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I. Introduction

The term risk generally refers to the volatility of a particular security. Investments typically have an associated risk based upon their exposure to markets and the fluctuations within them. The risk of an investment is the chance that an actual return will be different than expected. Risk includes the possibility of receiving less than the initial investment. The more individual returns deviate from the expected return, the greater the risk and the greater the potential reward. Risk is one of the most fundamental aspects of investing and lies within the core of research.

The degree to which all returns for a particular investment deviate from the expected return of the investment is a measure of its risk. A measure of the volatility of a security in comparison to the market as a whole is known as beta. Beta is used in the Capital Asset Pricing Model (CAPM), a model that calculates the expected return of an asset based on its beta and expected market returns. The CAPM and the concept of beta as a measurement of systemic risk have a number of practical uses in portfolio management. CAPM provides a rationale for a very simple passive portfolio strategy. Diversify your holding of risky assets according to the proportions of market portfolio and mix this portfolio with the risk free asset achieve a desired risk-reward combination. Moreover, given the fact that the CAPM is used in the determination of the discount rate in valuation models of the firm, it is not surprising that many research papers have examined the determinants of beta in the emerging and developed stock markets.

Systemic risk and its determinants have been widely discussed in financial literature and are considered the most interesting issues in stock market studies (Logue and Merville (1972), Breen and Lerner (1973), Kim et al. (2002)). Despite numerous studies on systemic risk and its determinants, the extant literature does not deal for systemic risk in pre-emerging stock market of Nepal. The current research aims at expanding the evidence arising from the existing literature by exploring the main financial determinants of systemic risk in the Nepalese stock market. More specifically, present estimates are based on accounting and market panel data on Nepalese listed companies that were publicly traded on the Nepal Stock Exchange from 2009 to 2013. Seven financial variables are explored as possible determinants of the systemic risk of listed companies stock: (1) Size, (2) leverage, (3) return on assets, (4) growth, (5) liquidity, (6) operating efficiency, and (7) dividend payment. The rationale for the selection of variables is essentially based on financial theory and investors' intuition (Beaver et al. (1970), Rosenberg and McKibben (1973), Lev and Kunitzky (1974), Bildersee (1975), Beaver and Manegold (1975), Chen et al. (1986), Martikainen, (1991), McMillan (2001), Hong and Sarkar (2007), Iqball and Shah (2011)).

Nepalese stock market is still in a pre-emerging stage of development with the structural problems-Government holding in major infrastructures-Nepal Stock Exchange Ltd. (NEPSE) and central securities depository (CSD) and fixed pricing system in public offerings; infrastructural deficiencies-absence of online trading system and proper over-the-counter (OTC) market; and regulatory weaknesses- poor disclosure practices, dominance of banks and other financial institutions in issuing and trading of securities, highly fluctuating market index, absence of enforcement of legal provisions, absence of cross-border listing and trading, and low level of international networking as Securities Board of Nepal (SEBON)-capital market regulator has not yet been the member of International Organisation of Securities Commissions (IOSCO). During the period of mid-July 1998 to mid-July 2013 (inclusive), there was annual average 14.90 percent of the listed enterprises making timely disclosure, annual

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average NPR 4370 million funds were raised from the stock market, and annual average 4.05 percent turnover was in the secondary market. This turnover percent is below than 7.5 percent specified by World Bank for emerging markets. During the same period of time, the trend of commercial banking activities as to the annual average deposits was NPR 391716.26 million, annual average loans and advances was NPR 271204.79 million, and loans and advances deposits ratio was 69.24 percent (NRB (2003, 2013)). The comparison reveals that loans and advances made by commercial banks were62.06 times higher than the funds mobilised through public issue of securities in the stock market. Similarly, turnover of banking activities is 17.10 times higher than stock market. In view of aforementioned facts, it is obvious that stock market in Nepal is in the pre-emerging stage of development.

A study devoted to per-emerging stock market on systemic risk would be interesting not only to the researchers around the globe but equally to the investors and corporate managers at home country as well as stock market authorities initiating to reform and develop stock market in the country. This paper, thus, contributes another piece to the emerging puzzle by examining the determinants of systemic risk in the pre-emerging stock market of Nepal. The policy implication section of this paper will illuminate the implication of findings in greater detail.

The relevant literature currently available for the type of empirical research is presented in section II. Since the study on systemic risk is lacking in Nepal, the review virtually concentrates on the research evidence of stock markets other than Nepal. Section III discusses the methodology and outlines the data and hypothesised relationships of select variables with the systemic risk for empirical findings. The empirical analysis is made insection IV. The findings and conclusion constitute section V. The policy implications and research avenues are stated in section VI.

II. Literature Review

Most of the empirical studies used multiple regressions with beta as the dependent variable and firm financial ratios as independent variables to identify the determinants of systemic risk.

The first significant attempt to link market risk and financial variables was made by Beaveret al. (1970). The results indicate a high degree of contemporaneous association between estimated betas and several financial variables such as dividend payout, financial leverage and earnings yield. In the case of banks, Biase and D'Apolito (2012) find that bank equity beta correlates positively with bank size and with the relative volume of loans and intangible assets, and negatively with bank profitability, liquidity levels and loan loss provisions. The available evidences clearly support the contention that accounting measures of risk are impounded in the market-price based risk measure.

Logue and Merville (1972) confirmthat debt leverage, profitability, and firm size were significant beta determinants. Size is often considered the most important factor when assessing the potential for systemic risk. Size is also relevant when analysing financial activities, exposures to other market participants, individual transactions and trading volumes. Size may be a determining factor when considering markets as well. Once they attain a certain volume, markets in of themselves can pose risks, since they often serve as important pools of liquidity. While size is an important consideration when assessing systemic risk, it should not be considered in isolation from other variables. In terms of entities, activities or markets, size alone does not necessarily imply systemic risk. It is prudent to establish empirically company size as a determinant of systemic risk and it is more so in the context of pre-emerging stock market like that of Nepal.

Titman and Wessels (1988) reveal that large firms tend to have a lower beta as large firms are likely to be well diversified and therefore less prone to financial distress. Hamada (1972) verifies that financial leverage had a significant positive relationship with beta. This conclusion was further supported by Bowman (1979) as indicated that leverage, debt to equity ratio, is an important variable that have influence on the systemic risk of a firm. Numerous empirical studies supported this notion, including Logue and Merville (1972), Mandelker and Rhee (1984), De Jong and Collins (1985), and Marston and Perry (1996). For operating efficiency, however, Logue and Merville (1972), and Borde (1998) suggest that it is negatively correlated with beta. The reason is firms that are highly efficient in generating revenues with their assets will be more likely to be profitable and less likely to suffer loss, hence lower beta.

Firms often commit to debt leverage to obtain resources for investment in growth opportunity (Roh (2002)). When growth is measured by assets growth or revenues growth, studies often show a positive relationship with beta. As high leverage leads to higher financial risk, growth becomes positively correlated with beta. On the other hand, when growth is measured by earnings before interest and taxes (EBIT), it usually shows anegative relationship with beta (Lee and Jang (2007), and Borde (1998)). As investor value growth opportunities, firms with high growth usually maintain high stock prices whereas firms with low growth may see their stock prices more volatile.

Several researchers suggest a negative relationship between beta and liquidity (Beaver et al. (1970), Logue and Merville (1972), Moyer and Chatfield (1983), Mear and Firth (1988)). This means firms with higher liquidity are expected to have less exposure to systemic risk. Studies also show a negative relationship

between beta and profitability (Logue and Merville (1972), Mear and Firth (1988)). The reason is with higher profits, firms are less likely to face bankruptcy. This is especially true for firms that are highly leveraged. Profitability is usually measured by return on asset (ROA) as unlike return on equity (ROE), it is not affected by the company's capital structure.

Lee and Brewer (1985) confirm that bank market risk relates to leverage and dividend pay-out ratio. Patroet al. (2000) expect that companies with high dividend payments may be less risky. If a company has their value tied to higher future growth, rather than to current dividends, it may be more sensitive to market performance, if one compares a company with high dividends against a growth company with no or few dividends, expectation is that the growth company may be more sensitive to future economic performance.

The review of aforementioned empirical evidences reveal that the total assets, leverage, profitability, growth, liquidity, operating efficiency, and dividend payout are the major determinants of systemic risk for companies traded on stock markets. Though there are these determinants of systemic risk of publicly traded stocks, they are all the evidences of developed and emerging stock markets. Such empirical evidence is scant in the context of pre-emerging stock markets like that of Nepal. Therefore, this paper is initiated to address the extant gap in the literature relating to determinants of systemic risk for the companies listed on Nepal Stock Exchange Ltd.

III. Research Methodoloty

The study examines the relationship of systemic risk, with company specific financial factors, such as size, profitability, growth, liquidity, operating efficiency, and dividend payment. In order to carry out this study, descriptive cum analytical research designs are employed. Descriptive research design is used mainly for conceptualisation of the issues. Analytical research design is employed to analyse the data and results. This section deals with a description of the research methodology employed in addressing the research issues of the paper.

a) Target population, data source, and sampling procedure

The population for this study consists of the companies listed on the Nepal Stock Exchange Ltd. (NEPSE). In mid-July 2013, there were 230 companies listed on NEPSE. The companies are selected based on the availability of information. The criteria by which the companies are included in the sample are: (i) The companies must have available data including dividend payment for all years, that is 2009-2013. (ii) The companies must have been listed on NEPSE before the aforementioned period of time and must have been actively traded. A review of data sources: individual annual reports-balance sheet and profit and loss statements of listed companies and annual trading reports of NEPSE reveal that there were 15 listed companies having all required data including dividend payments for the study period mid-July 2009 to mid-July 2013 (inclusive) for the purpose of the study. The reason for selection for 5 years' time span is to have a large number of companies having uninterrupted dividend payments and availability of other required data in the sample and that one business cycle is completed in 5-7 years (Rafique (2012)). Thus, cross-sectional data of 15 listed companies for the period with a total of 75 observations are used in the study as presented in Appendix 1.

b) Basic regression model, variables with hypothesized signs, and data

To examine the relationship between systemic risk and company specific financial factors, the following model developed based on empirical findings is employed with the aid of Statistical Package for Social Science (SPSS) 20:

$$\beta_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 LEV_{it} + \alpha_3 ROA_{it} + \alpha_4 GROWTH_{it} + \alpha_5 LIQ_{it} + \alpha_6 OE_{it} + \alpha_7 DPS_{it} + \mu_{it}$$

Where, the variables and hypothesized signs are as follows:

'β_{it}' is per share systemic risk of the stock of company 'i' in period't'; it is year-end systemic risk of the share of the company. The estimated beta is derived by regressing a company's yearly stock return against the yearly market return. A company's yearly stock return is measured by the yearly percentage change of stock prices, while yearly percentage change in the capital market index (NEPSE) represents a proxy for market return.

The monthly closing prices of the 15 companies are collected (2009-2013) to calculate returns as follows: $R_{it} = (P_{it} - P_{it-1}) / P_{it-1}$. Where, P_{it} is the price level of stock (i) in month (t). Market return is calculated using NEPSE returns as follows: $R_{mt} = NEPSE_t - NEPSE_{t-1} / NEPSE_{t-1}$. Where, $NEPSE_t$ is market return (R_m) in month (t). Based on the calculated monthly returns, the beta coefficient for each company is then estimated by using the market model: $R_{it} = \alpha_i + \beta_i R_{mt} + u_{it}$. Where, R_{it}: return for company (stock) (i) in month (t), α_i: the constant term that is the expected return when R_{mt} is zero, βi: the beta coefficient on yearly basis, R_{mt}: the returns on the general market index (NEPSE index) in month t, and u_{it}: the random error term with zero expectation. Market models use only a supposition of linear relationship between returns of securities and returns of the whole market. According to a study by Gu and Kim (1998), the systemic risk (beta) of each company can be estimated based on the equation or the characteristic line. The

slope of the characteristic line of each company, estimated by regressing the NEPSE index return against the company's stock return, represents the sensitivity of the stock's return to the market return and is the estimated beta. So through this market model beta for the share of each company is calculated by the formula: ßi= Cov (R_i, R_m)/Var(R_m)that is covariance of per share return and return on market)/ market variance for the year 2009 through 2013. Where, $ß_i$ is systemic risk of i_{th} stock, R_i return from i_{th} stock and R_m is market return. It is dependent variable in the model.

'$SIZE_{it}$' is size of the company 'i' in period't'. The size is measured by the total assets of the company and total assets are converted into natural logarithm of total assets. Logarithm conversion condenses the effect of skewness (Iqbal and Shah (2011)). Based on Logue and Merville (1972), Breen and Lerner (1973), Titman and Wessels (1988), Gu and Kim (2002), and Olib et al. (2008), it is hypothesised that beta of stock is negatively related to the total assets of company.

'LEV_{it}' is the leverage of company 'i' in period't'. Leverage measures the financial health of a company and help investors to determine a company's level of risk. The financial ratio selected for explaining leverage of companies is debt ratio that is total debt to total assets indicates what proportion of debt a company has relative to its assets along with the potential risks the company faces in terms of its debt-load. Total debt includes short and long-term borrowings from financial institutions, debenture/bonds, deferred payment arrangements for buying capital equipment, interest bearing public deposits, and any other interest bearing loans. Based on Amit and Livnat (1988), Kim et al. (2002), Lee and Jang (2007), Hong and Sarkar (2007), Olib et al. (2008), and Ramadan (2012), it is hypothesised that there is positive relationship between leverage and beta.

'ROA_{it}' is return on assets of company 'i' in period't' whichis net income tototal assets. It is the proxy for profitability of the company. High profitability can enhance companies' ability to lower financial instability and thus lessen systemic risk. Based on Logue and Merville (1972), Scherrer and Mathison (1996), Borde (1998), Gu and Kim (2002), Lee and Jang (2007), and Rowe and Kim (2010), it is hypothesised that there is negative relationship between return on assets and beta.

$GROWTH_{it}$ is growth of company 'i' in period't'. Annual percentage change in earnings before interest and taxes is used to compute the growth of the company. Rapidly growing firms, often measured with asset growth and revenue growth, are often considered vulnerable to economic changes. Based on Borde (1998), Gu and Kim (2002), Roh (2002), and Lee and Jang (2007), it is hypothesised that there is positive relationship between systemic risk and growth of the company.

'LIQ_{it}' is liquidity of company 'i' in period't', that is the ratioof current assetsminus inventory (sum of cash, marketable securities, and accounts receivable) to current liabilities or quick ratio. Current liabilities include creditors-outstanding loans, bills payables, accrued expenses, short-term bank loan, proposed and unpaid dividends, income-tax liability, long-term debt maturing in current year, and interest payable deposits. Companies with higher liquidity are expected to have less exposure to systemic risk. Based on Beaver et al. (1970), Logue and Merville (1972), Moyer and Charlfield (1983), Mear and Firth (1988), Gu and Kim (1998, 2002), Lee and Jang (2007), and Eldomiaty et al. (2009), the hypothesis is there is negative relationship between systemic risk (beta) and liquidity.

'OE_{it}' is operating efficiency of company 'i' in period't', it is total revenue to total assets or asset turnover. The operational efficiency of the analyzed companies is determined with the total assets turnover ratio which determines the amount of revenue that is generated from each rupee of assets. Total revenue includes interest income, commission and discount, other operating income, abnormal transaction income, non-operating income, and provision refund. Companies that are highly efficient in generating revenues with their assets will be more likely to be profitable and less likely to suffer loss. The empirical evidences reveal that companies which efficiently utilize their assets in generating revenues are more likely to reduce possible losses and consequently could have a low level of systemic risk. Based on Logue and Merville (1972), Borde (1998), Gu and Kim (1998, 2002), Eldomiaty et al. (2009), the hypothesis is the negative relationship between operating efficiency and systemic risk.

'DPS_{it}' is dividend per share of company 'i' in period't', and it is proxy for the dividend payment of the company. Agency cost can be reduced with high dividend (Ang et al. (1985)). Per share market price increases with the dividend per share distributed by the company (Graham and Dodd (1951), Bolster and Janjigian (1991), Pradhan (2003), Khan and Khan (2012), and Adhikari (2014)), hence it helps to reduce systemic risk of the company. Based onBeaver et al. (1970), Logue and Merville (1972), Breen and Lerven (1973), Borde (1998), and Gu and Kim (2002), the hypothesis is negative relationship between dividend payment and systemic risk of the company.

'μ_{it}' is random error term.

Data extracted from annual reports and trading reports were processed and transformed manually in order to obtain relevant measures of the financial factors.

IV. Empirical Analysis

Based on the time period 2009-2013, beta coefficients is estimated for total of 15 listed companies by using model set for the paper. The estimated betas are then related to their respective financial variables- company size, leverage, return on assets, growth, liquidity, operating efficiency, and dividend per share. The study is attempted at three levels using the sample, viz., (1) Descriptive statistics, (2) Correlation analysis, and (3) Regression analysis. The following sub-sections present the empirical analysis of data.

a) Descriptive statistics

Table 1 demonstrate the descriptive statistics of systemic risk (beta) and seven independent variables for 15 listed companies for five year period of 2009- 2013. Mean value of beta is 0.65. This mean value of beta is less than market beta that is always consider equal to 1 and also indicates that sample of listed companies are less riskier than the market. In the same way size has mean score of 9.02 with standard deviation of 1.70 and leverage has 0.65 mean with standard deviation of 0.31. Arithmetic means of return on assets, growth, liquidity, operating efficiency, and dividend payment are 0.09, 26.22, 0.59, 0.48, and 58.41 respectively. The descriptive statistics reveal that there is high variability in the growth and dividend per share of the select listed companies of Nepal.

Table 1 : Descriptive statistics

	BETA	SIZE	LEV	ROA	GROWTH	LIQ	OE	DPS
Mean	0.65	9.02	0.65	0.09	26.22	0.59	0.48	58.41
SD	1.34	1.70	0.31	0.17	24.25	0.79	1.0	150.99
Max	2.80	11.20	0.91	0.69	80.77	3.97	3.99	760
Min	-4.23	5.99	0.00	0.01	-44.80	0.05	0.06	0.66
N	75	75	75	75	75	75	75	75

b) Correlation analysis

Pearson correlation has been used for examining the relationship among all variables. Detection of correlation among explanatory variables is very useful for multicollinearity. Most researchers have mentioned that if the correlation between explanatory variables is 0.9 or more, it will cause the problem of multicollinearity. Table 2 shows the correlation among all variables and it indicates that there is high correlation between operating efficiency and liquidity, dividend per share and liquidity and dividend per share and operating efficiency, and there is problem of multicollinearity with liquidity and return on assets, operating efficiency and return on assets, and dividend per share and return on assets as they have correlation of 0.90 or more.

Table 2 : Correlation among select variables

	BETA	SIZE	LEV	ROA	GROWTH	LIQ	OE	DPS
BETA	1							
SIZE	0.48	1						
LEV	0.14	0.48	1					
ROA	-0.36	-0.51	-0.81	1				
GROWTH	0.02	-0.19	0.23	-0.07	1			
LIQ	-0.29	-0.39	-0.81	0.92	-0.14	1		
OE	-0.38	-0.53	-0.76	0.99	-0.03	0.87	1	
DPS	-0.38	-0.30	-0.58	0.90	-0.07	0.86	0.89	1

c) Regression analysis

The results of regression analysis of systemic risk per share on size, leverage, return on assets, growth, liquidity, operating efficiency, and dividend per share for the sample companies are shown in Table 3. The results reveal that coefficients of size and return on assets or profitability have positive signs in all equations, which are contrary to priori expectation and the coefficients are significant at 1 percent level of significance for size in all equations, and 1 percent level of significance in two equations and 5 percent level of significance in another two equations for return on assets, which indicate that size and profitability are major determinants of systemic risk of stock of the sample companies.

This table shows regression results for the model as defined by equation: $\beta_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 LEV_{it} + \alpha_3 ROA_{it} + \alpha_4 GROWTH_{it} + \alpha_5 LIQ_{it} + \alpha_6 OE_{it} + \alpha_7 DPS_{it} + \mu_{it}$. The regression analysis is based on 15 companies over 5 years of data for a total of 75 observations. β is beta which is the per share systemic risk of company, which is dependent variable. The

independent variables are defined as: SIZE is the total assets, LEV is the leverage, ROA is the return on assets, GROWTH is the annual growth in earnings before interest and tax, LIQ is the liquidity, OE is the operating efficiency, and DPS is the dividend per share.

Table 3 : Regression results for the sample companies

Eq.	Constant	SIZE	LEV	ROA	GROWTH	LIQ	OE	DPS	R^2	F-statistics
(1)	-2.64 (-1.94)	0.49 (4.83)* ((0.54))	-1.79 (-1.61) ((0.14))	10.09 (1.12) ((0.01))	0.01 (2.07)** ((0.79))	-0.55 (-0.98) ((0.08))	-1.19 (-1.15) ((0.02))	-0.01 (-1.43) ((0.08))	0.41	6.68*
(2)	-4.07 (-3.94)*	0.49 (4.80)* ((0.54))	-	17.05 (2.14)* ((0.01))	0.01 (1.63) ((0.88))	-0.35 (-0.62) ((0.08))	-1.62 (-1.59) ((0.02))	-0.01 (-3.42)* ((0.15))	0.39	7.19*
(3)	-3.41 (-3.55)*	0.45 (4.48)* ((0.57))	-	15.38 (1.92)* ((0.01))	-	-0.39 (-0.69) ((0.08))	-1.41 (-1.39) ((0.02))	-0.01 (-3.21)* ((0.15))	0.36	7.19*
(4)	-3.39 (-3.54)*	0.44 (4.45)* ((0.57))	-	11.08 (2.21)** ((0.02))	-	-	-0.96 (-1.23) ((0.03))	-0.01 (-3.30)* ((0.15))	0.36	9.84*
(5)	-3.54 (-3.72)*	0.46 (4.67)* ((0.60))	-	5.53 (2.49)** ((0.12))	-	-	-	-0.01 (-3.32)* ((0.15))	0.35	12.53*
(6)	-2.07 (-2.67)*	0.32 (3.83)* ((0.91))	-	-	-	-	-	-0.01 (2.48)** ((0.91))	0.29	14.63*

T-statistics are shown in single parentheses under estimated values of the regression coefficients, and tolerances are shown in double parentheses under estimated t-statistics.

** &** denote the significance of coefficients at 1 percent and 5 percent level of significance respectively. And, Eq. is equations*

Dividend per share is also appeared to be an important determinant of systemic risk of stock as its coefficient is significant at 1 percent level of significance in four equations and coefficient of dividend per share is as per priori expectation that is inverse relationship between dividend per share and systemic risk of stock of the sample companies. Hence, dividend per share affects negatively the systemic risk of the stock of listed companies in Nepal.

To gauge robustness and sensitivity-to-specification error of the regression, each independent variable having insignificant coefficient is removed from the complete model and the regressions are re-estimated. These results are shown in Table 3, Equations 2-5. The coefficients of the variables did not change in sign or size (regression coefficients are not sensitive to these alterations in terms of sign and significance). In the additional four equations, the explanatory power of the regression model as reflected by R2 decreased slightly. The closer tolerance (TOL) is to zero of the variable, the greater the degree of collinearity of that variable with the other regressors (Gujarati and Porter (2009)). The TOL of return on assets is close to zero in Equations 1-4 indicating some degree of multicollinearity between the systemic risk and return on assets. To avoid multicollinearity problem the variable return on assets is removed in Equation (6), the results remain the same in terms of sign and significance of coefficients of the variables, hence, indicating that muticollinearity is not a significant problem.

The R2, which has explained about 35 percent of cross-sectional variability in systemic risk of the stock with the independent variables used in the models, is considered as satisfactory in view of the pre-emerging stock market of the country. Similarly, F-value in all equations show that it is significant at 1 percent level of significance reflecting that regression equations provide statistically significant results.

In overall, the empirical results reveal that size and profitability influence positively and dividend payment affects negatively, and unlike in developed and emerging stock markets leverage, growth, liquidity, and operating efficiency do not affect systemic risk of the stock of sample companies in Nepal. The present inconsistent findings with the developed and emerging stock markets are attributed to idiosyncratic nature of pre-emerging stock market.

V. Findings And Conclusion

The results reveal that there is negative relationship between systemic risk and dividend per share, which is consistent and supportive to common intuitions of investors and previous empirical evidences of developed and emerging stock markets (Beaver et al. (1970), Logue and Merville (1972), Breen and Lerven (1973), Borde (1998), and Gu and Kim (2002)). However, contrary to financial intuition and several empirical evidences of developed and emerging stock markets such as Logue and Merville (1972), Breen and Lerner (1973), Titman and Wessels (1988), Gu and Kim (2002), and Olib et al. (2008)) for the relationship

between systemic risk and size, and Logue and Merville (1972), Scherrer and Mathison (1996), Borde (1998), Gu and Kim (2002), Lee and Jang (2007) and Rowe and Kim (2010)for the relationship between systemic risk and return on assets, the relationship is found to be positive in this paper. The findings, thus, partly move in line with the theoretical aspects of finance and empirical evidences of developed and emerging stock markets.

The results demonstrate that company's size, profitability, and dividend payment are significantly related to systemic risk. The conclusion resulting from this study is that systemic risk is significantly determined by financial characteristics of the listed company.

VI. Policy Implications and Future Research Avenues

It is believed that present findings provide a significant contribution to the understanding of the fundamental determinants behind the systemic risk of listed companies of Nepal. Their empirical value is threefold. First, present estimates allow corporate executives to better assess the consequences of different strategic options on the risk profile of listed companies under their control (e.g. with regard to size, profitability, and dividend payment). Second, this study may be of use to regulatory authorities, providing them with insights of the effects of their regulatory choices on risk profiles of listed companies. This point is particularly noteworthy in light of the stock market reform pressure created in the country from indigenous, non-resident Nepalese as well as foreign portfolio investors. Third, the importance of beta is also evident from the investor's point of view. Risk is differentiated from 'uncertainty' because it is measurable; therefore, investors must methodically research the securities they invest in to mitigate loss. Their research and analyses are crucial in deciding what kind of position, if any, should be taken. Systemic risk estimation is useful for investors in order to analyse the nature of risk associated with different investment options, recognise risk-return relationships within portfolio investment strategies and most importantly estimation of intrinsic value of stock as information contained in financial indicators is relevant.

Given the importance of CAPM and beta in financial analysis and informed investment decisions in the stock markets, NEPSE as the market operator and SEBON as the regulator should promote and encourage independent studies on systemic risk and its determinants. Stock market regulator has a key role to play in addressing systemic risk, bringing its particular perspective as market integrity regulator. To this end, IOSCO has identified reducing systemic risk as one of the three objectives of securities regulation. The financial crisis, 2007-09 has led securities regulators to put greater emphasis on systemic risk and financial stability. The IOSCO principles recognised the importance of systemic risk and the role of securities regulators in preventing and mitigating such risks as the principle 6 of IOSCO is identifying, assessing and mitigating systemic risk. Unless one is able to measure systemic risk objectively, quantitatively, and regularly, it is impossible to determine the appropriate trade-off between such risk and its rewards and, from a policy perspective and regulatory objective, how best to contain it. One of the illuminations of the present paper is how to measure the systemic risk and its determinants in Nepalese stock market. Further, it raises public awareness of key issues and potential systemic risks in the pre-emerging stock markets. Stock market regulators around the globe, who are concerned with the efficient functioning of markets, should try to ensure that investors are well-informed of investment risks; hence, SEBON cannot be exception. SEBON should pay sufficient attention to measure systemic risk and raise risk awareness based on the present paper. SEBON should also be concerned to promote transparency of financial reporting by incorporating mandatory provisions in the securities regulations for the listed companies to publish information about systemic risk in the financial reports that will help investors to reach a fair value of their investment and ultimately stabilize overall stock prices. The highly fluctuating trend of market index illustrated in the paper indicates that inadequate regulatory presence in the Nepalese stock market, hence, deeper structural changes are required, including regulatory reforms.

Based on the present efforts; future research should consider the relationship between systemic risk of the listed companies and major macroeconomic variables such as the ratios of exports to GDP, imports to GDP, tax revenues to GDP, inflation, and GDP growth rate. This type of research should be updated and extended using increased sample size and longer study period as well as including other financial factors like earnings variability and liquidity of the shares to have greater insights.

References Références Referencias

1. Adhikari, N. (2014). Managers' views on dividend policy of Nepalese enterprises, *NRB Economic Review*, 26 (1), 90-120.
2. Amit, R. and Livnat, J. (1988). Diversification, capital structure, and systematic risk: An empirical investigation. *Journal of Accounting, Auditing and Finance*, 3(I), 1943.
3. Ang, J., P. Peterson and Peterson, D. (1985). Investigations into the determinants of risk: A new look. *Quarterly Journal of Business and Economics*, 24(1), 3–20.
4. Beaver, W.H., P. Kettler and Scholes, M. (1970). The association between market determined and accounting determined risk measures. *The Accounting Review*, 45(3): 654-682.

5. Beaver, W. and Manegold, J. (1975). The association between market-determined and accounting-determined measures of systematic risk: Some Further Evidence. *Journal of Financial and Quantitative analysis*, 231-284.
6. Biase and D'Apolito. (2012). The determinants of systematic risk in the Italian banking system: A cross-sectional time series analysis, *International Journal of Economics and Finance*, 4(22), 152-164.
7. Bildersee, J. (1975). The association between a market-determined measure of risk and alternative measures of risk. *The Accounting Review*, 81-98.
8. Bolster, Paul J. and Janjigian, V. (1991). Dividend policy and valuation effects of the tax reform Act of 1996, *National Tax Journal*, 44(4), Part 2, 511-518.
9. Borde, S.F. (1998), Risk diversity across restaurants, *Cornell and Hotel Quarterly and Restaurant Administration Quarterly,* 39 (6), 64-69.
10. Bowman, R.G. (1979). The theoretical relationship between systematic risk and financial (accounting) variables, *Journal of Finance,* 34(3), 617-630.
11. Breen, J., and Lerner, M. (1973). Corporate financial strategies and market measures of risk and return. *The Journal of Finance*, 28(2), 339–351.
12. Chen, N. F., Roll, R. and Ross, S. A. (1986). Economic forces and the stock market, *Journal of Business*, 59, 383-403.
13. De Jong, D.V. and Collins, D.W. (1985), Explanations for the instability of equity beta: Risk-free rate changes and leverage effects, *Journal of Financial and Quantitative Analysis* 20, 73-94.
14. Eldomiaty, I.T., Mariam H. Al Dhahery, and Shukri, Muna A. (2009). The fundamental determinants of systematic risk and financial transparency in the DFM General Indux, *Middle Eastern Finance and Economics,* 5, 62-74.
15. Graham, Benjamin and Dodd, David L. (1951). *Security Analysis: Principles and Techniques*, third edition (McGraw-Hill Book Co, New York).
16. Gu, Z. and Kim, H. (1998). Casino firms' risk features and their beta determinants. *Progress in Tourism and Hospitality Research, 4,* 357-365.
17. Gu, Z. and Kim, H. (2002). Determinants of restaurant systematic risk: A reexamination. The *Journal of Hospitality Financial Management*, 10 (1), 1–13.
18. Gujarati, Damodar N. and Porter, Dawn C. (2009). *Basic Econometrics*. fifth edition (McGrew-Hill/Irwin, a business unit of The McGraw-Hill Companies, Inc., 1221 Avenue of the Americas, New York, NY, 10020).
19. Hong, G., and Sarkar, S. (2007). Equity systemic risk (Beta) and its determinants. *Contemporary Accounting research*, 24(2), 423-466.
20. Iqball, Muhammad Junaid and Shah, A. (2011). Determinants of systemic risk, *The Journal of Commerce,* 4(1), 47-56.
21. Hamada, R. S. (1972). The effect of the firm's capital structure on the systematic risk of common stocks. *The Journal of Finance, 27(2), 435-452.*
22. Khan, Ather Azim and Iqbal, K. (2012). Dividend policy and stock prices, *SAICON,* Lahore: COMSATS Institute of Information Technology.
23. Kim, H., Z., Gu and Mattila, A.S. (2002). Hotel real estate investment trusts' risk features and beta determinants. *Journal of Hospitality and Tourism Research*, 26(2), 138–154.
24. Lee, C., and Brewer, E. (1985). The association between bank stock market-based risk measures and the financial characteristics of the firm: A pooled cross-section time series approach. *Federal Reserve Bank of Chicago Proceedings*, 285-315.
25. Lee, J.S. and Jang, S.C.S. (2007). The systematic-risk determinants of the US airline industry, *Tourism Management*, 28, 434-442.
26. Lev, B. and Kunitzky, S. (1974). On the association between smoothing measures and the risk of common stock, *Accounting Review*, 259-270.
27. Logue, L. and Merville, J. (1972). Financial policy and market expectations, *Financial Management* 1(3), 37-44.
28. Ludvigsona S. C. and Ng, S. (2007). The empirical risk–return relation: A factor analysis approach. *Journal of Financial Economics*, 83, 171–222.
29. Malkiel, B. (2003). The efficient market hypothesis and its critics. *CEPS, Working Paper*, 91.
30. Mandelker, G.N. and Rhee, S.G. (1984). The impact of degrees of operating and financial leverage on systematic risk of common stock, *Journal of Financial and Quantitative Analysis* 19, 45-58.
31. Martikainen, T. (1991). On the significance of the economic determinants of systematic risk: empirical evidence with Finnish data. *Applied Financial Economics*, 1(2), 97-104.
32. Marston, F. and Perry, S. (1996), Implied penalties for financial leverage: Theory vs. empirical evidence, *Quarterly Journal of Business and Economics,* 35, 77-97.
33. McMillan, D. G. (2001). Cointegration relationships between stock market indices and economic activity: Evidence from US data, *Discussion Paper*, 0104, Centre for Research into Industry, Enterprise, Finance and the Firm (CRIEFF), University of St. Andrews, Scotland.
34. Mear, R. and Firth, M. (1988). Risk perceptions of financial analysts and the use of market and accounting data, *Accounting and Business Research,* 18(72), 335-340.
35. Moyer, R.C. and Chatfield, R. (1983). Market power and systematic risk, *Journal of Economics and Business,* 35(1), 123-130.
36. NRB. (2003, 2013). Banking and Financial Statistics, 41 and 59, Nepal Rastra Bank, Baluwatar, Kathmandu, Nepal.

37. Olib O.K., Michello, A. F. and Thorne J. (2008). Systematic risk and international diversification: An empirical perspective. *International Review of Financial Analysis,* 17, 681-698.
38. Patro, DilipK., Wald, John K. and Wu, Y. (2000). The impact of macroeconomic and financial variables on market risk. *Social Science Research*.
39. Pradhan, Radhe S. (2003). A survey of dividend policy and practices of Nepalese enterprises. *Research in Nepalese Finance,* first edition (Buddha Academic Publishers and Distributors Pvt. Ltd., Kathmandu).
40. Rafique, M. 2012. Factors affecting dividend payout: evidence from listed non-financial firms of Karachi Stock Exchange, *Business Management Dynamics*, 1(11), 76-92.
41. Ramadan, Zeyad S. (2012). Does leverage always mean risk? Evidence from ASE, *International Journal of Economics and Finance*, 4 (12), 150-158.
42. Rosenberg, B. and McKibben, W. (1973). The prediction of systemic and specific risk in common stocks. *Journal of Financial and Quantitative Analysis*, 317-333.
43. Roh, Y.S. (2002). Size, growth rate and risk sharing as the determinants of propensity to franchise in chain restaurants. *International Journal of Hospitality Management,* 21(1), 43-56.
44. Rowe, T. and Kim, J. (2010). Analyzing the relationship between systematic risk and financial variables in the casino industry. *UNLV Gaming and Research Journal,* 12(2), 47-58.
45. Schemer, P. S. and Mathison, T. J. (1996). Investment strategies for REIT investors. *Real Estate Review*, 26(I), 5-10.
46. Tellis, G. and Johnson, J. (2007). The value of quality, *Marketing Science*, 26(6), 758-773.
47. Titman, S. and Wessels, R. (1988). The determinants of capital structure choice, *Journal of Finance*, 43(1), 1-19.

Appendix 1 : List of the select listed companies for the study including years of dividend payments and number of observations

S.N.	Name of the companies	Years	Observations
1	Nabil Bank Limited (Nabil)	2009,10,11, 12, 13	5
2	Nepal Investment Bank Limited (NIBL)	2009,10,11,12,13	5
3	Standard Chartered Bank Nepal Limited (SCBNL)	2009,10,11,12, 13	5
4	Himalayan Bank Limited (HBL)	2009,10,11,12, 13	5
5	Nepal SBI Bank Limited (NSBL)	2009, 10,11,12,13	5
6	Bank of Kathmandu Limited (BKL)	2009,10,11,12,13	5
7	Everest Bank Limited (EBL)	2009,10,11,12, 13	5
8	NirdhanUtthan Bank Ltd. (NUBL)	2009,10,11,12, 13	5
9	SwabalamwanLaghubittaBikash Bank Ltd.(SLBBL)	2009,10,11,12,13	5
10	ChhimekLaghubittaBikash Bank Ltd.(CLBBL)	2009,10,11, 12, 13	5
11	United Finance Company Limited (UFCL)	2009,10,11,12,13	5
12	Shree Investment Finance Company Limited (SIFCL)	2009, 10,11,12,13	5
13	Soaltee Hotel Limited (SHL)	2009, 10, 11, 12, 13	5
14	Butwal Power Company Ltd. (BPCL)	2009,10,11,12,13	5
15	Unilever Nepal Limited (UNL)	2009,10,11,12,13	5
Total observations			75

Note: S.N. indicates serial number for the companies selected.
Source: Annual reports of the listed companies for the fiscal year mid-July 2009 to mid-July 2013 and annual trading reports of Nepal Stock Exchange Ltd.