Dancing to the Same Tune: Commonality in Securities Lending Fees

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ABSTRACT

We document the existence of commonality in short selling loan fees, and we show that the common component of loan fees explains a high degree of their variation. Stocks with high loan fees tend to exhibit high sensitivity to the common component. The common component is highly correlated with several asset pricing factors, suggesting loan fee commonality is associated with consequential states. Loan fee commonality is an important limit to arbitrage, as evidenced by a strong relationship between loan fee commonality and both low future returns and decreased price efficiency. Loan demand is the primary driver of the observed commonality.

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I. Introduction

Short selling is risky. In addition to the economic exposures faced by all investors, there are risks unique to short selling. These risks come from a number of sources, including regulatory restrictions, institutional barriers, and the availability of stock loans. Furthermore, Engelberg, Reed, and Ringgenberg (2018) have demonstrated that the risks faced by short sellers are not static. Instead, because loan fees are dynamic, the risk of changing loan fees is a significant limit to arbitrage.

In this paper, we highlight a new dimension of these dynamic risks: commonality. In the empirical asset pricing literature, a central consideration is the extent to which there are common, systematic risks that influence expected returns and volatilities. Applying this idea to loan fees, we present the first evidence that there is commonality in loan fee movement and that the common component of loan fees moves with other well-known asset pricing risk factors.

As an example, suppose there are two stocks – A and B – that are identical in every way, including the level of their loan fees and their level of loan fee volatility. However, suppose that in one scenario, loan fees move independently, and in a second scenario, loan fees move together. In the second scenario, short selling a portfolio of stocks is considerably more risky than in the first scenario. Furthermore, suppose that in this second scenario, not only do loan fees move together, but they also move against the short seller at exactly the same times as other economic exposures move against the short seller. These two possibilities indicate that commonality in loan fees can form an important limit to arbitrage for short sellers.

Previous literature, e.g., Geczy, Musto, and Reed (2002), has suggested that loan fees are primarily idiosyncratic in nature. Our work finds the opposite. Using a principal components framework, we show that loan fees possess a very high degree of commonality. For example, we find that the first principal component explains 45.6 percent of the variation in loan fees, which indicates a significantly higher degree of commonality than is present in the corresponding equity returns, where the first principal component explains only 28.3 percent of the variation. Moreover, the first principal component of loan fees explains a much higher degree of variation in loan fees than the first principal component of liquidity (as measured by turnover), which only explains 11.6 percent of turnover variation. [1]

In addition, we find that the common component of loan fees moves with other risk factors to which investors have exposure. We find that the risk-free rate, Momentum, Betting Against Beta, and the Pastor & Stambaugh (2003) liquidity factor are all strongly correlated with the common component of loan fees. Together these two facets of commonality–loan fees moving both together and with other risk factors–represent an important new dimension of risk for short sellers.

We then turn to understanding how the loan fees for individual stocks move with the common component of loan fees. We find an interesting pattern: when loan fees are high, sensitivity to the common component is especially strong. For example, we show that when loan fees are in the top 25th percentile, the beta (here defined as the sensitivity of a stock's loan fees to the common component) increases by more than 5. In other words, loan fees in the top quartile co-move to a much higher degree with the common component than do lower loan fees. This, along with a number of similar findings, paints a picture that when loan fees are low, correlations to the common component are low, but when loan fees are high, loan

[1]For other papers related to principal component analysis, see Connor and Korajczyk (1986), Litterman and Scheinkman (1991) and Joslin, Priebsch, and Singleton (2014). For papers related to liquidity commonality, see Chordia, Roll, and Subrahmanyam (2000), Hasbrouck and Seppi (2001), and Huberman and Halka (2001).

fees move together, as if they are up and dancing to the same tune.

With these facts in hand, we then ask whether a possible systematic risk exposure (loan fee exposures to a common component) is priced in the cross section. Decomposing total loan fee volatility into its idiosyncratic and systematic components, we begin with a simple double-sorted portfolio analysis. Recognizing the importance of the findings in Engelberg, Reed, and Ringgenberg (2018) in this setting, we sort on both total loan fee volatility and systematic volatility. Conditional on high total loan fee volatility stocks, our results suggest a strategy in which an investor buys (shorts) stocks with low (high) systematic loan fee volatility earns a positive and significant annual return of 6.2 percent. In contrast, we find no significant difference in the returns of portfolios formed on the basis of idiosyncratic loan fee volatility.

The fact that stocks with a relatively high systematic component of loan fee volatility have unusually low future returns is consistent with the idea that these stocks are overpriced. In other words, investors are unwilling to take short positions against these stocks given the additional risk that loan fee commonality poses, even after controlling for total loan fee risk.

In addition to conducting a double-sorted portfolio analysis to determine whether loan fee commonality is priced in the cross section of equity returns, we also regress future returns on loan characteristics in a panel setting, following the approach used by Boehmer, Jones, and Zhang (2007). In this setting, as in the double-sorted portfolio analysis, we decompose total loan fee risk into systematic and idiosyncratic components. We find that systematic risk dominates idiosyncratic risk in an economically and statistically significant way. Controlling for stock fixed effects and other important characteristics of the short loan market, we estimate a statistically significant coefficient estimate of -0.183. In other words, an increase from the 25th to the 75th percentile in systematic loan fee volatility would be associated with a 1.01 percent lower return in the following quarter. [2]

The fact that systematic loan fee risk has such a large effect on returns suggests that it is one of the driving forces behind investors' unwillingness to short and likely driving the overall effect found in Engelberg, Reed, and Ringgenberg (2018). In other words, fear of loan fee commonality and its associated correlation with well-known risk factors may dissuade investors from taking short positions in overvalued stocks.

Further corroborating the assertion that loan fee commonality is an important limit to arbitrage, we find that systematic loan fee risk is associated with decreased price efficiency. We examine two measures of stock-specific price inefficiency, from Bris, Goetzmann, and Zhu (2007) and Hou & Moskowitz (2005). We find that systematic loan fee volatility is positively correlated with both measures. This suggests that institutional investors, such as hedge funds, may be deterred from shorting stocks with high loan fee commonality, which results in decreased price efficiency.

In addition, we show that our key results are largely invariant to a few important experimental design characteristics. Specifically, the financial crisis could be a central driver of our results and thus a concern for our analysis. We show that the financial crisis is indeed an important driver of many of our estimates, but we also replicate many of our main tables both before and after the crisis, and we find largely similar results. We also show that that the nature of our results is unchanged when we use alternative measures of the common component of loan fees.

A natural next question is: What is the origin of loan fee commonality? We

[2]Alternatively, we estimate that an increase from the 10th to the 90th percentile in systematic loan fee volatility would be associated with a 3.53 percent lower return in the following quarter.

hypothesize that if the demand for stock loans is a greater driver of fee commonality than the supply of stock loans, we should observe that portfolios of stocks likely to be heavily shorted will demonstrate high levels of loan demand commonality. Following an approach similar to Karolyi, Lee, and van Dijk (2012), we construct common components of loan demand (supply) for each quarter, defined as the median loan demand (supply) across all firms in that quarter. Then, for each of ten portfolios sorted according to momentum, we regress each stock's loan demand (supply) on the respective common component over the full sample. We record the resulting betas and R^2s. We observe high demand betas and R^2s for the first two momentum (loser) portfolios, suggesting that loan demand commonality is highest in momentum portfolios which are likely to be heavily shorted, whereas the same phenomenon is not present regarding loan supply. This result suggests that loan fee commonality primarily originates with the demand side for stock loans.

An important parallel to our exploration of the mechanics of the shorting market is the now well-documented commonality in liquidity. To provide some context, several papers document the extent to which an asset's expected return is affected by its illiquidity or the costs associated with trading the asset (see, for example, Amihud and Mendelson (1986)). However, subsequent research documents significant co-movement, or commonality, in liquidity among individual assets (Chordia, Roll, and Subrahmanyam (2000), Hasbrouck and Seppi (2001), and Huberman and Halka (2001)). While the literature has debated the origins of commonality in liquidity (e.g., derived from shocks to the demanders of liquidity vs. its suppliers), this commonality has been definitely linked to variables that we think are indicative of important states of the world (volatility, financial conditions, etc.) (see Hameed, Kang,and Viswanathan (2010) and Karolyi, Lee, and van Dijk (2012) among many others, for example). From an asset pricing perspective, an individual asset's exposure to systematic liquidity risk can affect asset price determination;

that is, not only is an asset's liquidity time-varying, but the fact that its liquidity dries up at otherwise challenging times for its investors (high marginal utility states) affects risk compensation.

Another related paper is Drechsler & Drechsler (2021), which discusses the properties of a cheap-minus-expensive-to-short (CME) portfolio. The CME is constructed with stock returns: returns from high loan fee stocks versus returns from low loan fee stocks. This approach is fundamentally different from our approach, which uses the loan fees themselves to construct the common component of loan fees. Furthermore, Drechsler & Drechsler's (2021) analysis describes the properties of portfolios of returns, whereas our analysis aims to describe and explain properties of loan fees.

The paper proceeds as follows. In Section II, we provide an overview of our data and empirical procedure. In Section III, we discuss our results. Specifically, in Section III.A, we provide evidence of loan fee commonality. In Section III.B, we show the ways in which loan fee movements correlate with other asset pricing and macro variables that are important to investors. In Section III.C, we consider the ways in which investors might view the commonality of loan fees and show that high systematic volatility of loan fees is associated with low future returns. In Section IV, we consider the origin of loan fee commonality. Finally, in Section V, we conclude.

II. Data

In this section, we discuss our data set and empirical strategy. In Section II.A, we provide an overview of the data. In Section II.B, we discuss the measures of loan fee commonality we construct. In Section II.C, we provide a comparison of the loan fee common components. Overall, the results of this section indicate that there is commonality among short-selling loan fees. We also show that the commonality is not driven by one particular time period.

A. Data Overview

Following Engelberg, Reed, & Ringgenberg (2018), we use a comprehensive equity lending database, which allows us to observe daily short-selling loan fees, volume, returns, and other firm characteristics for 4,675 US equities. The data span 66 months from July 2006 through December 2011.

Out of the 4,675 stocks in our sample, 700 are in the current Russell 1000. These Russell 1000 stocks constitute 15 percent of our sample and 70 percent of the current index. The sample also contains 417 stocks in the current S&P 500, which constitute 9 percent of our sample and 83 percent of the current index. These numbers indicate that our sample is representative of the market and contains most of the largest publicly traded firms.

Throughout our sample period, many stocks enter or leave the sample. For the average day, loan fee data is populated for about 3,200 stocks, and this number does not fluctuate much throughout the sample period. We restrict our analysis to stocks that have populated loan fee data for at least 252 trading days, which reduces the total number of firms in our analysis from 4,675 to 4,039.

While most loan fees in the data are positive, some loan fees are negative. Because there is little precedent in the short-selling literature for how to interpret negative loan fees, we set a -20 basis point floor for the purpose of constructing our common component.[3] This loan fee floor allows loan fees to fluctuate around zero

[3]Anecdotal evidence suggests that negative loan fees are not necessarily errors. For example, some lenders' investments in highly rated collateralized securities became extremely illiquid during the financial crisis, which gave lenders the incentive to maintain cash in their collateral investment pools to avoid selling these securities. This incentive to maintain cash, in turn, led to an incentive

but limits the ability of large negative loan fees to impact our loan fee common components. We also winsorize at the one percent level on the right tail in order to limit the influence of outliers.

[Table 1]

Table 1 presents summary statistics for our sample. Panel A presents firm-level summary statistics for average loan fees and loan fee volatilities across the full sample. After data trimming, we find that the median firm in the sample has an average loan fee of 16 basis points per annum. The firm at the 25th percentile of average loan fees across the sample has an average loan fee of 10 basis points, whereas the 75th percentile firm has an average loan fee of 73 basis points, indicating sizeable right skewness in loan fees.

B. Common Component Construction

In order to establish a common component of loan fees, we create and compare several candidate loan fee variables. Each variable is a daily time series which indicates how the aggregate of all stock loan fees in the sample moves over time.

Component 1: *Median Loan Fee*. For each day in the sample, we take the median across all loan fees to construct a time series. While a potential downside of using this measure of commonality is that the median is insensitive to tail movements, *Median Loan Fee* incorporates all available data and is the best measure of the average stock's loan fees for a given day. We use this as our measure of the loan fee common component in most of our analyses because of its clear economic intuition and its high correlation with the other candidate components.

Component 2: *PC1*. A long-standing tradition across empirical asset pric-

to lend out shares, which gave rise to lenders effectively paying borrowers to open and maintain equity loans.

ing research has been to extract one or more relevant statistical factors from a large panel of asset returns. For example, Connor and Korajczyk (1986) employ principal components by building on the factor model theory of Chamberlain and Rothschild (1983). Many other researchers subsequently employ similar techniques. Principle component analysis also plays a role among researchers in evaluating Treasury bond returns in the term structure literature (see, for example, Litterman and Scheinkman (1991) and Joslin, Priebsch, and Singleton (2014)).

To construct our second loan fee common component, we first standardize the data by de-meaning all loan fees and dividing by the standard deviation for each firm. In order to conduct a principal component analysis (PCA), the panel must be balanced. In our data set, there are numerous firms that enter or leave the sample at different points in time, so we can not conduct a PCA on the original data set. Before conducting the PCA, we remove all stocks which were missing data for at least one day, which leaves us with 1,935 stocks (about 40 percent of the total stocks in the sample).[4] We conduct a PCA on the loan fees of the remaining stocks. The first principal component, which we call *PC1*, explains a high degree of variation in loan fees (46 percent). However, a downside of using this measure is that there is a lack of clear economic intuition, and a large portion of our data is ignored in constructing the measure. Hence, we only consider this variable as a robustness check. The percentage of variation explained by each of the top ten principal components can be found in Table A.1.

Component 3: *Mean Loan Fee (VW)*. Using market capitalization data, we calculate a value-weighted average across all loan fees for each day. While this measure incorporates all available data, has strong economic intuition, and has

[4]We acknowledge that the $PC1$ common component is subject to look-ahead bias, which is a potential drawback to using this measure. For all of our analyses, we first consider the *Median Loan Fee* common component, which does not suffer from look-ahead bias, and only use $PC1$ as a robustness check.

historical precedent, this measure is highly correlated with several of the largest firms' loan fees and thus is insensitive to small firms' loan fees. Hence, we only consider this variable as a robustness check.

Component 4: *Mean Loan Fee (EW)*. We calculate the equal-weighted average of all loan fees for each day. This variable is not highly correlated with the other common component candidates (see Table 2) because small stocks with highly volatile loan fees are weighted equally with large stocks, whose loan fees tend to have a higher degree of co-movement with other stock loan fees. Because of its low correlation with the other candidates, we only consider the equal-weighted average as a robustness check.

Table 1 (Panel B) presents the time series summary statistics of the loan fee common components in basis points per annum. On the average day, the median loan fee across firms is about 10 basis points, whereas the first principle component (PC1) is 0 due to standardizing the data before conducting the PCA.

C. Common Component Comparison

In this sub-section, we compare loan fee common components over time and determine whether there is co-movement in loan fees.

[Figure 1]

From Figure 1, it is evident that three measures of loan fee commonality (the median, PC1, and the value-weighted average loan fee) move together over time. Note that the levels of the median and value-weighted measures are measured on the primary vertical axis, while the level of PC1 is measured on the secondary vertical axis. Because PC1 was calculated on standardized loan fee data, the units do not correspond directly with those of the median and value-weighted measures.

Abstracting from the level of PC1, it is clear that there is a high degree of correlation among the three.

Notably, the levels of all three components sharply rise around the onset of the financial crisis of the late 2000's. The median loan fee rose from around 15 basis points in early September 2008 to 90 basis points in October 2008, and then it subsequently fell to nearly zero basis points for the remainder of the crisis. [5] The large spike we observe in fee levels occurs several days after the short selling ban on financial stocks. While financial stock loan fees did indeed rise more than the average stock's fees following the short selling ban, non-financial stock loan fees rose significantly as well.

The subplots on the right side of Figure 1 illustrate that the high correlation among the three loan fee common components is not driven solely by the crisis. There is a high degree of commonality of loan fees regardless of the regime we examine. Further corroborating this finding, Table 2 shows the correlations among the components for several subsamples. Reassuringly, the loan fee common components we consider appear to be highly correlated in each of the subsamples we examine.

[Table 2]

III. Results

We divide our results into three sections. Section III.A investigates whether or not loan fees move together or are purely idiosyncratic in their movements. We find that loan fees do indeed move together, and Section III.B investigates the ways

[5] This may be related to the illiquidity in collateral reinvestment pools mentioned above.

in which loan fee movements correlate with other macro variables important to investors, and how individual loan fees move with the common component through time. Section III.C considers the ways in which investors might view this commonality of loan fees. In other words, is loan fee sensitivity to the common component priced?

A. The Commonality of Loan Fees

Previous literature has suggested that loan fees and loan fee variances are primarily idiosyncratic in nature. For example, Geczy, Musto, and Reed (2002) point to merger arbitrage as one of the leading drivers of high loan fees. Thus, one of the primary goals of this paper is to understand whether or not commonality exists in loan fees. Establishing loan fee commonality will serve as a foundation for our analysis.

Following a long-established literature, we turn to principal components analysis to understand the degree of commonality in loan fees.[6] We find that after standardization, loan fees possess a very high degree of commonality. We find that the first principle component, PC1, explains 45.6 percent of the sample variation. As a reference, using the same sample of stocks, we find that the first principal component of stock returns explains only 28.3 percent of the variation.[7] This finding counters some of the previous literature, which suggests that loan fee variation is primarily episodic in nature. For further details on the percentage of variation

[6] As described in Section II.B, we had to drop a sizeable portion of our sample in order to conduct the PCA. To assuage the concern that the first principal component only explains a high degree of variation because of the subsample over which it is constructed, we note from Table 2 that the correlation between the $PC1$ and *Median Loan Fee* (which is constructed using 4,039 firms with at least 1 year of populated data) time series is 0.955. Thus, even after dropping firms with missing data for the PCA, $PC1$ is very highly correlated with the full-sample median loan fee time series.

[7] Although we don't use principal components beyond the first factor, we do find that subsequent factors, e.g., PC2 through PC10, each individually explain more in the loan fee analysis than their corresponding factors do in the stock return analysis. Overall, we find a very high degree of commonality in loan fees, especially compared with equities. Together, PC1 through PC10 explain a relatively large 74.4 percent of the variation in loan fees, whereas PC1 through PC10 in the stock return analysis explain significantly less variation at 36.9 percent.

explained by each of the top ten principal components of loan fees and returns, see Table A.1.

B. The Factor Structure of Loan Fees

Investors' overall tolerance for risk at the portfolio level is limited, and therefore investors care about commonality in loan fees. High commonality means that the risk of short selling and borrowing stocks is higher for a portfolio, relative to a portfolio in which loan fees move randomly. In other words, commonality generates considerable risk for investors in its own right. In addition, the risk of short selling and borrowing stock can be especially high if the common component of loan fees moves with other risk factors to which investors have exposure. To establish this scenario more firmly, we turn to the analysis that follows.

[Table 3]

In Table 3, we analyze the correlation of the daily common component in loan fees with other well-known asset pricing factors. In various models, we include the risk-free rate (proxied by the return on the one-month U.S. Treasury bill), market risk premium (Mkt-Rf), small minus big (SMB), high minus low (HML), momentum (MOM), betting against beta (BAB), the Pastor-Stambaugh Liquidity Factor ($PS\ Liq\ Factor$), the daily percent change in the $Ted\ Spread$, the daily percent change in VIX, and finally a dummy variable indicating the 2008-2009 financial crisis, $1_{Recession}$.

In addition to fairly standard asset pricing factors that capture states of the world important to investors and short sellers, as featured in Fama and French (1993, 1996) and Carhart (1997), we augment our exploration with several additional factors that capture financial conditions or potential limits to arbitrage that may be important covariates with short selling demand or supply. Specifically, the

BAB factor of Frazzini and Pedersen (2014) is designed to capture time-series variation in investor leverage constraints. The $PSLiqFactor$ of Pastor and Stambaugh (2003) captures variation in market illiquidity risk. Finally, the $TedSpread$ and VIX are commonly employed measures of broad financial market conditions (see, for example, Brunnermeier (2009)).

The time series correlation between the common component in loan fees and other well-known factors yields some interesting insights. Although we find that the loan fee common component isn't highly correlated with the traditional one- and three-factor models, several well-known asset pricing factors seem very closely connected to the common component in loan fees. Model 1 introduces the risk-free rate, which is measured by the return on the one-month U.S. Treasury bill. The risk-free rate has a very strong correlation with the median loan fee, as shown by a t-statistic of 38.497. Loan fees, on average, appear to rise when overall borrowing costs in the economy are elevated. Since the common component has the strongest correlation with the risk-free rate out of all the variables considered, we continue to control for the risk-free rate in all subsequent columns.

Model 2 shows very little connection between Mkt-Rf and the common component of loan fees, with a statistically insignificant coefficient estimate of -0.249. Similarly, the other two factors in the three-factor model, SMB and HML, are generally not significant in the various models included. However, as Model 3 shows, MOM, as given in Carhart (1997), has a high correlation with the common component of loan fees; its coefficient estimate of 0.376 is statistically significant at the five percent level. The positive coefficient estimate indicates that loan fees are relatively high when the returns to the momentum portfolio are also high.

We can view this as a potential risk for investors who use a momentum strategy; although the returns to the underlying portfolio might be good, the short leg will incur a relatively high loan fee at times when the total return to the momentum strategy is high. This relationship is a potential demonstration of how the academic literature underestimates the difficulty of trading on well-known anomalies, e.g., Engelberg, Pontiff, and McLean (2017).

We also find a strong correlation between BAB and the common component of loan fees. Model 4 shows that BAB has a coefficient estimate of -1.326, which is statistically significant at the one percent level. This relatively strong correlation exists fairly consistently throughout the remaining models and indicates that loan fees are, on average, elevated when the betting against beta return is negative. Frazzini and Pedersen (2014) argue that the BAB factor produces negative returns when credit constraints are more likely to be binding, reflecting possible tightening financial conditions or limits to arbitrage.

Model 5 shows a statistically significant negative correlation between the Pastor-Stambaugh Liquidity Factor ($PS\ Liq\ Factor$) developed in Pastor and Stambaugh (2003) and the common component of loan fees.[8]

Model 6 introduces the percent change in *Ted Spread*, which is the difference between the three-month Treasury bill and the three-month LIBOR based in US dollars. We observe a slightly positive but insignificant correlation with the median loan fee. In particular, the positive coefficient estimate of 4.823 indicates that when the *Ted Spread* increases (i.e., when financial conditions become relatively tighter), the median loan fee also increases. This correlation likely indicates that in times of relatively high perceived corporate uncertainty, loan fees are also likely to be high.

Model 7 introduces the daily percent change in VIX, which does not have a significant correlation with the median loan fee.

[8]The significance on the liquidity factor coefficient goes away if we do not simultaneously control for the risk-free rate.

The risk-free rate (Rf), Momentum (MOM), and Betting Against Beta BAB are fairly consistent in their order of magnitude and strength of statistical significance across models. This indicates that Rf, MOM, and BAB are fairly strongly correlated with commonality of loan fees.

Finally, Model 8 introduces a dummy variable, which captures the presence of the 2008-2009 financial crisis. As indicated in Figure 1, the financial crisis has a huge effect on loan fees.[9] Of course, this could be a central driver of our results and thus a concern for our analysis. To better understand this relationship, we've replicated many of our main tables, both before and after the crisis, and we find largely similar results. [10] The overall pattern that emerges is that although the financial crisis is absolutely critical for driving loan fees, our results hold whether considering the pre- or post-crisis period.

In order to gain further understanding of the signs of the correlations we observe between the loan fee common component and asset pricing and macro factors, we also construct common components of loan supply and demand (defined in our dataset as the number of shares available to be lent and the number of shares on loan, respectively) and regress these variables on the same set of asset pricing factors.[11] Appendix Tables A.3 and A.4 show that many of the same factors which are correlated with loan fees are also correlated with loan supply and loan demand, and the correlations often hold the same signs. In particular, we note that MOM is positively correlated with loan supply, demand, and fees, and we observe that BAB

[9]The coefficient on $1_{Recession}$ is highly significant when we do not control for the risk-free rate, but the significance on $1_{Recession}$ goes away when we control for the two variables simultaneously, likely because of the high correlation between the two.

[10]Further analysis indicates that the relationship between the median loan fee and the factors of Table 3 largely do not change during the crisis, as evidenced by insignificant coefficients on interaction terms which interact the crisis dummy and the asset pricing factors. Appendix Tables A.7, A.8, A.14, and A.15 show the results of subsequent analyses broken down by subsample.

[11]Further robustness checks can be found in Appendix Tables A.2 and A.5. In Table A.2, we regress the $PC1$ common component on the same group of factors and macro variables and find largely similar results. In Table A.5, we construct a new $PC1$ using just the top 10% of the loan fee distribution, and we find that strong correlations with the risk-free rate and BAB remain.

tends to be negatively correlated with loan supply, demand, and fees. Interestingly, we observe that while the risk-free rate is negatively correlated with loan supply, it is positively correlated with loan demand and fees.

Overall, our results indicate that even though a common component of loan fees is not correlated with the traditional one- and three-factor models, that common component is very highly correlated with several factors important to investors. Primary among these are the risk-free rate, momentum, and Betting Against Beta, which are all very highly correlated with the common component of loan fees. Specifically, momentum (or some other anomaly play) may reflect share demand (for the stocks in the short side), but financial conditions (BAB or the risk-free rate) may reflect share supply considerations. These factors introduce risks to investors' overall performance that may be difficult to manage and that make short selling and borrowing stocks riskier than may have previously been thought.

Having established that (1) loan fees move together and (2) the common component of loan fees moves with other well-known risk factors, we next examine how loan fees for individual stocks move with the overall common component of those fees. Understanding how stocks move with this common component determines whether or not investors can mitigate the risk of a portfolio of loan fees moving together.

First, Table 1 (Panel C) presents summary statistics for full-sample loan fee β's. These β's are calculated over the full sample as stocks' loan fee sensitivities to each common component.[12] The median stock's loan fee sensitivity to the $MedianLoanFee$ common component is around 1, indicating that stock loan fees move together. Note that the magnitude of loan fee sensitivities to PC1 (β_{PC1}) is much lower. This is due to the fact that the level of the PC1 has been magnified

[12]Note that β's in this table are estimated over the full sample, while β's used elsewhere in this paper are estimated on a quarterly basis.

as a result of the loan fee standardization we implemented prior to conducting the PCA.

[Table 4]

Second, Table 4 includes a quarterly panel regression with stock i's quarter t sensitivity to the common component as the left-hand side variable. The right-hand side shows stock i's quarter t characteristics of interest. Panel A shows the results of the panel regression, incorporating stock fixed effects and utilizing White-Huber robust standard errors.

Model 1 asks whether the level of a stock's loan fee is correlated with that stock's sensitivity to the common component. Interestingly, in this linear specification, we find no statistically significant relationships. However, as Model 2 and later models indicate, a very strong relationship exists between the level of stock-specific loan fees and their sensitivity to the common component. Specifically, Model 2 splits loan fees nonlinearly, by including an indicator variable for loan fees below the 25th percentile within a quarter and another for loan fees above the 75th percentile. The model shows a strong relationship between loan fees above the 75th percentile with a coefficient estimate on the indicator of 5.187, which is statistically significant at the one percent level. In other words, when loan fees are high, specifically in the top 25 percent of loan fees, stock sensitivity to the common component is especially strong.

A similar result emerges in Model 3, which includes the loan fee level as a control. The loan fee level controls for any possible relationship between the 25th and 75th percentile. If anything, the finding of extreme loan fees being closely related to sensitivity to the common component is amplified in Model 3, with a coefficient estimate on $\mathbb{1}_{LoanFee>75thPctile}$ of 6.094.

Model 4 clarifies the pattern further, showing that the sensitivity to the common component rises only when loan fees are in the top 40 or the top 20 percent, respectively. The title of this study, "Dancing to the Same Tune," draws its inspiration from this table. Model 4 paints a picture of a high school dance. Most loan fees are relatively low and move independently, like the students sitting on chairs along the walls at the dance doing their own thing. But as loan fees rise, especially into the top 40 or 20 percent, they move together, like the students who stand up and start dancing. Of course, they're all dancing to the same tune.

From an investor's perspective, this loan fee sensitivity pattern creates some unique issues. Loan fees are especially high when people want to borrow stocks and the quantity borrowed is high, as shown in Kolasinski, Reed, and Ringgenberg (2013). But our finding indicates that it is at these exact moments of high demand that sensitivity to loan fee commonality is also high. Furthermore, as we've established, such commonality is not benign. Instead, the common component moves with other well-known asset pricing risk factors. Taken together, these results highlight a significant new risk for investors in any strategy that leads to the shorting of high loan fee stocks.

Models 5 through 8 replicate the above results while controlling for stock size and trading volume. The results remain robust to these controls and whether or not we incorporate stock fixed effects. [13]

[13] We further test the robustness of these results in Appendix Tables A.6 (in which we explore the relationship between loan fee levels and sensitivities to PC1 of loan fees), A.7 (in which we run the same regressions in the pre-crisis period), A.8 (in which we run these regressions in the post-crisis period), and A.9 (in which we explore the relationship between loan fee levels and sensitivities to common loan fee changes). We recognize that this result raises the question of whether we would obtain similar results if we constructed the common component using just high-fee stocks, since these stocks exhibit the strongest co-movement. Appendix Tables A.5 and A.16 test several of the main results of our paper using a common component constructed using just the top 10 percent of the loan fee distribution. The results remain largely unchanged. Finally, we also consider whether loan fee *changes* rather than fee levels matter to investors. We construct another version of the common component using daily loan fee changes, and then we test the robustness of our main pricing results to this variable in Appendix Table A.17.

C. The Pricing of Loan Fee Sensitivities

Having established that loan fees move together and that they move with well-known asset pricing risk factors, we now question whether these effects are priced in the cross section. In other words, do investors care about these risks enough to be less willing to short stocks that lead to exposure to these risks, to the extent that the pricing of equities reflect this risk?

[Table 5]

We decompose total loan fee risk into systematic and idiosyncratic components, and we ask whether portfolios formed based on systematic loan fee risk yield higher returns. In Table 5, we take a fairly simple approach and perform a double sort. Recognizing the importance of the findings in Engelberg, Reed, and Ringgenberg (2018) to these results, our first sort variable is total loan fee volatility, found in the columns of Table 5. Interestingly, when we examine the difference between total volatility portfolios, we only see the pricing of total loan fee volatility in Panel A among the high systematic volatility stocks. In particular, conditional on stocks having low systematic loan fee volatility, a long-short strategy based on total loan fee volatility earns an insignificant return. However, conditional on stocks having high systematic loan fee volatility, an investor would earn a statistically significant 7.0 percent annual return by buying (shorting) low (high) total loan fee volatility stocks. This finding provides some evidence that high total loan fee volatility may only have pricing implications for high systematic loan fee volatility stocks.

The second sort variable tells a different story. Panel A introduces the systematic component of loan fee volatility in the rows. We split the sample into two groups, one with systematic volatility below the median, Low $SysVol$, and the other with systematic volatility above the median, High $SysVol$. We find that low systematic volatility yields relatively high returns. Conditional on low total loan fee volatility, a long-short strategy based on systematic loan fee volatility yields an insignificant return. However, conditional on high total loan fee volatility, a strategy which buys (shorts) low (high) systematic loan fee volatility stocks earns a statistically significant 6.2 percent annual return. When controlling for the Fama & French (1993) three factors, we see that this strategy yields a significant 7.6 percent annual alpha.

Conditional on a stock having above-median total loan fee volatility, an investor who buys the high systematic volatility and shorts the low systematic volatility portfolios would earn a negative return. In other words, stocks with relatively high systematic components of loan fee volatility are shown to have unusually low future returns. This likely indicates that these stocks are overpriced and investors are unwilling to take short positions against these stocks, even though they may be able to identify them as overpriced. It is worth pointing out, again, that this result is in a setting in which we've controlled for the level of total loan fee risk.

Panel B performs a similar analysis, but this time the second sort variable is idiosyncratic volatility of the loan fees. In this case, the returns to low and high idiosyncratic volatility in loan fee portfolios are similar, and the long/short portfolios are not statistically different from zero. Overall, these results indicate that even while controlling for total volatility in a double-sort setting, systematic loan fee volatility seems to be a key driver of stock returns. [14]

It's worth noting here that these double-sorted portfolio returns may be sensitive to the overall level of loan fees. In our next set of results, we investigate these patterns in a regression setting in which we can control for the level of the loan fees. We follow a relatively standard approach used by Boehmer, Jones, and

[14]We conduct other single- and double-sorting exercises in Appendix Tables A.10 (in which we use $PC1$ rather than *Median Loan Fee*), A.11 (in which we sort on systematic loan fee volatility and the loan fee level), and A.12 (in which we solely sort on systematic and idiosyncratic loan fee volatilities), and we find consistent results.

Zhang (2007) and Engelberg, Reed, and Ringgenberg (2018), in which we regress future returns on loan characteristics in a panel setting.

[Table 6]

Panel A, Model 1 of Table 6 confirms a well-documented fact, which is that stocks with high loan fees tend to earn lower future returns (see, for instance, Asquith, Pathak, and Ritter (2004)). Model 2 indicates that, as found in Engelberg, Reed, and Ringgenberg (2018), loan fee volatility is indeed a significant, negative predictor of future returns. As the loan fee coefficient estimate indicates, we are also controlling for stock-specific loan fee levels. To provide a measure of economic significance of the coefficient on loan fee volatility, we estimate that an increase from the 25th to the 75th percentile in total loan fee volatility would be associated with a 0.44 percent lower return in the following quarter, holding all else equal. This number is found by multiplying the coefficient on total volatility by the IQR of loan fee volatility across the sample. Alternatively, we estimate that an increase from the 10th to the 90th percentile in total loan fee volatility would be associated with a 1.76 percent lower return in the following quarter.

In Model 3, we decompose loan fee risk along parameters in line with our analysis, i.e., into the systematic and idiosyncratic components of loan fee risk. We find that systematic risk dominates idiosyncratic risk, yielding a coefficient estimate of -0.183, which is highly statistically significant at the one percent level. We believe this coefficient is also economically significant, as we estimate that an increase from the 25th to the 75th percentile in systematic loan fee volatility would be associated with a 1.01 percent lower return in the following quarter. Similarly, we estimate that an increase from the 10th to the 90th percentile in systematic loan fee volatility would be associated with a 3.53 percent lower return in the following quarter.

That systematic loan fee risk has such a large negative coefficient estimate indicates that this is the driving force behind investors' willingness to short, and it is likely driving the overall effect found in Engelberg, Reed, and Ringgenberg (2018). In other words, fear of loan fee commonality and its associated correlation with well-known risk factors may dissuade investors from taking short positions in overvalued stocks in the first place.

Interestingly, the coefficient estimate on idiosyncratic loan fee risk is positive and statistically significant. Although the coefficient estimate is relatively small compared with systematic volatility, in the Appendix we see that this result is less robust over different time periods, making it less likely that investors have a special fondness for shorting stocks with loan fees that move idiosyncratically. Overall, we find that systematic volatility is the dominant force in the relationship between total risk and returns, but systematic risk does not necessarily explain or subsume the relationship between idiosyncratic risk and returns.

Models 4, 5, and 6 paint a very similar picture, although their inclusion of stock-specific fixed effects indicates that results are largely similar when we control for stock characteristics that may be driving some of the return patterns. [15]

D. Implications on Price Efficiency

Now that we have established the pricing implications of loan fee commonality, we ask whether there are also efficiency implications. We start by constructing two measures of stock-specific price efficiency: the Bris, Goetzmann, and Zhu (2007) measure and the Hou & Moskowitz (2005) D1 price delay.

To replicate the Bris, Goetzmann, & Zhu measure, we first calculate $\rho^{cross} = corr(r_{i,t}, r_{m,t-1})$, which is the quarterly cross-autocorrelation between contempora-

[15] We present further robustness tests of the asset pricing implications of loan fee commonality in Appendix Tables A.13 through A.17.

neous weekly stock returns and one-week lagged market returns. We then apply the transformation $ln[(1+\rho)/(1-\rho)]$ to get our measure, which we call "BGZ ρ^{cross}" in Table 7.

To replicate the Hou & Moskowitz measure of price efficiency, we first regress weekly stock returns on stock fixed effects, contemporaneous market returns (proxied by returns on the S&P 500), and four weeks of lagged market returns; we store the resulting R^2_{full}. We then regress weekly stock returns on stock fixed effects and contemporaneous market returns and store the resulting R^2_{rest}. Then the D1 measure of price delay is $D1_i = 1 - \frac{R^2_{rest}}{R^2_{full}}$. To provide alternative notation, following Hou & Moskowitz (2005), we estimate $r_{i,t} = \alpha_i + \beta_i * r_{m,t} + \Sigma_{n=1}^{4} \delta_i(-n) * r_{m,t-n} + \epsilon_{i,t}$, and then $D1_i = 1 - \frac{R^2_{\delta_i^{-n}=0, \forall n \in [1,4]}}{R^2}$.

[Table 7]

It is evident from Table 7 that loan fee commonality has negative implications on price efficiency. In columns 1 and 2, the left-hand side variable is the Bris, Goetzmann, and Zhu (2007) cross-autocorrelation measure, and the left-hand side variable in columns 3 and 4 is the Hou & Moskowitz (2005) D1 price delay. Note that an increase in either left-hand side variable indicates lower price efficiency (or higher price inefficiency).

Columns 1 and 3 confirm the finding from Engelberg, Reed, & Ringgenberg (2018) that high loan fee volatility is associated with price inefficiency, suggesting that high loan fee volatility is a limit to arbitrage that results in slower price reactions to new information.

Columns 2 and 4 demonstrate that stocks with high systematic volatility of loan fees exhibit higher price inefficiency. This finding, in conjunction with our earlier result that systematic loan fee volatility is associated with low future returns, suggests that loan fee commonality is also an important limit to arbitrage.

To provide a practical interpretation for how loan fee commonality might affect price efficiency, consider a hedge fund which holds a portfolio of short positions. A stock which exhibits high systematic volatility of loan fees is risky for the hedge fund to short, since its loan fees are highly varying at the same time that most other stocks' loan fees are highly varying. As a result, the hedge fund is deterred from taking as large a short position in this stock, which results in decreased short selling, lower price efficiency, and overvaluation.

We also note in column 2, idiosyncratic volatility of loan fees has a negative and significant coefficient; however, it is insignificant when the left-hand side variable is the Hou & Moskowitz D1 price delay.

Overall, the results from this analysis provide further evidence for the claim that loan fee commonality is an important, previously unexplored short sale constraint which has both pricing and efficiency implications.

IV. The Origin of Loan Fee Commonality

At this point, we have established the existence of commonality among loan fees and have explored some of its implications on stock prices and efficiency. A natural next step is to understand the origin of the commonality itself. In other words, is the loan fee commonality primarily driven by demand- or supply-side factors?

In order to address this question, we explore loan demand and supply as they relate to momentum, a well-documented anomaly. Our hypothesis is that if loan fee commonality is driven mostly by the demand for stock loans, we should observe higher loan demand commonality in portfolios of stocks that are likely to be heavily shorted based on a long/short momentum trading strategy.

Before discussing our empirical strategy to test this hypothesis, it may be helpful to clarify some details regarding the loan demand and supply data. We do not observe demand or supply schedules for each point in time; rather, for each stock-day, we observe the total quantity of shares on loan for that day (*loan demand*) and the total quantity of shares available to be lent (*loan supply*).

First, we calculate momentum for each stock-quarter according to Jegadeesh & Titman (2011) as the cumulative past 12 month return. We separate stocks into deciles in each quarter based on this measure of momentum. Hence, a trader who wishes to implement a long/short momentum strategy would invest long in portfolio 10 and short portfolio 1.

Next, we construct common components of loan demand and loan supply. These common components are simply the median loan demand (supply) across all stocks for each quarter. We then take a similar approach to Karolyi, Lee, and van Dijk (2012) in calculating the degree of loan demand and supply commonality for each stock and quarter. For each momentum decile, we run the following two regressions:

$$LoanDemand_{i,t} = \beta_0^D + \beta_1^D * LoanDemandCC_t + \varepsilon_{i,t}^D$$
$$LoanSupply_{i,t} = \beta_0^S + \beta_1^S * LoanSupplyCC_t + \varepsilon_{i,t}^S$$

After regressing stock-specific loan demand (supply) on the common component of loan demand (supply), we record the resulting betas and R^2. Following Karolyi, Lee, and van Dijk (2012), we interpret high betas and R^2 to indicate high levels of loan demand (supply) commonality.

[Table 8]

In Table 8 Panel A, we display the betas and R^2 from the loan demand commonality regressions. Note that while loan demand commonality is quite high in momentum portfolios 1 and 2 (as evidenced by high betas and R^2), there appears to be lower loan demand commonality for portfolios of stocks with higher momentum. In the final column of this table, we see that the difference in betas between portfolios 1 and 10 is large and statistically significant. This, along with the fact that a much higher percentage of variation in loan demand is explained in portfolios 1 and 2, implies that loan demand commonality is highest in portfolios of stocks which are likely to be shorted in a long/short momentum trading strategy. We believe this result suggests that loan demand is likely a significant driver of the loan fee commonality we observe.

In Panel B, we display the betas and R^2 from the loan supply commonality regressions. Interestingly, we do not observe significantly higher betas in portfolios 1 and 2, and we also see that R^2 is low for these portfolios. Whereas we observed high loan demand commonality in stocks that are likely to be on the short side of a momentum strategy, we do not observe high loan supply commonality for these same stocks. We interpret this result to imply that loan demand may be a greater driver of loan fee commonality than loan supply.

V. Conclusion

In this paper, we highlight a new dimension of dynamic loan fee risks: commonality. We are the first to present evidence that there is commonality in loan fee movement.

Using a principal components framework, we find that the first principal component of loan fees explains 45.6 percent of the variation in loan fees, which indicates a much higher degree of commonality than is present in corresponding equity returns. Moreover, in constructing several different measures of the loan fee common component, we show that they move together over time, and, while important, this high correlation is not driven solely by the financial crisis.

We highlight another risk from the investor's perspective; we show that the common component of loan fees moves with other well-known asset pricing risk factors. Specifically, the commonality of loan fees is strongly correlated with Momentum, Betting Against Beta, the Ted Spread, and the risk-free rate. Not only do loan fees move together, but they move with well-known macro and asset pricing factors that investors care about.

Furthermore, we show that when loan fees are unusually high, sensitivity to the common component is especially strong. When loan fees are in the top 25th percentile, the exposure of stock-level loan fee variation to the loan fee common component increases by more than 5. This presents a picture that when loan fees are low, correlations to the common component are low, but when loan fees are high, loan fees move together, as if they are dancing to the same tune.

We also show that the degree of commonality affects asset prices. Beginning with a double-sort, we show that an investor who buys low systematic volatility stocks and shorts high systematic volatility stocks would earn a positive return, conditional on the stocks having above-median total loan fee volatility. Further corroborating this finding, we regress future returns on loan characteristics in a panel setting and show that systematic volatility in loan fees is strongly and negatively associated with future returns. This finding indicates that systematic loan fee risk is the driving force behind investors' willingness to short. Fear of loan fee commonality and its associated correlation with well-known risk factors may dissuade investors from taking short positions in overvalued stocks in the first place.

Additionally, we show that the degree of commonality affects price efficiency. Using two measures of stock-specific price efficiency, we find that systematic volatility in loan fees is strongly associated with decreased price efficiency, providing further evidence that loan fee commonality is a significant limit to arbitrage.

Finally, we present suggestive evidence that loan demand may be the origin of the observed loan fee commonality. Examining the degree of loan demand and supply commonality among momentum portfolios reveals that stocks which are likely to be on the short side of a commonly implemented long/short trading strategy exhibit a high degree of loan demand commonality but not loan supply commonality.

As we examine whether stock lending fees are driven, in part, by common shocks, an equally important consideration becomes whether forward-looking agents in the shorting market internalize a more nuanced source of contract uncertainty. What are the consequences for the stock lending market when the fees exhibit commonality associated with challenging states of the world?

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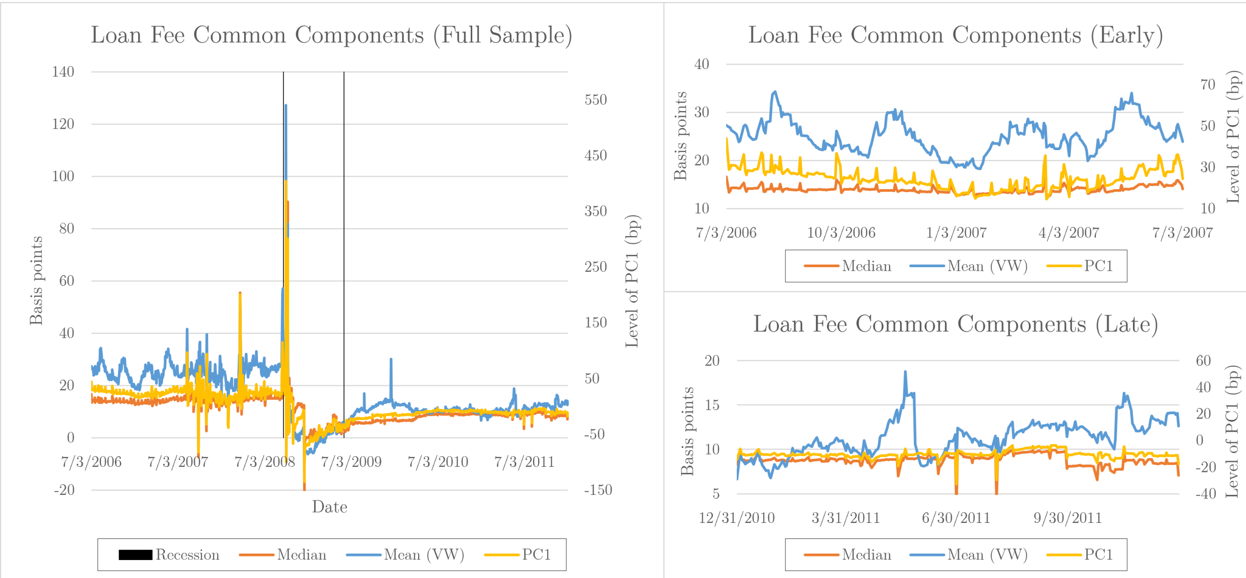

Figure 1: A plot of the common components of loan fees moving through time. Median and value-weighted (VW) mean loan fee units are on the primary vertical axis on the left, while units for PC1 are on the secondary vertical axis on the right. Beginning of sample and end of sample movements are highlighted to show that the high correlation between common components is not solely driven by the crisis.

Table 1: **Summary Statistics.**

Panel A presents firm-level summary statistics for average loan fees and loan fee volatility across the sample. The median firm has an average loan fee of 15.7 basis points across the whole sample, whereas the mean firm has an average loan fee of 97.1 basis points, indicating right skewness in loan fees. The median firm's loan fees have a standard deviation of 19.7 basis points. The median firm has about 1.43 million shares on loan ($LoanDemand$), while the median firm has about 6.20 million shares available to be lent ($LoanSupply$). Panel B presents the time series summary statistics of the loan fee common components, in basis points per annum. On the average day, the median loan fee common component is about 10 basis points, the loan demand common component is about 1-1.2 million shares, and the loan supply common component is about 7 million shares. Panel C presents summary statistics for full-sample loan fee β's. β's are calculated over the full sample as stocks' loan fee sensitivities to each common component. Note that loadings vary cross-sectionally. While 4,675 firms are represented in the unrestricted sample, many enter or leave over the sample window. On the average day, loan fee data is populated for about 3,200 stocks, and this number does not fluctuate much throughout the sample window. We restrict our analysis to stocks that have populated loan fees for at least 252 days, which reduces our sample from 4,675 to 4,039. Out of the 4,675 total represented firms, 700 are in the current Russell 1000, thus constituting 70 percent of the current index. The median market capitalization across firms is $433 million, whereas the mean is $3.233 billion.

Panel A: Firm-level loan fee summary statistics

Statistic	Mean Loan Fee (bp)	Fee Volatility (bp)	Loan Demand (x1000 shares)	Loan Supply (x1000 shares)
10th Percentile	7.6	5.8	12.8	258.1
25th Percentile	9.8	8.1	263.9	1505.9
Median	15.7	19.7	1427.9	6198.3
Mean	97.1	103.7	3785.2	17394.0
75th Percentile	70.5	87.1	4058.9	17078.8
90th Percentile	248.1	242.0	8840.5	46363.2

Panel B: Common component summary statistics

Statistic	Median	PC1	Mean (VW)	Mean (EW)	Loan Demand (x1000 shares)	Loan Supply (x1000 shares)
10th Percentile	5.5	-29.1	4.1	53.0	875.2	6614.6
25th Percentile	8.0	-14.4	10.1	59.4	917.6	6779.4
Median	9.2	-7.8	12.7	67.7	1070.8	7041.2
Mean	10.6	0.0	15.8	73.9	1243.0	7056.0
75th Percentile	14.0	22.1	24.2	80.1	1537.8	7269.0
90th Percentile	15.1	27.4	27.5	115.3	1889.2	7850.5

Panel C: Full-sample beta summary statistics

Statistic	β_{median}	β_{PC1}	β_{VW}	β_{EW}
10th Percentile	-2.9	-0.8	-2.9	-1.0
25th Percentile	0.7	0.1	0.2	0.0
Median	1.1	0.2	0.6	0.1
Mean	1.8	0.2	2.4	1.6
75th Percentile	2.5	0.5	1.4	0.4
90th Percentile	8.0	1.8	5.5	3.0

Table 2: **Correlations among common components.**

This table presents the correlations among the different loan fee common components we constructed. These correlations are calculated over several subsamples of the data. The high correlations among the loan fee common components we consider do not appear to be driven entirely by any one subsample of the data.

Correlations	**Median**	**PC1**	**Mean(VW)**	**Mean (EW)**
Full Sample (7/3/2006 - 12/31/2011)				
Median	1.000	0.955	0.839	0.301
PC1		1.000	0.928	0.229
Mean (VW)			1.000	0.147
Mean (EW)				1.000
Pre-Crisis (7/3/2006 - 9/17/2008)				
Median	1.000	0.944	0.693	0.530
PC1		1.000	0.738	0.354
Mean (VW)			1.000	0.416
Mean (EW)				1.000
Crisis (9/18/2008 - 6/1/2009)				
Median	1.000	0.980	0.930	0.929
PC1		1.000	0.952	0.911
Mean (VW)			1.000	0.932
Mean (EW)				1.000
Post-Crisis (6/2/2009 - 12/31/2011)				
Median	1.000	0.955	0.115	0.569
PC1		1.000	0.982	0.495
Mean (VW)			1.000	0.242
Mean (EW)				1.000

Table 3: **Relation between loan fee common component and other asset pricing and macro variables.**

This table presents the results of time series regressions examining the relationship between the common component of loan fees (*Median Loan Fee*) and other asset pricing and macro factors. The dependent variable is the daily cross-sectional median loan fee across 4,039 firms with at least 1 year of populated data, in basis points. We implement Huber-White standard errors to correct for heteroskedasticity. t-statistics are displayed in parentheses.

	Dependent Variable: $MedianLoanFee_t$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rf_t	3.804***	3.801***	3.771***	3.722***	3.833***	3.706***	3.722***	3.698***
	(38.497)	(38.348)	(38.119)	(36.848)	(39.517)	(36.975)	(37.235)	(31.789)
$MktRf_t$		-0.249	-0.161	-0.444*	-0.381	-0.406	-0.506	-0.452
		(-1.081)	(-0.691)	(-1.797)	(-1.563)	(-1.543)	(-1.228)	(-1.085)
SMB_t			-0.518	-1.023	-0.993	-1.022	-1.028	-1.005
			(-0.680)	(-1.322)	(-1.322)	(-1.326)	(-1.330)	(-1.336)
HML_t			0.311	0.069	-0.026	0.069	0.061	-0.106
			(0.820)	(0.176)	(-0.070)	(0.178)	(0.148)	(-0.263)
MOM_t			0.376**	0.765***	0.755***	0.751***	0.744***	0.653***
			(2.022)	(3.709)	(3.780)	(3.720)	(3.239)	(2.813)
BAB_t				-1.326***	-1.256***	-1.272***	-1.335***	-1.223***
				(-3.909)	(-3.911)	(-3.715)	(-3.799)	(-3.577)
$PSLiquidity_t$					-0.166***			-0.179***
					(-2.906)			(-3.761)
% Change in $TedSpread_t$						4.823		3.920
						(1.505)		(1.284)
% Change in VIX_t							-1.457	-2.264
							(-0.264)	(-0.431)
$1_{Recession}$								-1.325
								(-1.503)
Observations	1386	1386	1386	1386	1386	1385	1385	1385
Adjusted R^2	0.238	0.242	0.246	0.266	0.281	0.268	0.266	0.286

Table 4: **Relationship between loan fee sensitivities and loan fee levels.**

This table presents the results of contemporaneous regressions examining the relationship between loan fee betas and loan fee levels. The dependent variable, $\beta_{i,t}^{median}$, is calculated by regressing each stock's time series of daily loan fees on the loan fee common component (the median loan fee) within each quarter. $LoanFee_{i,t}$ is the stock-specific median loan fee within each quarter, calculated using daily data. In columns 2 and 3, we control for dummies which indicate whether a stock's loan fee is in the top or bottom quartile of the loan fee distribution within a quarter. In column 4, we sort stocks into quintiles based on their loan fee levels in each quarter. The right-hand side variables in this specification are dummy variables which equal 1 if a stock's median loan fee during a quarter falls in the indicated quintile bucket. In columns 5-8, we replicate columns 1-4 while adding controls for size (market capitalization) and trading volume. Rather than using the actual values for these controls, we sort the stocks into deciles based on size and volume and use the deciles as controls. These columns show that stocks with high loan fees tend to have high sensitivities to the common component, and this finding is robust when controlling for stock characteristics and fixed effects. Panel A shows the results from panel regressions with stock fixed effects, while Panel B shows the results from Fama-MacBeth (1973) regressions with Newey West standard errors with 4 lags. t-statistics are displayed in parentheses.

Panel A: Panel Regression with Stock FE

	Dependent Variable: $\beta_{i,t}^{median}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	-0.004		-0.007		-0.006		-0.008	
	(-0.506)		(-0.759)		(-0.673)		(-0.882)	
$\mathbb{1}_{LF<25thpctile}$		-0.018	-0.040			0.135	0.137	
		(-0.072)	(-0.152)			(0.509)	(0.515)	
$\mathbb{1}_{LF>75thpctile}$		5.187***	6.094***			4.623***	5.585***	
		(3.021)	(3.547)			(2.684)	(3.151)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				-0.051				-0.069
				(-0.169)				(-0.229)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				-0.095				-0.277
				(-0.279)				(-0.791)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				2.315***				1.876**
				(3.009)				(2.298)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				4.889**				3.953*
				(2.080)				(1.695)
$SizeDecile_{i,t}$					-1.830***	-1.340**	-1.565***	-1.358**
					(-3.710)	(-2.503)	(-3.129)	(-2.550)
$VolumeDecile_{i,t}$					1.590*	1.307	1.451*	1.331
					(1.880)	(1.383)	(1.680)	(1.422)
N	72,966	72,966	72,966	72,966	72,962	72,962	72,962	72,962
R^2	0.01%	0.02%	0.03%	0.01%	0.03%	0.03%	0.05%	0.03%

Panel B: Fama-MacBeth Regressions

	Dependent Variable: $\beta_{i,t}^{median}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	0.002		-0.002		0.001		-0.002	
	(0.401)		(-0.272)		(0.104)		(-0.349)	
$\mathbb{1}_{LF<25thpctile}$		-0.058	-0.063			0.092	0.194	
		(-0.292)	(-0.300)			(0.140)	(0.304)	
$\mathbb{1}_{LF>75thpctile}$		2.916**	3.543*			2.386**	3.013	
		(2.211)	(1.895)			(2.232)	(1.708)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				-0.029				-0.141
				(-0.114)				(-0.275)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				-0.047				-0.029
				(-0.266)				(-0.043)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				1.557*				1.202
				(1.998)				(1.151)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				2.768*				2.070*
				(2.037)				(1.836)
$SizeDecile_{i,t}$					-0.670	-0.403	-0.482	-0.413
					(-1.542)	(-0.819)	(-1.063)	(-0.821)
$VolumeDecile_{i,t}$					0.450	0.363	0.403	0.378
					(1.135)	(0.850)	(1.013)	(0.880)
N	72,966	72,966	72,966	72,966	72,962	72,962	72,962	72,962
R^2	0.87%	0.69%	1.22%	0.76%	1.16%	0.93%	1.47%	1.03%

Table 5: **Double-sorted portfolio returns.**

In Panel A, for each quarter, stocks are sorted into one of four portfolios based on their loan fees: 1) low systematic loan fee volatility and low total loan fee volatility, 2) low systematic volatility and high total volatility, 3) high systematic volatility and low total volatility, and 4) high systematic volatility and high total volatility. In Panel B, instead of sorting on systematic loan fee volatility, we sort on idiosyncratic loan fee volatility. Systematic loan fee volatility is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{median})^2 * vol(MedianLF_t)^2}$. Idiosyncratic loan fee volatility is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{Median})^2}$. We also estimated 3-factor Fama & French (1993) alphas for long-short portfolio returns. Where returns are significant in this table, we also observe significant alphas.

Panel A

Annualized Returns		**Sort Variable: Total Vol(Loan Fee)**		**Long/Short Portfolios**
	Portfolio	Low $TotalVol$	High $TotalVol$	High - Low $TotalVol$
Sort Variable: $SysVol^{median}$	Low $SysVol$	-1.4%	-1.2%	0.2%
		[-0.11]	[-0.10]	[0.09]
	High $SysVol$	-0.4%	-7.4%	-7.0%***
		[-0.03]	[-0.60]	[-2.74]
Long/Short Portfolios	High - Low $SysVol$	0.9%	-6.2%***	
		[0.54]	[-3.16]	
	FF3 Alpha	1.1%	-7.6%***	
		[0.72]	[-4.54]	

Panel B

Annualized Returns		**Sort Variable: Total Vol(Loan Fee)**		**Long/Short Portfolios**
	Portfolio	Low $TotalVol$	High $TotalVol$	High - Low $TotalVol$
Sort Variable: $IdioVol^{median}$	Low $IdioVol$	-1.1%	-1.9%	-0.9%
		[-0.09]	[-0.16]	[-0.29]
	High $IdioVol$	-3.5%	-6.4%	-3.0%
		[-0.26]	[-0.52]	[-0.98]
Long/Short Portfolios	High - Low $IdioVol$	-2.4%	-4.5%	
		[-0.86]	[-1.31]	
	FF3 Alpha	-2.1%	-6.7%**	
		[-0.70]	[-2.18]	

Table 6: **Relationship between returns and several measures of loan fee risk.**

This table presents the results of one-quarter lagged panel regressions examining the relationship between returns and several measures of stock-specific loan fee risk. Columns 4 through 6 contain stock fixed effects. Total loan fee volatility ($Vol(LoanFee)_{i,t}$) is the standard deviation of stock-specific loan fees within a quarter. Systematic volatility ($Sys.Vol(LoanFee)_{i,t}^{Median}$) is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{median})^2 * vol(MedianLF_t)^2}$. Idiosyncratic volatility ($Idio.Vol(LoanFee)_{i,t}^{Median}$) is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{Median})^2}$. $LoanFee_{i,t}$ is the stock-specific median loan fee within a quarter, calculated using daily data. White-Huber robust standard errors are employed. t-statistics are displayed in parentheses.

Panel A

	Dependent Variable: One quarter ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.029***			-0.034***	
		(-7.185)			(-7.370)	
$Idio.Vol(LoanFee)_{i,t}^{Median}$			0.029***			0.034***
			(5.264)			(5.464)
$Sys.Vol(LoanFee)_{i,t}^{Median}$			-0.183***			-0.215***
			(-12.301)			(-11.475)
$LoanFee_{i,t}$	-0.012***	-0.008***	-0.009***	-0.015***	-0.012***	-0.013***
	(-9.755)	(-5.707)	(-6.044)	(-8.134)	(-5.611)	(-6.038)
$Ln(MarketCap_{i,t})$	-0.436***	-0.534***	-0.561***	-18.015***	-18.182***	-18.542***
	(-4.575)	(-5.594)	(-5.800)	(-22.535)	(-22.792)	(-22.932)
$BidAskSpread_{i,t}$	-0.016	-0.013	-0.012	-0.035*	-0.037*	-0.028*
	(-1.641)	(-1.338)	(-1.293)	(-1.775)	(-1.858)	(-1.737)
Stock FE				X	X	X
Observations	68936	68936	68279	68936	68936	68279
R^2	0.005	0.007	0.012	0.063	0.064	0.072

Panel B

	Dependent Variable: One month ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.010***			-0.015***	
		(-4.506)			(-5.775)	
$Idio.Vol(LoanFee)_{i,t}^{Median}$			0.028***			0.029***
			(9.338)			(8.000)
$Sys.Vol(LoanFee)_{i,t}^{Median}$			-0.117***			-0.136***
			(-13.560)			(-12.075)
$LoanFee_{i,t}$	-0.002***	-0.001*	-0.002**	-0.004***	-0.003***	-0.003***
	(-4.492)	(-1.876)	(-2.500)	(-5.208)	(-2.988)	(-3.700)
$Ln(MarketCap_{i,t})$	-0.335***	-0.369***	-0.373***	-8.141***	-8.212***	-8.375***
	(-7.303)	(-8.035)	(-8.134)	(-25.347)	(-25.630)	(-25.921)
$BidAskSpread_{i,t}$	-0.009	-0.008	-0.007	-0.020	-0.020	-0.013
	(-1.482)	(-1.306)	(-1.192)	(-1.485)	(-1.537)	(-1.401)
Stock FE				X	X	X
Observations	68931	68931	68276	68931	68931	68276
R^2	0.002	0.002	0.011	0.045	0.046	0.057

Table 7: **Relationship between loan fee commonality and price efficiency.**

This table presents the results of contemporaneous quarter panel regressions examining the relationship between several measures of loan fee risk and two measures of price inefficiency. The first measure we consider is from Bris, Goetzmann, and Zhu (2007). We first calculate $\rho^{cross} = corr(r_{i,t}, r_{m,t-1})$, the cross-autocorrelation between contemporaneous stock prices and one-week lagged market returns. We then transform this cross-autocorrelation such that our efficiency measure is $ln((1+\rho)/(1-\rho))$. The second measure of price efficiency is the Hou & Moskowitz (2005) D1 price delay measure. We regress weekly stock returns on contemporaneous and lagged weekly S&P 500 returns and stock fixed effects, and we store the R^2 as R^2_{full}. Then we regress stock returns on just contemporaneous index returns and stock fixed effects, and we store the R^2 as R^2_{rest}. The $D1$ measure of price delay is calculated as $1 - \frac{R^2_{rest}}{R^2_{full}}$. We multiply both measures of inefficiency by 100. Total loan fee volatility ($Vol(LoanFee)_{i,t}$) is the standard deviation of stock-specific loan fees within a quarter. Systematic volatility ($Sys.Vol(LoanFee)^{Median}_{i,t}$) is calculated within each stock-quarter as $\sqrt{(\beta^{median}_{i,t})^2 * vol(MedianLF_t)^2}$. Idiosyncratic volatility ($Idio.Vol(LoanFee)^{Median}_{i,t}$) is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)^{Median}_{i,t})^2}$. $LoanFee_{i,t}$ is the stock-specific median loan fee within a quarter, calculated using daily data. t-statistics are displayed in parentheses.

	BGZ ρ^{cross}		HM D1 Price Delay	
	(1)	(2)	(3)	(4)
$Vol(LoanFee)_{i,t}$	0.049***		0.024***	
	(7.436)		(10.145)	
$Idio.Vol(LoanFee)^{Median}_{i,t}$		-0.089***		0.002
		(-9.099)		(0.764)
$Sys.Vol(LoanFee)^{Median}_{i,t}$		0.441***		0.075***
		(14.527)		(10.235)
$LoanFee_{i,t}$	-0.001	-0.000	0.002***	0.002***
	(-0.704)	(-0.090)	(2.835)	(2.939)
Stock FE	X	X	X	X
Observations	69093	68421	72861	72065
R^2	0.050	0.057	0.128	0.128

Table 8: **Loan demand and supply commonality across momentum deciles.**

This table shows the degree of commonality in stock loan demand and loan supply across momentum deciles. Momentum is measured for each stock-quarter according to Jegadeesh & Titman (2011) as the cumulative past 12 month return. To determine the level of commonality in loan supply and demand for each momentum decile, we construct common components of loan demand (supply) by calculating the median loan demand (supply) quantity across all firms for each quarter. We then regress each individual stock's loan demand (supply) on the common component over the full sample. These results suggest that loan demand commonality is highest in momentum portfolios which are likely to be heavily shorted (portfolios 1 and 2), whereas the same phenomenon is not present regarding loan supply. We believe this result sheds light on the origin of loan fee commonality and suggests that loan fee commonality may be driven by the demand side for stock loans, as opposed to the supply side.

Panel A: Loan Demand

	Momentum Portfolio										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(1)-(10)
Beta	4.067***	3.355***	1.587***	2.343***	2.845***	1.921***	1.785***	2.228***	1.706***	0.322	3.745***
t-stat	(7.74)	(6.44)	(5.22)	(5.25)	(5.14)	(5.22)	(6.14)	(5.89)	(6.15)	(0.93)	(5.95)
R^2	1.33%	1.00%	0.36%	0.63%	0.65%	0.56%	0.64%	0.69%	0.35%	0.01%	

Panel B: Loan Supply

	Momentum Portfolio										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(1)-(10)
Beta	0.333	1.435***	3.285***	4.212***	3.535***	1.919***	1.832***	0.992*	0.759	-0.106	0.439
t-stat	(0.96)	(3.09)	(6.04)	(7.30)	(6.18)	(3.12)	(3.01)	(1.69)	(1.50)	(-0.33)	(0.93)
R^2	0.01%	0.12%	0.46%	0.70%	0.44%	0.12%	0.12%	0.04%	0.03%	0.00%	

Appendix

This section is the appendix for Andrews, Lundblad, and Reed (2022).

Table A.1: **Percentage of variation explained by each of the top principal components in loan fees, loan supply, loan demand, and stock returns.**

This table presents the percentage of variation explained by each of the top ten principal components of loan fees, loan supply, loan demand, and stock returns. Note that the first principal component of loan fees explains a high percentage of variation in loan fees (45.6%), while the first principal component of stock returns explains much less variation in returns (28.3%). The top ten principal components of loan fees explain a combined 74.4% of variation in loan fees, while the top ten principal components of returns only explain 36.9% of variation in returns. The top ten principal components of loan supply and demand explain a very high percentage of variation in supply and demand at 91% and 83%, respectively. The results of our principal component analysis indicate that there appears to be a high degree of commonality among stock loan characteristics. The sample size for this analysis is 1,935 stocks– the firms for which we are not missing any data.

	Stock Loan Characteristics						**Other Stock Characteristics**			
	Loan Fees		**Loan Supply**		**Loan Demand**		**Stock Returns**		**Liquidity (Turnover)**	
	% Variation Explained	*Cumulative*	*% Variation Explained*	*Cumulative*	*% Variation Explained*	*Cumulative*	*% Variation Explained*	*Cumulative*	*% Variation Explained*	*Cumulative*
PC1	45.6	45.6	37.6	37.6	37.2	37.2	28.3	28.3	11.6	11.6
PC2	8.5	54.1	24.0	61.6	15.3	52.5	1.9	30.3	5.3	16.9
PC3	5.8	59.9	11.2	72.8	11.0	63.5	1.2	31.5	3.5	20.4
PC4	3.3	63.2	5.8	78.6	5.6	69.1	1.2	32.6	1.8	22.1
PC5	2.8	65.9	4.5	83.1	4.0	73.0	1.0	33.6	1.4	23.5
PC6	2.5	68.4	3.0	86.1	3.1	76.2	0.8	34.4	1.2	24.7
PC7	1.7	70.2	2.3	88.4	2.9	79.0	0.7	35.1	1.1	25.8
PC8	1.7	71.8	1.3	89.7	1.8	80.9	0.7	35.7	0.9	26.8
PC9	1.4	73.2	1.0	90.7	1.7	82.6	0.6	36.3	0.9	27.7
PC10	1.2	74.4	0.8	91.5	1.3	83.8	0.6	36.9	0.8	28.5

Table A.2: **Relation between PC1 loan fee common component and other asset pricing and macro variables.**

This table presents the results of time series regressions examining the relationship between the $PC1$ common component of loan fees and other asset pricing and macro factors. The dependent variable is the daily $PC1$ time series, constructed using 1,935 firms with no missing data, in basis points. We implement Huber-White standard errors to correct for heteroskedasticity. t-statistics are displayed in parentheses.

	Dependent Variable: $PC1LoanFees_t$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rf_t	23.339***	23.327***	23.179***	22.988***	23.246***	22.903***	22.962***	21.179***
	(48.122)	(47.953)	(47.750)	(46.571)	(48.168)	(46.908)	(47.007)	(42.308)
$MktRf_t$		-0.939	-0.577	-1.683*	-1.535	-1.510	-1.506	-1.777
		(-1.038)	(-0.632)	(-1.701)	(-1.545)	(-1.447)	(-0.904)	(-1.047)
SMB_t			-1.925	-3.897	-3.826	-3.889	-3.881	-3.934
			(-0.676)	(-1.345)	(-1.345)	(-1.349)	(-1.342)	(-1.353)
HML_t			2.056	1.111	0.889	1.115	1.139	-0.264
			(1.274)	(0.673)	(0.545)	(0.674)	(0.660)	(-0.156)
MOM_t			2.126**	3.641***	3.617***	3.578***	3.698***	2.515***
			(2.490)	(3.918)	(3.949)	(3.914)	(3.621)	(2.598)
BAB_t				-5.172***	-5.009***	-4.927***	-5.152***	-4.846***
				(-3.442)	(-3.411)	(-3.257)	(-3.327)	(-3.243)
$PSLiquidity_t$					-0.386			-0.642***
					(-1.634)			(-3.241)
% Change in $TedSpread_t$						22.025*		14.090
						(1.686)		(1.093)
% Change in VIX_t							4.366	-6.020
							(0.192)	(-0.277)
$1_{Recession}$								-21.607***
								(-6.008)
Observations	1386	1386	1386	1386	1386	1385	1385	1385
Adjusted R^2	0.385	0.388	0.392	0.406	0.409	0.407	0.404	0.461

Table A.3: **Relation between loan supply common component and asset pricing and macro factors.**

This table presents the results of time series regressions examining the relationship between the common component of loan supply (*Median Loan Supply*) and other asset pricing and macro factors. The dependent variable is the natural log of the daily cross-sectional median loan supply (in shares) across 4,039 firms with at least 1 year of populated data. We implement Huber-White standard errors to correct for heteroskedasticity. t-statistics are displayed in parentheses.

	Dependent Variable: $Ln(MedianLoanSupply_t)$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rf_t	-0.031***	-0.031***	-0.031***	-0.031***	-0.032***	-0.031***	-0.031***	-0.032***
	(-5.913)	(-5.918)	(-5.952)	(-6.064)	(-6.059)	(-5.998)	(-5.964)	(-6.208)
$MktRf_t$		-0.002**	-0.002	-0.005***	-0.005***	-0.004**	-0.003	-0.003
		(-2.049)	(-1.008)	(-2.762)	(-2.771)	(-2.348)	(-1.244)	(-1.248)
SMB_t			0.001	-0.005	-0.005	-0.005	-0.005	-0.005
			(0.290)	(-1.364)	(-1.369)	(-1.391)	(-1.366)	(-1.391)
HML_t			0.004	0.001	0.001	0.001	0.001	0.001
			(1.316)	(0.337)	(0.388)	(0.308)	(0.364)	(0.224)
MOM_t			0.005**	0.009***	0.009***	0.009***	0.010***	0.009***
			(2.399)	(4.201)	(4.187)	(4.231)	(4.287)	(3.874)
BAB_t				-0.015***	-0.015***	-0.014***	-0.015***	-0.014***
				(-5.887)	(-5.877)	(-5.521)	(-5.753)	(-5.508)
$PSLiquidity_t$					0.000			0.000
					(0.609)			(0.443)
% Change in $TedSpread_t$						0.074		0.071
						(1.591)		(1.501)
% Change in VIX_t							0.033	0.022
							(0.610)	(0.404)
$1_{Recession}$								-0.011***
								(-2.838)
Observations	1386	1386	1386	1386	1386	1385	1385	1385
Adjusted R^2	0.051	0.051	0.051	0.060	0.059	0.059	0.057	0.059

Table A.4: **Relation between loan demand common component and asset pricing and macro factors.**

This table presents the results of time series regressions examining the relationship between the common component of loan demand (*Median Loan Demand*) and other asset pricing and macro factors. The dependent variable is the natural log of the daily cross-sectional median loan demand (in shares) across 4,039 firms with at least 1 year of populated data. We implement Huber-White standard errors to correct for heteroskedasticity. t-statistics are displayed in parentheses.

	Dependent Variable: $Ln(MedianLoanDemand_t)$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rf_t	0.304***	0.304***	0.303***	0.300***	0.303***	0.301***	0.302***	0.318***
	(23.872)	(23.866)	(23.748)	(23.775)	(23.523)	(23.774)	(23.812)	(24.787)
$MktRf_t$		-0.009	-0.009	-0.025***	-0.023***	-0.024***	-0.034***	-0.028**
		(-1.588)	(-1.149)	(-2.987)	(-2.897)	(-2.880)	(-2.591)	(-2.453)
SMB_t			0.008	-0.021	-0.020	-0.021	-0.021	-0.020
			(0.527)	(-1.366)	(-1.361)	(-1.375)	(-1.414)	(-1.452)
HML_t			0.021	0.008	0.005	0.008	0.006	0.012
			(1.388)	(0.474)	(0.344)	(0.466)	(0.387)	(0.825)
MOM_t			0.016*	0.038***	0.038***	0.038***	0.035***	0.042***
			(1.718)	(3.614)	(3.624)	(3.622)	(3.158)	(3.769)
BAB_t				-0.074***	-0.073***	-0.073***	-0.075***	-0.072***
				(-5.622)	(-5.576)	(-5.547)	(-5.633)	(-5.645)
$PSLiquidity_t$					-0.004			-0.002
					(-1.610)			(-0.782)
% Change in $TedSpread_t$						0.073		0.115
						(0.463)		(0.739)
% Change in VIX_t							-0.220	-0.160
							(-1.123)	(-0.857)
$1_{Recession}$								0.153***
								(7.589)
Observations	1386	1386	1386	1386	1386	1385	1385	1385
Adjusted R^2	0.314	0.315	0.315	0.328	0.330	0.329	0.330	0.343

Table A.5: **Factor regressions, using PC1 of the top 10% of the loan fee distribution.**

This table presents the results of time series regressions examining the relationship between the common component of loan fees among high-loan-fee stocks and other asset pricing and macro factors. The dependent variable in this table is the first principal component of loan fees, constructed among the top 10% of the loan fee distribution for each day. We implement Huber-White standard errors to correct for heteroskedasticity. t-statistics are displayed in parentheses.

	Dependent Variable: $PC1LoanFee10\%_t$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Rf_t	9.047***	9.045***	9.048***	9.019***	9.127***	9.028***	9.034***	9.777***
	(81.320)	(81.273)	(81.039)	(80.889)	(81.192)	(80.653)	(80.918)	(96.269)
$MktRf_t$		-0.157	-0.235	-0.407**	-0.345**	-0.414**	-0.695***	-0.469***
		(-1.295)	(-1.544)	(-2.481)	(-2.319)	(-2.484)	(-2.714)	(-2.994)
SMB_t			0.059	-0.248	-0.217	-0.249	-0.270	-0.200
			(0.188)	(-0.762)	(-0.733)	(-0.764)	(-0.823)	(-0.916)
HML_t			0.171	0.024	-0.070	0.023	-0.017	0.269
			(0.592)	(0.078)	(-0.250)	(0.075)	(-0.056)	(1.304)
MOM_t			-0.080	0.156	0.146	0.160	0.061	0.405***
			(-0.539)	(0.914)	(0.879)	(0.941)	(0.341)	(2.705)
BAB_t				-0.805***	-0.736***	-0.816***	-0.842***	-0.763***
				(-2.964)	(-2.932)	(-3.019)	(-3.086)	(-4.181)
$PSLiquidity_t$					-0.162***			-0.076**
					(-4.531)			(-2.413)
% Change in $TedSpread_t$						-1.128		0.650
						(-0.528)		(0.358)
% Change in VIX_t							-6.888**	-3.825*
							(-2.150)	(-1.662)
$1_{Recession}$								6.908***
								(24.303)
Observations	1386	1386	1386	1386	1386	1385	1385	1385
Adjusted R^2	0.704	0.705	0.705	0.708	0.716	0.708	0.710	0.782

Table A.6: **Relationship between β^{PC1} and loan fee levels.**

This table presents the results of contemporaneous regressions examining the relationship between loan fee betas and loan fee levels. The dependent variable, $\beta^{PC1}_{i,t}$, is calculated by regressing each stock's time series of daily loan fees on the loan fee common component ($PC1$) within each quarter. $LoanFee_{i,t}$ is the stock-specific median loan fee within each quarter, calculated using daily data. In columns 2 and 3, we control for dummies which indicate whether a stock's loan fee is in the top or bottom quartile of the loan fee distribution within a quarter. In column 4, we sort stocks into quintiles based on their loan fee levels in each quarter. The right-hand side variables in this specification are dummy variables which equal 1 if a stock's median loan fee during a quarter falls in the indicated quintile bucket. In columns 5-8, we replicate columns 1-4 while adding controls for size (market capitalization) and trading volume. Rather than using the actual values for these controls, we sort the stocks into deciles based on size and volume and use the deciles as controls. These columns show that stocks with high loan fees tend to have high sensitivities to the common component, and this finding is robust when controlling for stock characteristics and fixed effects. Panel A shows the results from panel regressions with stock fixed effects, while Panel B shows the results from Fama-MacBeth (1973) regressions with Newey West standard errors with 4 lags. t-statistics are displayed in parentheses.

Panel A: Panel Regression with Stock FE

	Dependent Variable: $\beta^{PC1}_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	0.001		0.001		0.001		0.001	
	(0.497)		(0.333)		(0.370)		(0.238)	
$\mathbb{1}_{LF<25thpctile}$		0.013	0.016			0.042	0.042	
		(0.245)	(0.295)			(0.792)	(0.792)	
$\mathbb{1}_{LF>75thpctile}$		1.145***	1.021**			0.968***	0.888**	
		(4.087)	(2.454)			(3.377)	(2.011)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				-0.032				-0.036
				(-0.531)				(-0.606)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				-0.030				-0.057
				(-0.408)				(-0.754)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				0.283*				0.186
				(1.668)				(0.981)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				1.354***				1.093***
				(3.246)				(2.957)
$SizeDecile_{i,t}$					-0.295***	-0.272**	-0.254**	-0.264**
					(-2.828)	(-2.118)	(-2.422)	(-2.157)
$VolumeDecile_{i,t}$					0.665**	0.655**	0.643**	0.651**
					(2.516)	(2.103)	(2.362)	(2.136)
N	72,966	72,966	72,966	72,966	72,962	72,962	72,962	72,962
R^2	0.0000	0.0001	0.0001	0.0001	0.0003	0.0004	0.0004	0.0004

Panel B: Fama-MacBeth Regressions

	Dependent Variable: $\beta^{PC1}_{i,t}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	0.002*		0.001		0.002**		0.001	
	(1.927)		(1.492)		(2.085)		(1.617)	
$\mathbb{1}_{LF<25thpctile}$		0.027	0.031			0.195	0.189	
		(0.694)	(0.802)			(0.952)	(0.937)	
$\mathbb{1}_{LF>75thpctile}$		1.324*	1.048*			1.120*	0.886*	
		(1.802)	(1.754)			(1.871)	(1.747)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				-0.048				-0.128
				(-0.843)				(-0.907)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				-0.055				-0.242
				(-1.503)				(-0.970)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				0.305				0.043
				(1.346)				(0.190)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				1.435*				1.045*
				(1.794)				(2.035)
$SizeDecile_{i,t}$					-0.183	-0.154	-0.137	-0.151
					(-1.399)	(-1.134)	(-1.107)	(-1.083)
$VolumeDecile_{i,t}$					0.099	0.097	0.083	0.092
					(1.196)	(1.086)	(1.030)	(1.041)
N	72,966	72,966	72,966	72,966	72,962	72,962	72,962	72,962
R^2	0.0129	0.0144	0.0201	0.0151	0.0168	0.0177	0.0232	0.0187

Table A.7: **Relationship between β^{median} and loan fee levels, pre-crisis period (Q3 2006 - Q2 2008).**

This table presents the results of contemporaneous panel regressions examining the relationship between loan fee betas and loan fee levels in the pre-crisis period of our sample (Q3 2006 - Q2 2008). The dependent variable, $\beta_{i,t}^{median}$, is calculated by regressing each stock's time series of daily loan fees on the loan fee common component (the median loan fee) within each quarter. $LoanFee_{i,t}$ is the stock-specific median loan fee within each quarter, calculated using daily data. In columns 2 and 3, we control for dummies which indicate whether a stock's loan fee is in the top or bottom quartile of the loan fee distribution within a quarter. In column 4, we sort stocks into quintiles based on their loan fee levels in each quarter. The right-hand side variables in this specification are dummy variables which equal 1 if a stock's median loan fee during a quarter falls in the indicated quintile bucket. Panel A shows the results from panel regressions with stock fixed effects, while Panel B shows the results from Fama-MacBeth (1973) regressions with Newey West standard errors with 4 lags. t-statistics are displayed in parentheses.

Panel A: Panel Regression with Stock FE

	Dependent Variable: $\beta_{i,t}^{median}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	0.008*		0.006		0.008*		0.006	
	(1.810)		(1.405)		(1.653)		(1.311)	
$\mathbb{1}_{LF<25thpctile}$		-0.299	-0.268			-0.259	-0.239	
		(-1.195)	(-1.060)			(-1.026)	(-0.944)	
$\mathbb{1}_{LF>75thpctile}$		2.212**	1.628*			2.091**	1.547*	
		(2.449)	(1.946)			(2.284)	(1.860)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				0.145				0.138
				(0.664)				(0.629)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				0.263				0.217
				(0.718)				(0.583)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				0.735*				0.633
				(1.680)				(1.429)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				3.492***				3.294***
				(2.958)				(2.709)
$SizeDecile_{i,t}$					-0.402	-0.410	-0.320	-0.363
					(-1.022)	(-1.177)	(-0.821)	(-1.030)
$VolumeDecile_{i,t}$					0.314	0.288	0.275	0.264
					(1.387)	(1.282)	(1.221)	(1.176)
N	27,333	27,333	27,333	27,333	27,333	27,333	27,333	27,333
R^2	0.0010	0.0009	0.0015	0.0013	0.0012	0.0011	0.0016	0.0014

Panel B: Fama-MacBeth Regressions

	Dependent Variable: $\beta_{i,t}^{median}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	0.007**		0.004*		0.007**		0.004*	
	(3.255)		(1.907)		(3.303)		(2.132)	
$\mathbb{1}_{LF<25thpctile}$		-0.255**	-0.230**			-0.504	-0.504	
		(-3.047)	(-2.672)			(-1.815)	(-1.680)	
$\mathbb{1}_{LF>75thpctile}$		2.468***	1.628***			2.482***	1.608***	
		(4.340)	(3.994)			(4.406)	(3.935)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				0.053				0.276
				(0.764)				(1.148)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				0.057				0.430
				(0.858)				(1.268)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				0.863***				1.545**
				(3.961)				(2.739)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				3.149***				3.690***
				(4.536)				(4.755)
$SizeDecile_{i,t}$					-0.041	0.039	0.068	0.101
					(-0.672)	(0.529)	(0.901)	(1.070)
$VolumeDecile_{i,t}$					0.051	0.038	0.014	0.025
					(0.727)	(0.593)	(0.209)	(0.384)
N	27,333	27,333	27,333	27,333	27,333	27,333	27,333	27,333
R^2	0.0090	0.0067	0.0105	0.0077	0.0109	0.0086	0.0126	0.0099

Table A.8: **Relationship between β^{median} and loan fee levels, post-crisis period (Q3 2008 - Q4 2011).**

This table presents the results of contemporaneous panel regressions examining the relationship between loan fee betas and loan fee levels in the post-crisis period of our sample (Q3 2008 - Q4 2011). The dependent variable, $\beta_{i,t}^{median}$, is calculated by regressing each stock's time series of daily loan fees on the loan fee common component (the median loan fee) within each quarter. $LoanFee_{i,t}$ is the stock-specific median loan fee within each quarter, calculated using daily data. In columns 2 and 3, we control for dummies which indicate whether a stock's loan fee is in the top or bottom quartile of the loan fee distribution within a quarter. In column 4, we sort stocks into quintiles based on their loan fee levels in each quarter. The right-hand side variables in this specification are dummy variables which equal 1 if a stock's median loan fee during a quarter falls in the indicated quintile bucket. Panel A shows the results from panel regressions with stock fixed effects, while Panel B shows the results from Fama-MacBeth (1973) regressions with Newey West standard errors with 4 lags. t-statistics are displayed in parentheses.

Panel A: Panel Regression with Stock FE

	Dependent Variable: $\beta_{i,t}^{median}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	-0.012		-0.013		-0.013		-0.014	
	(-0.959)		(-1.063)		(-1.071)		(-1.156)	
$\mathbb{1}_{LF<25thpctile}$		0.009	-0.048			0.151	0.117	
		(0.027)	(-0.137)			(0.420)	(0.325)	
$\mathbb{1}_{LF>75thpctile}$		5.125*	6.541**			4.549*	5.963**	
		(1.878)	(2.463)			(1.685)	(2.214)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				-0.212				-0.239
				(-0.524)				(-0.590)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				0.029				-0.157
				(0.072)				(-0.380)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				3.254**				2.829*
				(2.222)				(1.874)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				1.992				1.032
				(0.467)				(0.251)
$SizeDecile_{i,t}$					-2.526***	-1.881**	-2.272***	-2.022**
					(-3.066)	(-2.076)	(-2.772)	(-2.297)
$VolumeDecile_{i,t}$					2.234	1.858	2.125	1.936
					(1.482)	(1.123)	(1.394)	(1.191)
N	45,633	45,633	45,633	45,633	45,629	45,629	45,629	45,629
R^2	0.0003	0.0001	0.0004	0.0001	0.0005	0.0002	0.0006	0.0002

Panel B: Fama-MacBeth Regressions

	Dependent Variable: $\beta_{i,t}^{median}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	-0.001		-0.005		-0.003		-0.005	
	(-0.138)		(-0.562)		(-0.484)		(-0.694)	
$\mathbb{1}_{LF<25thpctile}$		0.054	0.032			0.432	0.592	
		(0.183)	(0.099)			(0.447)	(0.655)	
$\mathbb{1}_{LF>75thpctile}$		3.173	4.638			2.331	3.816	
		(1.538)	(1.717)			(1.375)	(1.446)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				-0.076				-0.379
				(-0.191)				(-0.498)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				-0.107				-0.292
				(-0.393)				(-0.286)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				1.953				1.006
				(1.701)				(0.619)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				2.550				1.144
				(1.180)				(0.735)
$SizeDecile_{i,t}$					-1.029	-0.655	-0.797	-0.707
					(-1.743)	(-0.882)	(-1.221)	(-0.948)
$VolumeDecile_{i,t}$					0.678	0.548	0.625	0.580
					(1.142)	(0.834)	(1.042)	(0.882)
N	45,633	45,633	45,633	45,633	45,629	45,629	45,629	45,629
R^2	0.0086	0.0070	0.0133	0.0076	0.0119	0.0097	0.0160	0.0104

Table A.9: **Relationship between loan fee levels and sensitivities to common loan fee changes.**

This table presents the results of contemporaneous panel regressions examining the relationship between loan fee betas and loan fee levels. In this table, the common component is the first principal component, taken from a PCA on a panel of daily loan fee changes, rather than levels. The dependent variable, $\beta_{i,t}^{PC1\Delta LF}$, is calculated by regressing each stock's time series of daily loan fee changes on the loan fee common component (PC1 of loan fee changes) within each quarter. $LoanFee_{i,t}$ is the stock-specific median loan fee within each quarter, calculated using daily data. In columns 2 and 3, we control for dummies which indicate whether a stock's loan fee is in the top or bottom quartile of the loan fee distribution within a quarter. In column 4, we sort stocks into quintiles based on their loan fee levels in each quarter. The right-hand side variables in this specification are dummy variables which equal 1 if a stock's median loan fee during a quarter falls in the indicated quintile bucket. Panel A shows the results from panel regressions with stock fixed effects, while Panel B shows the results from Fama-MacBeth (1973) regressions with Newey West standard errors with 4 lags. t-statistics are displayed in parentheses.

Panel A: Panel Regression with Stock FE

	Dependent Variable: $\beta_{i,t}^{PC1\Delta LF}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	0.002		0.002		0.002		0.002	
	(1.217)		(1.167)		(1.219)		(1.171)	
$\mathbb{1}_{LF<25thpctile}$		-0.002	0.003			0.011	0.011	
		(-0.146)	(0.184)			(0.427)	(0.419)	
$\mathbb{1}_{LF>75thpctile}$		0.273***	0.058			0.225***	0.032	
		(2.740)	(0.544)			(3.634)	(0.247)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				0.001				-0.000
				(0.168)				(-0.026)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				-0.009				-0.024
				(-0.391)				(-0.661)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				0.059**				0.023
				(2.364)				(0.412)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				0.350***				0.272***
				(2.655)				(4.065)
$SizeDecile_{i,t}$					-0.070	-0.114	-0.069	-0.112
					(-0.893)	(-0.927)	(-0.811)	(-0.910)
$VolumeDecile_{i,t}$					0.086	0.114	0.085	0.112
					(1.521)	(1.376)	(1.434)	(1.369)
N	72,966	72,966	72,966	72,966	72,962	72,962	72,962	72,962
R^2	0.0034	0.0003	0.0034	0.0003	0.0036	0.0007	0.0036	0.0008

Panel B: Fama-MacBeth Regressions

	Dependent Variable: $\beta_{i,t}^{PC1\Delta LF}$							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$LoanFee_{i,t}$	0.001***		0.001**		0.001***		0.001**	
	(3.124)		(2.425)		(3.079)		(2.454)	
$\mathbb{1}_{LF<25thpctile}$		-0.032**	-0.030**			-0.018	-0.024	
		(-2.346)	(-2.194)			(-0.965)	(-1.303)	
$\mathbb{1}_{LF>75thpctile}$		0.330***	0.159**			0.272***	0.124	
		(3.903)	(2.527)			(3.787)	(1.509)	
$\mathbb{1}_{20thpctile<LF<40thpctile}$				0.009				0.014
				(0.782)				(0.819)
$\mathbb{1}_{40thpctile<LF<60thpctile}$				0.022				0.024
				(1.561)				(1.445)
$\mathbb{1}_{60thpctile<LF<80thpctile}$				0.109**				0.083
				(2.491)				(1.579)
$\mathbb{1}_{80thpctile<LF<100thpctile}$				0.413***				0.351***
				(3.938)				(3.770)
$SizeDecile_{i,t}$					-0.038	-0.044	-0.030	-0.040
					(-1.461)	(-1.199)	(-0.992)	(-1.106)
$VolumeDecile_{i,t}$					0.027	0.036	0.025	0.034
					(0.870)	(0.947)	(0.771)	(0.917)
N	72,966	72,966	72,966	72,966	72,962	72,962	72,962	72,962
R^2	0.0335	0.0445	0.0548	0.0467	0.0373	0.0465	0.0564	0.0485

Table A.10: **Double-sorted portfolio returns, in relation to the PC1 loan fee common component.**

In Panel A, for each quarter, stocks are sorted into one of four portfolios based on their loan fees: 1) low systematic loan fee volatility and low total loan fee volatility, 2) low systematic volatility and high total volatility, 3) high systematic volatility and low total volatility, and 4) high systematic volatility and high total volatility. In Panel B, instead of sorting on systematic loan fee volatility, we sort on idiosyncratic loan fee volatility. Systematic loan fee volatility is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{PC1})^2 * vol(PC1_t)^2}$. Idiosyncratic loan fee volatility is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{PC1})^2}$.

Panel A

Annualized Returns		**Sort Variable: Total Vol(Loan Fee)**		**Long/Short Portfolios**
	Portfolio	$TotalVol$ **(1)**	$TotalVol$ **(2)**	$TotalVol$ **(2) - (1)**
Sort Variable: $SysVol^{PC1}$	$SysVol$ **(1)**	-1.2% [-0.10]	-1.6% [-0.14]	-0.3% [-0.15]
	$SysVol$ **(2)**	-0.5% [-0.04]	-7.1% [-0.58]	-6.6%*** [-2.66]
Long/Short Portfolios	$SysVol$ **(2) - (1)**	0.7% [0.39]	-5.6%*** [-2.63]	

Panel B

Annualized Returns		**Sort Variable: Total Vol(Loan Fee)**		**Long/Short Portfolios**
	Portfolio	$TotalVol$ **(1)**	$TotalVol$ **(2)**	$TotalVol$ **(2) - (1)**
Sort Variable: $IdioVol^{PC1}$	$IdioVol$ **(1)**	-1.1% [-0.09]	-6.3% [-0.51]	-5.2% [-1.33]
	$IdioVol$ **(2)**	-3.5% [-0.25]	-6.3% [-0.51]	-2.9% [-0.87]
Long/Short Portfolios	$IdioVol$ **(2) - (1)**	-2.4% [-0.66]	-0.1% [-0.02]	

Table A.11: **Double-sorted portfolio returns, sorting on systematic volatility and loan fee levels.**

For each quarter, stocks are sorted into one of four portfolios based on their loan fees: 1) low systematic loan fee volatility and low loan fee level, 2) low systematic volatility and high loan fee, 3) high systematic volatility and low loan fee, and 4) high systematic volatility and high loan fee. In Panel A, systematic loan fee volatility is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{median})^2 * vol(MedianLF_t)^2}$. In Panel B, systematic loan fee volatility is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{PC1})^2 * vol(PC1_t)^2}$.

Panel A

Annualized Returns	**Portfolio**	**Sort Variable: Loan Fee** LF **(1)**	LF **(2)**	**Long/Short Portfolios** LF **(2) - (1)**
Sort Variable: $SysVol^{median}$	$SysVol$ **(1)**	-0.9%	-3.1%	-2.2%
		[-0.07]	[-0.25]	[-1.30]
	$SysVol$ **(2)**	1.9%	-9.6%	-11.5%***
		[0.16]	[-0.74]	[-3.39]
Long/Short Portfolios	$SysVol$ **(2) - (1)**	2.8%*	-6.5%***	
		[1.77]	[-3.11]	

Panel B

Annualized Returns	**Portfolio**	**Sort Variable: Loan Fee** LF **(1)**	LF **(2)**	**Long/Short Portfolios** LF **(2) - (1)**
Sort Variable: $SysVol^{PC1}$	$SysVol$ **(1)**	-0.7%	-3.3%	-2.6%
		[-0.06]	[-0.26]	[-1.43]
	$SysVol$ **(2)**	1.7%	-9.6%	-11.3%***
		[0.15]	[-0.74]	[-3.46]
Long/Short Portfolios	$SysVol$ **(2) - (1)**	2.4%	-6.3%***	
		[1.55]	[-3.08]	

Table A.12: **Single-sorted portfolio returns.**

This table presents single-sorted portfolio returns, sorting firms into one of two portfolios based on quarterly volatility of loan fees. Panel A sorts on systematic volatility of loan fees, and Panel B sorts on idiosyncratic volatility of loan fees. Systematic loan fee volatility is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{median})^2 * vol(MedianLF_t)^2}$ and idiosyncratic loan fee volatility is calculated as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{Median})^2}$.

Panel A

Annualized Returns	**Portfolio**	**Return**
Sort Variable: $SysVol_{median}$	Low	-1.7% [-0.13]
	High	-5.6% [-0.45]
Long/Short Portfolio	High - Low	-4.0%*** [-3.27]

Panel B

Annualized Returns	**Portfolio**	**Return**
Sort Variable: $IdioVol_{median}$	Low	-1.1% [-0.09]
	High	-6.2% [-0.50]
Long/Short Portfolio	High - Low	-5.2%*** [-2.83]

Table A.13: **Relationship between returns and several measures of loan fee risk, using the $PC1$ common component.**

This table presents the results of one-quarter lagged panel regressions examining the relationship between returns and several measures of stock-specific loan fee risk. Columns 4 through 6 contain stock fixed effects. Total loan fee volatility ($Vol(LoanFee)_{i,t}$) is the standard deviation of stock-specific loan fees within a quarter. Systematic volatility ($Sys.Vol(LoanFee)_{i,t}^{PC1}$) is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{PC1})^2 * vol(PC1_t)^2}$. Idiosyncratic volatility ($Idio.Vol(LoanFee)_{i,t}^{PC1}$) is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{PC1})^2}$. $LoanFee_{i,t}$ is the stock-specific median loan fee within a quarter, calculated using daily data. White-Huber robust standard errors are employed. t-statistics are displayed in parentheses.

Panel A

	Dependent Variable: One quarter ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.026***			-0.023***	
		(-6.532)			(-5.291)	
$Idio.Vol(LoanFee)_{i,t}^{PC1}$			0.020***			0.025***
			(3.773)			(4.436)
$Sys.Vol(LoanFee)_{i,t}^{PC1}$			-0.123***			-0.120***
			(-9.473)			(-9.081)
$LoanFee_{i,t}$	-0.011***	-0.008***	-0.008***	-0.010***	-0.007***	-0.008***
	(-9.164)	(-5.291)	(-5.641)	(-5.334)	(-3.560)	(-3.855)
Stock FE				X	X	X
Observations	68938	68938	68314	68938	68938	68314
R^2	0.005	0.006	0.008	0.002	0.003	0.005

Panel B

	Dependent Variable: One month ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.008***			-0.010***	
		(-3.640)			(-3.854)	
$Idio.Vol(LoanFee)_{i,t}^{PC1}$			0.027***			0.028***
			(8.793)			(8.191)
$Sys.Vol(LoanFee)_{i,t}^{PC1}$			-0.091***			-0.095***
			(-12.576)			(-12.084)
$LoanFee_{i,t}$	-0.002***	-0.001	-0.001*	-0.002**	-0.001	-0.001
	(-3.377)	(-1.189)	(-1.897)	(-2.124)	(-0.697)	(-1.174)
Stock FE				X	X	X
Observations	68932	68932	68309	68932	68932	68309
R^2	0.000	0.001	0.007	0.000	0.001	0.007

Table A.14: **Relationship between returns and several measures of loan fee risk, pre-crisis period (Q3 2006 - Q2 2008).**

This table presents the results of one-quarter lagged panel regressions examining the relationship between returns and several measures of stock-specific loan fee risk during the pre-crisis period (Q3 2006 - Q2 2008). Columns 4 through 6 contain stock fixed effects. Total loan fee volatility ($Vol(LoanFee)_{i,t}$) is the standard deviation of stock-specific loan fees within a quarter. Systematic volatility ($Sys.Vol(LoanFee)_{i,t}^{median}$) is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{median})^2 * vol(MedianLF_t)^2}$. Idiosyncratic volatility ($Idio.Vol(LoanFee)_{i,t}^{median}$) is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{median})^2}$. $LoanFee_{i,t}$ is the stock-specific median loan fee within a quarter, calculated using daily data. White-Huber robust standard errors are employed. t-statistics are displayed in parentheses.

Panel A						
	Dependent Variable: One quarter ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.015**			-0.001	
		(-2.505)			(-0.113)	
$Idio.Vol(LoanFee)_{i,t}^{Median}$			0.009			0.037***
			(0.999)			(3.432)
$Sys.Vol(LoanFee)_{i,t}^{Median}$			-0.087***			-0.118***
			(-3.893)			(-4.780)
$LoanFee_{i,t}$	-0.011***	-0.010***	-0.010***	-0.005	-0.005	-0.007*
	(-7.807)	(-6.106)	(-6.116)	(-1.624)	(-1.525)	(-1.859)
Stock FE				X	X	X
Observations	23672	23672	23422	23672	23672	23422
R^2	0.005	0.005	0.006	0.000	0.000	0.002

Panel B						
	Dependent Variable: One month ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)\_i,t$		-0.001			0.008**	
		(-0.173)			(2.065)	
$Idio.Vol(LoanFee)_{i,t}^{Median}$			0.012***			0.029***
			(2.907)			(5.620)
$Sys.Vol(LoanFee)_{i,t}^{Median}$			-0.049***			-0.070***
			(-4.219)			(-5.392)
$LoanFee_{i,t}$	-0.003***	-0.003***	-0.003***	0.001	0.000	0.000
	(-3.863)	(-3.466)	(-3.424)	(0.694)	(0.224)	(0.043)
Stock FE				X	X	X
Observations	27066	27066	26796	27066	27066	26796
R^2	0.001	0.001	0.002	0.000	0.000	0.002

Table A.15: **Relationship between returns and several measures of loan fee risk, post-crisis period including the crisis (Q3 2008 - Q4 2011).**

This table presents the results of one-quarter lagged panel regressions examining the relationship between returns and several measures of stock-specific loan fee risk during the post-crisis period (Q3 2008 - Q4 2011). Columns 4 through 6 contain stock fixed effects. Total loan fee volatility ($Vol(LoanFee)_{i,t}$) is the standard deviation of stock-specific loan fees within a quarter. Systematic volatility ($Sys.Vol(LoanFee)_{i,t}^{median}$) is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{median})^2 * vol(MedianLF_t)^2}$. Idiosyncratic volatility ($Idio.Vol(LoanFee)_{i,t}^{median}$) is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{median})^2}$. $LoanFee_{i,t}$ is the stock-specific median loan fee within a quarter, calculated using daily data. White-Huber robust standard errors are employed. t-statistics are displayed in parentheses.

Panel A

	Dependent Variable: One quarter ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.029***			-0.028***	
		(-6.388)			(-5.329)	
$Idio.Vol(LoanFee)_{i,t}^{Median}$			0.036***			0.037***
			(5.650)			(5.302)
$Sys.Vol(LoanFee)_{i,t}^{Median}$			-0.202***			-0.196***
			(-12.039)			(-10.301)
$LoanFee_{i,t}$	-0.011***	-0.007***	-0.008***	-0.010***	-0.007***	-0.009***
	(-8.123)	(-4.277)	(-4.657)	(-4.863)	(-3.008)	(-3.539)
Stock FE				X	X	X
Observations	45266	45266	44859	45266	45266	44859
R^2	0.005	0.006	0.013	0.002	0.003	0.010

Panel B

	Dependent Variable: One month ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.010***			-0.014***	
		(-4.109)			(-4.670)	
$Idio.Vol(LoanFee)_{i,t}^{Median}$			0.033***			0.030***
			(9.300)			(6.979)
$Sys.Vol(LoanFee)_{i,t}^{Median}$			-0.130***			-0.132***
			(-13.112)			(-10.596)
$LoanFee_{i,t}$	-0.002**	-0.000	-0.001	-0.002**	-0.001	-0.002
	(-2.568)	(-0.145)	(-0.886)	(-2.183)	(-0.502)	(-1.434)
Stock FE				X	X	X
Observations	41866	41866	41481	41866	41866	41481
R^2	0.000	0.001	0.013	0.000	0.001	0.013

Table A.16: **Relationship between returns and several measures of loan fee risk.**

This table presents the results of one-quarter lagged panel regressions examining the relationship between returns and several measures of stock-specific loan fee risk. Columns 4 through 6 contain stock fixed effects. $\beta_{i,t}^{PC1,LFTop10\%}$ is a stock's quarterly sensitivity to the first principal component of loan fees, constructed from just the top 10% of the loan fee distribution. Total loan fee volatility ($Vol(LoanFee)_{i,t}$) is the standard deviation of stock-specific loan fees within a quarter. Systematic volatility ($Sys.Vol(LoanFee)_{i,t}^{PC1,LFTop10\%}$) is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{PC1,LFTop10\%})^2 * vol(PC1LFTop10\%_t)^2}$. Idiosyncratic volatility ($Idio.Vol(LoanFee)_{i,t}^{PC1,LFTop10\%}$) is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{PC1,LFTop10\%})^2}$. $LoanFee_{i,t}$ is the stock-specific median loan fee within a quarter, calculated using daily data. White-Huber robust standard errors are employed. t-statistics are displayed in parentheses.

Panel A

	Dependent Variable: One quarter ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.026***			-0.023***	
		(-6.532)			(-5.291)	
$Idio.Vol(LoanFee)_{i,t}^{PC1LFTop10\%}$			-0.011			0.001
			(-1.634)			(0.142)
$Sys.Vol(LoanFee)_{i,t}^{PC1LFTop10\%}$			-0.033***			-0.039***
			(-4.513)			(-4.912)
$LoanFee_{i,t}$	-0.011***	-0.008***	-0.008***	-0.010***	-0.007***	-0.008***
	(-9.164)	(-5.291)	(-5.351)	(-5.334)	(-3.560)	(-3.682)
Stock FE				X	X	X
Observations	68938	68938	68174	68938	68938	68174
R^2	0.005	0.006	0.006	0.002	0.003	0.003

Panel B

	Dependent Variable: One month ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.008***			-0.010***	
		(-3.640)			(-3.854)	
$Idio.Vol(LoanFee)_{i,t}^{PC1LFTop10\%}$			0.004			0.006
			(1.176)			(1.585)
$Sys.Vol(LoanFee)_{i,t}^{PC1LFTop10\%}$			-0.019***			-0.022***
			(-3.799)			(-4.293)
$LoanFee_{i,t}$	-0.002***	-0.001	-0.001	-0.002**	-0.001	-0.001
	(-3.377)	(-1.189)	(-1.366)	(-2.124)	(-0.697)	(-1.002)
Stock FE				X	X	X
Observations	68932	68932	68170	68932	68932	68170
R^2	0.000	0.001	0.001	0.000	0.001	0.001

Table A.17: **Relationship between returns and several measures of loan fee risk.**

This table presents the results of one-quarter lagged panel regressions examining the relationship between returns and several measures of stock-specific loan fee risk. Columns 4 through 6 contain stock fixed effects. $\beta_{i,t}^{PC1\Delta LF}$ is a stock's quarterly sensitivity to the first principal component of daily loan fees changes ($\Delta LF_{i,t} = LF_{i,t} - LF_{i,t-1}$). Total loan fee volatility ($Vol(LoanFee)_{i,t}$) is the standard deviation of stock-specific loan fees within a quarter. Systematic volatility ($Sys.Vol(LoanFee)_{i,t}^{PC1\Delta LF}$) is calculated within each stock-quarter as $\sqrt{(\beta_{i,t}^{PC1\Delta LF})^2 * vol(PC1\Delta LF_t)^2}$. Idiosyncratic volatility ($Idio.Vol(LoanFee)_{i,t}^{PC1\Delta LF}$) is calculated within each stock-quarter as $\sqrt{(Vol(LoanFee)_{i,t})^2 - (Sys.Vol(LoanFee)_{i,t}^{PC1\Delta LF})^2}$. $LoanFee_{i,t}$ is the stock-specific median loan fee within a quarter, calculated using daily data. White-Huber robust standard errors are employed. t-statistics are displayed in parentheses.

	Panel A					
	Dependent Variable: One quarter ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.026***			-0.023***	
		(-6.532)			(-5.291)	
$Idio.Vol(LoanFee)_{i,t}^{PC1\Delta LF}$			0.007*			0.011**
			(1.698)			(2.381)
$Sys.Vol(LoanFee)_{i,t}^{PC1\Delta LF}$			-0.488***			-0.481***
			(-13.547)			(-13.293)
$LoanFee_{i,t}$	-0.011***	-0.008***	-0.008***	-0.010***	-0.007***	-0.008***
	(-9.164)	(-5.291)	(-5.447)	(-5.334)	(-3.560)	(-3.899)
Stock FE				X	X	X
Observations	68938	68938	59129	68938	68938	59129
R^2	0.005	0.006	0.023	0.002	0.003	0.019
	Panel B					
	Dependent Variable: One month ahead return					
	(1)	(2)	(3)	(4)	(5)	(6)
$Vol(LoanFee)_{i,t}$		-0.008***			-0.010***	
		(-3.640)			(-3.854)	
$Idio.Vol(LoanFee)_{i,t}^{PC1\Delta LF}$			0.012***			0.012***
			(5.360)			(4.590)
$Sys.Vol(LoanFee)_{i,t}^{PC1\Delta LF}$			-0.277***			-0.288***
			(-14.347)			(-14.407)
$LoanFee_{i,t}$	-0.002***	-0.001	-0.001	-0.002**	-0.001	-0.001
	(-3.377)	(-1.189)	(-1.382)	(-2.124)	(-0.697)	(-1.312)
Stock FE				X	X	X
Observations	68932	68932	59124	68932	68932	59124
R^2	0.000	0.001	0.021	0.000	0.001	0.022