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ASSOCIATIONS AMONG EQUITY RISK PREMIUM MODELS IN MALAYSIA

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ABSTRACT

Although numerous equity risk premium estimates have been published using various estimation methods, especially in advanced economies, the accuracy of these estimations and which estimation method is the most appropriate remain inconclusive. There is, however, limited studies in emerging markets. This paper aims to bridge this gap by evaluating the associations among equity risk premium models for a small emerging market, i.e., Malaysia. This descriptive research adopts five methods to derive the risk premiums from 2005 to 2022, where the historical premiums are estimated using two averaging methods, i.e., arithmetic and geometric average, while the implied premiums are estimated using three methods. The first two implied premium methods are based on the constant growth dividend discount model, in which the first model uses the historical dividend growth, while the second applies the earnings retention model. The third is the yield-gap method. The findings demonstrate a wide disparity between arithmetic and geometric average historical premiums. The historical premiums are also highly volatile than the implied premiums, which is a common observation in emerging markets. Moreover, the historical premiums are very sensitive to financial or economic crises. Interestingly, the implied premiums appear to be exhibiting a mean reversion tendency since the global financial crisis, where the mean values ranged between 7.02 and 8.64 percent over time. The results may benefit policymakers, firms and investors in formulating accurate financing and capital budgeting decisions. The findings also contribute to the asset pricing literature by furnishing new evidence in a small emerging market context.

Keywords: COVID-19 health crisis, emerging market, equity premium puzzle, global financial crisis.

1.0 INTRODUCTION

The rising trend of globalization witnessed since the 1980s has precipitated considerable interest among investors to search for investments that can maximize returns for each unit of risk undertaken (Couto et al., 2020). The expected return on investment can be measured by the risk-free rate of return plus a risk premium to compensate for risk as propounded by Sharpe (1964) and Lintner (1965) in their capital asset pricing model (CAPM) or asset pricing theory. Both researchers and practitioners, however, are inconclusive about how the risk in investment should be measured and how the risk measure should be converted into an expected return to compensate for risk. The main issue highlighted in this research is the equity premium puzzle, where equity risk premium is the difference between the expected return on the market portfolio and risk-free rate of return (Basri et al., 2022). Stated differently, equity risk premium is the premium demanded by investors for "average risk" equity investments or investments in equities as a class (Damodaran, 2022).

Mehra and Prescott (1985) published the seminal paper on the equity premium puzzle, where they questioned the CAPM based on general equilibrium theory with expectations of rationality. The authors highlighted the inconsistencies between theory and empirical evidence, where the gap was so significant that it could not be explained by any improvements in estimations made to the theoretical models or changes in the values of parameters or assumptions. Similar evidence has been documented by other researchers around the world, such as in the United States of America (USA) (Blanchett, 2022; Couto et al., 2020; Duarte & Rosa, 2015), the United Kingdom (UK) (Blanchett, 2022; Gregory, 2011), Canada (Booth, 2019), Pakistan (Sajid et al., 2021) and Indonesia (Arifin, 2022; Basri et al., 2022; Morawakage et al., 2019).

Although equity risk premium is widely adopted as an essential metric in the evaluation of the stock market and serves as a fundamental and important component in the estimation of cost of equity and cost of capital in corporate finance, portfolio management and valuation, the accuracy of the equity risk premium estimates remains as an on-going debate and there is no consensus regarding which estimation methods is the most appropriate and reliable (Damodaran, 2022; Couto et al., 2020; Sanvicente & Carvalho, 2020). For instance, extant literature has documented wide disparities in the equity risk premiums estimated using different methods (e.g., historical versus implied equity risk premium), averaging techniques (e.g., arithmetic versus geometric averaging), investment horizons (e.g., short versus long horizons) and geographical coverage (e.g., domestic versus international market) (Ibbotson, 2023; Damodaran, 2022; Ngo et al., 2018).

Besides, the majority of research on the estimation of equity risk premiums are concentrated on advanced economies, such as the USA (Blanchett, 2022; Couto et al., 2020; Duarte & Rosa, 2015), the UK (Blanchett, 2022; Gregory, 2011) and Canada (Booth, 2019), whereas there is a paucity of studies in emerging markets (Arifin, 2022; Basri et al., 2022; Sajid et al., 2021). Prior studies (Menshchikova, 2024; Damodaran, 2022) have reported that the equity risk premiums tend to be higher in emerging markets than advanced economies. Thus, more studies ought to be conducted to shed light on equity risk premium estimations in the emerging market context. This is crucial because since stock markets in emerging markets are perceived to be riskier, investors would expect more compensation for bearing the extra risk. A higher equity risk premium would serve as an incentive for investors to invest in a particular stock market.

To summarize, given the importance of the equity risk premium in numerous modern finance applications, producing reliable estimates of equity risk premium is very crucial for various parties including investors, portfolio managers and equity analysts. Thus, the choice of measurement is essential to improve financial decision-making. Additionally, since research on equity risk premiums

in emerging markets is rather scarce and they may be different from the evidence furnished based on advanced economies, this necessitates more studies to be performed in the context of emerging markets.

Hence, the main purpose of this paper is to examine the associations among the equity risk premiums estimated using different models. We aim to address the following research question: What are the associations among the different equity risk premium models? This paper draws on the evidence from a small emerging Asian market, i.e., Malaysia, where a sample of 505 firms listed on the Malaysian stock exchange, Bursa Malaysia, are analyzed over the period of 2005 to 2022. This study considers two broad methods for equity risk premium estimation, i.e., the historical premium and implied equity risk premium methods.

The historical equity risk premiums are estimated using two averaging methods, i.e., arithmetic and geometric average. The implied equity risk premiums are measured using three methods. The first two implied equity risk premiums are estimated based on the constant or stable growth dividend discount model (DDM) or Gordon model, in which the first model estimates the growth rate in dividends and earnings over the long-run using the historical growth in dividends, while the second model applies the earnings retention model. Lastly, the third model computes the implied equity risk premium as the difference between forward earnings yield and risk-free rate of return, which is also known as the yield-gap approach.

Malaysia serves as a suitable case for this research due to several reasons. In general, emerging financial markets are major contributors to the world economies and attract investors from around the world who want to diversify their portfolios globally. This is particularly evident for the Asian financial markets, which have become the main attraction for investors. Thus, the Asian markets serve as a suitable context for investigating investment risks and the associated risk premiums. Among these Asian markets, Malaysia has been one of the best emerging markets in the recent decades as a result of financial integration, significant development in the financial sector, liberalization and trade openness (Ahmed et al., 2022).

At the same time, the Malaysian stock market has experienced heightened uncertainties over the decades, notably during crises such as the global financial crisis (GFC) in 2008 and the COVID-19 health crisis in 2020. During these periods, the stock price volatility in Bursa Malaysia increased tremendously and investors' confidence was badly affected. This can be observed from the substantial decline in the Financial Times Stock Exchange Bursa Malaysia Kuala Lumpur Composite Index (FBMKLCI), which represents Malaysia's main stock market index. The heightened uncertainties and reduced investors' confidence may also affect the risk premiums demanded by investors as compensation for assuming higher investment risks (Chow & Tan, 2023; Rowland et al., 2023; Chow et al., 2017).

Notwithstanding the preceding arguments, there is a dearth of research which has explored the equity risk premiums for Malaysia and these studies have documented wide disparities in the estimates. For example, Oueslati and Hammami (2018) estimated that the historical equity risk premium for Malaysia is 3.6 percent over the period of January 2001 to June 2016. Damodaran (2022) highlighted that the historical equity risk premium for Malaysia is 3.56 percent based on daily data from January 2021 to January 2022. Menshchikova (2024) claimed that using data from 2001 to 2023, the historical equity risk premium for Malaysia is 0.4 percent.

Such huge differences in the estimations of equity risk premium are also observed by other researchers around the world (Arifin, 2022; Basri et al., 2022; Blanchett, 2022; Sajid et al., 2021; Couto et al., 2020), which could be attributed to various reasons such as differences in estimation methods and averaging approaches. In essence, the estimation of equity risk premiums should cover a relatively long period of time to improve its accuracy (Booth, 2019). Nonetheless, this proves to be a daunting task for

emerging markets, including Malaysia, since their historical data may not be reliable and sufficient (Arifin, 2022; Naumoski & Nestorovski, 2018).

The contribution of this study is manifold. First, although there are abundant equity risk premium estimates being published using numerous estimation methods, the accuracy of these estimations remains as an on-going debate and no consensus has been reached concerning which estimation method is the most appropriate and reliable. This paper extends earlier works on equity risk premium estimation using multiple methods, in particular variations of the historical premium and implied equity risk premium models, to shed light on the equity premium puzzle. Second, the majority of research on equity risk premium estimation are concentrated on advanced economies but there is relatively scarce research being performed in emerging markets. This study furnishes new empirical evidence in a small emerging market context, i.e., Malaysia.

The rest of the paper is organized as follows. The next section outlines the literature review. Section 3 describes the data and methodology. Section 4 discusses the empirical results and Section 5 provides the concluding remarks.

2.0 LITERATURE REVIEW

Asset Pricing Theory

Sharpe (1964) and Lintner (1965) posited the CAPM, which gives rise to the asset pricing theory. This theory demonstrates the trade-off between risk and expected return, where it assumes that there is a positive association between both variables due to investor risk aversion. The CAPM is widely applied in corporate finance and portfolio management, such as for estimating the cost of equity and cost of capital as well as for assessing portfolio performance. In order to calculate the cost of equity, the CAPM takes into account the sensitivity of a particular stock to systematic or non-diversifiable risk (denoted as beta), as well the expected return of the market and risk-free rate of return. Put differently, the expected return on an investment can be measured by the risk-free rate of return plus a risk premium as compensation for risk. Meanwhile, the CAPM is also utilized to evaluate the performance of portfolios, such as mutual funds and other managed investments by estimating the CAPM time-series regression for a portfolio, where the intercept (known as Jensen's alpha) is used to determine abnormal performance.

One of the central issues faced by both researchers and practitioners is all parties remain inconclusive on how the risk in investment should be measured and how the risk measure should be converted into an expected return to compensate for risk, or in other words, the equity premium puzzle. Research interest in the equity premium puzzle escalated since Mehra and Prescott (1985) revealed the puzzling findings of the huge discrepancies between the historical realized equity risk premiums for the US stock market and the values predicted by the asset pricing models. Specifically, the authors demonstrated that the historical equity risk premiums were much higher than what was predicted based on usual assumptions regarding investor risk aversion. The results raised an empirical question of whether investors have been demanding and obtaining excessive returns for their shareholdings or are the asset pricing models adopted fundamentally flawed (Siegel, 2005). Voluminous studies have since attempted to solve the equity premium puzzle.

Historical Equity Premiums

The historical premium method, also known as the ex-post or realized equity risk premium, is essentially the most widely adopted method for estimating equity risk premiums, where the long-term past stock returns are estimated relative to the actual returns on risk-free investments (such as government

securities). The difference in past annual returns of both securities represents the historical risk premium (Blanchett, 2022; Damodaran, 2022). Among the advantages of the historical premium method are its ease of use and it shows the actual magnitude of how stocks outperformed risk-free assets such as government bonds over the study period (Othieno & Biekpe, 2019; Ngo et al., 2018). Stated differently, the historical risk premium is a better approach if we believe that the aggregate markets can be significantly undervalued or overvalued.

Notwithstanding these advantages, this method suffers from various limitations. First, the historical premium method assumes that the realized return serves as a good estimation of the ex-ante required return of the investors. This notion assumes a constant required risk premium and investors have rational expectations (Naumoski & Nestorovski, 2018). Nonetheless, past studies have furnished evidence that the constant required returns assumption does not hold true and behavioral finance research has shown that investors sometimes make irrational decisions (Ruan & Zhang, 2021; Othieno & Biekpe, 2019).

Second, although the risk premiums are derived from the same set of historical data, in practice large differences in the actual premiums are observed. According to Damodaran (2022), the premiums may range between three and 12 percent, while Derrig and Orr (2004) articulated that the equity risk premium estimates may vary between -1 and nine percent. The divergence in risk premiums could be attributed to multiple reasons. Among others, these include variations in the choice of risk-free rates, market indices and time periods used for estimation as well as disparities in how the returns are averaged over time. Damodaran (2022) further highlighted that the historical premium approach may not produce reliable estimates even in developed markets such the USA, which possess long-term historical data, and this can be an even more daunting task in emerging markets where past data are volatile and limited.

Third, since the historical premium method is based on past data, it is backward-looking (Blanchett, 2022; Damodaran, 2022). In order for firms or individuals to formulate investment decisions, the relevant cost should be the prevailing one at the decision-making time, rather than the average historical costs (Sanvicente & Carvalho, 2020). This is crucial in order to correctly depict equity risk premium as the compensation for investing in assets that will generate uncertain returns, especially during times of economic uncertainty (Othieno & Biekpe, 2019). Fourth, the historical premium method may be subject to survivor bias, which will lead to larger historical premiums relative to expected premiums for "survivor markets" with long periods of equity market history such as the USA (Damodaran, 2022; Ngo et al., 2018).

Past literature has investigated the historical equity risk premiums. For example, Morawakage et al. (2019) analyzed the equity premium puzzle for Indonesia and Sri Lanka for the period of 2004 to 2013 to identify the association between volatility of excess returns and historical equity risk premium. They found that negative return shocks have a significant impact on the historical equity risk premium for Sri Lanka, while there is no statistically significant relationship between the conditional volatility of excess returns and historical equity risk premium in both countries. Booth (2019) examined the historical equity risk premiums for Canada from 1926 to 2018 and revealed higher arithmetic average historical equity risk premiums as compared to geometric average estimates. Moreover, the findings demonstrated that the Canadian arithmetic average historical equity risk premium is 1.50 percent greater than in the USA, while the former's geometric average historical equity risk premium is 1.20 to 1.34 percent less than the latter.

In a similar view, Couto et al. (2020) estimated the historical equity risk premiums for Asia, the USA and Eurozone from 2002 to 2015. The authors reported that the aggregate risk preferences of investors are stable for all three economic regions. Shirvani et al. (2021) revisited the equity premium puzzle highlighted by Mehra and Prescott (1985) and demonstrated that the reported large historical equity risk premiums can be explained by selecting a more suitable return data distribution. Expressed differently, the authors showed that the high-risk aversion value reported by Mehra and Prescott (1985) may be

caused by issues related to fitting a proper distribution to the historical returns. Hence, they introduced a new distribution that better fits the return distribution and can explain the equity premium puzzle.

Consistent with this notion, Arifin (2022) analyzed the historical equity risk premiums for Indonesia for the period of 1990 to 2022. The author highlighted the significant discrepancies between the equity risk premiums derived using annual data (2.24%) and annualized monthly data (5.54%). Moreover, the results demonstrated that during the Asian financial crisis in 1997 and GFC in 2008, the equity risk premiums initially declined sharply before rising significantly in the subsequent months. Basri et al. (2022) investigated the determinants of historical equity risk premiums for Indonesia from 2007 to 2014. The authors reported that exchange rate, volatility of stock prices, beta, dividend ratio and debt ratio exert a positive influence on equity risk premium while inflation has a negative impact. Eldomiaty et al. (2023) explored the relationship between stock market development and competitiveness and historical equity risk premiums for various countries around the world over the period of 1996 to 2020. The findings demonstrated that the turnover ratio of local stocks to stocks traded has a negative association with equity risk premium. Besides, the authors showed that countries with low rankings in the market potential index have higher equity risk premiums.

Meanwhile, there is a dearth of research which has been performed on the estimation of equity risk premiums for Malaysia and thus far, these studies are predominantly limited to estimating the historical equity risk premiums. For example, Oueslati and Hammami (2018) revealed that the historical equity risk premium for Malaysia is 3.6 percent over the period of January 2001 to June 2016. Furthermore, the results also showed that the equity risk premium for Malaysia is solely predicted by the excess returns of the US market. Damodaran (2022) investigated the equity risk premiums for various countries around the world. According to the author, Malaysia, which is included as one of the sample emerging markets in the study, should have a higher equity risk premium since it is generally riskier investing in emerging markets. The author estimated that the historical equity risk premium for Malaysia is 3.56 percent based on daily data from January 2021 to January 2022.

Likewise, Menshchikova (2024) examined the differences in historical equity risk premiums between developed economies and emerging markets for the period of 2001 to 2023. The findings revealed that emerging markets yield better performance than developed economies prior to the GFC in 2008. Nonetheless, developed economies have been more resilient to negative economic shocks following the GFC, while emerging markets are still registering negative equity risk premiums and high volatility. The author concluded that these subsequent developments render investments in emerging markets less favorable. One of the emerging markets included in the study is Malaysia, which registers a historical equity risk premium of 0.4 percent for the full study period from 2001 to 2023. In detail, the historical equity risk premium for Malaysia is 0.8 percent before the GFC (2001 to 2008), 2.0 percent from 2008 to 2010, zero percent from 2010 to 2020 and -0.3 percent from 2020 to 2023.

Implied Equity Premiums

The implied approach is a forward-looking method for equity risk premium estimation, where it is current and market-driven, and does not rely on historical data (Blanchett, 2022). Hence, this approach can be applied for the implied equity premium estimation in any market, regardless of the length of its history (Damodaran, 2022; Othieno & Biekpe, 2019). Moreover, the sensitivity of the risk premiums to changes in market conditions is higher (Sanvicente & Carvalho, 2020). Nevertheless, the reliability of the estimates depends on the choice of valuation model and data availability of the model's inputs (Damodaran, 2022; Othieno & Biekpe, 2019).

Broadly speaking, the implied method, in particular the current implied equity premium, is more suitable if the overall markets are believed to be efficient or there are difficulties forecasting the overall direction of the market. Thus, the current implied equity premium, which is determined based on the present stock index level or large samples of individual stock prices, appears as the most appropriate

approach. On the flip side, the average implied equity risk premium over a long time is more suitable if we believe that the aggregate markets are either significantly undervalued or overvalued.

Extant literature has explored the estimation of the implied equity risk premiums. For instance, Fitzgerald et al. (2013) estimated the implied equity risk premiums for the USA from 1999 to 2008. The authors claimed that the significant variation in equity risk premiums implied by analyst forecasts with the realized equity returns may be attributed to measurement errors arising from various sources such as relying on consensus instead of detailed forecasts, using market rather than target prices and conservative assumptions. They attempted to address these measurement errors in their estimation of the implied equity risk premiums and found consistent estimates with the realized returns reported in historical data. Alam et al. (2014) analyzed the influence of research and development (R&D) expenditures on the implied equity risk premiums for the USA and reported a positive relationship. The authors asserted that since R&D expenditures are construed as a type of information risk stemming from poor quality reporting and information asymmetry regarding R&D between the managers and investors, this will cause the implied equity risk premiums to increase accordingly.

Consistent with this view, Duarte and Rosa (2015) investigated the implied equity risk premiums for the USA using eight versions of the DDM based on the dividend-to-price ratio, earnings-to-price ratio, price-earnings ratio, two-stage and six-stage DDMs and free-cash-flow-to-equity measures over the period of 1960 to 2013. The authors revealed that these models produce the lowest mean equity risk premium estimates with moderate standard deviations as compared to other equity risk premium models, such as historical risk premium, surveys, time-series and cross-sectional regressions. Additionally, they also found that these implied equity risk premium estimates demonstrate little variation across different time horizons. Specifically, all the DDMs examined in the study exhibit a constant or fixed term structure of expected equity returns and the risk-free rates are the only source of term structure variation in the estimation of the equity risk premiums. Lacina et al. (2018) estimated the implied equity risk premium for the USA and revealed that the risk premium produced by the model forecast errors is close to zero. The authors claimed that the average risk premiums reported by prior literature using earnings forecasts by analysts are too high.

In a similar manner, Ngo et al. (2018) estimated the implied equity risk premiums using the internal rate of return approach for 54 countries from 2001 to 2010. The authors found that ambiguity aversion influences the equity risk premiums, where the premiums are lower in countries where investors have higher degree of ambiguity aversion. Sanvicente and Carvalho (2020) examined the market determinants of implied equity risk premiums for Brazil from January 1995 to December 2019. The authors reported that country debt risk spread, changes in domestic interest rates, Standard & Poor's 500 Index level and the US market liquidity premium are significant determinants of equity risk premium changes. For comparison purposes, they repeated their analyses with the average historical returns and reported that the previously significant determinants are not statistically significant anymore. Accordingly, the authors elucidated that the implied equity risk premium is a more reliable approach than the historical method because the former changes in the expected direction with movements in market indicators.

In a similar vein, Hoang and Faff (2021) estimated the implied equity risk premium for the USA over the period of 1960 to 2016 using both the principal component analysis and boosted regression trees. They reported a negative risk premium during periods of low government and corporate bond returns, negative sloping term structure and high inflation, which are essentially linked to changes in business cycles. Gálvez (2022) compared the equity risk premiums estimated based on different DDMs using data from the Euro Stoxx 50 from 2001 to 2021. The author found similar dynamics among the equity risk premium estimates, which register heightened volatility during uncertain times such the onset of the COVID-19 pandemic.

3.0 METHODOLOGY

Sample and Data

Initially, this study considers all 766 listed firms on the Main Market of Bursa Malaysia from 2005 to 2022. However, we subsequently exclude financial firms due to their unique reporting requirements (Chow, 2023) and firms with incomplete data. This leaves us with a balance of 505 firms. The data adopted in this paper are gathered from multiple reliable sources. Financial and stock data are obtained from LSEG Workspace, while the yields on the 10-year Malaysian Government Securities (MGS) are collected from the website of the Central Bank of Malaysia.

Methodology

This descriptive research considers two broad methods for equity risk premium estimation, i.e., the historical premium and implied equity risk premium methods. The historical equity risk premiums are estimated using two averaging methods, i.e., arithmetic and geometric average. Meanwhile, the implied equity risk premiums are estimated using three methods, where the first two methods are based on the constant growth DDM, in which the first model uses the historical growth in dividends, while the second model applies the earnings retention model. The third is the yield-gap method.

First, this research considers the historical premium method, where the equity risk premium is measured as the average historical differences between stock returns and return on a risk-free security. We calculate both the arithmetic and geometric average returns based on the stock returns of 505 Malaysian listed firms. The arithmetic average return measures the simple average of a series of returns, while the geometric average is based on compounded rate of return. Stock returns are determined based on the annual closing stock prices of the listed firms, while returns on a risk-free security are proxied by the 10-year MGS yields. We apply the 10-year government bond yields as the risk-free rates of return to correspond with the long estimation period of this study (Ibbotson, 2023). Zanella (2017) and Gregory (2011) contended that since both long-term bonds and shares are regarded as long-term investments, they incorporate a long-term inflation premium. Moreover, unlike treasury bills, neither government bonds nor shares are utilized as instruments for investing the firms' excess cash, monetary policy tools or speculation vehicles in foreign exchange markets.

Next, this study adopts the discounted cash flow model for estimating the implied equity risk premiums. We only consider 62 of the sample firms which continuously pay dividends over the study period. Precisely, we apply the constant or stable growth DDM, also known as the Gordon model, which assumes that dividends will grow at a fixed or constant rate forever (Gordon, 1959). Assuming that the observed stock price or equity value is equal to its intrinsic value, we estimate the required return on equity using Equation (1) (Damodaran, 2022; Gálvez, 2022):

$$Equity\ value = \frac{Expected\ dividends\ for\ the\ next\ period}{Required\ return\ on\ equity - Expected\ growth\ rate} \quad (1)$$

Since three of the inputs in Equation (1), i.e., the current equity value, expected dividends for the following period and expected growth rate in dividends and earnings over the long-term, can be estimated or obtained, the remaining "unknown" input, i.e., the required return on equity, can be solved. This paper estimates growth rate using two methods, i.e., based on historical growth in dividends (Fama & French, 2002) and the earnings retention model (Alpalhão & Alves, 2005). The historical average growth in dividends is estimated using Equation (2):

$$Growth\ rate = \left(\frac{Latest\ dividend}{Earliest\ dividend}\right)^{\frac{1}{N}} - 1 \quad (2)$$

where:

N = Number of years of dividend growth

Alternatively, the growth rate in dividends is also estimated using the earnings retention model according to Equation (3):

$$Growth\ rate = Return\ on\ equity\ x\ (1 - Payout\ ratio) \quad (3)$$

Subsequently, we determine the required return on market portfolio, which is equal to the expected return under market equilibrium, by calculating the average required returns for a broad sample of stocks. The implied equity risk premium is computed as the difference between the implied expected stock returns and risk-free rate of return.

This paper also adopts another alternative estimation method for the implied equity risk premium by focusing on earnings in place of dividends as outlined in Equation (4) (Damodaran, 2022):

$$Growth\ rate = \left(1 - \frac{Dividends}{Earnings}\right)(Return\ on\ equity) \quad (4)$$

$$Growth\ rate = (1 - Payout\ ratio)(Return\ on\ equity) \quad (5)$$

$$Equity\ value = \frac{(Expected\ earnings\ for\ the\ next\ period)(Payout\ ratio)}{Required\ return\ on\ equity - (1 - Payout\ ratio)(Return\ on\ equity)} \quad (6)$$

If return on equity is assumed to be equal to the required return on equity, i.e., there is no excess returns, Equation (6) can be simplified to Equation (7) as follows:

$$Equity\ value = \frac{Expected\ earnings\ for\ the\ next\ period}{Required\ return\ on\ equity} \quad (7)$$

$$Required\ return\ on\ equity = \frac{Expected\ earnings\ for\ the\ next\ period}{Equity\ value} \quad (8)$$

According to Equation (8), the required return on equity is the inverse of the forward price-earnings ratio or forward earnings yield, if we assume a stable growth rate for the firm and it is earning no excess returns. Resultantly, the implied equity premium is the difference between the forward earnings yield and risk-free rate of return.

4.0 RESULTS AND DISCUSSION

Main Results and Discussion

Table 1 tabulates the distributional characteristics of the annual equity risk premiums for Malaysia using five equity risk premium models over an 18-year period from 2005 to 2022. Both Models 1 and 2 estimate the equity risk premium based on the historical premium method, where Model 1 uses arithmetic average returns, while Model 2 utilizes geometric average returns. Models 3 through 5 calculate the equity risk premiums using the implied equity premium method. Models 3 and 4 adopt the constant or stable growth DDM or Gordon model, in which Model 3 estimates the growth rate in

dividends and earnings over the long period using the historical growth in dividends, while Model 4 applies the earnings retention model. Model 5 computes the implied equity risk premium as the difference between forward earnings yield and risk-free rate of return, or the yield-gap method.

Table 1:

Distributional Characteristics of Annual Equity Risk Premiums, 2005 to 2022

Model	Mean	Median	Std Dev	Min	Max	Skewness	Kurtosis	Jarque-Bera statistic	Obs
Model 1	0.08	0.08	0.23	-0.40	0.46	-0.41	2.60	0.62	18
Model 2	-0.02	0.02	0.20	-0.45	0.34	-0.52	2.80	0.84	18
Model 3	0.09	0.08	0.01	0.07	0.12	1.25	5.17	8.22**	18
Model 4	0.07	0.07	0.02	0.04	0.12	0.72	3.36	1.65	18
Model 5	0.07	0.07	0.03	0.04	0.17	1.94	7.51	26.56***	18

Note: *, **, *** Statistical significance at the level of 10, 5 and 1 percent, respectively.

For Model 1, we observe an annualized historical equity risk premium of eight percent (both mean and median) with a standard deviation of 23 percent. The minimum historical equity risk premium is -40 percent while the maximum value is 46 percent. Meanwhile, Model 2 reveals a historical equity risk premium of -2 percent (both mean and median) with a standard deviation of 20 percent. The minimum historical equity risk premium is -45 percent, while the maximum value is 34 percent. The wide disparities between both historical equity risk premiums are not surprising even though we are referring to the same historical dataset. As highlighted by Damodaran (2022), the divergence in equity risk premiums could be attributed to multiple factors including the averaging method applied over time.

However, which averaging methods produce the best equity risk premium estimate remain an empirical debate. Damodaran (2022) advanced the view that if there is no correlation between the annual returns over time and the purpose is to determine the following year's equity risk premium, then the arithmetic average is regarded as the best and most unbiased estimate of the equity risk premiums. This is further supported by Derrig and Orr (2004) who contended that it is more preferable to apply arithmetic averages of periodic returns, rather than geometric averages, when estimating the returns for the following period because the former reproduces the appropriate probabilities and means of expected returns.

Nonetheless, geometric averaging may be a more superior estimation method for the equity risk premiums due to the following reasons. First, if the stock returns are negatively correlated over time, there is a high possibility that the arithmetic average method will overstate the equity risk premiums. Second, although one of the fundamental asset pricing models' assumptions is that they are single period models, if these models are applied to obtain estimates for periods exceeding one year, the geometric average may produce the best equity risk premium estimates (Damodaran, 2022).

Besides, it can be concluded that the historical equity risk premiums based on arithmetic average returns are higher than the estimates using geometric average returns, which is a common observation in the empirical literature and in practice (Blanchett, 2022; Damodaran, 2022). Notwithstanding this observation, Damodaran (2022) and Dimson et al. (2008) cautioned that the utilization of arithmetic average equity risk premiums to derive the discount rates, which are subsequently compounded over time, appears to be internally inconsistent. This may render the use of geometric average equity risk premiums more appropriate in corporate finance and valuation.

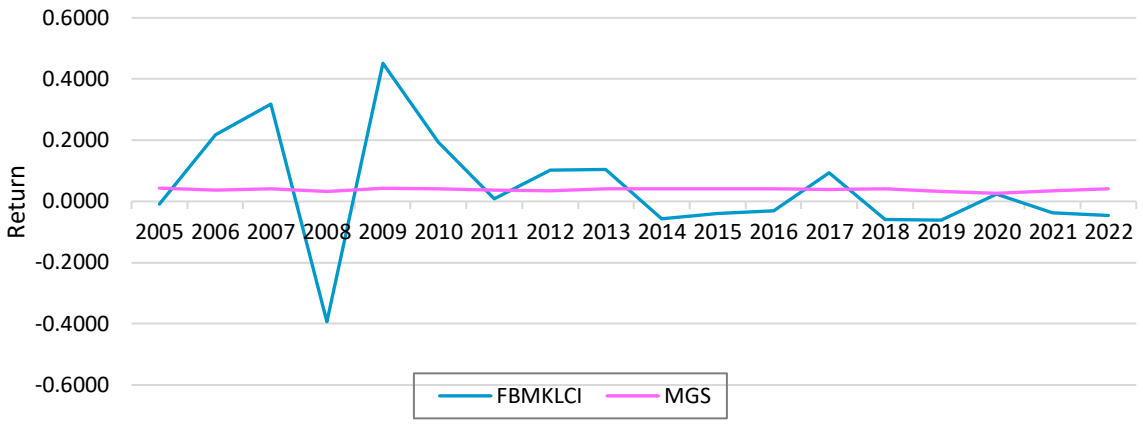
As regards the implied equity risk premium estimation, Model 3 demonstrates an estimate of nine percent (mean) and eight percent (median) with a much smaller standard deviation of one percent. The minimum estimate is seven percent, while the maximum value is 12 percent. Model 4 shows an implied equity risk premium of seven percent (both mean and median) with a standard deviation of two percent. The minimum implied equity risk premium is four percent, while the maximum value is 12 percent. Lastly, Model 5 reports quite similar results with Model 4, where the implied mean equity risk premium is seven percent (both mean and median) with a standard deviation of three percent. The minimum implied equity risk premium is four percent, while the maximum value is 17 percent.

Overall, the statistics suggest that the historical equity risk premiums are highly volatile as compared to the implied equity risk premiums. Damodaran (2022) documented similar evidence of relatively large standard deviations in emerging markets' historical equity risk premiums and proposed that they should not be applied in return and risk models. On a similar note, Salomons (2008) concurred that it is problematic to use historical data to forecast risk premiums because they are highly volatile, which create problems in determining long-run averages' confidence intervals.

In terms of skewness, both Models 1 and 2 demonstrate that historical equity risk premiums have a negative skewness. By contrast, Models 3 through 5 show that implied equity risk premiums have a positive skewness. According to Kraus and Litzenberger (1976), investors are typically assumed to exhibit a declining absolute risk aversion, or expressed differently, there is a greater tendency for equity risk premiums to have a positive skewness. The positive skewness in emerging markets is also observed in Kumar (2015) and Salomons and Grootveld (2003), who reported that most equity risk premiums in the emerging markets being examined have a positive skewness, as compared to the equity risk premiums for developed markets which are negatively skewed.

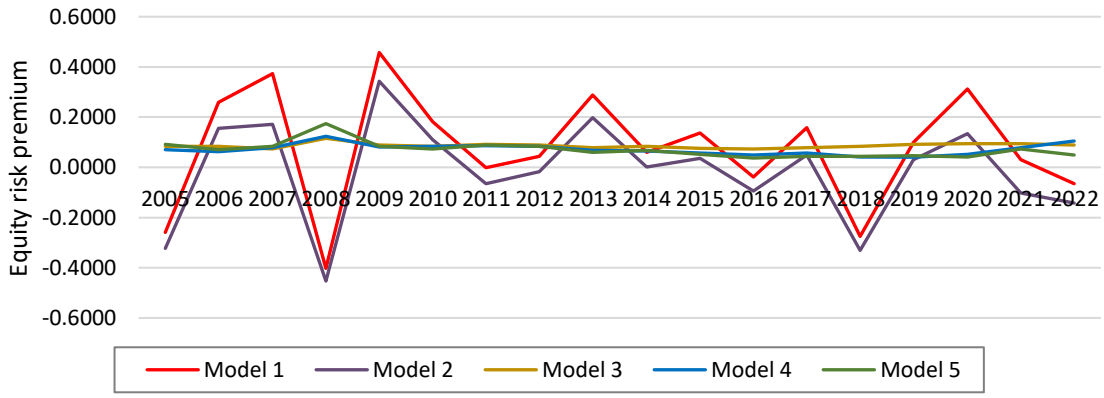
Turning to kurtosis, the kurtosis coefficients for the historical equity risk premiums for Models 1 and 2 are below three, which indicate that the data are normally distributed. This is also supported by the Jarque-Bera statistics, which are not statistically significant for both models. On the flip side, the kurtosis coefficients for the implied equity risk premiums for Models 3 through 5 are above three, which suggest that the data are not normally distributed. Instead, these implied equity risk premium data have leptokurtic distributions and contain more extreme values with long fat-tail distributions. The results for Models 3 and 5 are further supported by the statistically significant Jarque-Bera statistics, which confirmed the significant departure of these risk premiums from normal distribution. Similar evidence of a higher or excess kurtosis for emerging markets' equity risk premiums is provided by Morawakage et al. (2019) and Salomons and Grootveld (2003), who highlighted that the estimates are not normally distributed. Nonetheless, the Jarque-Bera statistic for Model 4 is not statistically significant, implying that the implied equity risk premiums calculated using the earnings retention model are normally distributed.

Figure 1 illustrates the returns on the FBMKLCI and 10-year MGS, while Figure 2 shows the annual equity risk premiums for Malaysia from 2005 to 2022. As depicted by Models 1 and 2 in Figure 2, the historical equity risk premiums tend to be less stable, fluctuate more and deviate from the implied equity risk premiums (Models 3 through 5) through time. This reaffirms the findings reported by Table 1 that the historical equity risk premiums exhibit higher volatility than the implied equity risk premiums. It is also notable that the historical equity risk premiums are very sensitive to the occurrence of financial or economic crises. In particular, the detrimental effects of the GFC in 2008 are evident and serve to demonstrate the extent to which downside risk is apparent. The results are consistent with Couto et al. (2020) who claimed that the historical equity risk premiums for the Asian market experienced significant volatility during the GFC. The findings are also in line with Henry et al. (2024) who demonstrated that financial uncertainty, including the GFC, is a powerful predictor of the equity risk premium.



Source: Authors' construction

Figure 1 : *Returns on FBMKLCI and 10-Year MGS, 2005 to 2022*



Source: Authors' construction

Figure 2 : *Historical and Implied Equity Risk Premiums in Malaysia, 2005 to 2022*

As a consequence of the GFC, Malaysia's economic growth deteriorated from 6.3 percent in 2007 to 4.6 percent in 2008 and this decline was primarily attributed to less external demand and private capital formation (Chow et al., 2017; World Bank, 2009). The country's export performance also contracted, where gross exports declined further by 20 percent in the first quarter of 2009 after registering a negative growth of 7.4 percent in the fourth quarter of 2008 (Bank Negara Malaysia, 2009). The crisis had badly affected the Malaysian stock market as well. Figure 1 demonstrates that the FBMKLCI recorded positive average daily returns of 7.6 percent prior to the GFC (from February 15, 2006 to July 25, 2007) but average daily losses of 8.7 percent during the GFC (from July 26, 2007 to December 31, 2008).

Interestingly, both arithmetic and geometric average historical equity risk premiums for 2007 are higher than the estimates for 2008, which appear counter-intuitive given the poor performance of the stock market in 2008 compared to 2007. The lower historical equity risk premiums for 2008 seems to suggest that investors perceived the stocks to be less risky during the GFC than before the crisis, hence demanding less premiums. By contrast, the historical equity risk premiums for 2009 increase sharply due to the recovery of the stock market from the crisis. The preceding observations, albeit unconventional, are consistent with the behavior of historical equity risk premiums estimated by Damodaran (2022) for the stock market in the USA over the same study period. The author elucidated that this represents another problematic attribute of the historical equity risk premiums, where in general, they tend to increase when the stock markets are performing well and investors have lower risk aversion and vice versa when stock markets collapse and investors' fear rises.

This issue, however, does not prevail for the implied equity risk premiums in Models 3 through 5, where the estimates rise in 2008 and are higher than the premiums for the pre- and post-GFC periods, which more appropriately reflect the poor performing stock market and heightened risk aversion of the investors during the crisis. The findings lend support to the asset pricing theory which posits a positive association between risk and the expected portfolio return (Campbell & Cochrane, 1999; Lintner, 1965; Sharpe, 1964). The findings are in accord with Zanella (2017) and Bali et al. (2015) who reported that during economic downturns which are characterized by lower economic activities, the aggregate riskiness and expected returns tend to be higher. Concomitantly, they found that the aggregate risk aversion of investors increases during such times due to short sale, financing or liquidity constraints, hence resulting in higher expected returns.

Notwithstanding the aforementioned arguments, the opposite can be observed during the COVID-19 health crisis in 2020, where both the arithmetic and geometric average historical equity risk premiums are higher than the estimates prior to the pandemic. A closer examination reveals that the behavior of the historical equity risk premiums remains consistent with its past behavior during the GFC. Following the World Health Organization's announcement on March 11, 2020 that the COVID-19 outbreak was officially a global pandemic, the majority of stock markets around the world, including Malaysia, witnessed a significant decline in stock performance. The FBMKLCI registered a sharp decline to below 1,500 points in March 2020 and subsequently reached its trough at 1,219.72 points on March 19, 2020 (Rowland et al., 2023).

This was followed by a rebound subsequent to the Malaysian government's announcement of stringent measures such as lockdowns and social distancing rules to curb the spread of the pandemic. The FBMKLCI continued to increase steadily and reached above 1,600 points by the end of 2020 as investors expected the Malaysian economy to recover after the COVID-19 cases in the country showed a downward trend (Chow & Tan, 2023; Rowland et al., 2023). As a whole, the Malaysian stock market registered a relatively brief decline and recovered quickly during the COVID-19 health crisis relative to the GFC, which explains why both the arithmetic and geometric average historical equity risk premiums are higher than the period before the pandemic. Nonetheless, this reaffirms the problematic characteristic of the historical equity risk premiums, which tend to increase when the stock markets are exhibiting good performance and investors are having lower risk aversion and vice versa when the performance of stock markets decline and investors' fear increases.

On the flip side, the implied equity risk premiums appear to be exhibiting a tendency towards mean reversion since the GFC. More specifically, although the implied equity risk premiums have deviated and peaked during the GFC in 2008, they quickly adjusted downward to between 7.96 percent (Model 4) and 8.94 percent (Model 3) in the subsequent year and remained around the mean values which ranged from a low of 7.02 percent (Model 5) to a high of 8.64 percent (Model 3) over time. Similar evidence is documented by Eren and Karahan (2020) for the Turkish stock market, where using CAPM-based equity risk premium estimations, the authors claimed that the mean reversion is attributed to the dynamic nature of equity risk premium instead of market inefficiency. Echoing Damodaran (2022), this

mean reversion tendency suggests the possibility of not only referring to the present premium, but also the historical trend lines to obtain better implied equity risk premium estimates. At the same time, we may not require as many years of observations when estimating the implied equity risk premiums as compared to the historical equity risk premiums since the former's standard deviations are smaller.

Further Discussions

Theoretical Contributions

The results of this study enrich the asset pricing literature by furnishing new evidence on the equity risk premium estimation. Despite numerous equity risk premium estimates being published using various estimation models, the accuracy of these estimations and which estimation method is the most appropriate and reliable remain inconclusive. Besides, the majority of these studies are concentrated on advanced economies but there is relatively limited research being conducted in emerging markets, including Malaysia.

For example, Oueslati and Hammami (2018) reported that the equity risk premium for Malaysia is 3.6 percent over the period of January 2001 to June 2016. Damodaran (2022) asserted that Malaysia should have a higher equity risk premium because it is generally riskier investing in emerging markets. The author estimated that the equity risk premium for Malaysia is 3.56 percent based on daily data from January 2021 to January 2022. Menshchikova (2024) estimated that the equity risk premium for Malaysia is 0.4 percent for the period of 2001 to 2023. It can be observed that there are wide disparities in the estimates documented by these studies and thus far, these estimates are predominantly limited to historical equity risk premiums. Therefore, the current study provides further evidence by estimating the equity risk premiums for Malaysia using multiple methods, in particular variations of the historical premium and implied equity risk premium models.

Practical Contributions

The findings may provide valuable guidance to the policymakers to better comprehend how different estimation models may influence the equity risk premium estimates. This is crucial for the formulation of monetary and fiscal policies because the equity risk premiums can serve as an indicator of the market's perception of the country's economic risk. Besides, this is also important to facilitate the policymakers' decision on public investment and infrastructure projects which typically require an assessment of the cost of equity to ascertain their economic feasibility (Damodaran, 2022; Gregory, 2011). The results may also prompt policymakers and stock market authorities to make the equity markets more attractive and competitive for both firms and investors, which ultimately may influence the equity risk premiums (Eldomiaty et al., 2023).

Similarly, firms may benefit from this research because an accurate estimation of equity risk premiums is essential for financing, investment and capital budgeting decisions. Equity risk premiums serve as a fundamental component in the estimation of the cost of equity and cost of capital and represent the minimum rate of return required by capital providers. Hence, a precise estimation of the cost of capital will provide a proper benchmark for firms to evaluate projects or investment opportunities and prevent them from making suboptimal investments, where only projects that generate returns above the cost of capital shall be selected.

The findings may also assist portfolio or fund managers and investors in their investment and asset allocation decisions, in particular regarding whether to include certain equities into their portfolios, where an accurate estimation of the equity risk premiums will provide a clearer notion of the compensation received for stock investments (Eldomiaty et al., 2023; Damodaran, 2022).

Limitations and Future Research Recommendations

The results of this paper should be interpreted with consideration of several limitations. First, this is a single-country research drawing on evidence from Malaysia. Therefore, caution should be taken when interpreting the generalizability of the findings to other countries because the equity risk premiums of different countries may vary according to their specific country risks and institutional settings. Future research could include more countries in the analysis to improve comparability and generalizability of the results. Second, the sample of this study is limited to listed firms with available data. Future research could incorporate more sample firms, provided that data are available, to generate more meaningful results. Lastly, this paper only focuses on estimating the equity risk premiums using two broad methods, i.e., historical and implied equity risk premiums. Future research could be extended to other areas, such as deriving equity risk premiums by surveying the opinions of financial professionals and investors, measuring the equity risk premiums using various information including financial, macroeconomic and behavioral factors as well as predicting or forecasting the equity risk premiums.

5.0 CONCLUSION

There is abundant literature on the estimations of equity risk premium, particularly in advanced economies. There is, however, a scarcity of research being conducted in emerging markets, including Malaysia. This paper aims to close this research gap by investigating the associations among the equity risk premium models for Malaysia from 2005 to 2022. This descriptive research uses five methods to derive the equity risk premiums, which can be broadly divided into historical and implied equity risk premium methods. The findings demonstrate that different methods yield varying estimates, thus reaffirming the prevalence of the equity premium puzzle. Precisely, arithmetic average historical equity risk premiums tend to be greater than geometric average estimates and these historical estimates are more volatile than the implied equity risk premiums. It is also notable that the historical equity risk premiums are very sensitive to financial or economic crises, including the GFC and COVID-19 health crisis. Interestingly, the implied equity risk premiums appear to be exhibiting a tendency towards mean reversion since the GFC.

The next question is which approach produces the best estimate for the equity risk premiums. Damodaran (2022) proposed that this depends on several factors. First, the method that possesses the best predictive power, where the estimated or forecast equity risk premium is close to the realized premium, should be given priority. For example, the author concluded that the implied equity risk premium at the end of the previous period is the best predictor of the premium for the following period, while the historical premium approach is the worst predictor. Second, the best approach depends on the beliefs or assumptions about the efficiency of the market. If the aggregate market is assumed to be efficient or if it is not feasible to forecast the overall market direction, the best approach is the current implied equity risk premium because it is estimated based on the current stock prices or indices. Nonetheless, if the market in aggregate is perceived to be either undervalued or overvalued, the average implied equity risk premium or historical equity risk premium over long periods is more preferable.

Lastly, the purpose of the analysis will determine the most suitable approach. For instance, Damodaran (2022) suggested that in equity research and valuation of acquisitions, the current implied equity risk premium is more appropriate because we are evaluating the value of a particular firm and not considering the overall market views. To conclude, there is no single estimation method that fits all forms of analyses, where the most appropriate approach may depend on whether predictive power or market neutrality is crucial, as well as the assumptions of whether the markets are efficient.

6.0 DECLARATION OF COMPETING INTEREST

The authors declare no conflict of interest.

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