Bank opacity and the efficiency of stock prices

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ABSTRACT

Prior research argues that the process of intermediation is opaque and produces uncertainty about the riskiness of banks, which may adversely affect the efficiency of bank stock prices. Using the Hou and Moskowitz (2005) measure of price delay, which captures the inefficiency of stock prices, we test for, and find evidence supporting the idea that opacity is positively associated with price delay. Bank stocks have markedly higher delay than similar non-bank stocks. This higher level of delay is driven, in part, by market-based measures of informational opacity as well as the asset composition of the bank's balance sheet. Combined, our findings suggest that bank opacity reduces the efficiency of financial markets.

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1. Introduction

The theory of efficient markets posits that asset prices reflect all available information. However, what if information about the risks associated with the asset are relatively opaque? In this study, we test the hypothesis that this type of opacity within firms will result in less efficient stock prices. We focus our analysis on banks, which are arguably more opaque than other types of firms, and explore how well bank stocks incorporate market-wide information. Prior research motivates this analysis by suggesting that firm opacity can decrease the stability of stock prices and lead to lower levels of market efficiency (Fishman and Hagerty, 1989; Jin and Myers, 2006; Haggard et al., 2008). For example, Veldkamp (2006) develops a model in which investors have incomplete, firm-specific information and must rely upon common signals to predict the cash flows of firms. The lack of information leads to greater co-movement across securities and, consequently, less informed stock prices. Similarly, our hypothesis suggests that the opacity of banks might adversely influence the ability of outsiders to accurately value banks, which may lead to less informational efficiency in the stock prices of banks.

To test this hypothesis, we follow Hou and Moskowitz (2005) and estimate price delay for a broad sample of both banks and non-banks. Price delay, which is a parsimonious measure of informational inefficiency, identifies stocks that have difficulty incorporating market-wide information into their share prices. If opacity creates informational uncertainty, then bank stocks are likely to have greater difficulty incorporating (or interpreting) market-wide information. Using this measure of price delay, we conduct two sets of tests. First, we test whether the price delay of bank stocks is greater than the price delay of matched non-bank stocks. Second, focusing strictly on our sample of banks, we investigate whether opaque banks have less efficient stock prices than non-opaque banks.

The motivation for our tests is based on existing theory that suggests that opacity in the intermediation process provides uncertainty to outsiders about the inherent risks of banks (Berlin and Loeys, 1988; Diamond, 1989, 1991).[1] Campbell and Kracaw (1980) present a model that suggests that while the market can produce information, which reflects the true value of the firm's assets, the opacity associated with the risks in the intermediation process make this information production inefficient and/or costly. Empirically, Morgan (2002) finds greater heterogeneity in bond ratings for banks than for non-banks. This result seems to indicate that, because of opacity, rating agencies have difficulty understanding the risks associated with the intermediation process. Following this line of research, we argue that investors might have difficulty

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[1] Some of the literature suggests that the riskiness of banks can be explained by other characteristics, such as abnormal loan growth (Laeven and Majnoni, 2003; Berger and Udell, 2004; Foos, Norden, and Weber, 2010), regulation and diversification (Wall, 1987; Boyd, Graham, and Hewitt, 1993; Demsetz and Strahan, 1997), credit and liquidity risk (Nijskens and Wagner, 2011), and systemic risk (Diamond and Dybvig, 1983; Rochet and Tirole, 1996; Freixas, Parigi, and Rochet, 2000).

assessing the true value of banks and, therefore, bank stock prices will be less efficient than non-bank stock prices.

Our tests are also motivated by a more recent line of research. Flannery et al., (2004 and 2013) argue that if outside investors have difficulty valuing banks, then market microstructure theory suggests that bank shares should have distinct trading characteristics, such as higher bid-ask spreads and less trading volume.[2] Flannery et al., (2004 and 2013) provide some evidence that bank stocks have less market liquidity than comparable non-banks, particularly during the recent financial crisis. Furthermore, their results are driven by banks that are most likely to be opaque. In another related study, Jones et al., (2012) show that the announcements of bank mergers not only affect the stock prices of target banks, but the information in these announcements also leads to a revaluation of other banks – particularly for those with a greater degree of opacity. These findings again suggest that some investors have difficulty assessing the value of banks and therefore rely on merger valuations. The results in Flannery et al., (2004 and 2013) and Jones et al., (2012), which show that outsiders have difficulty assessing the true value of opaque banks, make tests of our hypothesis more compelling.

Consistent with our hypothesis, our first set of results show that, for a broad sample of securities, price delay is markedly higher for banks than for non-banks. In particular, we follow Flannery et al., (2004) and create matched pairs of banks and non-banks based on market capitalization and share prices. Our multivariate tests show that, after controlling for other factors that influence the level of price delay, banks experience price delay that is between 5.6% and 8.2% higher than matched non-banks, suggesting that the differences are not only statistically significant but they are also economically meaningful. Our results are stronger during the recent financial crisis period but persist during other periods.

In our second set of tests, we determine whether the less efficient stock prices observed in banks are truly driven by opacity. These tests are conducted in two ways. First, we follow Flannery et al., (2004 and 2013) and test whether microstructure measures of liquidity influence price delay for our sample of banks. Consistent with the notion that opacity (as measured by illiquidity) directly contributes to higher levels of price delay, we find that banks with higher bid-ask spreads, banks with less trading activity, and banks with larger measures of Amihud's (2002) illiquidity have higher levels of price delay. These results are both statistically and economically significant. For example, a one standard deviation increase in bid-ask spreads is associated with an increase in price delay that represents about 22% of price delay for the average bank stock.

Second, we use opaque asset structures to test whether bank opacity drives the higher levels of price delay. Consistent with much of the theoretical research that argues that bank loans are informationally opaque (Campbell and Kracaw, 1980; Berlin and Loeys, 1988; Diamond, 1989, 1991; Kwan and Carleton, 2004), we find that the ratio of real estate loans to total assets is directly related to the price delay of banks. This relation is both statistically and economically significant. For instance, our multivariate tests show that a one standard deviation increase in the ratio of real estate loans to total assets is associated with a 0.6% to a 1.2% increase in price delay. Our tests also show that the ratio of non-real estate loans to total assets is positively associated with the level of price delay for banks. In economic terms, a one standard deviation increase in the ratio of non-real-estate loans to total assets is associated with a 0.64% to a 1.30% increase in price delay. The results from these tests provide support for the idea that opacity

(in the form of higher loan-to-asset ratios) creates an environment where bank stocks may be mispriced and have difficulty incorporating market-wide information.

For robustness, we use multivariate time-series analysis to examine how bank returns and non-bank returns respond to exogenous shocks in market-wide returns. Using a vector auto regressive (VAR) process, we estimate impulse responses functions (IRFs) of both bank stock returns and non-bank stock returns in response to exogenous shocks in market returns. These time-series tests complement our analysis of price delay given that delay captures the difficulty of individual stock prices in incorporating market-wide information. The impulse response functions measure how bank stock returns respond to exogenous shocks to market-wide returns. Our results seem to indicate that, relative to non-bank stock returns, it takes longer for bank returns to revert back to normal levels following these innovations in market-wide returns. These findings provide confirmation for our earlier results that banks are less efficient than non-banks. Additionally, we estimate the VAR processes for our sample of banks to determine whether IRFs differ between a sample of opaque banks and non-opaque banks. Opaque banks are first defined as those that have the highest bid-ask spreads (the most opaque banks) while non-opaque banks are those banks with the lowest bid-ask spreads (the least opaque banks). The results from these tests provide supportive evidence that innovations in market returns destabilize the returns of opaque banks more than the returns of non-opaque banks. As an additional measure of robustness, we also examine the IRFs of banks with the highest loan-to-asset ratios and banks with the lowest loan-to-asset ratios. These results show some evidence, albeit weaker, that opaque banks respond differently to shocks in market-wide returns than non-opaque banks.

The results in this study provide an important contribution to the literature by documenting that not only are the stock prices of banks less efficient than those of similar non-banks, but the inefficiency of bank stocks is driven, to some degree, by the level of opacity. These results provide a greater understanding about the role of opacity as it relates to the flow of information into stock prices. As Morgan (2002) argues, much of the regulatory structure for banks is based on the idea that outsiders face inherent uncertainty about the riskiness of banks. Our results suggest that this uncertainty reduces the ability of outsiders to properly access value-related information (Campbell and Kracaw (1980)). Morgan (2002) and Jones et al., (2012) argue that the opacity of banks inhibits effective market discipline, which exposes the entire financial system to bank runs, contagion, and other strains of systemic risk. Consistent with this argument, our findings suggest that the lack of market discipline created by bank opacity can also influence the informational efficiency of stock prices.

2. Data description

To carry out our analysis, we obtain every listed security on the Center for Research in Security Prices (CRSP) for the period January of 1996 to December of 2008.[3] From CRSP, we obtain daily returns, volume, market capitalization, and shares outstanding. From Compustat, we gather balance sheet data for each firm used in the sample. We follow Flannery et al., (2004) and create a sample of banks and matched non-banks. First, we extract all

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[2] Kyle (1985), Glosten and Milgrom (1985), and Copeland and Galai (1983) provide the theoretical foundation showing that, in the presence of information asymmetries, bid-ask spreads will widen and trading activity will decrease.

[3] Our choice of time period is based on the likelihood that the financial crisis brought about regulation targeting banks, which likely affected the efficiency of bank stock prices. For fear that our results could be driven by this time period, we chose to conclude our sample in the end of 2008 before many of these regulation policies went into effect. We realize that the cutoff is ambiguous so we have replicated much of our analysis without including 2008 and find the results to be qualitatively similar to those reported in this study.