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Credit conditions and stock return predictability

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ABSTRACT

U.S. stock return predictability is analyzed using a measure of credit standards (*Standards*) derived from the Federal Reserve Board's Senior Loan Officer Opinion Survey on Bank Lending Practices. *Standards* is a strong predictor of stock returns at a business cycle frequency, especially in the post-1990 data period. Empirically, a tightening of *Standards* predicts lower future stock returns. *Standards* performs well both in-sample and out-of-sample and is robust to a host of consistency checks. *Standards* captures stock return predictability at a business cycle frequency and is driven primarily by the ability of *Standards* to predict cash flow news.

1. Introduction

A large literature in finance and economics has documented stock return predictability using variables such as market valuation ratios, short- and long-term interest rates, firm financing patterns, the consumption-to-wealth ratio, and many other economic variables.[1] But recently, an active debate has arisen over whether any of these economic variables predict future excess stock returns better than historical average excess returns. Goyal and Welch (2008) argue that many predictive variables used in the literature perform poorly both in-sample and out-of-sample, especially over the last 30 years. In contrast, Campbell and Thompson (2008) show that many predictive regressions beat the historical average return once weak restrictions are imposed on the signs of coefficients and return forecasts. This paper contributes to this literature by providing evidence that an economically motivated predictive variable that measures credit conditions from a survey of bank officers has robust in-sample and out-of-sample predictive power in forecasting excess stock returns. Further, the predictive power is strongest in the post-1990 time period and is quantitatively significant.

Our work is motivated by several papers that study how supply-based measures of credit could impact the economy. Some of this work was prompted by papers that have studied the impact of the Federal Reserve's monetary policy on stock returns (Patelis (1997), Thorbecke (1997), and Bernanke and Kuttner (2005) among others) as well as the behavior of business condition proxies such as term premia, default premia, and dividend yields (Jensen et al., 1996). A possible explanation of the predictive power of monetary indicators relates to the credit channel of monetary policy transmission (Bernanke and Gertler, 1995). In particular, tighter monetary policy leads to a reduced and costlier bank loan supply that in turn impacts future stock returns. However, past work has not considered the direct influence of bank loan supply changes

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[1] See Koijen and van Nieuwerburgh (2013) for an extensive review of the predictability literature.

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on stock returns. In particular, it is unclear whether the credit channel either through a monetary policy transmission mechanism or some other economic channel has predictive power for stock returns. In this paper, this issue is addressed by examining whether shocks to the aggregate supply of bank loans predict stock returns.

Besides the credit channel transmission mechanism, fluctuations in the supply of bank loans can be caused by frictions in the credit creation process through bank views of future market conditions.[2] In particular, if agency costs time-vary as in the financial propagation mechanism described in Fazzari et al. (1988) and Bernanke and Gertler (1989), banks can change their supply of credit based on their views of borrowers' balance sheets. In a speech at the Federal Reserve Bank of Atlanta, Bernanke (2007) argues that the supply of bank loans is tightly linked to the credit channel of monetary policy.

Bank lending standards, or the terms in which loans are offered, have been used as a bank loan supply measure in several papers to study whether banks change their loan supply systematically over the business cycle and if there is an important loan supply effect in macroeconomic fluctuations. Asea and Blomberg (1998) examine the relationship between the cyclical component of aggregate unemployment and bank lending standards. Using a bank-level panel data set constructed from the terms of individual loan contracts, they find that cycles in bank lending standards are important in explaining aggregate economic activity. Our work uses survey data on bank lending standards obtained from the Federal Reserve's Senior Loan Officer Opinion Survey (SLOS). An earlier study using this data is Lown and Morgan (2006) who find that shocks to lending standards are significantly correlated with innovations in commercial loans and in real output. In particular, they find that "bank lending standards are far more informative about future lending than are loan rates." Building from this work, Bassett et al. (2014) use bank-level responses on changes in bank lending standards with an econometric model to control for the effect of loan demand. They find that tightening shocks to their credit supply indicator is significantly related to a decline in output and a widening of corporate credit spreads. Gorton and He (2008) show that the relative performance of commercial and industrial loans leads to endogenous credit cycles and is an autonomous source of macroeconomic fluctuations.

Despite this linkage of bank lending to macroeconomic variables, limited evidence exists whether changes in bank loan supply predict stock returns, which is our contribution. Keim and Stambaugh (1986), Campbell (1987), Fama and French (1988, 1989), Schwert (1990), and Cooper and Priestley (2009) provide evidence that business condition proxies such as aggregate dividend yield, default spreads, term spreads, the level of short-term interest rates, and a measure of the output gap can predict stock returns. Given some of these variables are also driven by market prices, it is difficult to discern if their predictive power is driven by rational time-varying opportunity sets or simply mispricing. Our work examines whether bank lending standards, a variable that captures aggregate supply-side credit conditions, that is not a direct function of equity market prices, serves as a leading indicator of future stock returns. In contemporaneous work to our own, Adrian et al. (2010) analyze the stock return predictability of several financial intermediary balance sheet variables and find that the annual growth rate of security broker–dealer leverage predicts future stock returns. In a supplementary appendix, our bank lending standards measure, meant to capture the supply of credit from commercial banks, still forecasts stock returns once controlling for the Adrian et al. (2010) broker–dealer leverage measure.

Our work joins a growing literature that uses survey data to explain stock returns and macroeconomic variables. Campbell and Diebold (2009) find that expected business cycle conditions obtained from the Livingston survey data has forecasting ability for stock returns. Ang et al. (2007) use the Livingston survey, the Survey of Professional Forecasters, and the Michigan survey to build inflation expectations. They show that the survey-based measures of inflation outperform other forecasting methods out-of-sample. For predictions of various macro variables, Engel et al. (2007), Engel and Rogers (2006, 2009) and Ghysels and Wright (2009) use the Consensus Forecasts survey data. Lown and Morgan (2006) document the predictive power of the SLOS on loan growth, GDP growth, and various other measures of business activity. The SLOS is used to provide direct evidence of the relationship between credit conditions through a bank loan supply measure and future excess stock returns.

Overall, our measure of credit conditions derived from the Federal Reserve Board's SLOS is a strong predictor of U.S. stock returns at frequencies up to and including a year. This measure contains information beyond the variables shown to have predictive power from the past predictability literature. Given this measure has been shown to predict macroeconomic variables in Lown and Morgan (2006), our work provides a direct link to stock return predictability and an aggregate macroeconomic supply variable. This credit condition measure performs well both in-sample and out-of-sample. It is also robust to a small sample bias analysis and a host of consistency checks that are summarized in a supplemental appendix.

Economically, it is important to understand the source of the predictability of bank lending standards. Our evidence, both from a Campbell and Shiller (1988) decomposition and from a vector autoregression approach advocated in Cochrane (2008, 2011) is consistent with bank lending standards predicting stock returns through a cash flow channel. In particular, bank lending standards strongly predicts future cash flow growth directly. Tightening credit standards predict lower expected future cash flows, hence lower future stock returns. These results are in line with agency or information imperfections at both the firm and bank level impacting real economic activity (Bernanke and Blinder, 1988; Bernanke and Gertler, 1989; Holmstrom and Tirole, 1997; Stein, 1998). Banks inability or unwillingness to extend credit to firms causes firms to reduce investment in some positive NPV investment projects leading to a drop in firm value (Chava and Purnanandam, 2011).

Our work joins a small, but growing, literature emphasizing the importance of cash flows in understanding stock market predictability. Recent examples include Lettau and Ludvigson (2005), Larrain and Yogo (2008), Bansal and Yaron (2011),

[2] See Berlin (2009) for a survey of models that explain bank lending cycles.