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New Perspective

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Address for Correspondence:

Kathmandu College of Management

Gwarko, Lalitpur, Nepal

+977 01 5201997

Email: journal@kcm.edu.np

Internet: <http://www.jbe.kcm.edu.np>

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The Relationship between Happiness and Academic Achievement

Sushmita Gautam, Anayas C.Gurung, Sushant Karki, Appisha Shrestha
Subashna Dahal, Bibek Pandey, Samikshya Karki

Author Note

The authors are studying in the International BBA Program at Kathmandu College of Management (KCM), Gwarko-17, Lalitpur, Nepal; Internet: <http://kcm.edu.np/>. This article is based on their original report submitted to the research department of the College to fulfill the requirement of business research course in the fourth semester. Correspondence relating to this article should be emailed to: anayas2019@kcm.edu.np

Abstract

This article explains the relationship between happiness and academic achievement and explores whether or not persons with good academic grades are happier than those who do not perform so well academically. Fifty random observations of CGPA and Likert-based happiness measure of students of Kathmandu College of Management were examined in the correlation and regression analysis.

Keywords: happiness, academics, CGPA, correlation, regression

Happiness is difficult to define as it has multiple meanings that tend to differ from people to people in terms of their perception. Happiness corresponds to whether we are satisfied with life or not.

Objective happiness is a psychological approach; this approach directly measures cardinal utility. Subjective happiness, which is most preferred by social scientists, can be understood through surveys where questionnaire is used to evaluate individuals' satisfaction with life. The study of happiness and its links with the various determinants have grown over the years. The areas of coverage are mainly concerned with identifying the determinacy of happiness and understanding its nature.

Though we cannot define happiness, we can ask people whether they are happy or not. Thus, to record this instinct we will be preparing a reward related to the linkage between happiness and CGPA inside the college premises.

Objectives

It is often seen that even though some individuals score lower CGPA they seem to be satisfied whereas on the other hand higher CGPA students seem dissatisfied with their performance. Hence to know the actual level of satisfaction or happiness, the research was conducted.

This study attempts to use data from KCM to know the undergraduate's perception of happiness and examines whether happiness is correlated to academic performance. It aims to determine if individuals are satisfied with the CGPA they have obtained.

Literature

Life satisfaction in adolescence and academic achievement

Life satisfaction is the way an individual finds his or her past or current conditions (Myers & Diener, 1995), which describes a person's satisfaction with important domains of their life, such as friends, family, or self. With respect to youth, adolescents' global LS reports are strongly correlated with ratings of satisfaction with family, friends, school, living environment, and self.

Studies of adults' overall life satisfaction have consistently demonstrated the importance of considering both positive and negative life experiences, as well as everyday hassles (Diener, 1984, 1994).

There is considerable measure of hypothetical support for the connection between scholarly accomplishment and happiness. Initially created in the field of organizational psychology, the happy-productive worker hypothesis has frequently been adapted to an educational context (Stress and Student Job Design, 2002). As per this proposition, the productivity of representatives is firmly connected to occupation fulfillment. Subsequently, with regard to class, better-performing students may likewise exhibit more elevated levels of happiness.

Several cross-sectional studies have demonstrated an association between subjective well-being and school success (ResearchGate, 2017). For example, according to a study at the beginning of the school year, the fifth-grade students completed measures of wellbeing and an intelligence test. In the spring, report card grades from school records were collected. One year later, the same procedure was repeated but without re-administering the intelligence test. Participants reporting higher well-being were more likely to earn higher final grades, even when controlling for IQ, age, and the previous year's CGPA. Furthermore, students earning higher grades tended to go on to experience higher wellbeing, controlling for IQ, age, and previous well-being (Quinn & Duckworth, n.d.). The findings suggest the relationship

between well-being and academic performance may be reciprocally causal (Gilman, 2006).

Till date, however, empirical studies have revealed conflicting results. Subjective measures of academic performance such as self-evaluated or perceived academic competence have been shown to predict life satisfaction (Frontiers in Psychology, 2015). Again, the link between objective indicators of academic achievement and happiness is confusing due to different findings that exist among different age groups and cultures.

In a southeastern state of the USA, 5,545 students were part of an intricate large-scale survey that sought to determine the variability in student's levels of school satisfaction. The students subjected to the research were asked to determine their levels of satisfactions with respect to 5 distinct domains which were family, friends, school, self and the living environment along with their overall life satisfaction. The survey concluded that most of the students had a high level of satisfaction regarding the five different domains. In the research conclusion, although a high number of participants reacted positively to the domains, 23% of the students reported dissatisfaction with their schooling experience, 9% described their experience as "horrible" while 7% as "unhappy" and another 7% as "mostly dissatisfied". This shows that while overall, students are happy, they are not satisfied with the schooling that they are exposed to. A review of the literature reveals that most studies of school satisfaction have focused on the presumed consequences of students' dissatisfaction. Few studies have attempted to identify determinants or predictors of school satisfaction. Another research sharing the same value found results consistent with the previous result and also found that importance of contextual experiences and self-perceptions in attempting to understand students' satisfaction with their school experiences was necessary.

The research findings provided at the world conference on psychology and sociology found that need achievement motivation and health locus of control significantly independently and jointly predicted life satisfaction among undergraduates, but anxiety was not a significant independent predictor. A limitation to this is study however would be the small sample size and the limited psychological variables that were examined.

Methodology

This research focuses on finding out the social psychological aspect i.e. happiness and its relationship with academics. To verify this, data was collected from the students of Kathmandu College of Management who are currently studying in the 2nd year.

Data source and sample

The data was collected with the help of questionnaire that were distributed to the students personally. The questionnaire contained six questions and a total of 50 responses were collected from Kathmandu College of Management deploying random technique. The students were eager to fill in the questionnaire.

Analysis tool

Statistical package (SPSS) and MS Excel were used to process the collected data. Regression and correlation analyses were used to test the hypothesis and draw a conclusion.

Limitation

Sample collected from a college with about similar age groups and social status was a barrier to generalizing the results.

Demographics

The demographic summary of the survey respondents is presented in Table 1. The sample consisted of 50 participants with 24 males (48%) and 26 females (52%) respondents. This shows an almost equal inclusiveness of both the genders. The age demographics also shows that the respondents fall under the category of young adults as all of them are below the age of 25.

Correlation

The correlation analysis between variables happiness and average CGPA (Table 2). The Pearson correlation between the two variables is 0.370 which shows a medium correlation between them. The value is also positive, correlation being measured from -1 to 1, which implies that when average CGPA increases, the rate of happiness of also increases and when average GPA decreases, the rate of happiness also decreases.

But at the same time, the p-level of the correlation is 0.008 which is less than 0.05, which suggests that there is a significant relationship between average CGPA and level of happiness.

Regression

The result of regression analysis indicates that the happiness level is dependent to academic achievement. Table 3 provides the coefficients for its equation i.e. $Happiness = 1.897 + 0.58 * CGPA + Error\ term$, which represents positive contribution of CGPA to the level of happiness. In addition, the contribution of academic achievement to level of happiness is 99 percent confidential according to this study.

Implication

Although it's needed to point out that such a small sample size cannot truly be accurate, we have reached an understanding. As per the findings, the data showed us that CGPA determines the happiness of an individual as they have a moderate correlation. This shows that people with higher CGPA are in fact happier. But to point out again, the sample size is likely to cause us to obtain a flawed result. There are many other aspects to consider that can affect a person's happiness. The reason for this conflicting result is due to the small sample size as stated in the limitation section of the report.

The current state of being, external influences, etc. can also factor in on a person's happiness. But nonetheless, the data acquired showed us this result and thus, CGPA and Happiness do have a moderate correlation and also that gender doesn't play a role in the CGPA of a person but a larger sample size will be needed to attain accurate results. Future studies need to concentrate on happiness and academic variables and justifiable samples to fit the objectives.

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Development%20and%20Management/..%5C..%5Cstaff/maureendollard/Cotton-Dollard-de-Jonge-2002.pdf

Annexure

Questionnaire

1. What would you rate your happiness as?
 - Strongly Unhappy
 - Unhappy
 - Neutral
 - Happy
 - Strongly happy

2. For you, what are three most important sources of happiness? (Choose any three)
 - Family
 - Education
 - Career
 - Friends
 - Money
 - Traveling
 - Romantic relationship
 - Children
 - Sports
 - Movies

3. If your life until now was a dream, how would you feel after waking up? (Select any 3)
 - Excited
 - Depressed
 - Anxious
 - Insecure
 - Unsatisfied
 - Thrilled
 - Heartbroken
 - Fulfilled
 - Nervous

4. What is your current level of education?
 - Literate

- SLC
- +2
- Under-graduate
- Graduate
- Post-Graduate

5. What was your average CGPA or percentage? (Provide the most recent one)

6 How satisfied are you with your educational performance? (With 1 being extremely dissatisfied and 5 being extremely satisfied)

1 2 3 4 5

7. Your Age: Sex:

Table 1

Demographic summary of survey respondents

Title	Category	Frequency	Percentage (%)
Gender	Male	24	48
Age	Below 20	25	50

Table 2

Correlation table

Correlations			
	Happiness	CGPA	
What would you rate your happiness?	Pearson correlation	1	.370**
	Sig. (2-tailed)		.008
	N	50	50
What is your average CGPA?	Pearson correlation	.370**	1
	Sig. (2-tailed)	.008	
	N	50	50

** . Correlation is significant at the 0.01 level (2-tailed).

Table 3

Regression table

Coefficients					
Model		Unstandardized Coefficients	Standardized Coefficients	t	Sig.
		B	Std. Error	Beta	
1	(Constant)	1.897	.615		3.083 .003
	CGPA	.580	.210	.370	2.763 .008

a. Dependent

Reaction of Bonus Share Issue in the Stock Market

Prateek Joshi

Author Note

Student of BBA eighth semester, Kathmandu College of Management (KCM), Gwarko-17, Lalitpur, Nepal; Internet: <http://kcm.edu.np/>. This article is based on the original report submitted to the research department of the College. Comments and enquiries can be emailed to: *prateek11268@gmail.com*

Abstract

This article investigates the relationship between bonus share issue to the stock market price and volume of trade. The main objective of this study is to examine the trend of buying and selling of shares before and after announcement and also its effect on the market price and trade volume of the shares. To analyze the effect of bonus share issue on stock market and volume of trade, two months' price and volume before announcement and two months' price and volume after announcement are used. To do so, the variation of median share prices and volume before and after the announcement date are calculated and analyzed. In doing so, this report has used convenient sampling method for collecting data and hence a non-parametric test, the Wilcoxon signed rank test. Data was collected from NEPSE, Share Sansar and Merolagani websites. The result shows that the magnitude of price reactions to bonus share issue announcements is statistically related to size of the bonus share issues. And also, the volume of trade reaction depends upon the price to bonus share ratio i.e. if the bonus share issue proportion is reasonable compared to the share price of the stock. Therefore, it opposes the argument that bonus share issue is cosmetic in nature.

Keywords: bonus share, announcement, NEPSE, Wilcoxon signed ranked test, convenient sampling, trade volume

An intriguing question has been 'Why is the Nepalese stock market not regulated by the odds of economic rules of demand and supply or profitability of a firm or by the future prospects of investment? It is believed that the trend of Nepalese stock market has unique features and frequently prompt to any directions if a few players wish to do so. Besides, the unofficial leakage of companies' information is perceived as another factor for the emergence of abnormal market behavior.

There is general agreement that there are irregularities in the share market of Nepal that are yet to be brought under legal control. This was the backdrop that initiated this study. The study takes into account the volume of transaction in addition to the price change during the two periods i.e. before and after announcement of bonus share allotment by Everest Bank Ltd (EBL), Global Bank Ltd.(GBIME), Standard Chartered Bank (SCB) and Nabil Bank Ltd. (NABIL).

Objectives

The objectives of this research paper are:

- i. to find whether the median variation in share price before and after bonus share announcement differs,
- ii. to find whether the median variation in trade volume of stock before and after bonus share announcement differs.

Literature

Studies have spelled out the signaling effect of such bonus share issue on share price (Dravid & McNichols, 1990), (Obaidullah, 1992). According to the research the change in price during bonus share and split announcements are significantly correlated with split factors provided that other factors remain constant. Such correlations depict that management's decision on split factors signals undisclosed information about future earnings and this in turn makes the investors revise their beliefs about firm value and its future.

A study on bonus share issue and its reaction to market price opposes the view that bonus share issue is cosmetic, but argues that there are numerous effects on stock market. In doing so, the study uses standard event study methodologies. This particular study concluded with 1.8% abnormal returns due to bonus share issue (Dhar & Chhaochharia, 2008). Studies undertaken in India (Mishra, 2005) and China (Barnes & Ma, 2001) spelled out the efficiency of the market in absorbing information about bonus share issue announcement and the abnormal returns that investors get during this period. This kind of abnormal return from such issue is generated due to information leakage and the market's capacity to absorb such information quickly. In the Indian market, there is greater evidence showing information leakage than in the market in China, where very less evidence of such leakage can be seen. Further, a study based

on the Nigerian stock market also imparts knowledge about reaction of the stock market to bonus share issue. This particular research used a technique called modified market model to investigate whether the Nigerian stock market reacts efficiently to bonus share issue announcements with respect to price adjustments. The outcome of this study was that for dividend paying firms, the cumulative excess returns (CERs) are positive and significant for 30 days from the day of the announcement. While the CERs for dividend omitting firms for the same period are significant but negative (Adelegan, 2009).

Researchers have examined the share price reaction to announcement of bonus share in the Australian market and found that market share price reaction to announcement of bonus share issues from the day of the announcements to the day after the announcements is statistically significant and positive. Further, it was found that price reaction to bonus share issue announcements was statistically significantly stronger for industrial non- financial companies and mining companies compared to financial companies. Also, pre-announcement effect was found only for industrial non- financial companies and financial companies that announced bonus issues simultaneously with other market sensitive information such as interim or quarterly or final results. Also, they found that the magnitude of price reactions to bonus share issue announcements are statistically related to size of the bonus share issues (Tanner & Balachandran, 2001).

In addition, another study of companies was quoted at the Nairobi Stock Exchange with the main objective of determining whether there were abnormal returns surrounding the bonus share issues announcement. Descriptive statistics (mean and standard deviation and t-test) were used to analyze data. The findings of this particular paper were that bonus share issues generated positive stock prices in the short run but no lasting gains in the market price in the long run. The limitation of this study was its too heavy reliance on secondary data (Grace, 2007).

All the above-mentioned literatures have used the same handpicked samples of companies that are listed in the share market and have issued such share features. However, my report will only consider the variation of price and trade volume before and after book close, as other reports are too complicated for they consider insider trading and abnormal returns. Further, all the above-mentioned research papers have mostly used standard event study methodology to investigate efficient market hypothesis (EMH). This hypothesis refers to pricing efficiency of stock markets. This states that in an efficient market the market price of a stock reflects all the available information. Also, one study has used naïve and residual method (Obaidullah, 1992). However, all these studies are complicated and also too broad for an undergraduate student. Because of this, dependent test considering two periods- before and after the book close of bonus share issue will be best for attaining stated objective of this research. All the above-mentioned research has concluded that there is a signaling effect of such information (Bonus share issues). However, only a few have considered the trade volume while conducting such research project.

Methodology

This research has adopted non- parametric test, Wilcoxon signed rank test to analyze the reaction of bonus share issue on traded market price and volume of stock of five to six months. The problem statement was developed after discussion with the research supervisor and broker number 57 firm in Kathmandu and only four commercial banks issuing bonus share i.e. EBL, GBIME, SCB, and NABIL were identified for collecting sample data by deploying convenient process. Data were adapted from the following web sites: Nepal Stock Exchange's (NEPSE DATA: Nepal Stock Exchange, 2017), Merolagani (Market: Merolagani, 2017) and ShareSansar (Home: Sharesansar, 2017) to calculate the effect of bonus share issue.

Finding that there was abnormality of data, non-parametric test was used to compare two sets of outcomes that came from the same bank — in this case before and after market price reaction due to bonus share issue. Similarly, descriptive statistics of share trade volume is used to know any abnormality in the flotation of shares and to check the possibility of any information leakage.

Assumption

When there is pre-information leakage the median of share trade volume prior to announcement is greater than the post announcement.

Conceptual framework

The conceptual framework of this research is not based on any of published paper, rather it is a concept developed through the course of this study (Figure 1).

To check the reaction of bonus share issue to NEPSE price, the study is divided into two periods — prior and post announcement period. The gap between the price reaction before and after the announcement shows the variation of share price. This variation shows the efficiency of the market in observing the bonus share issue announcement. Based on the conceptual framework, the following hypotheses were formulated:

H_0 : The median difference between price and volume before and after announcement is equal to zero.

H_1 : The median difference between price and volume before and after announcement is not equal to zero

Significance level 0.05

Limitation

The scope of this article is limited by the fact that only four banks were considered for this study and median variation is taken as a clue to anticipate leakage of information if it was greater in share transactions concluded before the formal announcement of bonus shares.

Analysis and result

Variation on stock price

The median variation in the share price of four commercial banks before and after announcement (Table 1) indicated, in the case of EBL's, SCB's and NABIL's, that there was significant difference implying that announcement of bonus share issue has created buzz around the market in favor of these three banks.

The signaling effect was observed as announcement signaled prosperity. In case of GBIME, the null hypothesis was retained because significance level is greater than 0.05. This means that the median difference between the two dependent periods in terms of price is close to zero. So, not much variation in price is absorbed in this case. As the bonus share portion or percentage of bonus share is the lowest among all the remaining three banks, it was not able to observe significant difference in market price.

The result shows that the weighted or percentage of the bonus share issue also plays vital role in signaling the market price for positive increase. The magnitude of reaction is observed to be greater for companies issuing greater percentage of bonus share issue. To sum up, we observed that the bonus share issue reacts with the price of the share. However, the magnitude of reaction depends on the percentage (weight) of bonus share issue.

Median variation in stock trade volume

The null hypothesis was rejected for EBL's and GBIME's case (Table 2). This particular case showed there was significant median difference between the two periods: pre- and post- announcement. Whether, the abnormal flotation of shares occurred before the announcement or after the announcement will be discussed in the descriptive analysis section.

Further, in SCB's and NABIL's case, the test retained the null hypothesis. This means there was no significant median difference between the two periods; implying that announcement of bonus share issue had not created much of unusual transaction around the market. This particular trend might be because of both companies' stock price being very expensive as compared to their weight of bonus share issue. For instance, both companies' bonus share issue did not have greater weight (33% and 30%) as compared to that of EBL's (70%). Due to this reason, they had lesser influence on the market.

From the above analysis, we can observe that stocks with greater weight of bonus share issue or having relatively cheaper price (P/E ratio) had variation in trade volume before and after announcement.

In the case of EBL, the median of share trade volume before the announcement was close to double than that of after announcement period (Table 3) leading to a situation that there could be a possibility of information being leaked prior to the announcement as the trade volume was exceptionally higher prior to the announcement than to post announcement. Due to information being leaked before announcement, investors might have purchased EBL's shares to capitalize on the attractive return that it held. This deduction is supported by standard deviation too, as the SD was more than double prior to the announcement than post-announcement.

In the case of SCB and NABIL, there was no significant difference in the median and standard deviation between the two periods. Any strong inference is not possible through the available information, as the median variance was not significant for the two banks. In case of GBIME, the median difference was significant. However, the median of share trade volume after the announcement was higher than before the announcement. This means that there is no trace of information being leaked prior to the announcement. It also means that the announcement was absorbed efficiently by the market and hence resulted in higher flotation of GBIME's stock after the announcement.

Discussion

Firstly, this research depends heavily on secondary data as does the research of Gichema Grace (Grace, 2007). The entire analysis depends upon the data of NEPSE. Further, this study found that the magnitude of price reactions to bonus share issue announcements is statistically related to size of the bonus share issues. This particular inference is exactly same in Nepalese market as was found in the Australian market (Tanner & Balachandran, 2001). Furthermore, this paper like many of the papers mentioned in the literature review section shows evidence of signaling effect. However, the method used by this paper was not used by any of the papers mentioned in the literature review section. Also, this paper like the one conducted in Indian market (Dhar & Chhaochharia, 2008), opposes the view of bonus share issue as cosmetic event, since the EBL's case may open a new avenue to focus further exploration in future.

Implication

Analysis of data shows that announcement of dividend, in this case bonus share issue, stimulates reaction of investors. Firstly, bonus share issue leads to significant change or variation in share price pre-and post- announcement. Secondly, this study found that the magnitude of price reactions to bonus share issue announcements is statistically related to size of the bonus share issues. It shows that stocks with greater magnitude of bonus share issue or the ones available at comparatively cheaper price (having low current P/E ratio) has significant reaction to the announcement. And stock with greater current P/E ratio or lesser weight of bonus share issue has no significant reaction in terms of trade volume to bonus share issue. Also, the median of share trade volume for EBL is greater prior to announcement than post-announcement. This means there might be leakage of information. This might be because of availability of such information to a handful of investors. As investors knew in advance about the bonus share issue announcement, the demand for the share grew abnormally. People holding such information in advance accumulated the shares of such company prior to the announcement in order to capitalize on the abnormal return that such information holds. Activities such as insider trading is illegal, however, many participate in such information in order to capitalize on information that other investors are deprived of. GBIME's case also showed significant median variance. However, the median share trade volume after the announcement was greater than before announcement. This might be because of healthy competition by all the market players.

The results met the objectives of research and hence will help investors and scholars to observe the signaling effect of bonus share issue. These inferences, up to some extent, will help the investors while buying or selling shares in times of such bonus share issue. They may expect an increase in price of the share if the bonus share issue has greater weight compared to other market offerings. Additionally, by

knowing the volume of trade of shares, that shows liquidity of the stock, one can expect greater volume of trade for stock with higher bonus share issue and low current P/E ratio and vice versa. Also, this research talks about insider trading too. If there is hint of some leakage of such information, then, there is high chance of low flotation of shares in the share market after the announcement and hence the information deprived investors should look out for the risks associated with such unhealthy practice. The following suggestions have been given to future researchers:

- 1) Standard event study methodology can be used to investigate efficient market hypothesis (EMH), which will help us to know pricing efficiency of stock market. And will also help to know the percentage of abnormal returns due to such issue.
- 2) This particular study was not able to make strong inference regarding the leakage of information and its side effects. An in-depth research regarding insider trading could make inference regarding such issues in the market.

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Appendix

Table 1

Wilcoxon signed rank test on price before and after announcement

Company	Null Hypothesis	Sig.	Decision
EBL	The median difference between EBLB_P and EBLA_P is equal to 0	0.000	Reject Null Hypothesis
SCB	The median difference between SCBB_P and SCBA_P is equal to 0	0.000	Reject Null Hypothesis
NABIL	The median difference between NABILB_P and NABILA_P is equal to 0	0.000	Reject Null Hypothesis
GBIME	The median difference between GLOBALIMEA_P is equal to 0	0.896	Retain Null Hypothesis

Table 2

Wilcoxon signed rank test on traded volume before and after bonus share announcement

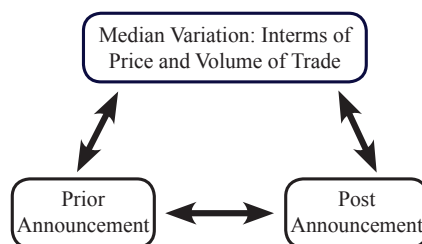
	Null Hypothesis	Sig.	Decision
EBL	The median difference between EBLB_V and EBLA_V is equal to 0	0.003	Reject Null Hypothesis
SCB	The median difference between SCBB_V and SCBA_V is equal to 0	0.307	Retain Null Hypothesis
NABIL	The median difference between NABILB_V and NABILA_V is equal to 0	0.159	Retain Null Hypothesis
GBIME	The median difference between GLOBALIMEB_V and GLOBALIMEA_V is equal to 0	0.000	Reject Null Hypothesis

Table 3

Median of share trade volume before and after announcement

Bank	MD		SD		N	
	Before	After	Before	After	Before	After
EBL	15814.50	8118.00	25906.30	12816.71	50	77
SCB	4784.00	4463.00	292.82	3724.12	46	75
NABIL	7384.00	5566.50	7745.12	9951.93	47	60
GBIME	11737.50	24569.50	6478.40	45442.34	50	38

Figure 1

Conceptual framework

Test of Financing Constraint Hypothesis in Nepalese Non-Financial Firms

Bikash Shrestha

Author Note

Faculty, Kathmandu College of Management (KCM), Gwarko-17, Lalitpur, Nepal; Internet: <http://kcm.edu.np/>. This article is based on the original thesis submitted to earn M.Phil. degree in financial management. Correspondence can be addressed to: bikashshrestha@kcm.edu.np

Abstract

Financing corporate investment is mostly affected by financial factors but a debate on whether investment-cash flow sensitivity reflects financing frictions has been going on for many years. This study tests the same controversy based on the correlation coefficient between investment and cash flows assuming that the constrained high sensitive firms may have a greater positive-investment cash flow sensitivity compared to low sensitive ones i.e. the unconstrained Nepalese firms.

Keywords: investment, cashflow, financing constraints, sensitivity.

The focus of empirical studies on the relation between investment and internal finance has been on the influence of financial constraints (Myer & Kuh, 1957). Financing constraints are at the center of a vast literature and studies on the sensitivity of corporate investment in relation to a firm's cash flow have focused on it since the last century (Myers & Majluf, 1984).

The study of investment decisions of firms represents a prominent area in finance and economics. Investment and capital accumulation have traditionally been accorded a prime place in the literature. At firm-level business investment, there is awareness of the significant role of financing constraints (Myer & Kuh, 1957). An expansive assortment of work in exact fund has additionally made an observation of the venture choices of firms and how these choices were influence by different monetary variables. It was proposed that the financial structure of a firm was irrelevant for investment decisions (except for tax considerations), which greatly influenced the preliminary research (Modiglianni & Miller, 1958).

Policy makers and econometrists want to know whether investment expenditure of a firm is determined by the availability of its internal finance, and if it is, to what extent and how it is determined by the availability of its internal finance. An expansive and developing assortment of writing plans to build up a sufficient intermediary to gauge the level of financing limitations a firm may confront by assessing the speculation of income affectability (ICFS), which is characterized as venture reaction because of an adjustment in income. Investment–cash stream affectability has been deciphered as an essential flag of budgetary limitations (Fezzari, Hubbard, & Peterson, 1988).

However, literature is ambiguous on whether this influence has a positive or negative impact on the relationship. There are two prominent schools of thought regarding measurement of financing constraints. Numerous studies around the globe are directed to test the applicability of these thoughts. However, there is still lack of unanimous findings on the nature of the pattern of investment-cash flow sensitivity and this has become a topic of spirited debate in recent years (Hubbard, 1998).

Literature

Writings that record the affectability of firms' investment to changes in their inward supports i.e. cash flow, initiated by (Fezzari, Hubbard, & Peterson, 1988), are large and growing. They viewed firms as constrained when external financing was too costly, as in such cases, firms must use internal funds to finance their investments rather than to pay out dividends. These were identified as firms with low dividends, as "Most constrained" and firms with high dividends as "Least constrained." They presented evidence consistent with the hypothesis that the sensitivity of a firm's investments to its internally generated cash flow is higher by showing that firms having low dividend payout (their proxy for financial constraints) had higher investment-cash flow sensitivities than high dividend paying firms. The financing constraint was measured by the coefficient obtained by regressing investment on cash flow by controlling for investment opportunities using Tobin's q and named it investment cash flow sensitivity.

Several studies following (Schiantarelli, 1996); (Hovakimian, 2009); (D'Espallier, Vandemaele, & Peeters, 2008); (Denis, 2010); (Shrestha, 2015) provided supporting evidence, using data from a variety of contexts to conclude that investment–cash flow sensitivity was an important signal of financial constraint.

On the other hand, Kalpan and Zingales identified firms without access to more funds than needed to finance their investment as "likely constrained" and firms with access to more funds than needed to finance their investment as "never constrained" (Kaplan & Zingales, 1997). Their empirical findings indicate, in contrast, that investment is most sensitive to internal cash flow for the least constrained firms

and should be lower for a more constrained firm i.e. the investments of “likely constrained” firms are less sensitive to cash flows than the investments of “never constrained” firms. They presented evidence conflicting with the general notion that investment cash-flow sensitivity is a positive function of the degree of financial constraints and concluded that firms with ample cash reserves are not really financially constrained, since they can use it to take the desired projects.

This was the (Kaplan & Zingales, 1997) disagreement with (Fezzari, Hubbard, & Peterson, 1988) interpretation. (Vogt, 1994); (Athey & Laumas, 1994); (Bond & Meghir, 1994); (Gilchrist & Himmelberg, 1995); (Kadapakkam, Kumar, & Riddick, 1998); (Ericsson & Whited, 2000); (Almeida, Campello, & Weisbach, 2004); (Bond, Harhoff, & Reenen, 2005) and (Cummins, Hassett, & Oliner, 2006) further extended similar investment-cash flow sensitivity model by considering differing measures of firm sizes under distinct institutional arrangement and questioned the relevance of investment – cash flow sensitivity as an indicator of financial constraints. This contradicting empirical evidence has inspired many studies to revisit the theoretical evidence and identify several theoretical and methodological problems that affect the ICFS-approach. Despite many efforts to resolve these methodological issues, there seems to be growing disagreement on the usefulness of the ICFS-metric.

The studies undertaken in the concerned area have focused on the investment cash flow sensitivity as a measure of financing constraints faced by firms of developed financial market across various firms' categories. There is very less research on the particular area in the context of Nepal. (Pradhan & Kurmi, 2004) examined the sensitivity of firm investment decision to liquidity status using polled cross-sectional data of 33 enterprises that were listed in NEPSE over the 1996/97 to 2000/01 periods. The firms were classified on the basis of dividend payout ratios only and they concluded that business fixed investment was negatively related to investment opportunities measured by market value to book value of equity and the relationship between them was very weak as well.

The study in this regard aims at contributing to the empirical studies on the investment-cash flow relationship in Nepalese context on the investment pattern of the manufacturing, hotel, trading and hydropower companies by emphasizing new classification criteria based on the firm level estimates of ICFS. In view of this context and reality, this study has been undertaken and directed to investigate whether investment cash flow sensitivity vary across high and low sensitive firms in Nepal.

Objectives

The objectives of this study are to explore the controversy over investment cash flow sensitivity as a measure of financing constraints and to analyze the relation between cash flow and the investment decisions of nonfinancial high vs. low sensitive firms which were classified on the basis of firm level estimates of ICFS in Nepal.

Method

Research design

The research design adopted in this study consists of descriptive and correlational comparative to deal with the issues raised in this study. Descriptive research design includes fact-finding enquiries of different kinds. It is undertaken in order to ascertain and be able to describe the present characteristics of the variables of interest. Correlational comparative design has been adopted to compare the correlation of cash flow and investment differences across low and high sensitive firms.

Population and sample

All the Nepalese companies from manufacturing and processing, hotel, hydropower and trading sectors listed in the Nepal Stock Exchange (NEPSE) have been taken as the population of the study. The sample selected for the study includes 19 enterprises through the use of judgmental sampling. The study does not cover enterprises from banking, finance and insurance sectors listed in NEPSE and other private sector enterprises that have huge influential role on the Nepalese economy. This is one of the limitations of this study. The final sample has a balanced panel dataset of 190 observations representing 19 non-financial firms, constituting about 48 per cent of the total population. The number of observations for each firm is 10 between 2004 and 2013 (Table 1). In order to be included in the sample, firms had to meet two criteria. Firstly, only the NEPSE listed non-financial firms were considered as the sampling frame. Finally,

only firms that had complete data for capital expenditures, current cash flows, beginning-of-period net fixed capital, beginning-of-period market-to-book ratio, dividend payment and other variables under study for every year of the study period considered had been selected. The majority of existing studies on the effect of internal funds on investments focus on non-financial firms i.e. specially manufacturing firms. The study follows the same practice to facilitate comparison.

Firm level estimates of ICFS

Firm-level ICFS model has been used to determine the ex-ante identification of firms as high and low sensitive firms. For each year study period, 19 firms that would demonstrate significantly different levels of investment-cash flow sensitivity under the traditional investment regression approach (Hovakimian, 2009) were studied. The construction of ICFS is analogous to the external financing weighted average market-to-book ratio (Baker & Wurgler, 2002).

$$ICFS = \sum \left(\frac{CF/K}{\sum CF/K} X(I/K) \right) - \sum (I/K)$$

In (1), n is the number of annual observations for firms during the study period, CF denotes cash flow, defined as the sum of the earnings before interest and tax and depreciation and amortization, and I represent investment, defined as capital expenditures for firm during the period. Both variables are standardized by K , which is the beginning-of-period net stock capital/value of total assets. The basis for classifying firms is the mean value of all sample ICFS. The individual firm with higher value of mean ICFS is categorized as high sensitive firms and vice versa. The main interest of the study centers on the correlation coefficient of cash flow with investment in the correlation analysis. This coefficient represents the investment-cash flow sensitivity. The study expects higher coefficient of cash flow with investment for high sensitive firms in comparison to low sensitive firms.

Reliability

The variables developed using multi-item scales have to be evaluated for their reliability using Cronbach's alpha (Table 2). The reliability value of asset tangibility, leverage, cash flow, dividend payout ratio, market to book ratio, interest coverage, probability of bankruptcy, and investment cash flow sensitivity were observed to be 0.652, 0.633, 0.716, 0.641, 0.597, 0.643, 0.822 and 0.758 respectively. They produced higher than the prescribed minimum threshold to accept as variables (Cronbach, 1951); (Bagozzi & Yi, 1988); (Nunnally & Bernstein, 1994) for correlation analysis.

Analysis and result

Analysis

It is observed that the mean value of asset tangibility is 0.649, which ranges from 0.03 to 0.742 with standard deviation of 0.279. The mean value of leverage is 0.726 with minimum, maximum value and standard deviation of 0.1, 0.936 and 0.456 respectively. The cash flow mean value is observed to be NPR 263.403 million. The mean investment i.e. capital expenditure during the study period is NPR73.509 million and the minimum, maximum value and standard deviation of NPR 0.000, NPR 931.040 and NPR 142.147 respectively. The minimum dividend payout ratio is observed to be 0.000 and the maximum dividend payout ratio is 0.780 with standard deviation of 0.225 and the mean value of dividend payout is observed to be 0.191. The mean values of market to book ratio, interest coverage, Z score, ICFS, size (based on annual sales) and age are observed to be 2.177times, 3.507 times, 3.242 times, 0.166 times, NPR 846.725 million and 21.295 years (Table 3).

Twelve of the 19 selected firms were observed to be low and seven firms were high sensitive to the ICFS mean value of 0.022 and 0.413 respectively (Table 4). The cut off value was the 0.166, mean of ICFS for whole sample firms (Table 3) for determining firms as high and low sensitive firms. The trading sector enterprises namely Salt Trading Ltd. and Bishal Bazaar Company Ltd. are observed to have negative cash flow sensitivity values of -0.019 and -0.061 respectively. The main interest of the study centers on the correlation coefficient of cash flow with investment in the correlation analysis. This coefficient represents the investment-cash flow sensitivity.

Table 5 exhibits the mean difference in FA/TA (asset tangibility) to be insignificant and the mean

difference in TD/TA (leverage), CF (cash flow), investment, dividend payout, market to book ratio (proxy for growth opportunities), interest coverage, PB or Z score (proxy for probability of bankruptcy), ICFS, size (measured in terms of total annual sales), and age are observed to be significant at 0.001 level of significance across the high and low cash flow sensitive firms.

Positive, higher and significant (0.382) correlation coefficient in comparison to 0.154 are observed between investment in capital expenditure and cash flow of the firms for high and low sensitive firms respectively (Table 6), which supports the hypothesis propounded by (Fezzari, Hubbard, & Peterson, 1988) and contradicts the (Kaplan & Zingales, 1997) findings and confirms that the high sensitive firms are more financially constrained than low sensitive firms and reconfirms the significant mean difference (67.308*) of investment across low and high sensitive firms (Table 5).

Further, the correlation between investment and asset tangibility, interest coverage, ICFS and size for high sensitive firms tends to be positive, significant and higher than for low sensitive firms. However, the correlation between investment and growth opportunities is observed to be higher for low sensitive firms, which can be interpreted as low sensitive firms have higher capacity to invest more to grab the market growth opportunities. Negative and statistically significant relationship has been found between investment and leverage (-0.067), dividend payout ratio (0.179), probability of bankruptcy (-0.216) and age (-0.137) of the firms for high sensitive firms indicating that as the leverage, dividend payout ratio, probability of bankruptcy and age of the firms increases, the investment in capital expenditure decreases for high sensitive firms. Association between investment and interest coverage for high sensitive firms is observed to be positive and significant (0.384) but it is observed to be positive and insignificant for low sensitive firms (0.272), which is lower in comparison to high sensitive firms. It can be concluded that as the interest coverage for high sensitive firms increases, the investment in capital expenditure increases significantly and at higher rate than that of low sensitive firms.

Result

Based on the analysis of the collected data, the results of the study are summarized as:

1. the mean investment expenditure, cash flow generation and ICFS between high and low sensitive firms are observed to be significantly different for non-financial Nepalese enterprises.
2. the mean size, age, asset tangibility, total debt level, interest coverage and probability of bankruptcy of non-financial Nepalese firms are also observed to be significantly different.
3. the correlation coefficient of capital investment and cash flow is observed to be positive, higher and significant for high sensitive firms, suggesting these firms are more financially constrained in comparison to low sensitive firms i.e. 0.382 and 0.154 respectively.

The correlation coefficient of market to book ratio (MBR) and capital investment (INV) is observed to be positive, lower and significant (0.137) in comparison to 0.469 for high and low sensitive firms respectively and it can be concluded that, as the MBR (proxy for growth opportunities) increases, the capital investment also increases at a higher rate for low sensitive firms.

Discussion

The significant mean difference in investment expenditure across Nepalese firms classified on ICFS basis is observed, which is further supported by the correlation coefficient of cash flow obtained, which is consistent with the findings of (Bond & Meghir, 1994), who had the intuition that liquidity variable i.e. cash flow, relates to its ability to relax binding financing constraints.

A firm that is not financially constrained is indifferent to use of internal or external sources of financing since there is no difference in the cost of the funds. Such a firm has the freedom to optimally adjust its investment according to its investment opportunities. If such a firm generates larger cash flow in a period, it will be able to invest more and vice versa.

This indicates high sensitive firms are financially constrained and their investment is high during high cash flow periods and vice versa, to be in line with the findings of (Fezzari, Hubbard, & Peterson, 1988), (Almeida, Campello, & Weisbach, 2004), (Pradhan & Kurmi, 2004), (Bond, Harhoff, & Reenen, 2005) and contradict the findings of (Kaplan & Zingales, 1997).

Conclusions

This study concludes that the investment cash flow sensitivity can be used as a measure of financing constraints as constrained firms have high investment cash flow sensitivity (measured by the coefficient of cash flow and capital investment) and lower potential growth opportunities (measured by the coefficient of market to book ratio and capital investment) and vice versa.

Finally, the analysis result supports the hypotheses and findings of Fezzari et.al. (Fezzari, Hubbard, & Peterson, 1988) but obviously discards the conclusion drawn by Kalpan and Zingales (Kaplan & Zingales, 1997) relating to financing constraints hypothesis controversies in the Nepalese context.

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Appendix

Table 1
Selected non-financial enterprises in sample

S.N.	Enterprises	Study Period	Observations
1	Soaltee Hotel Ltd.	2004-2013	10
2	Oriental Hotel Ltd.	2004-2013	10
3	Yak and Yeti Hotels Ltd.	2004-2013	10
4	Taragaon Regency Hotels Ltd.	2004-2013	10
5	Salt Trading Ltd.	2004-2013	10
6	Bishal Bazaar Company Ltd.	2004-2013	10
7	Butwal Power Company Ltd.	2004-2013	10
8	Arun Valley Public Ltd.	2004-2013	10
9	Chilime Hydropower Ltd.	2004-2013	10
10	National Hydro Ltd	2004-2003	10
11	Himalayan Distillery Ltd.	2004-2013	10
12	Nepal Bitumin Ltd.	2004-2013	10
13	Unilever Nepal Ltd.	2004-2013	10
14	Fleur Himalayan Ltd.	2004-2013	10
15	Nepal Khadya Udhyog Ltd.	2004-2013	10
16	Sri Ram Sugar Mills Ltd.	2004-2013	10
17	Nepal Lube Oil Ltd.	2004-2013	10
18	Bottlers Nepal Ltd (Terai)	2004-2013	10
19	Bottlers Nepal Ltd (Balaju)	2004-2013	10
	Total		190

¹The sample includes 15 non-financial firms listed in NEPSE. Firms selected as sample for the study represent from manufacturing and processing, trading, hotel and hydropower sector as classified by NEPSE. The following table shows the detail of number of companies selected from each sector and period covered for the study.

Table 2

Reliability analysis

Variables	Measurement items	Cronbach's Alpha
FA/TA	2	0.652
TD/TA	2	0.633
CF	3	0.716
DPR	2	0.641
MBR	2	0.597
CI	2	0.643
Z	5	0.822
ICFS	5	0.758

Table 3

Summary of descriptive statistics

Variables	N	Min.	Max.	Mean	S.D.
FA/TA (Times)	190	0.030	0.742	0.649	0.279
TD/TA (Times)	190	0.100	0.936	0.726	0.456
Cash Flow (Million Rs.)	190	-72.240	1142.15	263.403	304.212
Investment (Million Rs.)	190	0.000	931.04	73.509	142.147
Dividend Payout (Times)	190	0.000	0.78	0.191	0.225
Market to Book Ratio (Times)	190	0.020	10.43	2.117	1.797
Interest Coverage (Times)	190	0.000	10.23	3.507	2.581
Z	190	-3.800	10.16	3.242	2.861
ICFS Value	190	-0.070	0.72	0.166	0.208
SIZE (Total Sales)	190	14.790	4619.85	846.725	1018.675
AGE	190	4.000	48.00	21.295	10.510

²The table depicts the reliability analysis of the major variables under study developed by using multi-item scales. FA/TA (Asset tangibility) is the ratio of fixed assets to total assets; TD/TA (leverage) is the ratio of total debt to total assets; CF (cash flow) is defined as the sum of earnings before interest, tax and depreciation and amortization; DPR (dividend payout ratio) is defined as ratio of dividend paid of firm *i* during time *t* to net income of firm *i* during time *t*; MBR (market to book ratio) is defined as the ratio between (market value of equity) / (book value of assets), as of the beginning of the year; CI (interest coverage) is defined as the ratio between EBIT/Interest expenses as of the beginning of the year; Z is the probability of bankruptcy obtained by using the Altman model and ICFS is the investment cash flow sensitivity.

³The table summarizes the descriptive statistics of the variables for total sample. FA/TA (Asset tangibility) is the ratio of fixed assets to total assets; TD/TA (leverage) is the ratio of total debt to total assets; cash flow is defined as the sum of earnings before interest, tax and depreciation and amortization; investment is defined as capital expenditures for firm *i* during period *t*; dividend payout is defined as ratio of dividend paid of firm *i* during time *t* to net income of firm *i* during time *t*; market to book ratio is defined as the ratio between (market value of equity) / (book value of assets), as of the beginning of the year; interest coverage is defined as the ratio between EBIT/Interest expenses as of the beginning of the year; Z is the probability of bankruptcy obtained by using the Altman model, ICFS value is the investment cash flow sensitivity, size is the annual sales of the firms under study and age is the number of years from the time of its incorporation based as per the annual general meetings held.

Table 4

Investment cash flow sensitivity classification

S.N.	Enterprises	ICFS	S.N.	Enterprises	ICFS
Panel A: Low Sensitive Firms			Panel B: High Sensitive Firms		
1	Soaltee Hotel Ltd.	0.057	1	Taragaon Regency Hotels Ltd.	0.352
2	Yak and Yeti Hotels Ltd.	0.036	2	Himalayan Distillery Ltd.	0.668
3	Salt Trading Ltd.	-0.019	3	Nepal Bitumin Ltd.	0.284
4	Bishal Bazaar Company Ltd.	-0.061	4	Fleur Himalayan Ltd.	0.473
5	Butwal Power Company Ltd.	0.066	5	Nepal Khadya Udhog Ltd.	0.343
6	Arun Valley Public Ltd.	0.005	6	Sri Ram Sugar Mills Ltd.	0.369
7	Chilime Hydropower Ltd.	0.049	7	Nepal Lube Oil Ltd.	0.401
8	National Hydro Ltd	0.046			
9	Unilever Nepal Ltd.	0.006			
10	Bottlers Nepal Ltd (Terai)	0.021			
11	Bottlers Nepal Ltd (Balaju)	0.037			
12	Oriental Hotel Ltd.	0.019			
Mean		0.022	Mean		0.413

Table 5

Independent sample t-test of the variables across low and high sensitive firms

Variables	Mean difference
FA/TA	-0.034
TD/TA	-0.315*
Cash flow	273.477*
Investment	67.308*
Dividend payout	0.207*
Market to book ratio	1.712*
Interest coverage	2.812*
PB	3.196*
ICFS	0.391*
Size	610.011*
Age	10.662*

*Significant at 0.01 level (2 tailed).

⁴The table presents the Investment Cash Flow Sensitivity classification, calculated to determine the ex-ante identification of firms as high and low sensitive firms for each firm on each year of study period for 19 firms under study. The firms with higher the whole sample mean value of investment cash flow sensitivity (0.166) are considered as high sensitive firms and vice versa.

⁵The table presents independent sample t-test (mean difference) of portfolios sorted by ICFS for the variables under study. The basis of sorting the portfolios was the mean value of ICFS. The firms with higher the mean values of investment cash flow sensitivity (0.166) are considered as high sensitive firms and vice versa

Table 6

Pearson's correlation for the firms classified as panel A and panel B⁶

Panel A: Low sensitive firms											
Variables	FA_TA	TD_TA	CF	INV	DPR	MBR	CI	Z	ICFS	Size	Age
FA/TA	1										
TD/TA	-.036	1									
CF	-.057	-.281**	1								
INV	.064	.096***	.154**	1							
DPR	-.12	-.282**	.484**	.188***	1						
MBR	.205*	-.298**	-.101	.469**	.109	1					
CI	.037	-.351**	.133	.272	.356**	.799**	1				
Z	-.107	-.459**	.492**	.107**	.336**	-.196*	.074	1			
ICFS	.118**	.196*	.155***	.148***	.101**	0.475**	.143	.069**	1		
Size	-.370**	-.046	.598**	.097**	.215*	-.162	.028	.096	.520**	1	
Age	-.220*	.243**	.283**	.104*	-.521**	-.048	-.272**	-.413**	.171**	.295**	1

Panel B: High sensitive firms											
Variables	FA_TA	TD_TA	CF	INV	DPR	MBR	CI	Z	ICFS	Size	Age
FA_TA	1										
TD_TA	-.455**	1									
CF	.402**	-.311*	1								
INV	.171***	-.067**	.382**	1							
DPR	-.518**	-.043	-.03	-.179**	1						
MBR	.186**	-.260*	-.019	.137**	-.179	1					
CI	.226	-.431**	.17	.384**	-.082	.830**	1				
Z	.259*	-.887**	0.024	-0.216**	.037	.176	.324*	1			
ICFS	.840**	-.723**	.445**	.219**	-.301*	0.108*	.353**	-.472**	1		
Size	.014	.438**	.263*	.121*	-.389**	-.142	-.185	-.330*	.704**	1	
Age	.004	-.447**	.311*	-.137**	.175	.614**	.668**	.377**	-.272*	-.013	1

*. Significant at 0.01 level (2 tailed). **. Significant at 0.05 level (2 tailed). ***. Significant at 0.1 level (2 tailed).

⁶Asset tangibility is the ratio of fixed assets to total assets; leverage is the ratio of total debt to total assets; cash flow is defined as the sum of earnings before interest, tax and depreciation and amortization; investment is defined as capital expenditures for firm *i* during period *t*; dividend payout ratio is defined as ratio of dividend paid of firm *i* during time *t* to net income of firm *i* during time *t*; market to book ratio is defined as the ratio between (market value of equity) / (book value of assets), as of the beginning of the year; interest coverage is defined as the ratio between EBIT/Interest expenses as of the beginning of the year; Z score is the probability of bankruptcy obtained by using the Altman model, size is the annual sales of the firms under study and age is the number of years from the time of its incorporation based as per the annual general meetings held.

Financial Management Techniques in Decision-Making

Astha Joshi, Kriti Shrestha, Susan Chand, Athithi Prasai,
Jasmine Shrestha, Amar Nath Shrestha, Sameer Prasad Bagale

Author Note

The authors are studying in the International BBA Program at Kathmandu College of Management (KCM), Gwarko-17, Lalitpur, Nepal; Internet: <http://kcm.edu.np/>. This article is based on their report submitted to the research department of the College to fulfil the 3-credit hour requirement in research in finance of the sixth semester. Correspondence relating to this article should be emailed to: amar2018@kcm.edu.np, astha2018@kcm.edu.np

Abstract

This article aims to identify the role played by financial management techniques in management decision making across manufacturing and service sectors of Nepal by focusing on the use of working capital technique, capital budgeting technique and capital structure technique. Thus, this study tries to examine the practice level of financial management in large organizations and investigates the level of perceived usefulness of financial management techniques.

This study was conducted through an online survey, which was distributed to 40 respondents; representing 20 organizations from manufacturing and service sectors. Through the research we were able to conclude that financial management techniques were popular among the organizations while making management decisions.

Keywords: financial management technique, management decisions, manufacturing and service sectors.

Financial management is the specific planning of the use and the management of a firm's financial resources in order to attain their objectives such as business concern and wealth maximization for shareholders. In simpler words, it is the efficient and effective management of funds to accomplish the objectives of the organization. It means applying general management principles to the financial resources of the enterprise. Financial management is a challenge in a world where spending is seen as the key to get ahead. The top three types of financial decisions are: investment decisions, financing decisions and dividend decisions.

Investment decision relates to the determination of total amount of assets to be held in the firm, the composition of these assets and the business risk complexions of the firm as perceived by its investors. It is the most important financial decision. Since, firms regularly make new investments; the needs for financing and financial decisions are ongoing.

The third major financial decision relates to the disbursement of profits back to investors who supplied capital to the firm. The term dividend refers to that part of profits of a company, which is distributed by it among its shareholders.

Financial techniques help to forecast the consequences of various investment and financing decisions and weigh the effect of various alternatives. All the businesses have a common goal of shareholder's wealth maximization. Financial techniques have been increasingly recognized as a key element of effective corporate management, which is a vehicle for making sound financial decisions that contribute to the general corporate objectives.

Objectives

The overall objective of this study is to identify the usefulness and importance of financial and management techniques in manufacturing and service industries. The specific objectives of this study are:

- to identify the role of financial management techniques while making management decisions across sectors.
- to rank the working capital management techniques used to make management decisions.
- to determine if there is a significant mean difference among the techniques used across manufacturing and service sectors.

Literature

There is rich theoretical and empirical literature exploring financial management techniques and their effects on financial management decisions. Major empirical studies undertaken in relation to financial management techniques and their effects on financial management decisions covering the period from 2006 to 2016 were conducted in various countries. The first column of table 1, shows the citation and the second column presents the major findings of the study respectively.

Zopoundis & Doumpous, (2002) state that the MCDA offers a highly methodological and realistic framework to decision problems. In 2002, Bonabeau conducted a research to investigate the relationship

between agents and financial management. Bhetuwal, (2006) conducted research on the Nepali economy over 10 years and found that financial liberalization improves the functioning of the financial system. Again in 2006, researchers Zager & Zager, concluded that financial information can be very useful in estimating the current business quality and creating assumption for more successful business in the future. Also, Jha & Hui, (2012) studied the factors affecting the ROA across different commercial banks of Nepal.

Recently, in 2014, Toit and Vermaak conducted a research on South African companies and found that financial statements were useful for decision-making and prediction purposes and information other than only financial information from the financial statements needed to be considered when a company's financial health was being analyzed. Also, through the research of Wolmeran & Meintjes (2015) it was found that firms became successful SMEs because they had a stronger focus on short-term management issues than on medium-to-long-term aspects and that short-term management issues like cash flow was much more relevant for established SMEs than medium to long-term view of the firm. Similarly, Sharma, (2015) conducted research on financial and management accounting practices in the SMEs and found that management accounting reports were considered more useful than financial accounting reports and there was no significant mean difference in the practices of each accounting system across three types of SMEs.

Louw, Brummer & Hall (2016) discovered that effective management of working capital improved a firm's profitability and increased shareholder's wealth. This is the ultimate goal of any firm. Their comprehensive survey investigated a wide variety of issues ranging from traditional methods used in capital budgeting and working capital management areas to analytical techniques related to financial reports and information.

Methodology

In order to obtain an accurate view of the corporate decision-making process, it was important that knowledgeable individuals with broad understanding of the types of financial techniques conducted by their firms complete the questionnaire. Thus, we mailed our questionnaire to the respective financial officers of firms in both manufacturing and service sectors.

Sources of data

This study is based on primary data. The survey questionnaire has been prepared to create primary data. A structured questionnaire was emailed to 60 participants considered relevant for the study. Only 40 of the participants, who were willing to participate and had sufficient time, were included for the questionnaire survey (convenient sample). The survey was designed to understand the opinions of respondent in identifying the usefulness and importance of financial and management techniques in manufacturing and service industries of Nepal.

Nepalese companies from manufacturing and service industry were taken as the population of the study. The study covered both the listed and non-listed companies of Nepalese Stock Exchange (NEPSE). Firms selected as sample for the study represent from manufacturing and service sectors.

Analysis tools

The methods of primary data analysis used in this study consist of descriptive analysis correlation and regression analysis. Independent sample t-test helped us understand how the typical value of the dependent variable changes when any one of the independent variables is varied, while the other independent variables were held as fixed. Similarly, correlation analysis is used to study the strength of the relationship between the variables. In our research, we determined to find the relationship between different financial management techniques and management decisions.

Analysis and results

Primary data

All of the respondents unanimously agreed that the working capital technique does influence the financial management's decision-making. On the other hand, majority (95%) agreed that capital budgeting techniques affect the financial management's decision-making while the rest didn't know. Similarly,

majority (95%) of the respondents believed that the capital structure influences financial management's decision-making. This finding shows that the capital structure technique is mostly used by manufacturing and service sector companies while making financial management decision. (Table 3)

Figure 1 describes the most popular working capital management technique among the manufacturing and service sectors is the account receivable method. Similarly, figure 2 shows the payback period is used more because of its simplicity and also because it is a more traditional approach. And finally, figure 3 shows that the capital structure technique mostly used is debt-equity ratio, probably due to its simplicity of use and popularity among decision makers.

T-test of mean difference

Table 4 presents independent sample t-test (mean difference) of portfolios sorted by working capital technique, capital budgeting technique, capital structure technique and financial management decision for the variables under study.

The significant value of the variables capital budgeting techniques, capital structure technique, working capital technique and financial decisions across the sectors are insignificant to financial decisions as shown in the above table. Results presented in the table reveal that the mean difference of the variables capital budgeting technique, capital structure technique, working capital technique and financial management decision is observed to be insignificant across manufacturing and service sectors. Thus, there is insignificant or no relationship of financial management techniques across the manufacturing and service sectors.

Correlation

Table 5 depicts the correlation analysis of the major variables under study. The correlation analysis is conducted for the whole sample. As exhibited in the table, there is a positive and significant relationship between working capital technique and financial decision at a confidence level of 99%. There is a positive and significant relationship between capital budgeting technique and financial decision at a confidence level of 99%. There is a positive and insignificant relationship between capital structure technique and financial decision. Thus, while making financial decisions, firms from both manufacturing and service sectors mostly use working capital technique and capital budgeting technique.

Discussion

As depicted in the correlation analysis, there was a positive and significant relationship between working capital technique and financial decision at a confidence level of 99%, a positive and significant relationship between capital budgeting technique and financial decision at a confidence level of 99% and a positive and insignificant relationship between capital structure technique and financial management decision. Thus, while making financial decisions, firms from both manufacturing and service sectors mostly use working capital technique and capital budgeting technique. This finding is in line with the findings of Louw, Brummer, & Hall (2016) who indicated that effective management of working capital will improve a firm's profitability and increase shareholder's wealth, which is the ultimate goal of any firm thus making the working capital management technique the most popular techniques. It can be concluded that corporations mostly use this method because of their objective to increase the firm's profitability and shareholder's wealth.

Findings

1. According to the survey, all of the respondents unanimously voted that working capital technique does influence the financial decision making.
2. The usage rates for the following working capital items: cash, securities, accounts receivables and inventory, majority of the respondents use a form of accounts receivable model followed by cash management model. Both the security portfolio model and inventory management model were used the least.
3. As the survey revealed, the majority of respondents used payback method as a form of capital budgeting technique, followed by the internal rate of return. However, less than half of the

respondents use the other capital budgeting techniques: net present value and average rate of return.

4. The survey revealed that the most popular capital structure technique is debt to equity ratio. This is followed by debt to asset ratio and earning coverage ratio. The least used capital structure technique is Z-score ratio.
5. The significant value of the variables capital budgeting techniques, capital structure technique, working capital technique and financial decisions across the sectors are insignificant to financial management.

There was a positive and significant relationship between working capital technique and financial management decision at a confidence level of 99%. There was a positive and significant relationship between capital budgeting technique and financial management decision at a confidence level of 99%.

Conclusions

Based on the findings, the major conclusion that we derive from the study is that financial management techniques play an important role in the management's decision-making process and the most popular techniques used are capital budgeting technique and working capital management technique. The significant value of the variables capital budgeting techniques, capital structure technique, working capital technique and financial decisions across the sectors are insignificant to the financial management decisions. Moreover, the widely used method among the working capital techniques is accounts receivable method, for capital budgeting techniques it's payback method and for capital structure it's debt to equity ratio.

Furthermore, the study concludes there is a positive and significant relationship between working capital technique and financial decision at a confidence level of 99%. There is a positive and significant relationship between capital budgeting technique and financial decision at a confidence level of 99%. There is a positive and insignificant relationship between capital structure technique and financial decision. Thus, while making financial management decisions, firms from both manufacturing and service sectors mostly use working capital technique and capital budgeting technique.

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Annexure

Table 1

Studies and findings

Study	Findings
Zopoundis & Doumpos, 2002	States that the MCDA offers a highly methodological and realistic framework to decision problems
Bonabeau, 2002	The research is conducted to investigate the relationship between agents and the financial management.
Bhetuwal, 2006	Conducted research of Nepali economy over 10 years and found that Financial liberalization improves the functioning of financial
Zager & Zager, 2006	The researchers concluded that financial information can be very useful in estimating the current business quality and creating assumption for more successful business in the future.
Jha & Hui, 2012	Studied the factors affecting the ROA across different commercial banks of Nepal
Meyer & Wet, 2013	Identified a significant negative relationship between the number of directors serving on the corporate board and the percentage shares owned by the board members.
Toit & Vermaak, 2014	Conducted research on South African companies and found that financial statements are useful for decision-making and prediction purposes and information other than only financial information from the financial statements needs to be considered when a company's financial health is analyzed
Wolmeran & Meintjes, 2015	Through the research it was found out that firms became successful SMEs because they had a stronger focus on short-term management issues than on medium- to long-term aspects and that short-term management issues like cash flow, is much more relevant for established SMEs than to have a medium to long-term view of the firm
Sharma, 2015	Conducted the research on the financial and management accounting practices in the SMEs and found that the management accounting reports are considered to be more useful than financial accounting reports and there is no significance mean difference of practices of each accounting system across three types of SMEs.
Louw, Brummer, & Hall, 2016	Discovered that effective management of working capital will improve a firm's profitability and increase shareholder's wealth, which is the ultimate goal of any firm

Table 2

List of manufacturing and servicing sectors selected for sample

S.N.	Enterprises	Observations	Sectors
1.	Namaste Plywood Pvt. Ltd.	3	Manufacturing
2.	Mirabel Resort Hotel Pvt. Ltd.	1	Service
3.	Jawalakhel Group of Industries	3	Manufacturing
4.	Citizen Bank	2	Service
5.	Hello Nepal	1	Service
6.	Kathmandu College of Management	1	Service
7.	Global IME Bank	1	Service
8.	AYON	1	Service
9.	Salesberry Department Store	1	Service
10.	New Ojha Enterprise	1	Service
11.	Unilever Nepal Ltd.	2	Manufacturing
12.	Soaltee Hotel Ltd.	2	Service
13.	Oriental Hotel Ltd.	2	Service
14.	Yak and Yeti Hotels Ltd.	2	Service
15.	Taragaon Regency Hotels Ltd.	2	Service
16.	Bottlers Nepal Ltd. (Balaju)	2	Manufacturing
17.	Chaudhary Group	3	Manufacturing
18.	Platinum Hotel & Spa	2	Service
19.	Kathmandu View	1	Service

Table 3

Multiple response table of techniques that influences management's decision making

Techniques	N	Percent	Percent of cases
Working capital techniques	10	14.90%	25.00%
Capital budgeting techniques	25	37.30%	62.50%
Capital structure	32	47.80%	80.00%
Total	67	100.00%	167.50%

a. Dichotomy group tabulated at value 1.

Table 4

Independent sample t-test between sectors

Technique	Sector	N	Mean	Std. Deviation	Std. Error	Mean Difference	P-value
Working Capital	Manufacturing	20	3.000	0.649	0.145	-0.317	(0.16)
	Service	20	3.317	0.868	0.194		
Capital Budgeting	Manufacturing	20	3.600	0.792	0.177	0.217	(0.866)
	Service	20	3.383	0.751	0.168		
Capital Structure	Manufacturing	20	3.867	0.596	0.133	0.750	(0.611)
	Service	20	3.117	0.533	0.119		
Financial management Decision	Manufacturing	20	3.333	0.572	0.128	-0.167	(0.671)
	Service	20	3.500	0.776	0.174		

Table 5

Spearman correlation coefficients for all sample firms

Factors	Working capital technique	Capital budgeting technique	Capital structure technique	Management's decision
Working capital technique	1.			
Capital budgeting technique	.571** (0.001)	1		
Capital structure technique	0.097 (0.275)	.541** (0.001)	1	
Management's decision	.422** (0.003)	.413** (0.004)	0.018 (0.457)	1

** Correlation is significant at the 0.01 level (1-tailed).

Figure 1

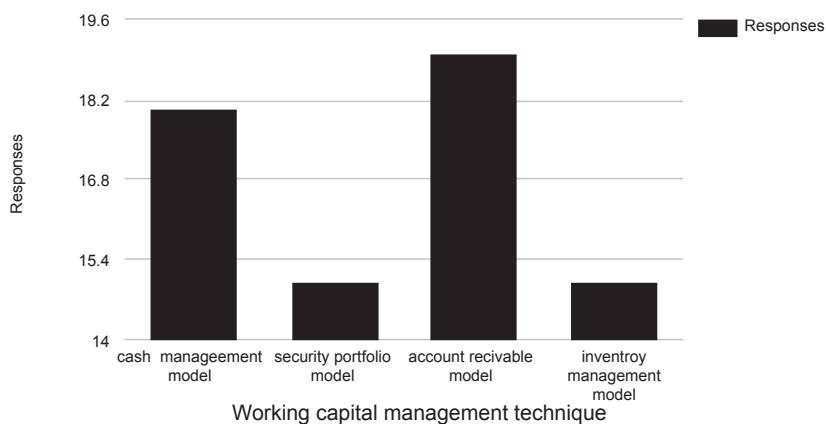
Ranking of working capital management techniques

Figure 2

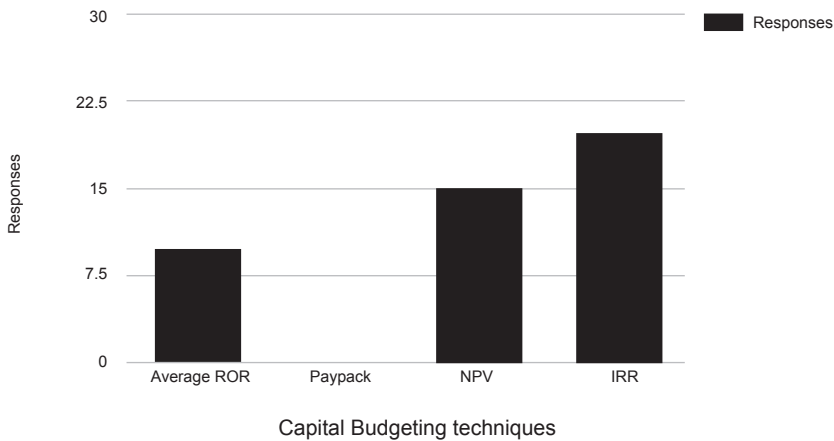
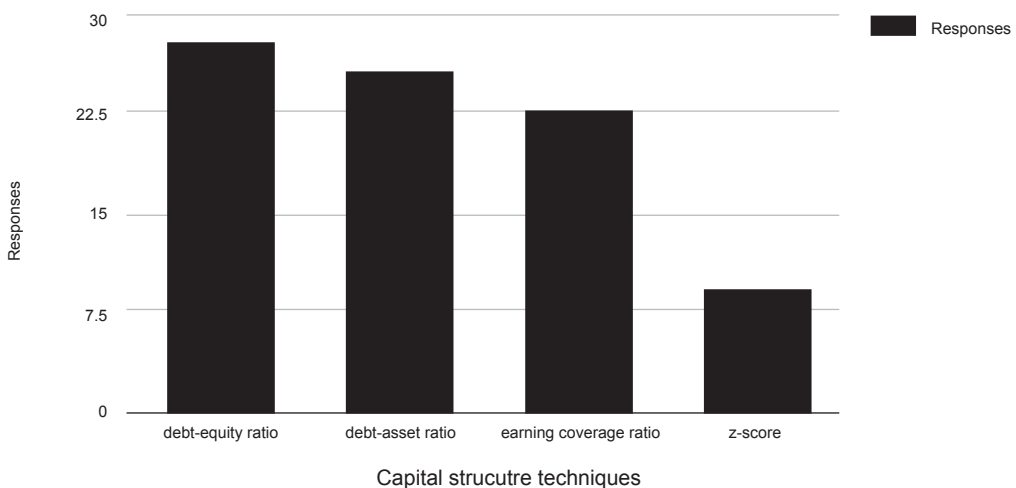
Ranking of capital budgeting techniques

Figure 3

Ranking the capital structure techniques

Questionnaire

Dear respondent,

We are an ongoing student of Kathmandu College of Management and are conducting a research on "Role of Financing Management Techniques in the context of Nepal". This research is conducted as a partial fulfillment of the requirement for the Bachelor of Business Administration. Your response will be only used for the research purposes and information received will be held confidential.

Part 1

1. Name
2. Post
3. Sector

- Manufacturing
 - Service
4. Age
- 25-35
 - 35-45
 - 45 above
5. Do the working capital techniques influence the financial management's decision-making?
- Yes
 - No
 - Do not Know
6. Do you think the capital budgeting techniques affects the financial management's decision-making?
- Yes
 - No
 - Do not Know
7. Do you think the Capital Structure influence the financial management's decision-making?
- Yes
 - No
 - Do not Know
8. Which of the following are the important factors that influences financial decision-making?
- ☐ Working Capital Techniques
 - ☐ Capital Budgeting Techniques
 - ☐ Capital Structure

9. Rank the following Working Capital Management Techniques (1= Least important)

Cash Management Models	Security Portfolio Models	Accounts Receivables Models	Inventory Management Models
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10. Rank the following Capital Budgeting Techniques (1= Least Important)

Average ROR	Payback	NPV (DCF)	IRR
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11. Rank the following Capital Structure Techniques (1= Least Important)

Debt-Equity Ratio	Debt-Asset	Earnings coverage ratio	Z-Score
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Part 2

Please take the relevant column's showing scales from 'strongly disagree -1' to 'strongly agree - 5'

12. Working Capital Techniques	Rating
Availability of raw materials is influenced by working capital techniques	
I make my management decision only after evaluating the condition of financial liquidity	
I use working capital techniques to set the credit allowances of my firm	
13. Capital Budgeting Techniques	Rating
I evaluate available alternatives and relevant cash flows by using Capital Budgeting	
I select the best alternative using this technique	
Decision regarding growth and expansion is made by using this technique	
14. Capital Structure	Rating
I get highly influenced by the cost of capital	
I consider the current capital structure before making any management decision	
An opinion of the firm's majority stockholder influences my decision regarding firm's	
15. Financial Management's Decision	Rating
Increase in financial management techniques accuracy, raises my interest in financial management decision	
I tend to make management decision using above mentioned techniques	
I have high level of self-confidence in my management decisions	

Extended Du Pont Analysis of Two Nepalese Banks

Sashwot Pathak

Author Note

Student of BBA eighth semester, Kathmandu College of Management (KCM), Gwarko-17, Lalitpur, Nepal; Internet: <http://kcm.edu.np/>. This article is based on the original report submitted to research department of the College. Comments and enquiries can be emailed to: sashwotk@gmail.com

Abstract

This article aims to find the extended Du Pont identity factors of the two banks — NMB and NIBL. A comparison of identity factors shows that NMB Bank has lower ROE than NIBL. On the basis of the financial statements of on the last five years, it can be said that the ROE of NMB bank is not satisfactory when compared to NIBL bank which has the highest level of ROE among three close competitors. In addition, this article mentions the components of extended Du Pont in which NMB bank lagged behind. They were tax burden, interest burden and EBIT margin. From correlation analysis, it can be seen that there is positive correlation of TB, IB, EBIT margin, and net profit margin with ROE. But, the correlation of EBIT is weak, thus NMB bank does not need to focus sharply on improving EBIT margin. Also, it was seen that EM has moderate positive correlation with ROE and total assets turnover has strong negative correlation with ROE.

Keywords: Du Pont analysis, bank, ROE, liquidity, net worth

Investors invest their funds in companies so that they are able to earn the required rate of return that corresponds with the level of risk that is associated with various companies. Investors may be interested in investing in three kinds of financial instruments viz. bonds, preferred stocks, and common stocks. The investors investing in bonds provide debt financing to the company, those who invest in preferred stock provide a hybrid of debt and equity financing and investors investing in common stock provide equity financing to the companies. Common stock holders are owners of a company and have voting rights in annual general meetings, which allow them to elect the board of directors who take important decisions that impact the profitability of the company.

The return provided by banks should be measured in order to track the return and make necessary changes in their corporate strategy to be able to provide a required rate of return that is in line with the risk taken by common equity holders while investing in the banks. One such measure of the return that is achieved by common shareholders is the ROE. ROE can be defined as return in one monetary unit of equity invested in a company. Since benefitting shareholders should be the goal of every public limited company, ROE in an accounting sense is the true net measure of this performance.

Du Pont identity is an expression that breaks the ROE into three parts, viz., operating efficiency; assets use efficiency, and financial leverage. Extended Du Pont identity breaks the operating efficiency into tax burden, IB, and assets use burden. The extended Du Pont¹ identity is used to identify the factor(s) in which NMB Bank lags due to which ROE of the bank has been low throughout the years in comparison to other commercial banks. Since NIBL has had the highest ROE over the years, the research report has used NIBL as the benchmark for comparison of the Du Pont identity of NMB Bank. This analysis may help NMB Bank to identify factors affecting ROE that need improvement and provide the appropriate level of return to its equity investors.

Objective

The objective of the study is to analyze the trends in the parts of extended Du Pont identity of both NMB Bank and NIBL.

Limitations

The first and the foremost limitations of the study are limited data, time, and budget. The data of only the past five years has been used; this has limited the insight that can be gained through analysis. Another limitation of the study is that even though Du Pont identity is considered a good model, it is not perfect. Use of just a particular bank i.e. NIBL as a benchmark limits the scope for comparison.

Literature

Many researchers have used the Du Pont identity model to analyze the profitability of companies, including commercial banks. (Almazari A. A., 2013) used Du Pont identity to compare the financial performance of Samba and AlRajhi banks from 2006 to 2011. The results of the study showed that the financial performance of two banks with regard to profit margin was relatively steady even though asset

¹Refer to annexure for its detail description.

utilization was declining for both banks. Due to decline in the total assets turnover, both the banks faced decrease in ROE over the years. This showed that Du Pont identity is a good model to study ROE and the factors that affect it.

Herciu and others (Herciu, Ogorean, & Belascu, 2010) conducted a study that concentrated on the Du Pont analysis of the companies and found that the top twenty profitable companies were not the most attractive ones for investors. In the study, they found that the firms did not maintain their rankings when ratios such as ROE and ROA were considered. The findings of this study show that high level of net profit margin does not guarantee a high level of ROE. Furthermore, this study shows the importance of ROE analysis in making sure that the company is considered more attractive by investors for lucrative returns.

Another study (Collier & McGowan, 2010) used Du Pont identity to evaluate the impact of rapidly changing economic environment on banks' financial performance. The Du Pont model was used to measure the performance of Bank Al Bilad. The study found that Bank Al Bilad had relied on debt to a high degree each year to exhibit its ROE figures. This indicated a lower percentage of ROE being derived from the sales or profit margin. This shows that the Du Pont model can be used to identify the factors that cause changes in ROE. The findings of this study have confirmed the importance of Du Pont identity in analyzing ROE.

Raza and others (Raza, Jawaaid, & Adnan, 2013) conducted a Du Pont analysis of the insurance sector in the south Asian region. Through Du Pont analysis, the study tried to determine the types of companies that are most attractive for investors. The study used two methods of ranking, one based on net income and the second one based on Du Pont equation. The finding of the study was that ranking companies according to Du Pont was more reliable for investors as compared to net profit. The findings of this study confirm that Du Pont identity is a reliable model to analyze performance that is suitable for both investors and companies.

Chang and others (Chang, Chircherina, & HassabElnaby, 2013) found that the information provided by Du Pont components may reduce profit in the health care sector. The findings of this study showed that special features of the health care industry affect the information content of the accounting signals based on financial statements. This study has shown that Du Pont model must be used carefully as it might not be the best model for analysis across all industries.

Therefore, it has been tried to study the ROE of NMB bank with NIBL so that comparative assessment of factors could be identified.

Methodology

Data source

This study focuses on the use of balance sheet and income statements of both NMB Bank and NIBL. Data of the components of the extended Du Pont identity equation was acquired from the annual reports of both NMB Bank and NIBL. The annual reports were accessed from the respective websites.

Data structure

The focus of this research is the factors that affect the ROE of NMB Bank. So, the extended Du Pont analysis using data from FY 2010/11 to 2014/15 fairly represent the past as well as present condition of the bank. Taking less data than this will make it almost impossible to properly analyze the ROE. The fiscal year of Nepal starts around 16th July

Analysis tool

The data were processed through Microsoft Excel. Six financial ratios that were the part of extended Du Pont model along with sample averages from descriptive analysis were used to achieve the stated research objective. Correlation analysis was used to know the strength of the relationship and also used coefficient of determination (r^2) to know the association between independent variables and ROE. Arithmetic mean is used to calculate the average value of each component of the extended Du Pont identity.

Components of extended Du Pont Analysis. The components of extended Du Pont analysis were used to understand the impact of the components on the ROE as well as to calculate the ROE. These components are the six financial ratios, namely, $TB = \text{net income} \div EBT$, $IB = EBT \div EBIT$, $EBIT \text{ margin} = EBIT \div \text{total revenue}$, $TAT = \text{total revenue} \div \text{total assets}$, $EM = \text{total assets} \div \text{total equity}$, and $ROE = TB \times IB \times EBIT \text{ margin} \times TAT \times EM$.

Analysis and result

Comparative correlations of NMB and NIBL

From the correlation analysis of two banks (table 1 and table2), it can be seen that in the case of NMB Bank there is a very strong positive correlation between the components of net profit margin and ROE, the value of correlation coefficient between net profit margin and ROE. However, in the case of NIBL, there exists only moderate positive correlation between net profit margin and ROE as the value of correlation coefficient is only 0.62. This is the result of weak correlation of TB and IB with ROE. However, there is a similarity between the correlation of NMB Bank and NIBL. There exists negative correlation among the components of ROE for both banks.

Comparative extended Du Pont of NMB and NIBL

This section focuses on the comparative graphical analysis between extended Du Pont components of NMB Bank and NIBL with the aid of table 3 and table 4. Table 3 contains the TB, IB, and TAT components of extended Du Pont identity of NMB and NIBL bank over the five-year period from 2010/11 to 2014/15. Table 5 depicts the EM, profit margin, and ROE of NMB and NIBL bank over the same five years.

Tax burden

From table 3, the trend of TB over five years for NMB Bank and NIBL can be seen. In the fiscal year 2010/11, the TB of NIBL was 70.12% and in the next four fiscals there was minimal change in the TB with 70.28% TB in 2014/15. The TB of NMB bank also seemed to be at the same level in the fiscal years 2010/11 and 2011/12. Then there was an increase in the TB of NMB bank by almost 6.5% to 72.6% in the year 2012/13. And then in the fiscal year 2013/14, the TB decreased by about 2% to 70.24% and remained at almost the same level in 2014/15.

Data shows that the TB of NIBL is quite stable, whereas, the TB of NMB bank is fluctuating even though its level has been almost the same for the past two years. Furthermore, the graph showed that the TB of NIBL was higher than that of NMB bank in the years 2010/11 and 2011/12. In the year 2012/13 the TB of NMB bank was greater than that of NIBL and for the past two years both the banks had almost the same level of TB.

Interest burden

The data presented in table 3 shows that the pattern of fluctuations in IB of NMB bank and NIBL is almost similar with increasing trend in interest since the past three years for both banks. However, it should be noted that over five years the IB of NMB bank was lower than that of the NIBL and this showed that the interest expense compared to operating profit was higher for NMB bank.

EBIT margin

Similarly, table 3 shows that the EBIT margin of NIBL bank fluctuates in an alternating manner in which there are alternate periods of high and low level of EBIT Margin. The EBIT margin of NMB bank also seems to be fluctuating alternatively for the past two years and it is worth noting that in the past five years the EBIT margin of NMB bank has been less than that of NIBL. This indicates that the operating expense relative to sales is higher in NMB bank than NIBL.

Total assets turnover

Again, from table 3, the trend of TAT over five years can be seen for NMB Bank and NIBL. Data shows decreasing trend in TAT for both NIBL and NMB bank. However, the TAT of NIBL was still higher

than that of NMB bank in all these years, but the TAT of both banks in fiscal year 2014/15 was almost equal at 6.69% and 6.43% for NIBL and NMB bank respectively.

Equity multiplier

In table 4, the trend of EM over five years for NMB Bank and NIBL can be seen. The graphical analysis shows that there is opposite trend in the EM of the two banks. The graph depicts decreasing trend of EM for NIBL, whereas, there is increasing trend of EM for NMB. Except for the fiscal year 2014/15, the EM of NIBL has been greater than that of NMB for all the other years.

Net profit margin

Table 4 also shows that the trend in fluctuation of net profit margin for NIBL and NMB bank is similar over five years. But the level of fluctuation in the net profit margin of NIBL is less than NMB. In the fiscal year 2011/12, net profit margin of NIBL fell by 2.77% points and in the same year the net profit margin of NMB bank fell by 10.78% points. Then in the year 2012/13, net profit margin of NIBL increased by 12.81% points and in the same year net profit margin of NMB increased by 15.15%. Then, for the last two years, the net profit margins of both banks have shown minimal level of fluctuation. It must be noted that NIBL had higher net profit margin in all the five years.

Return on equity

Again, table 4 shows that for the first three years the trend in ROE of both banks were similar. But the levels of fluctuation were different. NMB bank had higher level of fluctuation than NIBL. In the two-year period from 2012/13 to 2014/15, the ROE of NIBL showed a decreasing trend and the ROE of NMB was stable with very minimal fluctuation. It is worth noting that in all these five years NIBL has had higher ROE than NMB.

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Annexure

Table 1

Correlation coefficient and coefficient of determination of NMB

	ROE (r)	Tax Burden	Interest Burden	Margin EBIT	Turnover Assets	Equity Multiplier	(r ²)
Tax Burden	0.805	1					0.648
Interest Burden	0.995	0.74	1				0.990
EBIT Margin	0.43	-0.06	0.48	1			0.188
Assets Turnover	-0.800	-0.797	-0.785	0.136	1		0.640
Equity Multiplier	0.721	0.774	0.703	-0.25	-0.991	1	0.52
Net Profit Margin	0.99	0.75	0.99	0.508	-0.759	0.674	0.99

Source: Annual Report NMB bank (2010/11-2014/15)

Table 2

Correlation coefficient and coefficient of determination of NIBL

	ROE (r)	Tax Burden	Interest Burden	EBIT Margin	Assets Turnover	Equity Multiplier	(r ²)
Tax Burden	0.566	1					0.32
Interest Burden	0.59	-0.153	1				0.35
EBIT Margin	0.65	0.410	0.216	1			0.434
Assets Turnover	-0.02	0.55	-0.815	0.180	1		0.00
Equity Multiplier	-0.283	0.52	-0.679	0.19	0.581	1	0.080
Net Profit Margin	0.62	-0.124	0.99	0.26	-0.791	-0.665	0.39

Source: Annual Report NIBL (2010/11-2014/15)

Table 3

Extended Du Pont components of NMB & NIBL

Time	NMB Tax Burden	NIBL Tax Burden	NMB Interest Burden	NIBL Interest Burden	NMB EBIT Margin	NIBL EBIT Margin	NMB Assets Turnover	NIBL Assets Turnover
2010-2011	66.04%	70.12%	24.15%	31.67%	85.36%	82.10%	10.20%	11.06%
2011-2012	66.21%	69.83%	5.91%	28.07%	72.26%	78.86%	9.99%	10.23%
2012-2013	72.67%	69.95%	31.51%	49.66%	78.50%	81.37%	7.98%	9.26%
2013-2014	70.24%	70.11%	32.43%	49.52%	78.86%	80.20%	7.55%	8.08%
2014-2015	70.28%	69.63%	34.59%	50.09%	77.48%	80.59%	6.43%	6.69%

Source: Annual Report NMB and NIBL (2010/11-2014/15)

Table 4

Extended Du Pont components of NMB & NIBL

Time	NMB Multiplier	NIBL Multiplier	NMB Net Profit Margin	NIBL Net Profit Margin	NMB ROE	NIBL ROE
2010-2011	7.21	11.3	13.61%	18.23%	10.02%	22.80%
2011-2012	8.17	10.86	2.83%	15.46%	2.31%	17.18%
2012-2013	10.36	10.41	17.98%	28.27%	14.87%	27.28%
2013-2014	10.74	10.87	17.96%	27.84%	14.57%	24.47%
2014-2015	12.54	10.63	18.84%	28.11%	15.20%	20.00%

Source: Annual Report NMB and NIBL (2010/11-2014/15)

Table 5

Comparative five-year's average of extended Du Pont components

Components	Five Year Average	Five Year Average (NMB)
Tax burden Interest	69.93%	69.09%
Burden	41.80%	25.72%
EBIT margin Assets	80.62%	78.49%
Turnover	9.06%	8.43%
Multiplier	10.82	9.80
ROE	22.35%	11.39%

Source: Annual Report NMB and NIBL (2010/11-2014/15)

*Extended Du Pont identity is the simple extension of the Du Pont Identity that was originally developed by Du Pont Corporation. In extended Du Pont identity the profit margin is taken and disintegrated into three parts, viz., tax burden, interest burden, and EBIT (Earnings before Interest and Tax). The other two measures of efficiency are the same. Extended Du Pont analysis has given valuable insight into the operating efficiency part of the ROE. The most important insight this model has given is that if the cost of debt is very high then increase in financial leverage can actually decrease the ROE. The components of profit margin as per this model are:

Tax Burden (TB). Tax burden is the ratio of net income to earnings before tax (EBT). Even though the name given to this equation is tax burden, it is actually equal to one minus the tax rate ($1 - \text{tax rate}$). This ratio shows net income earned as a percentage of earnings before tax. High TB ratio creates high level of profit margin. $\text{Tax Burden} = \text{Net Income} \div \text{EBT}$

Interest Burden (IB). Interest burden is the ratio of earnings before tax (EBT) to the earnings before interest and tax (EBIT). This ratio shows EBT as a percentage of EBIT. High level of interest cost on debt financing decreases this ratio. High IB ratio creates high level of profit margin. $\text{Interest Burden} = \text{EBT} \div \text{EBIT}$

EBIT Margin: EBIT margin is the ratio of earnings before interest and tax (EBIT) to total revenue. This ratio shows EBIT as a percentage of total revenue. High level of operating costs will decrease this ratio. High EBIT margin ratio creates high level of profit margin. $\text{BIT Margin} = \text{EBIT} \div \text{Total Revenue}$

The Extended Du Pont Identity:

Return on Equity = Operating efficiency $\times$ Assets use Efficiency $\times$ Financial leverage

$ROE = PM \times TAT \times EM$

$ROE = TB \times IB \times EBIT \text{ Margin} \times TAT \times EM$

Analysis Tool

Arithmetic Mean: Arithmetic mean is used in this business research report as a means of calculating the average value of each component of the Extended Du Pont identity. Arithmetic mean is calculated by dividing the sum of obtained variables by the total number of items. Formula, $X = \sum x \div N$

Where, X = Arithmetic mean, $\sum x$ = the sum of variables, N = Total number of items

