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Does the equity premium puzzle persist during financial crisis? The case of the French equity market

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ABSTRACT

This paper examines the effects of the financial crisis that began in 2008 on the equity premium of 6 French sector indices. Since the systematic risk coefficient beta remains the most common explanatory element of risk premium in most asset pricing models, we investigate the impact of the crisis on the time-varying beta of the six sector indices cited. We selected daily data from January 2003 to December 2012 and we applied the bivariate MA-GARCH model (BEKK) to estimate time-varying betas for the sector indices. The crisis was marked by increased volatility of the sector indices and the market. This rise in volatility led to an increase in the systematic risk coefficient during the crisis and first post-crisis period for all the major indices. The results are intuitive and corroborate findings in the empirical literature. The increase of the time-varying beta is considered by investors as an additional risk. Therefore, as expected, investors tend to increase their equity premiums to bear the impact of financial crisis.

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1. Introduction

The crisis of 2008 is considered as the worst financial crisis since the Great Depression of the 1930s as, even today, the world still lives under its impact on the global economy. It was triggered by a liquidity shortfall in the United States banking system, causing the collapse of large financial institutions, the bailout of banks by national governments and downturns in stock markets around the world. Equity premium is the excess return that an individual stock or the overall stock market provides over a risk-free rate (such as a Treasury bill) during a given period. In their seminal paper nearly three decades ago, Mehra and Prescott (1985) proved that equity premium is too large to reflect a 'proper' level of compensation that would occur as a result of investor risk aversion. They dubbed this historical regularity 'the equity premium puzzle'.

A large number of explanations have been proposed. Some authors explain the puzzle through an analysis of full rationality by introducing more complex utility functions. Epstein and Zin (1989) and Weil (1989) use a utility function that splits The tight relationship between the risk aversion coefficient and the elasticity of inter-temporal substitution, while Constantinides (1990), Campbell and Cohrane (1999) and Boldrin et al. (1997) introduce the utility function with habit formation.

Others see the puzzle as a result of market friction such as transaction costs Amihud and Mendelson (1986, 1989), Aiyagari and Gertler (1991), Fisher (1994) and asymmetric information (Merton (1987), Zhou (1999), Bellalah and Aboura (2001), Gollier and Schlee (2003).

An alternative explanation for the puzzle has been proposed under the frame-work of behavioral finance. The most distinguished behavioral finance explanations proposed so far in the literature include myopic loss aversion (Benartzi and Thaler, 1995; Barberis et al., 2001), disappointment aversion (Gul, 1991; Ang et al., 2005), Ambiguity aversion (Epstein and Wang, 1994; Chen and Epstein, 2002; Gollier, 2006; Erbas and Mirakhor, 2007; Alonso and Prado, 2008), and heterogeneous beliefs and pessimism (Abel, 2002; Jouini and Napp, 2006).

Another explanation for the high level of equity premium is that it is a result of extraordinary events, such as financial crises, war, etc. The idea was first proposed to explain the equity premium puzzle by Rietz in 1988. Since then, other researchers have backed up this idea with further evidence (Barro, 2006; Gabaix, 2008).

Given the effects of the recent financial crisis on both the economy and the financial markets, it is interesting to empirically study the effects of the crisis on the existence and magnitude of equity premium.

Since portfolio managers often take industrial level stock in financial portfolios into consideration, we investigated the effects of the 2007–2010 crisis and Eurozone crisis on the time-varying beta of the six French sector indices from the level 1 Industry Classification Benchmark (ICB) (it should be noted that the beta remains the most common explanatory element of risk premium in most asset pricing models).

In this paper, the time-varying beta is estimated by means of Engle and Kroner (1995)'s bivariate BEKK GARCH model. To our knowledge, most studies conducted to date concern the effects of the Asian financial crisis on equity markets or firms around the world. Chen and So (2002) observed that during the Asian financial crisis, the volatility observed in the global financial markets also increased. When stock returns are more volatile, market risk (beta) is likely to be higher, with stronger stock price responses for firms that have greater exposure to the source of risk. Maroney et al. (2004) explored risk and return relations in six Asian equity markets affected by the 1997 Asian financial crisis. Their findings show that national equity betas increased and average returns fell substantially after the start of the crisis, which they believe to be due to leverage increases. Choudhry (2005) provided a study of the effects of the Asian crisis on the beta of Malaysian and Taiwanese firms. The results indicate a rise in the beta during the crisis, especially in the case of Malaysian firms. More recently, Choudhry et al. (2010), empirically investigated the impact of the 1997–98 Asian financial crisis on the time-varying beta of four industrial sectors (chemicals, finance, retail and industry) in Indonesia, Singapore, South Korea and Taiwan. They showed that during the crisis period (1997–98) and the post-crisis period there was a substantial increase in the positive impact of the individual industry's conditional volatility on time-varying betas.