The Equity Premium Puzzle in Nepal

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ABSTRACT

The study concentrates on one of the most famous puzzles in asset pricing, the equity premium puzzle, which was first identified by Mehra and Prescott (1985). The paper examines the existence and extent of the equity premium puzzle in Nepalese market. The equity premium puzzle refers to the fact that common stocks have offered a very high real risk premium over that of risk-free bills, which leads to unexplainable high risk-aversion of the investors.

The study considers the time period of 1995/96 to 2007/08. The result shows that the equity premium exists in Nepal even though the advent of the premium is low compared to other developed countries. This could be a surprising result given the Nepalese context. It was found that the risk aversion of Nepalese investors is greater than 10 (the upper boundary set by Mehra and Prescott, 1985) which do not fit the conventional financial theories resulting in unexplainable equity premium puzzle.

Key Words: risk-aversion, yield on stock market, yield on short term debt, subjective time discount factor, equity premium

JEL Classification Codes: G14

1. INTRODUCTION

Equity premium puzzle has been a hotcake debate in the recent years. Many researchers have tried to prove the existence of equity premium puzzle and others have tried to disprove its existence. The equity premium puzzle refers to the fact that common stocks have offered a very high real risk premium over that of risk-free bills, which leads to unexplainable high risk-aversion of the investors. Typical investors are risk averse. Risk-averse behavior can be defined in many ways but would be better understood with following decisional situation: if an investor will have to choose between two assets with similar expected returns but different risks, the risk averse investor will choose the assets with lowest level of risk, which also implies that investors who seek higher return must also accept higher risk. The equity risk premium is defined as the reward that investors require to accept the uncertain outcomes associated with owning equity securities. The equity risk premium is measured as the extra return that equity holders expect to achieve over risk-free assets, on average. Capital Assets Pricing Model (CAPM), an asset-pricing model based on equilibrium gives us basic intuition about the trade-off between risk and return. The model illustrates that generally riskiness of an assets can be compensated by higher return. It postulates a linear relationship between an asset's beta (a measure of systematic risk) and expected return.

Even if we consider risk, the stocks have historically outperformed bonds and other risk free investment. General utility-based theories of asset prices have difficulty explaining (or fitting, empirically) why the first rate is so low and the second rate so high, not only in the US but in other countries too. Consequently, there have been several explanations and theories developed concerning the equity premium puzzle. For instance, market segmentation, myopic loss aversion, survival bias, habit formation of investors and disappointment aversion.

Even though several studies and research has been done to prove and disprove the existence of this puzzle, these efforts has mainly localized in the well-developed financial markets like UK and US and less attention has been paid to least developed markets like Nepal. Nepalese market is indeed different from western markets and even developed Asian market like that of China, Japan, and India. As far as Nepalese market is concerned no effort has yet been made to establish the existence of equity premium puzzle. This paper is aimed at finding out whether such puzzle exists in Nepal. However, it is not the goal of the paper to find an explanation for the existence or absence of this equity premium.

1.1 Equity Premium: A brief introduction

Referred to as one of the most famous puzzle of asset pricing, equity premium puzzle was associated with high level of risk aversion. It refers to the substantial outperformance of listed shares over safer government bonds. Mehra and Prescott (1985) showed that the average annual return on the stock market over the last 110 years has been an estimated 8.06%, while the average annual return on short-term debt was only 1.14% over the same period. This very large equity premium of 6.92% poised a question the risk aversion attitude of investors. Observing the significant variance, they termed it as "equity premium puzzle".

Mehra and Prescott (1985) adopted a variation of Lucas' (1978) Pure Exchange Model for asset pricing, but altered an underlying assumption. They assume the growth rate of per capita consumption, rather than the consumption itself follows a Markov Process, in order to suit the huge increase in per capita consumption over the period of 1889-1978. They also suppose that investors are homogeneous, which means that there is one representative in terms of consumption preference. They expressed the consumption function as:

$$E_0\left\{\sum_{t=0}^{\infty}\beta^t U(c_t)\right\}, 0 < \beta < 1 \qquad Equation\ (1)$$

Where, Ct is the per capita consumption, and β is the subjective time discount factor, which describes investors' time preference for consumption. A higher β value means that investors prefer consumption today less than later on. In order to get the utility of a certain amount of consumption and enable comparison between consumption in different periods, Mehra and Prescott (1985) further introduced the utility function of constant relative risk aversion class, as:

$$U(c,\alpha) = \frac{c^{1-\alpha} - 1}{1 - \alpha}, 0 < \alpha < \infty \qquad Equation\ (2)$$

Where $\propto$ measures the degree of risk aversion. For $\propto$ equals to one, they define the utility function as a logarithmic function, and for other $\propto$ values, it reveals the curvature of the utility function.

Mehra and Prescott (1985) suggested the risk aversion higher than 10 to justify the perceived risk premium of 6.18%. Obliviously, it is not acceptable in the conventional asset pricing models, and was thus considered as the "Equity Premium Puzzle".

2. LITERATURE REVIEW

The equity premium puzzle was identified by Mehra and Prescott in 1985. They investigated US data from the period of 1889-1978 and concluded that the average real annual yield on the stock market was around seven percents and that the average yields on short-term debt was less than one percent. They further demonstrated that the equity risk premium does not link up with the implication of a standard rational model. Different authors have different views on the equity premium puzzle, so their efforts are categorized into two groups. The first is the view of traditional economist and second the view of behavioral economics.

2.1. Explanations for the equity premium puzzle - traditional economic aspect

Constantinides (1990) introduced that the equity premium puzzle could be resolved by habit persistence. He proved that "the equity premium puzzle is resolved in a rational expectations model, once we relax the time separability of preferences and allow for adjacent complementarily in consumption, a property known as habit persistence." Investors tend to be more sensitive to short-term consumption fluctuation and thus require a higher premium given the degree of risk aversion because of the time non-separability of consumption and positive subsistence rate of consumption.

Likewise, Campbell and Cochrane (1999) claimed that investor require higher premium due to stocks' bad performance during recession periods, rather than the price fluctuation itself which may reduce investors' wealth. They used this model to explain a wide variety of dynamic asset pricing phenomena. Brown, et al. (1995) assessed that the available data for the empirical analysis may suffer from a so-called survival bias, making estimates of the equity risk premium too high. This bias was the result of simply missing data, since most stocks which survived during those time periods were recorded, whereas stocks which had low earnings and were abolished were missing. For instance, it is possible that a longer period of time would include severe crises, implicating discontinuous data series. The effect of survival bias turned out to be substantial but largely insufficient to explain the equity premium puzzle.

2.2. Explanations for the equity premium puzzle - behavioral economic aspect

Benartzi and Thaler (1995) attempted to rationalize the equity premium puzzle under behavioral explanation. The solution to the puzzle is myopic loss aversion as proposed by Benatzi and Thaler (1995). The myopic loss aversion combines loss aversion with frequent evaluations. Based on the prospect theory, developed by Kahneman and Tversky (1979) loss aversion refers to the larger sensitivity that individual investors have to losses than to gains, making people demand higher premium to compensate the larger return variability.

On the other hand, investor's decision-making is largely influenced by how frequent they check the performance of purchased stocks. Benatzi and Thaler (1995) performed several tests to determine whether myopic loss aversion explains the equity premium puzzle. The results turned out that investors are myopic loss aversion and short-sighted. Investors ask for higher return when investing. Furthermore, Benatzi and Thaler (1995) based their research not only on individual investors but also on institutional investors, such as pension fund and endowments. They showed that institutional investors present more myopic loss aversion than individual investors, mostly because of agency problem.

Another explanation from behavioral finance view is disappointment aversion. Ang et al. (2005) relied on the axiomatic Disappointment Aversion framework of Gul (1991). They pointed out that investors do not invest into stock market even though there is a large premium, because their expectation is less likely to be met. Nevertheless, investors turn to another investment which has lower expected return in absolute terms but higher possibility to fulfill expectation. Last but not least, ambiguity aversion also contributes to rationalize the equity premium puzzle. Olsen and Troughton (2000) provided evidence to explain the equity premium puzzle caused by ambiguity aversion. When investor knows less about the profit distribution, the investor is more ambiguity averse. The findings indicated that even professional investment managers are ambiguity averse. As a consequence, investors need higher return to compensate ambiguity of stock market.

2.3. Empirical evidences of Equity Premium Puzzle in emerging countries

There are empirical evidences of equity premium puzzle in various emerging nations as well, such as Brazil. Cysne (2005) used quarterly data to test the existence of equity premium puzzle in Brazil where he used two different methods of log normality and calibration and reported the coefficient of risk aversion as 1175 and 561.75 respectively, which proved the existence of equity premium puzzle. In context to Asian countries, very little research has been done to report the existence of equity premium puzzle. In one of the research done by Park and Kim (2009), they found the evidence of equity premium puzzle in Korea despite small equity premium. This suggested that the volatility of consumption and the correlation between consumption and asset returns matter more than the absolute magnitude of equity premium. Xiao and Wang (2000) concluded that there is no equity premium puzzle in China with degree of risk aversion less than the threshold set by Mehra and Prescott (1985) but Liu and Wang (2005) found coefficient of risk aversion as 52 implying the existence of equity premium puzzle in China.

In the context of India, Mehra (2006) himself tested the existence of equity premium puzzle and concluded that the theoretical equity premium should be in the range 0.02% to 0.16% if the coefficient of risk aversion is varied from 2 to 10. He further explained that the observed risk premium in India is an order of magnitude more; there is puzzle with respect to Indian data as well.

Xiaojing (2011) tried to calculate the equity premium for various Asian nations and concluded that the equity premium puzzle exists in the countries as shown in Table (1).

Table 1: Asian Countries with Equity Premium Puzzle

Countries	Coefficient of Risk Aversion
Japan	19.91
Singapore	14.85
Hong Kong	20.37
Indonesia	185.96
Philippines	33.73
Taiwan	34.87
India	59.56

(Source: Xiaojing, 2011)

3. DATA SOURCES AND MODEL

3.1 Data Sources

The main data sources used for the research is the market return over a period of time. Likewise, the risk free rate of return, Consumer Price Index (CPI), and consumption expenditure per capita growth rate over the same period of time has been used. The risk premium has been estimated by comparing the real market return and real risk free rate. This will help to identify whether the equity premium puzzle exists in Nepalese market or not.

3.1.1 Sample Period

The sample period that has been chosen to study is from 1995/96 to 2008/09. Even though, empirical studies of equity premium puzzle in western and other developed countries are done over a sample period of more than hundred years, but because of the short existence of stock market and lack of proper data, the short sample period has been chosen. The choice of sample period is based on the availability of data of risk free rate of return, market indices, and consumption expenditure over the same period of time.

3.1.2 Important Macroeconomic Data

In order to analyze the equity premium puzzle in Nepal, two important series of macroeconomic indices have been examined, namely the per capita household consumption expenditure, which reflects the consumption level, and the CPI, which is used as consumption deflator to adjust the influence of inflation.

The CPI as well as annual inflation level of Nepal since 1995/96 to 2008/09 has been presented in Table (2) considering 1995/96.

Table 2: CPI and Inflation of Nepal

Year	CPI Index	previous year=100	Inflation%
1995/96	100.00	108.10	-
1996/97	108.10	108.10	8.10
1997/98	117.10	108.32	8.33
1998/99	130.40	111.35	11.36
1999/2000	134.90	103.45	3.45
2000/01	138.10	102.37	2.37
2001/02	142.10	102.89	2.90
2002/03	148.90	104.78	4.79
2003/04	154.80	103.96	3.96
2004/05	161.80	104.52	4.52
2005/06	174.70	107.97	7.97
2006/07	185.90	106.41	6.41
2007/08	200.20	107.69	7.69
2008/09	226.70	113.23	13.24

(Source: NRB, 2007a)

Household final consumption expenditure is the market value of all goods and services, including durable products (such as cars, washing machines, and home computers) purchased by the households. It excludes purchases of dwellings but includes imputed rent for owner-occupied dwellings. It also includes payments and fees to government agencies to obtain permits and licenses. To calculate the consumption expenditure per capita, the data regarding the total consumption expenditure of Nepal was collected and then it was divided by the population of each year. The data was collected from World Bank website (www.data.worldbank.org), hence it could be assumed that the data enjoy high degree of reliability. The calculation of household consumption expenditure per capita is shown in Table (3).

Table 3: Household consumption expenditure per capita

Year	Consumption expenditure (in constant US dollar 2000)	Population	Per-capita Consumption
1995	3,712,098,420	21,594,872	171.89722
1996	3,871,265,472	22,137,784	174.87141
1997	4,187,360,775	22,691,788	184.53199
1998	4,232,000,701	23,255,046	181.98204
1999	4,348,388,521	23,825,372	182.51083
2000	4,660,648,617	24,400,606	191.00545
2001	5,306,353,741	24,980,184	212.42252
2002	5,476,662,716	25,562,573	214.24536
2003	5,788,510,148	26,143,530	221.41272
2004	6,419,301,058	26,717,875	240.26241
2005	7,190,760,054	27,281,945	263.57212
2006	8,259,626,979	27,833,665	296.74953
2007	9,268,648,175	28,373,838	326.66177
2008	11,336,567,804	28,905,358	392.19607
2009	11,683,096,202	29,432,743	396.94215

(Source: www.data.worldbank.org)

In this report, the more emphasis is given to consumption per capita indices. The consumption per capita indices series are adjusted into real terms by dividing the consumption deflator series, that is, consumer price index.

$$CI_{t+1} = \frac{V_{t+1}}{V_t} / CPI_{t+1} \qquad Equation\ (3)$$

Where, CI_{t+1} stands for the consumption index of period $t+1$, V_{t+1} and V_t stands for the consumption value in the period $t+1$, and t in absolute terms respectively, and CPI_{t+1} is the inflation deflator for period $t+1$. It is used to determine the real growth rate of consumption expenditure over the sample period of 1995 to 2008. Table (4) illustrates the calculation of consumption indices from 1995 to 2008.

Table 4: Consumption per capita

Year	Per-Capita Consumption	CPI (Preceding year=100)	Consumption Index (preceding year=100)	Growth Rate (%)
1995	171.89	108.10	-	-
1996	174.87	108.10	94.10	-5.89
1997	184.53	108.32	97.41	-2.58
1998	181.98	111.35	88.55	-11.44
1999	182.51	103.45	96.94	-3.05
2000	191.00	102.37	102.22	2.22
2001	212.42	102.89	108.08	8.08
2002	214.24	104.78	96.25	-3.74
2003	221.41	103.96	99.40	-0.59
2004	240.26	104.52	103.81	3.81
2005	263.57	107.97	101.60	1.60
2006	296.74	106.41	105.80	5.80
2007	326.66	107.69	102.21	2.21
2008	392.19	113.23	106.02	6.02
2009	396.94	-	-	-

3.1.3 Stock Market Return

The stock market return is very important measure in this equity premium puzzle. Market return is the change in the market index from time *t* to *t+1*. These returns are not however, real rates of return. These returns are nominal rate of return. For the analysis, the nominal rate of return would be converted into real rate of return by adjusting the inflation factor. Moreover, market return does not consider the dividend received over the holding period. Theoretically, dividend return should be incorporated while calculating the market rate of return. But because of the statistical lag, dividend return over the same period of time has not been incorporated. Hence, it is assumed that dividend was not paid within the sample period. Since, the dividend paid would have been very small, it is believed that the overall impact of dividend payments would be ignorable. As a whole, real annual return on equity can be adjusted using the following formula:

$$R_{t+1} = Ln\left(\frac{I_{t+1}/CPI_{t+1}}{I_t}\right) \qquad Equation\ (4)$$

Where, R_{t+1} is the real rate on equity in the period *t+1*, and I_{t+1} and I_t stands for the index value at time *t+1* and *t* respectively. D_{t+1} and CPI_{t+1} is the return on dividend and inflation deflator in the period *t+1* respectively. Table 5 shows the real rate of return on equity.

Table 5: Results of Real Annual Return Calculation

Year	NEPSE Index	CPI Index previous year = 100	Real Return
1993/94	226.03	-	-
1994/95	195.48	107.68	-21.92
1995/96	185.61	108.10	-12.97
1996/97	176.31	108.10	-12.92
1997/98	163.65	108.32	-15.44
1998/99	216.92	111.35	17.42
1999/2000	360.70	103.45	47.45
2000/01	348.43	102.37	-5.80
2001/02	227.54	102.89	-45.46
2002/03	204.86	104.78	-15.17
2003/04	222.04	103.96	4.16
2004/05	286.67	104.52	21.12
2005/06	386.83	107.97	22.29
2006/07	683.95	106.41	50.77
2007/08	963.36	107.69	26.84
2008/09	749.10	113.23	-37.58
2009/10	477.73	-	-

(Source: SEBON, 2010)

3.1.4 Risk Free rate

According to conventional financial theories, the investment on Treasury Bills is usually considered as the risk-free since they are free of default risk, and the liquidity risk is also negligible because of the presence of secondary market. Mehra and Prescott (1985) used ninety-days government Treasury Bills, Treasury Certificates, and sixty-day to ninety-day Prime Commercial Paper as risk-free rate in their study, and other subsequent studies also turn to the US Treasury Bills as risk-free rate. Continuing this tradition, ninety days Treasury Bills rate has been used for the study. However, the risk free rate again is nominal risk free rate of return but Real Annual Risk Free Rate of Return is required for the analysis. Real risk free rate of return can be calculated using following formula.

$$RF_{t+1} = rf_{t+1} - (CPI_{t+1} - CPI_t)/CPI_t \qquad Equation\ (5)$$

Where rf_{t+1} is the nominal rate of return, CPI_{t+1} and CPI_t is the Consumer Price Index with base 1995/9 as 100 at time $t+1$ and time t respectively. RF_{t+1} is the real risk free rate of return. Table (6) shows the calculation of real risk free rate of return.

Table 6: Real Annual Risk Free Rate of Return

Year	Nominal Risk Free Rate of Return	CPI index (1995/96=100)	Real Risk Free return
1994/95	7.35	92.50	-
1995/96	10.93	100.00	2.82
1996/97	10.22	108.10	2.12
1997/98	3.52	117.10	-4.80
1998/99	2.33	130.40	-9.02
1999/2000	4.66	134.90	1.20
2000/01	4.96	138.10	2.58
2001/02	4.71	142.10	1.81
2002/03	3.48	148.90	-1.30
2003/04	2.93	154.80	-1.03
2004/05	2.46	161.80	-2.06
2005/06	2.84	174.70	-5.13
2006/07	2.42	185.90	-3.99
2007/08	3.33	200.20	-4.36

(Source: NRB, 2012)

Finally, the risk premium is calculated as the difference between the real annual return on NEPSE and real annual risk free rate of return as calculated above.

3.2 Basic Model

The basic model that has been used in this study is derived from the consumption based model used by Mehra and Prescott in their notable research on the equity premium puzzle in 1985. Moreover, the basic model and the simplification of model have been derived from the MA dissertation by Ni (2006).

It is assumed that there is a representative agent in the market, which represents the general expectation and preference of all investors. In other words, all investors are identical in their endowment processes, and thus need not worry about individual risk management. The same assumption was made by Mehra and Prescott as well. As a result, homogenous representative agent who maximizes the expected utility with infinite time horizon can be considered as:

$$\max W = maxE_0\left\{\sum_{t=0}^{\infty}\beta^t[U(C_t)]\,\middle|\,I_t\right\} \qquad Equation\ (6)$$

Where, C_t refers the consumption per capita in the sample *t,* and βt *(0<β<1)* is the subjective discount factor, representing the time preference of the representative agent. Higher β values suggest that investor gives higher weights to the consumption in the future. I_t represents the information available for the representative agent at time *t* and $E_0\{./\ I_t\}$ is the expectation operator of the whole flow of consumption conditional upon I_t. *U(.)* is a strict increasing, continuous and

concave utility function, which is twice differential. Since it assumed that investors are homogeneous, the utility function of the representative agent can be defined as a typical constant relative risk aversion utility function:

$$U(c,\alpha) = \frac{c^{1-\alpha} - 1}{1 - \alpha}, 0 < \alpha < \infty \qquad Equation\ (2)$$

Where, parameter α measures the degree of risk aversion of investors, and also suggests the curvature of the utility function. Since it is assumed that investors are risk averse, α is defined as $0 < \alpha < \infty$.

In his dissertation paper, Ni (2006) derived the following equation, by first and second order condition for normal logarithmic and deriving the marginal contribution of additional wealth, which is also widely known as Hansen and Singleton (1983) model or basic capital assets pricing model based on consumption.

$$\frac{1}{\beta} = E_t\left\{\left[1 + E_t(R_{t,t+1})\right].\left(\frac{C_t}{C_{t+1}}\right)^{\alpha}\right\} \qquad Equation\ (7)$$

According to the basic statistical rules for covariance, the covariance between two variables can be expressed as:

$$cov(x,y) = \sigma_{x,y} = E(x.y) - E(x).E(y) \qquad Equation\ (8)$$

Thus converting Hansen and Singleton (1983) model into covariance, one can get:

$$cov\left[(1 + R_{t,t+1}),\left(\frac{C_t}{C_{t+1}}\right)^{\alpha}\right] = \frac{1}{\beta} - E_t\left\{\left[1 + E_t(R_{t,t+1})\right].\left(\frac{C_t}{C_{t+1}}\right)^{\alpha}\right\} \qquad Equation\ (9)$$

Rearranging the equation one can get:

$$E_t(1 + R_{t,t+1}) = \frac{\frac{1}{\beta} - cov\left[(1 + R_{t,t+1}),\left(\frac{C_t}{C_{t+1}}\right)^{\alpha}\right]}{E_t\left(\frac{C_t}{C_{t+1}}\right)^{\alpha}} \qquad Equation\ (10)$$

The equation is the basic equation where the empirical data observed in the Nepalese market can be introduced and then generate model implied α and β, which are the relative risk aversion degree and subjective time discount factor. It will help us to test whether equity premium exists in Nepalese market or not.

Further, the equation can be simplified as done by Ni (2006). Like him, it is assumed that the consumption growth is identical independent distributed and for risk free rates, the covariance between consumption growth and risk free rates is zero. Thus, if it is assumed that it follows a log normal distribution that $In\ Z \sim N(\mu_z, \sigma^2_z)$ and take the normal logarithm for both sides, one may get:

$$\ln(1 + R^f_{t,t+1}) = -ln\beta + \alpha \ln[E_t(C_{t+1}/C_t)] - \frac{1}{2}\alpha^2\sigma_c^2 \qquad Equation\ (11)$$

Analogously, one may get another equation for the logarithmic return for the risk equity:

$$r^e_{t,t+1} = ln\beta + \alpha c_{t+1} - \frac{1}{2}\alpha^2\sigma_c^2 + \alpha.cov\left(r^e_{t,t+1}, c_{t+1}\right) \qquad Equation(12)$$

in which $\begin{cases} r^e_{t,t+1} = \ln(1 + R^f_{t,t+1}) \\ c_{t+1} = \ln[E_t(C_{t+1}/C_t)] \end{cases}$

As a result, the relations between risk-free rate of return, return on equity, relative degree of risk aversion, and subjective time discount factor can be illustrated by the following set of equations. So as long as two of these four variables are known, another two variables from the model can be generated, and test the equity premium puzzle in Nepal.

$$\begin{cases} \ln(1 + R^f_{t,t+1}) = -ln\beta + \alpha \ln[E_t(C_{t+1}/C_t)] - \frac{1}{2}\alpha^2\sigma_c^2 \\ \ln\left(1 + R^e_{t,t+1}\right) = \ln\left(1 + R^f_{t,t+1}\right) + \alpha.cov\left(r^e_{t,t+1}, c_{t+1}\right) \end{cases} \qquad Equation\ (13)$$

4. BASIC MODEL SOLUTION

A simplified version of equity premium equation (13) has been derived in this report. In order to calculate the model implied relative degree of risk aversion and subjective time discount factor, the returns on both equity and risk-free assets, consumption growth rate, standard deviation of consumption growth, and covariance (or correlation) between logarithm of stock return and consumption growth must be given. These data have been calculated in Table (7).

Table 7: Calculation of Empirical Data

Year	Real Stock Return	Real Risk Free Return	Consumption Growth Rate
1995/96	-12.97	2.82	-0.05
1996/97	-12.92	2.12	-0.02
1997/98	-15.44	-4.80	-0.11
1998/99	17.42	-9.02	-0.03
1999/2000	47.45	1.20	0.02
2000/01	-5.80	2.58	0.08
2001/02	-45.46	1.81	-0.03
2002/03	-15.17	-1.30	-0.01
2003/04	4.16	-1.03	0.03
2004/05	21.12	-2.06	0.01
2005/06	22.29	-5.13	0.05
2006/07	50.77	-3.99	0.02
2007/08	26.84	-4.36	0.06
Arithmetic Average	6.32	-1.62	0.01
Standard Deviation of Consumption Growth	-	-	0.52
Covariance Between Real Stock Return and Consumption Growth	-	-	0.69

The above calculation can be summarized in Table (8).

Table 8: Summary of the Empirical data

Data Series	Symbol in Model	Arithmetic Average (1995/96 to 2007/08)
Real Stock Return	$R^{e}_{t,t+1}$	6.32
Real Risk Free Return	$R^{f}_{t,t+1}$	-1.62
Consumption Growth	$\ln[E_t(C_{t+1}/C_t)]$	0.01
Standard Deviation of Consumption Growth	α_c	0.52
Covariance between Real Stock Return and Consumption Growth	$cov(r^{e}_{t,t+1}, c_{t+1})$	0.69

By substituting these data on the simplified equation (13) we can get, the model implied relative degree of risk aversion (α) and subjective time discount factor (β) as 11.12 and 4.231×10^{-8} respectively.

5. CONCLUSION

The basic model suggests a degree of relative risk aversion of 11.12 and a subjective time discount factor of $4.231x10^{-8}$ with in the sample period of the year 1995/96 to 2007/08. The theoretical relative degree of risk aversion, which measures the curvature of the utility function, should be independent with the consumption growth process. Mehra and Prescott (1985) suggest that α less than ten is in line with the existing theories. Obviously, the model implied relative risk aversion is much higher than what Mehra and Prescott (1985) suggested. As a result, same as that in the western economies, the equity premium puzzle also exists in Nepalese market. This has proved that equity premium puzzle does exist in Nepalese market.

The result of this study suggests that unlike the US market, as well as the majority of other developed markets, the equity risk premium is much lower in Nepalese market. However, the basic model suggests that to get the risk premium investors of the Nepalese market will actually request an extremely high potential gain to compensate a very low potential loss. The short existence of Nepalese stock market complicates the problem due to potential short-term biases. On the other hand, the efficiency level of Nepalese statistical reports and indices are also doubtable, especially in the earlier years. The frequent reforms in the Nepalese financial market can radically distort the market performance and preference, and the investors' rationality is also questionable at the debut stage of a market.

However, it should also be noted that the subjective time discount factor fits within the conventional financial theories. According to conventional finance theories, the subjective time discount factor is assumed to be less than one in order to reveal the common concept that investors prefer utilities today more than utilities tomorrow. Even though, the basic assumption that β should be less than 1 should be applicable to all investors all around, few researches have revealed β greater than 1. Ni (2006) found subjective time discount factor greater than 1 in Chinese market, which means Chinese investors prefer utility tomorrow more than today. Campbell (1996) also found β higher than one in economies like US, Japan, Canada, and others. In Nepalese market, the subjective time discount factor falls with 0 to 1, which Nepalese investors choose utility today more than tomorrow. As a whole, the restriction of $0 < \beta < 1$ is consistent with the Nepalese market.

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REFERENCES

Ang, A., G. Bekaert and J. Liu. 2005. Why stock may disappoint. Journal of Financial Economics, Vol. 7 (3): 471-508.

Benartzi, S., and R. H. Thaler. 1995. Myopic Loss Aversion and Equity Premium Puzzle. The Quarterly Journal of Economics, Vol. 110 (1): 73-92.

Brown, S., W. Goetzmann and S. Ross. 1995. Survival. Journal of Finance, Vol. 50 (2).

Campbell, J. Y., and J. H. Cochrane. 1999. By force of habit: a consumption-based explanation of aggregate stock market behavior. Journal of Political Economy, Vol. 107 (2): 205-251.

Campbell, J. Y. 1996. Consumption and the stock market: Interpreting international experience. Swedish Economic Policy Review, Vol. 3: 251-299.

Constantinides, G. M. 1990. Habit Formation: A Resoultion to Equity Premium Puzzle. Journal of Political Economy, Vol. 98 (3): 519-543.

Cysne, R. P. 2005. Equity-Premium Puzzle: Evidence from Brazilian Data. Ensaios Economicos da EPGE, No. 586.

Gul, F. 1991. A theory of Disappointmet Aversion. Econometrica, Vo. 59: 667-686.

Kahneman, D. and A. Tversky. 1979. Prospect Theory: An analysis of Decision under Risk. Econometrica, Vol. 47: 263-291.

Kim, K. and Park, K. (2009), " Explaining the Equity Premium in Korea", The Journal of the Korean Economy, Vol. 10, No. 2

Liu, R. and Wang, Z. (2005), "The Risk - free Rate Puzzle and Equity Premium in China", Modern Finance and Economics – Journal of Tianjin University of Finance and Economics (China), (4): 21-23, 80

Mehra, R. (2006),"The Equity Premium in India", NBER Working Paper Series, National Bureau of Economic Research, Massachussets, Cambridge, pp. 13

Mehra, R., and C. Prescott, E. (1985). The Equity Premium: A puzzle. Journal of Monetary Economics , 145-146.

Ni, Z. (2006). "The Equity Premium Puzzle in China". MA in Finance and Investment Dissertation, The University of Nottingham, United Kingdom

Olsen, R. A., and Troughton, G. H. (2000). "Are risk premium anamolies caused by Ambiguity". Financial Analyst Journal, Vol. 56, No. 2 , 24-31.

NRB. 2007b. Inflation Analysis and Price Situation. Special Issue on Labor cost and Employment, Vol II, No. 1. Nepal Rastra Bank, Kathmandu, Nepal.

NRB. 2007a. Inflation in Nepal. Nepal Rastra Bank, Kathmandu, Nepal.

NRB. 2012. Current Macroeconomic Situation, Mid March 2012. Nepal Rastra Bank, Kathmandu, Nepal.

SEBON. 2010. Annual Report 2009/2010. Securities Board of Nepal, Kathmandu, Nepal.

Xiao, J. and Wang, Q. (2004), "Transaction cost, consumption based asset pricing and equity premium puzzle: empirical analysis from Chinese stock market", Management World (China), (12): 3-11, 49

Xiaojing, J. (2011),"Equity Premium Puzzle: Asian Countries Review", Erasmus School of Economics, Erasmus University Rotterdam