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High short interest effect and aggregate volatility risk[☆]

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ABSTRACT

We propose a risk-based firm-type explanation on why stocks of firms with high relative short interest (RSI) have lower future returns. We argue that these firms have negative alphas because they are a hedge against expected aggregate volatility risk. Consistent with this argument, we show that these firms have high firm-specific uncertainty and option-like equity, and the aggregate volatility risk factor can largely explain the high RSI effect. The key mechanism is that high RSI firms have abundant growth options and, all else equal, growth options become less sensitive to the underlying asset value and more valuable as idiosyncratic volatility goes up. Idiosyncratic volatility usually increases with aggregate volatility (i.e., in recessions).

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1. Introduction

It is well established that stocks of firms with high relative short interest (RSI) have low future returns (e.g., [Asquith, Pathak, and Ritter, 2005](#)). In this paper, we call this pricing anomaly the high RSI effect. Theoretical models that try to explain the high RSI effect build on seminal work by [Miller \(1977\)](#) and [Diamond and Verrecchia \(1987\)](#). [Miller \(1977\)](#) argues that the presence of short sales

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constraints keeps pessimistic investors out of the market, which leads to overvaluation, and subsequent corrections result in low returns (e.g., Jones and Lamont, 2002; Asquith, Pathak, and Ritter, 2005; Boehme, Danielsen, and Sorescu, 2006, 2009). Diamond and Verrecchia (1987) propose that short sellers are more likely to be informed because short sales are more expensive than long transactions. Among others, Dechow, Hutton, Meulbroek, Sloan (2001) and Boehmer, Jones, and Zhang (2008) argue that due to slow incorporation of the information short sellers have, highly shorted firms can have lower future returns.²

Both explanations for the high RSI effect, however, are not quite satisfactory for rational asset-pricing due to the assumption of some type of investors' irrationality. The Miller argument assumes that some optimists repeatedly fall prey to the winner's curse. Indeed, even if the short-sale constraints keep pessimists out of the market, the remaining optimists should not pay for the short-sale constrained stocks as much as they do since they should be aware of the bad historical performance of such stocks.³ The informed short sellers argument suggests not only that short sellers short "bad" shares, but also that other investors fail to correctly process the information in short interest even after it is revealed to them. It is not surprising that heavily shorted firms underperform after they are shorted, but it is surprising, if one believes in investors' rationality, that heavily shorted firms continue to do poorly (several months into the future) even after everyone learns that they are heavily shorted.

In this paper, we propose an alternative risk-based firm-type explanation on why high RSI firms have lower future returns. In contrast to the two theories above, this explanation does not require the assumption of investors' irrationality. We argue that high RSI firms have lower aggregate volatility risk, that is, they tend to outperform when expected aggregate volatility unexpectedly increases. The key reason is that high RSI firms turn out to be firms with high firm-specific uncertainty and option-like equity.⁴

The negative relation between various measures of firm-specific uncertainty and equity option-likeness and aggregate volatility risk has been empirically confirmed in several studies. Barinov (2011) shows that growth firms and high idiosyncratic volatility firms have low aggregate volatility risk. Barinov (2013, 2014) demonstrates a similar relation between turnover and aggregate volatility risk and disagreement and aggregate volatility risk, respectively.

We first examine whether high RSI firms have high uncertainty and option-like equity. We show that high RSI firms indeed possess higher levels of firm-specific uncertainty and more option-like equity than low RSI firms or firms in the whole Compustat sample. Since prior work has established that our measures of firm-specific uncertainty and equity option-likeness are negatively related to aggregate volatility risk, this evidence means that high RSI firms are also likely to have low aggregate volatility risk.

We start our tests of the aggregate volatility risk explanation of the high RSI effect by presenting anecdotal evidence from the most recent recession. We show that high RSI firms experience much smaller losses than what is suggested by their market beta, implying that high RSI firms behave like a hedge against aggregate volatility risk. We then examine whether augmenting several benchmark asset pricing models with the aggregate volatility risk factor (FVIX) can explain the high RSI effect. We find that high RSI firms yield no negative alphas when controlling for FVIX. The main reason is that high RSI firms have strong and positive loadings on the FVIX factor that tracks changes in VIX, our measure of expected aggregate volatility. By construction, the FVIX factor earns positive returns when aggregate volatility increases. Therefore, positive FVIX betas of high RSI firms indicate that these firms outperform when aggregate volatility increases, thereby they act as a hedge against aggregate volatility risk.

² This last sentence steps outside the Diamond and Verrecchia (1987) model because in their model prices are unbiased. Their model shows that the price discovery process is slower with short sale constraints (e.g., Bris, Goetzmann, and Zhu 2007; Saffi and Sigurdsson, 2011; Boehmer and Wu, 2013).

³ Duffie, Garleanu, and Pedersen (2002) introduce bargaining power over lending fees and show that, in a dynamic model and in the presence of irrational optimistic investors, some rational investors are willing to pay a very inflated price.

⁴ Equity can be option-like either because it is a claim on option-like assets (growth options) or because it is an option on the assets due to risky debt.

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