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# Did the value premium survive the subprime credit crisis?

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ABSTRACT

We provide evidence that value stocks significantly underperformed growth stocks during the subprime credit crisis, despite a positive value premium before the crisis. The reversal in the value premium concentrates in financially constrained firms, suggesting it was due to the adverse influence of the crisis rather than confounding effects. These findings are robust to alternative financial constraint proxies and asset pricing models. The observation that value stocks are vulnerable to losses during extreme downturns like the crisis is consistent with them being riskier than growth stocks. Our findings have implications for the academic debate on the underlying cause of the value premium and for investors on the profitability of value investing strategies.



## 1. Introduction

We examine the impact of the subprime credit crisis that started in early 2007 on the well documented value premium in the US market. The general consensus is that this was the worst financial crisis since the Great Depression of the 1930s (e.g., IMF, April 2008).[1] Originating in the housing mortgage market, it quickly resulted in a credit crunch that permeated the entire capital market and adversely affected the external funding of non-financial firms (Brunnermeier, 2009; Krishnamurthy, 2010; Wilson, Casu, Girardone, & Molyneux, 2010). Extreme market downturns provide a useful research setting to explore the value premium, which has been popularized by the endorsement of well-known investment practitioners such as Warren Buffett (Damodaran, 2012) and characterized in the academic literature in terms of mispricing vs. risk (Alwathainani, 2009; Fama & French, 1996, 1998; Richardson, Tuna, & Wysocki, 2010; Strong & Xu, 1997). Empirical evidence on whether the value premium persists, diminishes, or even reverses during an exogenous event like the crisis has interesting implications for both academics and practitioners. To date, however, the literature on the influence of the crisis focuses largely on market liquidity and corporate finance (e.g., Dick-Nielsen, Feldhutter, & Lando, 2012; Duchin, Ozbas, & Sensoy, 2010; Erkens, Hung, & Matos, 2012) and does not explore its impact on equity investment. We fill this gap.

The academic literature contains two schools of thought that explain the value premium, the phenomenon that higher book-to-market equity, or value stocks, earn higher returns than lower book-to-market equity, or growth stocks. The first explanation involves security mispricing and implies market inefficiency (e.g., Lakonishok, Shleifer, & Vishny, 1994; Skinner & Sloan, 2002). It argues that judgmental errors by investors induce systematic underpricing of value stocks and overpricing of growth stocks, resulting in higher and lower returns respectively as prices gravitate towards intrinsic values. The second

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[1] 'The financial market crisis that erupted in August 2007 has developed into the largest financial shock since the Great Depression, inflicting heavy damage on markets and institutions at the core of the financial system.' World Economic Outlook, April 2008, The International Monetary Fund.

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explanation attributes the value premium to risk and implies market efficiency (e.g., Avramov & Chordia, 2006; Chen & Zhang, 1998; Fama & French, 1996, 1998). It argues that value stocks are risker than growth stocks, and the higher returns of the former are compensation to investors for bearing higher risk. If value stocks are riskier, there should be evidence that they underperform growth stocks during "bad times" or periods when investors' marginal utility of consumption is high (e.g., Barberis & Thaler, 2003, pp. 1053–1128). Lakonishok et al. (1994), however, show that the value premium does not necessarily diminish or reverse during the down markets or recessions they examine.

The financial crisis of 2007/2008 provides a natural experiment to evaluate whether value stocks are riskier than growth stocks. There is evidence that this crisis reduced the availability of external funding to non-financial firm. For instance, based on an analysis of syndicated loans, Ivashina and Scharfstein (2010) document a dramatic reduction of lending to corporate borrowers during the crisis. They argue that the drop in lending was more severe than in a typical recession because of the additional impact of bank failures. There is also evidence that shortage of external funding during the crisis adversely affected firms' operating activities, especially for financially constrained firms. For instance, based on a survey of over 1000 CFOs, Campello, Graham, and Harvey (2010) document that financially constrained firms planned deeper cuts in spending, used up more of their cash reserves, sold more assets to fund projects, and passed up more investment opportunities. If value stocks are riskier, they should have underperformed growth stocks during the extreme conditions of the crisis and this effect should have concentrated among financially constrained firms.[2]

To test our assertions, we compare the value premium in the US before the crisis (01/1963–03/2007) and during the crisis (04/2007–12/2008). We sort firms into decile portfolios based on book-to-market equity, and use the difference in returns between the top and bottom deciles to capture the value premium.[3] We repeat this analysis conditioning on firms' financial constraints by independently sorting firms on three financial constraint proxies, namely total assets, due-to-total long-term debt ratio, and Whited and Wu's (2006) index. We benchmark the returns against the Carhart (1997) and Fama and French (1996) factor model. As a robustness test, we incorporate industry portfolio returns into the model and consider the investment-based asset pricing model of Hou, Xue, and Zhang (2012).

Our findings are as follows. Consistent with previous studies (e.g., Richardson et al., 2010), value stocks earn higher returns than growth stocks, giving a significant value premium before the crisis. During the crisis, value stocks earn significantly lower returns than growth stocks, leading to a value discount, consistent with our prediction. Comparing stock returns in the crisis and pre-crisis periods, value stocks experience significantly greater return reductions than growth stocks, suggesting that the value tail rather than the growth tail drives the value premium reversal. This implies that adverse economic conditions affect value stocks and contrarian investment strategies due to their higher risk.[4,5]

Conditioning on financial constraint proxies, the value premium exists only among constrained firms before the crisis. This evidence also supports the argument that value stocks earn higher returns because they are risky.[6] During the crisis, value stocks underperform growth stocks among more financially constrained firms while the value premium diminishes among less constrained firms. The value premium reversal among more constrained firms is due to a significant decline in the returns of value stocks rather than an increase in the returns of growth stocks. Since financially constrained firms are more vulnerable to a credit crunch, our findings of a greater value premium reversal among such firms strengthens the inference that this effect is due to the financial crisis rather than unidentified confounding effects.

Our study contributes to the literature through its implications for academics and practitioners. We provide original empirical evidence, based on the impact of the 2007/2008 financial crisis, that value stocks, especially those of more financially constrained firms, underperformed during a period of high marginal utility of consumption, consistent with the risk explanation of the value premium. Our findings also imply that factor models such as those of Carhart (1997), Fama and French (1996), and Hou et al. (2012) may not fully capture the underlying risks that drive the value premium. For practitioners, our findings suggest that value investing may not be profitable, can lead to greater risk exposure, and is more suitable for investors with lower risk aversion.

The paper continues as follows. Section 2 reviews the relevant literature and develops hypotheses. Section 3 discusses the sample, data, and methodology. Section 4 contains empirical results. Section 5 concludes.

[2] The crisis could have affected the performance of financially constrained firms through the supply side (i.e., restricted access to finance reduced their profitability) or the demand side (investors lost confidence more readily in these firms given their potential exposure to the crisis). Tong and Wei (2008) suggest that both channels were at work and the supply side was economically more evident.

[3] Other measures used to identify value and growth stocks include dividend-to-price, earnings-to-price, cash flow-to-price, and sales growth. We use book-to-market equity not only because it is the most widely used measure, but also because the credit crisis is less likely to affect equity book values. The crisis may have made earnings, cash flow, dividends, and sales too noisy to identify value and growth stocks during the crisis.

[4] Our findings offer counter-evidence to the mispricing explanation of the value premium, which attributes it to investor underreaction to the bad performance of growth stocks (e.g., Griffin & Lemmon, 2002; Skinner & Sloan, 2002), because if lower returns of growth stocks drive the value premium, growth stocks rather than value stocks should drive any changes during the financial crisis.

[5] While we find evidence supporting the risk explanation of the value premium, the reason why value stocks are risky is outside the scope of this study. Value stocks may be risky due to higher financial leverage or greater earnings uncertainty (e.g., Chen & Zhang, 1998). The underperformance of value stocks during the crisis may be due to costly reversibility during bad times making it harder to reduce assets in place (Zhang, 2005) or to their being exposed to higher liquidity risk due to a flight-to-quality during bad times (Akbas, Boehmer, Genc, & Petkova, 2010).

[6] Whether financially constrained firms are systematically risky is still unclear in the literature. While there is evidence that financially constrained firms' returns covary, suggesting they are affected by common shocks, there is no significant premium associated with this systematic risk (Gomes, Yaron, & Zhang, 2006; Lamont et al., 2001; Whited & Wu, 2006).