c\Psi_{t,i}^4$				0.00048**
				(0.034)
$c_{t,i}^{0,3}\Phi_t^c\Psi_{t,i}^5$				0.00132***
				(0)