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Systematic risk, government policy intervention, and dynamic contrarian investments☆

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ABSTRACT

When systematic risk is high, or the market crashes, most risk-averse investors choose to exit the market; however, there are some contrarian investors who opt to make investments. We model such contrarian behaviors by incorporating investors' expectations of government policies into the conventional risk–return trade-off framework. We show that when policy risk is low and there is a high probability that the market will recover subsequent to government intervention, the optimal solution is for investors to make investments. However, when the policy risk is high and the market has a high probability of deteriorating, the optimal investment decision is to exit. Our simulation results are consistent with the model predictions.

"*Mr. Buffett says he still felt the government had the tools to head off calamity… As the government swung into action, Mr. Buffett recalls, he gained confidence that the crisis would be resolved.*"—The Wall Street Journal, December 14, 2009

1. Introduction

In the midst of a market crash, most risk-averse investors choose to exit the market; however, there are some contrarian investors who opt to make investments. For example, during the financial crisis of 2008 as reported by *The Wall Street Journal*, Warren Buffett looked "into the abyss" in a year of investing dangerously. After the government announced a guarantee of assets in money-market funds in September 2008, he decided to purchase the stocks of Goldman Sachs, General Electric, and Burlington Northern Santa Fe. These deals, according to Warren Buffett, were based on his faith that the government "would stave off the kind of financial catastrophe".[1]

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[1] "In Year of Investing Dangerously, Buffett Looked 'Into the Abyss'", by Scott Patterson, *TheWall Street Journal*, December 14, 2009.

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When the stock market crashes and systematic risk elevates, investors expect governments to undertake new policies to "save" the market. But it is uncertain whether government intervention, through its visible hands, will succeed, so comes with a certain level of policy risk. As illustrated by the Warren Buffett example, investors appear to make their investment decisions during financial crisis periods based on the expected risk of government intervention policies.

In this paper, we attempt to explain such risk-seeking behavior of contrarian investors by incorporating exogenous government policy risks into the model. Contrarian investors are those that do not "herd", or those with "uncommon strategies" (Wei, Wermers, & Yao, 2014). Contrarian investment profit has been attributed to investors' overreactions to both good and bad news (DeBondt & Thaler, 1985). Lakonishok, Shleifer, and Vishny (1994) show that value strategies produce higher returns because they contrast with the "naive" strategies followed by other investors. De Hanna and Kakesb (2011) report that Dutch institutional investors tend to be contrarian traders; i.e., they buy past losers and sell past winners. Differing from this behavioral finance perspective, our explanation of contrarian investments is derived from a "rational", or traditional risk–return perspective.

Previous studies have investigated both the impact of government political risks and uncertainty on asset prices and risk premia. Pastor and Veronesi (2012) analyze how changes in government policy can affect stock prices by using a general equilibrium model of existing uncertainties about government policies and government decisions. One of their model's predictions is that government policy changes are more likely to occur after "bad" periods, including downturns or periods of unexpectedly low profitability. This prediction is consistent with Alesina, Ardagna, and Trebbi (2006) who find evidence that a crisis is likely to induce government policy reform. Similar findings are also reported in the political economy literature, including Rodrik (1996); Drazen (2000), and Drazen and Easterly (2001). In the same vein, Pastor and Veronesi (2013) models the effect of political uncertainty on risk premia; their model implies that political risk is associated with an increased risk premium, with a larger magnitude in weaker economic conditions. Such a positive relation between the equity premium and political risk has been supported by several empirical studies, including Pantzalis, Stangeland, and Turtle (2000); Li and Born (2006), and Brogaard and Detzel (2012). An important contribution of our model is that we extend the two dimensions of the traditional risk–return capital asset pricing model (Lintner, 1965; Mossin, 1966; Sharpe, 1964) to three dimensions by incorporating investors' expectations of government policies when systematic risk is high: a policy-risk–return model.

We show that, in addition to the conventional risk–return trade-off, contrarian investors consider the risks of government intervention policies when they make investment decisions during a financial crisis. Our model suggests that when the policy risk is low and there is a high probability that the market will improve subsequent to government intervention, the optimal solution for investors is to make an investment. Conversely, when the policy risk is high and there is a high probability that the market will get worse, the optimal investment decision is to exit. Consistent with Lin and Lin (2014), we show that government policies play an important role in affecting investors' behavior. Our simulation results are consistent with the model predictions.[2]

2. Basic model

2.1. Contrarian investment return function

Assuming a certain risk of σ and an expected exogenous policy intervention of p, we model the function of the dynamic contrarian investment return μ as follows:

$$\mu(\sigma, p) = \left(1-p^{\alpha}\right)\sqrt{1-\sigma^2} + bp^{\alpha}\sigma^{n} + c \tag{1}$$

where b is a return adjustment factor: $b = 1$; $0 < n \le N$; α is a parameter showing the speed of the government policy effect; and c is a constant.

Note that b is a return adjustment factor that shows the effect (including both the direction and the magnitude) of government policy on the market systematic risk. When $b > 0$, it indicates that government policy has a positive (good) effect on the systematic risk; the larger b is, the bigger the positive effect (i.e., the market is improving). When $b < 0$, it indicates that government policy has a negative (bad) effect on the systematic risk; the larger b is, the bigger the negative effect (i.e., the market is deteriorating). In our model, we assume that $b = 1$, and that the effect of government policy on the systematic risk is at the "right" level and the systematic market risk is back to normal.

Fig. 1 below shows a simulated three-dimensional dynamic indifference surface for contrarian investment return given various systematic risk expectations based on Eq. (1).[3] The figure is a collection of numerous indifference curves across a continuous-time stochastic process over a certain time period, with each curve representing a trade-off between the expected contrarian investment return m and a certain level of risk s. The value of $p$in the figure indicates the extent to which exogenous policy intervention affects the systematic risk. The A-A curve in Fig. 2a depicts contrarian investors' Tobin risk-seeking preferences at the beginning of a period when the systematic risk is high (or a financial crisis occurs). The B–B curve in Fig. 2b depicts contrarian investors' Markowitz risk aversion at the end of a period when the systematic risk reduces to a normal level. Together, the figures show that as the effects of exogenous policy intervention on the systematic risk increase, the risk behavior of contrarian investors will also change, transitioning

[2] Similarly, Zhou (2013) models the impacts of the confidence on market equilibrium and shows that a contrarian trading pattern arises due to the insider's overconfidence. Vo (2008) shows that early-informed investors may behave like contrarians.

[3] According to the Modern Portfolio Theory and Capital Asset Pricing Model, only systematic risk matters in pricing capital assets, while firm-specific or non-systematic risk can be diversified away in a well-diversified portfolio.