



EQUITY RISK PREMIUM: THE CHARACTERISTICS AND  
DETERMINANTS IN CRISIS AFFECTED EMERGING  
MARKETS

BY

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## ABSTRACT

The flow of foreign portfolio investment in emerging markets is growing but is lower than market capitalization growth due to the relatively higher investment risk inherent in those markets. This is exacerbated by the fact that most emerging markets have been adversely affected, albeit with varying degree, by financial crises. As a central component in the risk and return concept, research in equity risk premium (ERP) is imperative, particularly if financial crisis dimension is coalesced into the study. Hence, this study is conducted to examine the characteristics and determinants of the equity risk premium in the emerging markets inflicted by various financial crises. In the first part, panel regressions are utilized to examine the determinants of ERP, while in the second part, event study methodology is used to investigate the immediate impact that financial crises had on the levels of ERP in the emerging markets. The findings in the overall panel regression are different from the findings in the group regressions that take into account the various crises and different time periods. Although GDP per capita growth rate and inflation rate are consistently positively significant in the overall regressions, the results do not persist in the crises-grouped regressions. These findings extend the current literature on the determinants of ERP as well as the characteristics of emerging market crises. In the event study analysis, the mixed results indicate that each emerging market is uniquely different in terms of how the ERP was affected at the onset of the crises. Furthermore, the grouped cumulative abnormal equity risk premium (CAERP) findings indicate that the crises also are distinctly different from each other. The Tequila crisis is the worst hit crisis, followed by the Russian crisis and the Asian crisis, as far as the CAERP findings are concerned. Furthermore, there are also differences in the results calculated using estimates from different regressions, namely, the OLS, ARCH and GMM regressions. Thus, the findings of this study have contributed to the current literature, as well as having practical implications to the practitioners such as fund managers and corporate managers who rely heavily on the equity risk premium as a key input in their decision-making processes.

## خلاصة البحث

سيلان الاستثمارات الخارجية في الأسواق الجديدة ينمو ولكنه أقل من نمو رأسمالية الأسواق وفق وجود أعلى نسبي لمخاطرة الاستثمار التي تترتبها تلك الأسواق. وهذه الظاهرة تفاقمها الحقيقة التي تقول أن أغلبية الأسواق الجديدة تتأثر بشكل الواضح بأزمات مالية ولو يختلف حد تلك الأزمات لكل واحد منها. كما أن العنصر الوَسْطِي في المخاطرة ونظام العائد، فالبحت في قسط مخاطرة العقار يعتبر ضروريا لا سيما في حالة تندمج وجهة أزمة مالية بهذه الدراسة. وبالتالي، يهدف هذا البحث إلى فحص العناصر والعوامل المقررة لقسط مخاطرة العقار داخل الأسواق الجديدة التي ابتليت بالأزمات المالية المتعددة. وفي القسم الأول في هذا البحث استخدم تحليلُ الإنحدار للوحة (panel regression) لفحص العوامل المقررة لقسط مخاطرة العقار، بينما استخدم منهجُ بحث الحادثة ( event study methodology) لفحص تأثير مباشر للأزمة المالية على قسط مخاطرة الأسواق في الأسواق الظاهرة. فإن النتائج المأخوذة من تحليل الإنحدار للوحة (panel regression) متباينة عن النتائج المأخوذة من تحليل الإنحدار للمجموعة (group regression) الذي أخذ بعين الاعتبار وجود عدة أزمات وجرياتها في الأزمان المختلفة. وبالرغم أن معدل الانتاج الداخلي (GDP) مقابل معدل نمو لكل فرد، ومعدل التضخم، لا يزال ايجابيا بالشكل المستمر في تحليل الإنحدار الكلي للوحة، فإن النتائج لا تظهر مثل ذلك في أزمات وفق تحليل الإنحدار للمجموعة. وأخيرا فإن النتائج قد أضافت شيئا جديدا للدراسات السابقة الموجودة بشأن مقررة (determinants) لقسط مخاطرة العقار وكذلك للموصفات لأزمات الأسواق الجديدة. وفي تحليل دراسة الحادثة، فإن النتائج المتعددة تبلور أن لكل السوق الجديد يختلف من ناحية تأثير قسط مخاطرة العقار بالأزمات المالية. ومن هذا المنطلق، فإن نتائج مجموعة قسط مخاطرة العقار غير العادي (CAERP) تبين أن الأزمات تختلف بينها اختلافا بينا. اعتبرت أزمة التقويلا (Tequila) أشد أزمة وأزمة روسيا تليها شدة، وأزمة آسيا تليها شدة. وإضافة على ذلك، فإن هناك الاختلافات في النتائج التي تستخدم التوقعات المأخوذة من التحليلات المتعددة مثل OLS، ARCH، وGMM. وبالتالي، فإن نتائج البحث تسهم في تزويد الدراسات الحالية في هذا المجال، وكذلك أهما تعطي هذه التطبيقات العملية لعدة جهات مثل مديري الثروة ومديري الشركة الخاصة الذين يتمسكون كثيرا بقسط مخاطرة الأسواق كالعنصر الأساسي في تحديد موقفها.

## **APPROVAL PAGE**

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## DECLARATION

I hereby declare that this dissertation is the result of my own investigation, except where otherwise stated. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at IIUM or other institutions.

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To my beloved wife, Falikhah Zawawi, who has given me the physical, moral, emotional and spiritual support others could only dream of; my understanding father, Haji Mazlan Noordin; and my lovely children; Nuha, Najah, Muhammad Hassan, Muhammad Husin, and Ahmad Husni.

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## LIST OF ABBREVIATIONS

AERP	Abnormal equity risk premium
AMR	Annualized monthly return
APT	Arbitrage pricing theory
ARCH	Autoregressive conditional heteroskedasticity
CAPM	Capital asset pricing model
CBR	Central Bank of Russia
CML	Capital market line
COV	Covariance
CRRA	Constant relative risk aversion
DFI	Direct foreign investment
EMBI	Emerging market bond index
ERP	Equity risk premium
FTSE	Financial times stock exchange
GARCH	Generalized autoregressive conditional heteroskedasticity
GDP	Gross domestic product
GMM	General method of moments
IFS	International financial statistics
IMF	International Monetary Fund
MSCI	Morgan Stanley Capital International
NAFTA	North American Free Trade Agreement
OLS	Ordinary least squared
RFR	Risk free rate
S&P 500	Standard & Poor 500
SML	Security market line
VAR	Vector autoregression
YOY	Year on year

# CHAPTER ONE

## INTRODUCTION

### 1.1 BACKGROUND OF THE STUDY

The emerging markets are important investment avenues for many investors worldwide, hence the growing number of studies conducted to examine issues in emerging markets. After emerging markets liberalized their capital markets investors from developed markets make their presence in the emerging markets to capitalize on the huge growth potential offered by these markets. The increasing capital investment goes hand-in-hand with portfolio investment in various financial assets such as equity, bonds and money market instruments. However, with a series of financial, banking and currency crises coalesced with political turmoil, investors are often cautious in their analysis of investment prospects, particularly equity investment in the emerging markets, because it is relatively riskier than other financial instruments.

According to a report in Morningstar.com, a financial website which covers global financial and investment issues, emerging-market stocks have grown as a portion of total U.S. holdings from 1.63 percent in 2004 to 2.41 percent in 2009<sup>1</sup>. During the same period however, emerging-market stocks grew from 8.7 percent to 15.9 percent of total world market capitalization. This means that the growth of U.S. investment in emerging markets is not synchronized with the rapid growth recorded in the emerging-market stock capitalization.

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<sup>1</sup> <http://www.morningstar.com/1/3/74756-is-it-time-emerging-markets.html>



One explanation to the above scenario may be due to the relatively higher level of risk associated with emerging-market stocks. The risk-return tradeoff in finance theory asserts that a riskier asset should provide investors with higher return in order to compensate the investor for the risk assumed (Bodie, Kane and Marcus, 2004). A central component of the risk and return theory, particularly in stock investment, is the equity risk premium. It calculates by how much the average stock return is greater than the return of a risk-free asset. In this sense, it measures the premium a stock should command over a risk-free asset. Thus it will only make sense if the return an investor expects from a risky equity investment is higher than the return of an investment that bears minimal or zero risk, such as the treasury-bills. According to Damodaran (2009), the equity risk premium signals basic assessment we make about how much risk we perceive in an economy or market and what price we associate to that risk. This in turn will affect the expected return on every risky investment and the value we estimate for that investment. The equity risk premium is defined as the difference between the return on the market portfolio of common stocks and the risk-free interest rate:

$$\text{Equity premium} = R(E) - RFR$$

$R(E)$  is the return on the market portfolio of common stocks and  $RFR$  is the risk-free rate of return. The average return on a broad portfolio of stocks is usually used to estimate the equity market return, while the average return on the treasury bills or six-month commercial paper is used to estimate the risk-free interest rate (Fama and French, 2002).

Mehra and Prescott (1985) are considered the first researchers who tried to explicitly explain the concept and size of equity risk premium. Mehra and Prescott show that the historical return on stocks has been too high in relation to the return on

risk-free assets to be explained by the standard economic models of risk and return without raising unreasonably high levels of risk aversion, hence the equity premium puzzle phenomenon. Later, there have been many attempts to explain the equity risk premium puzzle using various finance models (Abel, 1991; Kocherlakota, 1996; Cochrane, 1997; Siegel and Thaler, 1997; Fama and French, 2002; Mehra and Prescott, 2003; and Sterken, Hullegie and Salomons, 2004). Most of these studies focused on matching the data on equity returns with observed interpretations of risk aversion. These studies explored either theoretical approaches, like habit formation in consumption, or empirical observations, like using ex ante or estimated equity risk premium versus ex post or observed equity risk premium. Generally, the findings asserted that the observed equity risk premiums are significantly larger than the theoretical or estimated equity risk premiums due to the difference in theoretical economic models as opposed to the actual returns realized by stocks.

Several other researchers tried to explain the puzzle by proposing survivorship bias theory (Rietz, 1988; Brown, Goetzmann and Ross, 1995; Jorion and Goetzmann, 1999) in which they asserted that the U.S. market posted high ex post returns because of ‘survival’ – it survives a long time period without significant crashes or interruptions. The researchers cited above found that the U.S. equity market recorded the highest equity risk premium because the market is biased upward by survivorship. In a similar vein, Henry (2000) looked at the effect of stock market liberalization and economic reform on the equity premium in emerging equity markets. The average equity risk premium in the emerging markets is also found to be smaller than the developed markets.

Besides survival explanation to the equity premium puzzle, researchers also examined the determinants of equity risk premium, focusing on macroeconomic

variables such as inflation rate and gross domestic product (GDP) per capita growth rate and also national characteristics such as economic inequality, civil liberty and regulatory quality. Among the studies are by Rouwenhorst's (1999) Salomons and Grootveld (2003) Sterken et al. (2004), Aggarwal and Goodell (2008) and Khan (2009). Unlike the studies on survivorship bias theory, most of the determinant studies found that the equity risk premiums for emerging markets are significantly larger than that of the developed markets.

In another angle of looking at equity risk premium issue, expected excess returns on common stocks appear to vary with the business cycle (Lettau and Ludvigson, 2001). Arnott and Bernstein (2002) estimated the objective forward-looking U.S. equity risk premium relative to bonds from 1802 to 2001 and supported the importance of inflation in explaining the variations in equity risk premium.

The other studies which examined the relationship between equity risk premium and inflation are those by Solnik (1983), Kaul (1987) Lee (1992), Marshall (1992), Boudoukh and Richardson (1993), Boyd, Levine and Smith (2001), Al-Khazali (2004) and Kyriacou, Madsen and Mase (2006). These studies show mixed results – equity risk premium are both positively or negatively related to the inflation rate.

Although financial researchers have studied equity risk premium for more than three decades and investigated various issues, debates are still at large on the findings as well as on the conclusions of those studies. Also, the area is still considered vibrant due to the many inconclusive issues. For example, although there has been a growing number of studies which focus on the equity risk premium in emerging markets, none of them specifically include in the financial crisis dimension in their studies to examine how differently equity risk premium is affected during the crises. This is

considered vital because emerging markets are synonymous with crisis. Therefore, this study is carried out due to the importance and significance of equity risk premium issue in finance, as well as the possibility to extend crises literature. In so doing, the study also may support or refute the findings and conclusions of previous studies.

## **1.2 PROBLEM STATEMENT**

This study is motivated by the importance of understanding the characteristics and the determinants of equity risk premium in emerging markets inflicted by several major financial crises<sup>2</sup>. Although numerous studies have been conducted to examine the various issues of equity risk premium and also financial crises, not many focused specifically on the financial crises' impact on equity risk premium in the emerging markets. This is quite surprising considering the fact that equity risk premium is a key input used in the calculation of the theoretically appropriate required rate of return of an asset in CAPM. The estimation of the required rate of return of an asset is heavily applied in stock valuation and capital budgeting (Goetzmann and Ibbotson, 2005).

According to Huang (2005), issues relating to equity risk premium are of primary interest to any equity investor, especially to the index investor because it is used as an input to forecast the growth of investment portfolios over the long term. In those decisions, the size or magnitude of the equity risk premium has significant implications because the model is sensitive to even a slight change in the inputs' values. This is also supported by Damodaran (2009) who asserted that the equity risk premium influences both how we allocate wealth across different asset classes and which specific assets or securities we invest in within each asset class.

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<sup>2</sup> For ease of discussion at this stage, the term 'financial crises' is used to denote the crises in general. Detailed definition and discussion on the specific type of crisis (financial, banking, currency and sovereign default crisis) are provided in chapter two later.

In this respect, the issue of equity risk premium is relevant and important to investors, fund managers and corporate managers in their decision-making. It is imperative for them to be able to accurately estimate the appropriate equity risk premium as well as to understand equity risk premium characteristics, particularly during financial crises. This is because investors and corporate managers are usually more cautious during financial crisis. In addition, the estimation of equity risk premium is also important for regulatory decisions such as resource allocation, social welfare and economic policy (Grant and Quiggin, 2006). Therefore, in addition to the academicians and corporate players, the issue of equity risk premium has an implication to the policy makers as well.

Although it is vital in practice and considered important among academicians, the calculation and estimation of equity risk premium is relatively a new phenomenon. In their paper, Goetzmann & Ibbotson (2005) noted that reliable data to estimate the historical equity risk premium of the U.S. and other developed countries were only collected in the mid 20<sup>th</sup> century while the precise econometric estimates of the equity risk premium were only available after the development of the capital asset pricing model (CAPM). For the emerging markets, the systematic data collection and analysis pertaining to equity premium are lagging even far behind. As discussed earlier in section 1.1, the studies on equity risk premium in emerging markets centered on the determinants issue. However, none of them specifically include in the financial crisis dimension in their studies to examine how differently equity risk premium is affected during the crises.

The crisis literature can be broadly categorized into the determinants and propagations of crises; capital flows and reversals; institutional factor and financial structure; and policy responses (Glick, Moreno and Spiegel; 2001). Most of the

studies use macroeconomic variables and also financial data that include stock market index performance. However, none of these studies specifically include the equity risk premium when issues of asset prices were discussed or equity market return models were developed. For instance, Kaminsky and Reinhart (1999) used sixteen macroeconomic and financial variables to examine the common determinants of “twin” crises and calculated an index of equity prices as one of the indicators of the real sector. However, they did not include any proxy for risk-free rate of return to compare with the stock return, hence neglecting the equity risk premium.

In Masson (2001), equity index return was calculated as an indicator of financial asset prices and was regressed against several macroeconomic variables. However, equity risk premium was not measured as a gauge for equity return over the return of risk-free asset. In another study, Aguiar and Broner (2006) presented a multi-factor model of asset returns by calculating return on stocks. Although they used the term “risk premium” to denote the expected returns of stocks, their model did not actually contain any measurement of risk-free rate of return. Singh (2009) calculated the percentage decline in stock market index during “twin” crises as part of his objective to provide an asset-side explanation of the crises. Singh used stock market index as one of the indicators of asset prices while ignoring the equity risk premium as the appropriate barometer to gauge the stock market performance.

The previous studies which examined the equity risk premium in the emerging markets have not specifically incorporated the financial crisis dimension into their studies. This means that there is a gap in the literature with regards to the emerging markets’ equity risk premium characteristics during financial crisis periods and during non-crisis periods. This study intends to fill in the gap in the literature by integrating the relevant empirical issues of the equity risk premium with financial crises. This is

in light of the obvious absence of studies that specifically examine the equity risk premium in the context of emerging markets financial crises. This study will analyze the determining factors of equity risk premium in those countries during crisis and non-crisis periods.

In addition to the determinant study explained above, another analysis is added to examine the immediate impact that financial crises have on the equity risk premium of emerging markets. This is vital because it can provide the fund managers and policy makers the findings that could assist them in making short-term or immediate decisions when a crisis occurs. Furthermore, it will enable them to assess the different immediate impact that financial crises have on the equity risk premiums of different emerging markets. In order to examine this immediate effect, an event study analysis is considered suitable and relevant because daily data analysis can be conducted. Event study methodology has been utilized by researchers such as Jorion and Goetzmann (1999) and Henry (2000) to examine the survivorship bias theory of the equity risk premium in the U.S. market and other developed markets.

According to Jorion and Goetzmann (1999), although capital markets in emerging markets have relatively shorter histories compared to that of the developed markets, event studies to examine survivorship bias theory can still be conducted because generally, the time period is still considered long. As such, event study methodology can be deployed in this study in order to assess the immediate impact of financial crises on the levels of equity risk premium. However, instead of testing the survivorship bias theory, this study will use event study methodology to analyze the equity risk premium of emerging markets and will examine the existence of abnormal equity risk premium at the onset of the financial crises.

### **1.3 THEORETICAL FRAMEWORK**

The underlying theory in finance that corresponds to equity risk premium is the capital asset pricing model (CAPM) which is a model for pricing an individual security or a portfolio. The CAPM was separately developed by Sharpe, Linter and Mossin in the mid-1960s as follow-up studies on Markowitz's seminal work in 1952 entitled 'Portfolio Selection' (Mahyudi, 2008). The two main models developed in CAPM are the capital market line (CML) and the security market line (SML). By using the SML and its relation to expected return and systematic risk (beta), it can be shown that the market must price individual securities in relation to their security risk class (French, 2003).

The SML enables the calculation of reward-to-risk ratio for any security in relation to that of the overall market. According to French (2003), the market reward-to-risk ratio is effectively the market risk premium, while the individual asset reward-to-risk ratio is the asset risk premium. In the context of stocks or equities, it is called the equity risk premium. Based on the CAPM, the equity risk premium can also be linked to the concept of risk-return tradeoff, whereby the rate of return on riskier assets such as stocks is expected to be greater than risk-less assets such as treasury-bills. Although much debate has been put forth by its opponents, CAPM is still considered relevant by many researchers, especially on the usefulness of its simple, yet applicable concept of systematic risk of securities and portfolio of securities. The details of the CAPM will be addressed in chapter three.

### **1.4 OBJECTIVES OF THE STUDY**

The general objective of the study is to investigate the determinants of equity risk premium in the emerging markets inflicted by financial crises. The focus is on the