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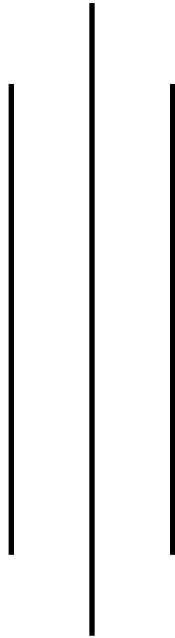
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Macroeconomic Determinants of Banking Sector Development: An Empirical Analysis

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ABSTRACT

This paper explored the macroeconomic determinants of banking sector development in Nepal using the dynamic generalized methods of moments (GMM) estimation technique with panel-balanced data ranging from 2006 to 2018. The major advantage of the GMM approach is its ability to capture the dynamic characteristic of banking sector development data and address the endogeneity problem. This study reveals that banking sector development and GDP positively and significantly influenced the banking system in line with theoretical predictions. Remittance and foreign direct investment have a positive and statistically significant role to explain banking sector development in Nepal. Also, it demonstrates that trade openness negatively but insignificantly impacted on banking sector development whilst inflation had a marginal negative impact on banking sector development in Nepal. In addition, stock market capitalization had a positive and significant effect on banking sector development. The study implies that a country authority should implement economic growth enhancement policies to increase the development of their banking sectors. They are also urged to reduce government expenditure, trade openness, and inflation levels to enhance banking sector development.

Keywords: Banking Sector; Macroeconomic determinants; GMM techniques

JEL Classification Code: E2, G1, G2, G3

1. Introduction

The banking sector plays a pivotal role in the economic growth and development of any country. Schumpeter (1911) is of the view that a well-developed banking or financial sector avails capital to firms, which they will use to produce innovative products and promote technological innovation and economic growth. The success and progress of the commercial banking sector depend on several dimensions including in particular profitability growth and lending behavior. Since the 1970s, there has been a significant change in the banking environment both domestically and internationally due to the rapid

developments of banking activities because of the wave of financial liberalization and financial globalization. Developed countries completed the process of liberalization in the banking sector at the end of the eighties and early nineties of the past century, and then many developing countries initiated some economic reform programs, which comprised the banking sector to increase its effectiveness and enhance its role in the economic development.

The banking sector represents one of the fundamental pillars of the economy of any country where it plays a vital role in pushing the development and progress of economic and financial sectors. Kaur et al. (2013) also observed that the banking sector development quickens the rate at which a host country benefits from foreign direct investment inflows through providing services such as loans and efficient capital allocation. On the other hand, Antras et al (2009) argued that a shallow banking sector forces foreign and domestic firms to heavily depend on external sources thus triggering the scaling down of foreign firms' activities and low economic growth. It is clear from the literature that the positive role that the banking sector plays in the promotion of economic growth is no longer an unsettled issue. What is still unclear is what determines banking sector development hence the current study was undertaken to fill in that void.

This study explored the macroeconomic determinants of the development of the banking sector by using a dynamic GMM estimation procedure that addresses the endogeneity problem and takes into account the dynamic nature of banking sector development data. The main research question in this study is that what are the main determinants of the development of the banking system in Nepal? Section 2 discusses the macroeconomic determinants of banking sector development from an empirical literature review perspective. Section 3 carries out a methodology, which shows data & variables description, correlation, and descriptive statistics are described in this section. The section also explains an empirical model specification used, shows, and interprets the dynamic GMM estimation results. Section 4 concludes the study.

2. Literature Review

Several studies have investigated the determinants of banking sector development and their findings are varied but closely related. Yu and Gan (2010) studied the determinants of banking sector development in Malaysia using multiple regression analysis. Higher level of gross domestic product were found to be a significant determinant of banking sector development whereas financial liberalization destabilized the Malaysian banking sector. Trade openness and real interest rates positively but none significantly affected banking sector

development in Malaysia. Using multiple regression analysis with time series data from 1977 to 2012, Mahmoud (2014) studied the macroeconomic determinants of banking sector development in Egypt and Saudi Arabia. The study found out that real interest rates, financial liberalization, and trade openness positively and significantly influenced the banking sector of both Egypt and Saudi Arabia.

Using panel data analysis, Raza et al (2014) explored the determinants of financial development in developing and developed countries. Credit to the private sector was found to have been positively and significantly influenced by trade openness, foreign direct investment, government expenditure, GDP growth rate, population growth rate, and growth of the agricultural sector in developing and developed countries. Hamdi (2015) also studied financial development determinants in 15 developed and 23 developing countries using panel data analysis with data ranging from 1997 to 2013. Human capital development and economic growth were found to be the major drivers of financial development in both developed and developing countries. The same study revealed that stability of the economy, institutional and legal infrastructure determined financial development only in developed countries. Employing random and fixed effects methods, Naceur et al (2014) investigated the determinants of financial sector development in the Middle East and North African (MENA) region. Their study noted that inflation, savings, trade openness, investment, and financial liberalization had a positive and significant influence on financial development in the MENA region. Cherif and Dreger (2016) also studied financial development determinants in the MENA region using panel data analysis. Trade openness, corruption, and law and order were found to have played a critical role in influencing both the banking sector and stock market development in the MENA region.

Takyi and Obeng (2013) used Autoregressive Distributive Lag (ARDL) framework with time-series data (1988-2010) to explore the financial development determinants in Ghana. GDP per capita and trade openness were found to have had a significant positive influence on financial development in Ghana both in the long and short run. The same study showed that factors that negatively and significantly influenced financial development in Ghana include interest rate, inflation, and reserve ratio requirement. Elsherif (2015) studied the financial development determinants in Egypt using ARDL and Johansen co-integration test with time-series data (1974-2012). Four macroeconomic variables were found to be the key positive drivers of financial development in Egypt. These include trade openness, human capital development, GDP per capita, and investment levels. Consistent with the majority of empirical studies, inflation was found to have negatively influenced Egypt's financial sector

development during the period under study. Ayunku and Etale (2014) investigated the macroeconomic determinants of banking sector development in Nigeria using the error correction model (ECM) with time-series data from 1977 to 2010. Trade openness and economic growth were found to have positively influenced banking sector development in Nigeria.

3. Methodology and Model Specification

3.1 Data description and Variables

This study used annual panel data of a country ranging from 2006 to 2018. These secondary data was extracted from Nepal Rastra Bank, NEPSE, SEBON, and MOF databases, all of which are reputable national organizations. Consistent with Mahmoud (2014) and Raza et al (2014), this study used the ratio of liquid asset to GDP and private credit to GDP provided by the financial sector (% of GDP) measure of banking sector development as a dependent variable. The overall banking sector development was obtained by the arithmetic average of the normalized values of these two variables. Independent variables in the study include per capita GDP, trade openness, inflation, foreign direct investment, stock market capitalization, and remittance, in line with similar studies of banking sector development determinants (Raza et al. 2014; Naceur et al. 2014; Elsherif. 2015). GDP per capita, exports of goods and services as a ratio of GDP, inflation, consumer prices (annual %), stock market development (% of GDP), and remittance (% of GDP) were used as proxies of economic growth, trade openness, inflation, and foreign direct investment respectively in line with similar prior studies.

3.2 Pre-estimation diagnostics

Table 1. Descriptive Statistics with dependent and independent variables, 2006-2018

	BDS	PCG	TO	INF	SMC	REMIT	FDI
Mean	42.09	925	38.49	5.69	45.31	12.39	15.98
Median	19.45	880	29.42	5.02	29.45	9.85	10.76
Maximum	102.62	1245	119.7	9.93	85.39	26.42	32.61
Minimum	7.89	682	20.63	3.45	11.45	2.05	0.85
Std. Dev.	10.45	102.41	21.85	236.4	19.45	24.69	41.35
Skewness	1.61	1.56	1.09	2.35	1.47	3.54	1.34
Kurtosis	3.05	9.49	13.56	6.41	2.88	3.07	8.45

The difference between minimum and maximum values is too large across all the variables under study, a sign of the presence of extreme values. Per capita GDP and inflation data have the highest standard deviation above 100, which is also evidence of the existence of abnormal or extreme values. The data for all the variables is positively skewed and is not normally distributed. The Kurtosis values for all the variables are not around 3. This is proof that data for the variables used is not normally distributed. In order to ensure that the quality and reliability of the final results is not compromised, the issue of data not normally distributed, abnormal and extreme values was addressed by transforming all the data sets into natural logarithms before using it for main data analysis.

Table 2. Correlation Analysis with dependent and independent variables, 2006-2018

	BDS	PCG	TO	INF	SMC	REMIT	FDI
BSD	1						
PCG	0.4621***	1					
TO	-0.1826*	0.4154***	1				
INFL	-0.0856	-0.0983	0.3756***	1			
SMC	0.1826**	0.3128**	0.0586	0.0851	1		
REMIT	0.3924***	0.2847**	0.1931*	0.1789*	0.3614***	1	
FDI	0.5133***	0.3421***	0.1467*	0.2169**	0.2384**	0.0475	1

Note: ***, ** and * denote 1%, 5% and 10% level of significant respectively.

Where BSD is average liquid liability & private credit provided by the financial sector (% of GDP), PCG stands for per capita gross domestic product, trade openness (TO) is exports & imports of goods and services (% of GDP), INFL represents inflation, consumer prices (annual %), SMC is total stock market capitalization (% of GDP), REMIT is a sum of current transfers by migrant workers and wages and salaries received (% of GDP), and FDI stands for the total investment made by a foreign country firm or individual (% of GDP). GDP, trade openness, and FDI variables are positively correlated with banking sector development in line with the literature. Contrary to theoretical predictions but consistent with empirical studies done by Taiwo and Obeng (2015), remittance and SMC are correlated positively with banking sector development. Following Stead (1996), the problem of multi-collinearity does not among the variables being studied because all the correlations in Table 2 are below 65%.

3.3 Empirical model specification

This study only investigated how GDP, trade openness, inflation, foreign direct investment, remittance, and stock market capitalization influenced banking sector development in Nepal. The relationship between banking sector development and its determinants are identified by equation 1.

Banking Sector Development

$$= \alpha_0 + \beta_1 GDP_t + \beta_2 SMC_t + \beta_3 FDI_t + \beta_4 TO_t + \beta_5 REM_t + \beta_6 INF_t + \varepsilon_t \dots \dots \dots (1)$$

There are two major reasons why the current study employed the dynamic GMM approach, consistent with Nor et al (2015): (1) it takes care of dynamic data such as banking sector development, (2) addresses the endogeneity problem emanating from the correlation between right-hand regressor, time-invariant and country-specific factors and (3) it controls for simultaneity bias and country-specific effects which arises from the possibility that some of the independent variables may be endogenous.

Equation 2 presents and discusses the results of stationarity tests, panel root testing, and the dynamic GMM estimation technique. Following Taiwo and Olayemi (2015), this study used Levin et al (2002), Im et al (2002), Fisher-tests using Philips-Perron (PP), and Augmented Dickey-Fuller (ADF) panel root tests.

Banking Sector Development

$$= \alpha_0 + \beta_1 GDP_{t-1} + \beta_2 SMC_{t-1} + \beta_3 FDI_{t-1} + \beta_4 TO_{t-1} + \beta_5 REM_{t-1} + \beta_6 INF_{t-1} + \varepsilon_t \dots \dots \dots (2)$$

Not all variables were stationary at level hence prompting the author to perform unit root tests at first difference. The null hypothesis, which says that variables are not stationary, was rejected at a 5% level of significance at the first difference. In other words, the data for all the variables under study were integrated of order 1, which is a precondition that must be met before the existence of a long-run relationship between variables is tested, consistent with Jiang and Liu (2014).

The following cointegration framework develop by Pedroni (2004) was used for this study.

$$y_t = \beta_0 + \beta_1 y_{t-1} + \dots \dots \dots + \beta_k y_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \alpha_2 x_{t-2} + \dots \dots \dots + \alpha_q x_{t-q} + \varepsilon_t \dots \dots \dots (3)$$

Where Y_t is the dependent variable at time t , ε_t represents the residuals of a panel regression and X_t - q stands for the model's exogenous variables. Pedroni's (2004) approach has seven-panel statistics, which are extracted from pooling residuals along within and between the dimensions of a panel.

The Wald test (F-statistics) derived from the above three models, forms a critical part of the GMM procedure. This is helpful to assess the existence of a long-run relationship among the variables included in the model. The Wald test (F-statistics) can be computed by imposing linear restrictions on the estimated long-run coefficients of one period lagged level of variables. The existence of a long-run relationship among the variables can be found by testing null hypotheses of no co-integration against its alternative hypothesis of co-integrating relationship.

$$\begin{aligned} \Delta \text{Banking Sector Development}_t &= \alpha_0 + \sum_{i=0}^q \beta_i \Delta \text{macroeconomic Variable}_{t-i} \\ &+ \sum_{i=0}^q \delta_i \Delta \text{other factor}_{t-i} + \mu_2 \text{macroeconomic variable}_{t-1} \\ &+ \mu_1 \text{other factors}_{t-1} + \varepsilon_t \dots \dots (4) \end{aligned}$$

3.4 Empirical Results Discussion and Interpretation

Table 3: Macroeconomic Determinants and Banking Sector Development, Difference GMM

(Regressions use the system GMM estimator. Standard errors are reported in brackets. The instruments used are Per Capita Gross Domestic Product (PCG), Stock Market Capitalization (SMC), Trade Openness (TO), Inflation (INF), Foreign Direct Investment (FDI), Remittance (REM) and Inflation (INF): for the difference equations, all in lagged levels and, for the level equation, in first difference. ***, **, and * denote significance at the 1%, 5% and 10% levels, respectively.)

Estimation Model:					
<i>Banking Sector Development (BSD)</i>					
$= \alpha_0 + \beta_1 GDP_t + \beta_2 SMC_t + \beta_3 FDI_t + \beta_4 TO_t + \beta_5 REM_t + \beta_6 INF_t + \varepsilon_t$					
	GMM Coefficients				
	Model 1	Model 2	Model 3	Model 4	Model 5
PCG	0.0738** (0.0444)	0.0824** (0.0493)	0.0599 (0.0426)	0.0775** (0.0486)	0.0894** (0.5012)
SMC	0.6471*** (0.4336)	0.7065** (0.4944)	0.5867* (0.3812)	0.8475** (0.5320)	0.7927** (0.8298)

FDI	0.0035*** (0.9440)	0.00296*** (0.9876)	0.0020*** (0.6523)	0.0015*** (0.5098)	0.0022** (0.8934)
TO	-0.1683** (-0.6457)	-0.1639** (-0.5859)	-0.2138 (-0.8551)	-0.1278** (-0.5054)	-0.1852* (-0.8716)
REM	0.5578*** (0.1404)	0.6692*** (0.1703)	0.5719*** (0.1355)	0.4475*** (0.1286)	0.4592*** (0.1642)
INF	-0.0073* (-0.2484)	-0.0092* (-0.3084)	-0.0106 (-0.2401)	-0.0102* (-0.1706)	-0.0116 (-0.1895)

As shown in Table 3, where the whole sample of determinants are estimated, economic institutions heavily affect banking sector development (0.0738) with the dimension of stock market capitalization to be displayed as more important at a rate close to 0.6471 (model 1). FDI and remittance have become a core component of the Nepal government, which is primarily motivated by their concerns over regulation of economic activity and private sector development. Therefore, FDI and remittance enhance banking sector development by forcing host nations to open up financial markets thus ensuring increased competition in the financial sector. Regarding the other variables in question, openness in the goods market (rather than in financial markets) and inflation have negative and statistically significant coefficients. As shown in model 3, inflation, trade openness, and GDP growth have not statistically significant determinants of banking sector development.

Table 4. Generalized Methods of Moments Estimation Technique Results, 2006 - 2018

Determinants	Co-efficient	Standard Error	T-statistic	Probability
Constant	8.1003**	3.9742	2.019	0.031
Per Capita Gross Domestic Product (PCG)	0.1763***	0.0469	3.921	0.002
Foreign Direct Investment (FDI)	0.1258***	0.0786	1.844	0.036
Stock Market Capitalization (SMC)	0.0347**	0.0168	1.791	0.402
Trade Openness (TO)	-0.217	0.2666	-0.814	0.198
Remittance (REM)	0.1136**	0.0336	2.174	0.045
Inflation (INF)	-0.195	0.1605	-1.215	0.135
Diagnostic test				

Adjusted R- Squared	0.827			
Durban-Watson statistic	1.965			
Wald Test	3.017**			
Endogenous regressor test	41.589***			

Table 4 shows that economic growth; Remittance, SMC, and FDI positively and significantly affected banking sector development in Nepal. A 1-percentage increase in GDP led to a 17.63 percentage surge in banking sector development, consistent with Robinson (2012). Banking sector development went up by 12.58% in response to a 1% increase in net FDI inflows, a finding that resonate with Shifotoka (2014) whose study argued that FDI enhances financial sector development by forcing host nations to open up financial markets thus ensuring increased competition in the financial sector. A 1% surge in remittance resulted in an 11.36% positive growth in banking sector development in Nepal in line with Yu and Gan (2010) who argued that higher levels of remittance inflows boost investment levels and financial intermediation activities. A single unit positive change in stock market capitalization resulted in an increase in banking sector development by 3.47 units in Nepal. On the other hand, inflation and trade openness had a negative impact on banking sector development in Nepal, in line with theoretical predictions (Baltagi et al. 2009 respectively).

4. Conclusions and Implication

This paper explored the macroeconomic determinants of banking sector development in Nepal using the dynamic GMM estimation technique with panel-balanced data ranging from 2006 to 2018. The literature identified several factors from both a theoretical and empirical perspective that affects banking sector development. The study could not include all the banking sector development determinants identified by literature in the estimation model because of data unavailability. The study contributes to the literature because no similar study has been done in Nepal to the author's knowledge. This study reveals that banking sector development and GDP positively and significantly influenced the banking system in line with theoretical predictions. The latter is therefore encouraged to accelerate the implementation of economic growth enhancement policies to boost the development of the banking sector. Remittance and foreign direct investment have a positive and statistically significant role to explain banking sector development in Nepal. Policies that directly and indirectly promotes the inflow of FDI and remittance needs to

be implemented by the Nepal government to enhance the development of the banking sector. In addition, it demonstrates that trade openness negatively but insignificantly influenced banking sector development whilst inflation had a marginal negative impact on banking sector development in Nepal. Such a finding implies that the Nepal government should keep trade openness and inflation at lower levels target policies to boost banking sector development. Besides, stock market capitalization had a positive and significant effect on banking sector development. The study, therefore, urges the authorities to design and implement policies that increase fund mobilization efforts to promote banking sector development. Given the availability of data, future studies should include more variables in the estimation model.

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Small and Medium Scale Enterprises and Their Contribution in Employment Creation in Nepal

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ABSTRACT

Naturally, all businesses start as small businesses or even start out of small businesses initiated by individuals. So, SMEs have historically played an important role in contributing to employment creation of many countries around the world. It is imperative to give high priority to Nepalese labor, skill and raw material based domestic investments to promote national industries for achieving high level employment. This study has used Johansen Cointegration, Vector Error Correction Model (VECM) and Granger Causality test to investigate relative changes in the position of the Nepalese small and medium scale enterprises (SME's) and investment to the employment between the time period 1989 and 2018 based on secondary data. It has examined the dynamic relationship among the SMEs, investment and employment in Nepal and was found to be significant and positive relationship in between SMEs and employment while significant but inverse relationship in between investment and employment of Nepal. It implies that number of employment was seemed to be mostly influenced by number of SMEs rather than investment. However it was and still is contributing significant role in employment creation in Nepal.

Key Words: Small and Medium Scale Enterprises, Employment, Dynamic Relationship, Regression, Cointegration.

1. Introduction

As the study of OECD, SMEs are the predominant form of enterprises, accounting for approximately 99% of all firms in the OECD country. SMEs provide the main source of employment, accounting for about 70% of jobs on average, and are major contributors to value creation, generating between 50% and 60% of value added on average. However, these contributions vary widely across firms and across countries and sectors. Better access to global markets and knowledge networks can strengthen SMEs' contributions. Digitalization offers new opportunities for SMEs to participate in the global economy, but

SMEs are lagging behind in the digital transition and disruptive effects need to be considered (OECD, 2017).

Therefore SMEs is regarded as the major sector of the economy for employment creation. The economic development of a nation depends upon the stage of industrial development while industrial development starts as the development of SMEs. That's why SMEs are playing the greatest role to provide employment to the mass people who help to increase per capita income and reduces the poverty.

Industrial development started rather late in Nepal even if cottage and small industries were operated since ancient time. It progressed with the establishment of Industrial Council in 1936 A.D . The Gharelu Illam Prachar Adda was established in 1940. After that industries were gradually established. Raghupatti Jute Mills was established in 1946, which is regarded as the first modern industry in Nepal. The process of planned industrialization started with the initiation of the First Five Year Plan in 1956. Gradually, a number of small, medium and large-scale industries were established in the public along with private sectors. But, the overall state of industrialization is still in its infant stage. The industry which is regarded as the secondary sector of economy contributes below 10 percent (i.e. only 5.5 percent on an average of last five fiscal year) of the Gross Domestic Product (GDP) and till F.Y. 2018/19, industrial sector has provided employment to 5,98,500 persons. The total number of industries registered till F.Y. 2018/19 is 7,967 (Ministry of Industry, 2019).

There has been many empirical researches that examine the influence of small and medium scale enterprises (SMEs) on the employment in global context. But in Nepalese context there have been a few empirical researches that examine the influence of small and medium scale enterprises (SMEs) on the employment. Bringing employment in domestic production is imperative for Nepal's economic prosperity. It is imperative to give high priority to Nepalese labor, skill and raw material based domestic investments to promote national level industries for achieving national employment creation as per the spirit of the Constitution of Nepal. Likewise, knowledge skill, technology and capital in possession of non-resident Nepalese can be utilized in national development efforts thereby making the economy prosperous (MOF, 2016). So, public, private, and cooperative sectors need to be mobilized through SMEs to achieve industrial employment.

That's why this study explores the roles of the SMEs in employment

creation by the SME sector broadly. Accordingly, this study has made three contributions. First it extends the literature by providing insights into the relationship amongst SMEs and Nepalese economy. Second, the study contributes to developing a better understanding of the effects of economic forces in emerging SMEs development like Nepal whose structure and the institutional characteristics are different from developed economies (for instance relatively short history of the industrial development and capital investment). Hence it is worthwhile to examine whether SMEs in Nepal respond to economic activities differently. Finally, it may pave the way towards extending the investigation to the large scale industry's development in Nepal.

2. Review of Literature

The working paper of World Bank describes a unique cross-country database that presents consistent and comparable information on the contribution of the small and medium enterprises to total employment, job creation, and growth in 99 countries. The researchers compare and contrast the importance of small and medium enterprises to that of young firms across different economies. They find that small firms (in particular, firms with less than 100 employees) and mature firms (in particular, firms older than 10 years) have the largest shares of total employment and job creation. Small firms and young firms have higher job creation rates than large and mature firms. However large firms and young firms have higher productivity growth. This suggests that while small firms employ a large share of workers and create most jobs in developing economies their contribution to productivity growth is not as high as that of large firms (Ayyagari et al., 2011).

According to Ramanathan et al. the Small and Medium Enterprise (SME) sector is recognized for its contribution to employment, innovation and economic dynamism, it is considered as an engine of growth and an essential part of a healthy economy. Recognizing the distinctly positive impact of small enterprises on the economy, the governments of many industrially advanced countries have taken several policy initiatives for the growth and expansion of SMEs for improving their technological capability and market competitiveness. SMEs in developing countries suffer from several inadequacies such as, technological backwardness, low production efficiency and poor quality of products (Ramanathan et al. (ed.), 2011).

According to the study of Kongolo, SMEs have historically played an important role in contributing to economic development of many countries

around the world. In South Africa, SMEs account for about 91% of the formal business entities, contributing to about 51 to 57% in GDP, providing almost 60% of employment. The main challenges affecting SMEs in South Africa include lack of managerial skills, finance, access to bank credit, access to markets, appropriate technology, low production capacity, recognition by big companies, lack of interest, long bureaucracy processes, and support for the roles that small businesses can play in economic development. This study re-assesses the role of SMEs in creating jobs, boosting, enhancing and supporting economic development in South Africa (Kongolo, 2010).

A study of Burhanuddin et al. Small and medium-scale industries (SMI) have played a significant role in an economy of Malaya, mainly in terms of employment creation, better income distribution and as a training ground for entrepreneurs before investing in larger scale businesses. However, there are many factors reducing the adoption of new technologies especially related to Information and Communication Technology (ICT) in the challenging world today. It is important to identify the primary obstacles they face with regard in adopting new technology. In order for them to survive in a long run, their study identifies problems and constraints faced by SMI in Malaysia. Then, focus on the challenges and barriers for them in adopting new technology. The researchers of this study visited little food processing SMI in the Southern Region of Malaysia and made comparison with few important publications on SMI development (Burhanuddin et al., 2009).

A study of OECD, SMEs account for 60 to 70 per cent of jobs in most OECD countries, with a particularly large share in Italy and Japan, and a relatively smaller share in the United States. Throughout their study SMEs also account for a disproportionately large share of new jobs, especially in those countries which have displayed a strong employment record, including the United States and the Netherlands. Some evidence also points to the importance of age, rather than size, in job creation: young firms generate more than their share of employment. However, less than one-half of start-ups survive for more than five years and only a fraction develop into the high-growth firms which make important contributions to job creation. High job turnover cause problems for employment security; and small companies are often free from giving notice to their employees. Small firms also tend to invest less in training and rely relatively more on external recruitment for raising competence. The demand for reliable, relevant and internationally comparable data on SMEs is on the rise, and statistical offices have started to expand their collection and

publication of data. International comparability is still weak, however, due to divergent size-class definitions and sector classifications. To enable useful policy analysis, OECD governments need to improve their build-up of data without creating additional obstacles for firms through the burden of excessive paper work (OECD, 2000).

Rotar et al. (2019) for the European Union countries, Al-Haddad et al. (2019) for emerging economy, OECD (2017) for global economy, Heyman, et al. (2017) for Sweden, Kok et al. (2013) for most developing and emerging countries, Herman (2012) for Romania, Dahal & Sharma (eds) (2004) for Nepal, OECD (2000) are also found significant and have direct relationship in between SMEs and employment in their study.

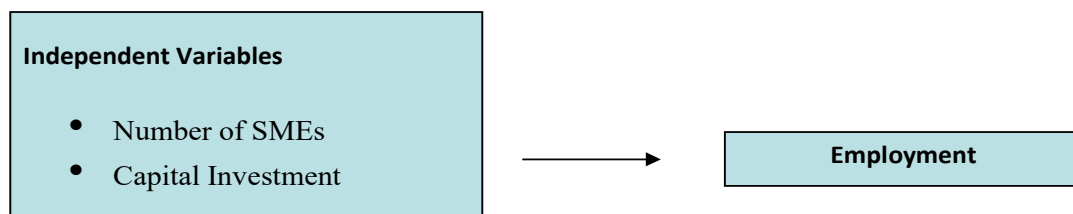
3. Conceptual Framework

This study primarily focuses on role of SMEs in employment. Three variables such as employment, capital investment and number of SMEs are used in an attempt to examine the relationship between these variables. The relationship between SMEs and macroeconomic factors is based following model-

1) Employment = F (SMEs, Capital Investment)

It is widely accepted that increase in SMEs of an economy leads to increase in employment (the World Bank, 2011). So, employment is a function of number of SMEs and capital investment.

Conceptual Framework



Therefore, this relationship can be explained as the following model:

$$EMP = f(SMEs, INV)$$

In equation form this can be written as:

$$EMP = \beta_0 + \beta_1 SMEs + \beta_2 INV + \varepsilon$$

Where, variables EMP, SMEs and INV denote the values of employment, number of SMEs and capital investment respectively. The expected signs of the coefficients of the variables are:

$$\beta_1 > 0 \text{ and } \beta_2 > 0.$$

As to the literature review the theory expects a positive relationship between these variables. It means that economic employment has found a positive relationship with number of SMEs and capital investment. So, based on the literature review, it could be argued that the increase in SMEs and investment would directly increase mass employment.

4. Data and Analysis

4.1 Nature of Data

The population for this study encompassed index of SMEs of Nepal and the macroeconomic variables (employment and investment) for the study period. The sample comprised yearly data of all variables. The starting of sample period was 1989 A. D. & covered the latest available data on macroeconomic variables till 2018 A.D.

A secondary method of data collection is employed for study and data of macroeconomic variables for sample period is obtained from department of industry (Ministry of Industry) under government of Nepal. Literature for the study is obtained from Journal of Finance, American Economic Review, Journal of Economic Surveys, The Financial Review, IMF and World Bank working papers, Economic Journal of Nepal, Economic Review: Occasional Paper (Nepal Rastra Bank), FNCCI, NPC, Ministry of Industry, Finance other journal articles and working papers from Google scholar. Since the studies cover most recently available data on SMEs contribution to employment.

4.2 Description of SMEs and Variables

Concerned variables are defined as follows:

Table 1: Description of Variables

Symbol	Variable	Definitions
EMP	Employment	Total Employment Generated by SMEs
SMEs	Number of SMEs	Total Number of SMEs (Small + Medium)
INV	Capital Investment	Total Capital Investment in these SMEs

Here, EMP indicates growth of employment which is also called as contribution of SMEs. Accordingly other variables are also defined.

4.3 Employment Generated by Nepalese Industries

Small-scale industries on the other hand belong to the group of industries which

have capital investment up to Rs 5 crores (Industrial Policy 2067 B.S.) and are operated with the help of outside labour ranging in the most cases from 10 to 25 heads. The Industrial Policy 1992 has considered an industry as a small industry if it has installed machinery and tools worth more than Rs. 200,000 and has fixed capital not exceeding Rs. 10 million. Woodcarving, dying, printing, cloth weaving, carpet knitting and oil processing are some of the examples of small-scale industries in Nepal. Similarly, medium scale industries are the industries which have capital investment between Rs. 5 crores to 15 crores (Nepal Industrial Policy 2067).

Nepal government also improved company act 2063, implemented foreign investment policy 2071, industrial business act 2073, special economic zone act 2073 and national intellectual property policy 2073. Similarly department of industry provides different facilities to promote SMEs in Nepal.

Table 2: Summary Sheet of Industry Registered - Scale Wise
(From the Beginning to 2018/19)

Scale of Industry	No. of Industry	In Percent	Total Capital (Rs. in million)	In Percent	No. of Employment	In Percent
Large	1,112	13.96	17,10985.69	87.13	1,58,118	26.42
Medium	1,731	21.73	1,67,541.86	8.53	1,58,996	26.56
Small	5,124	64.31	85,214.92	4.34	2,81,386	47.02
Total	7,967	100	19,63,742.47	100	5,98,500	100

Source: Author's Derivation based on Data of Department of Industry, Ministry of Industry, Nepal

This table shows that small industries cover almost 64.31 % out of total industries in low investment i. e. 4.34% and provides more employment i.e. 47.02% in comparison to others. Similarly, medium scale industries cover almost 21.73% out of total industries in. 8.53% investment that is also low and provides 26.56% employment in comparison to large scale industries. Therefore to generate employment opportunities within a domestic economy Nepal government should promote and develop SMEs.

4.4 Growth Path of Employment, Investment and Industries

Various studies have examined SMEs contributions on employment and it has been identified as the most important driver of employment. Hence to ensure the socioeconomic progress of the countries we have to create employment opportunities.

Below figure 1 shows that total employment increases as increased in total industries (i.e. small and medium scale industries). Similarly there is direct relationship between total employments and total industries in Nepalese economy. Therefore it also implies that Nepal government should promote these industries to increase more employment opportunities. On the contrary, total investment also leads to increase in employment but after 2012 AD it has not increased employment. The graph indicates that investors mostly focus on capital intensive technology rather than labour intensive technology.

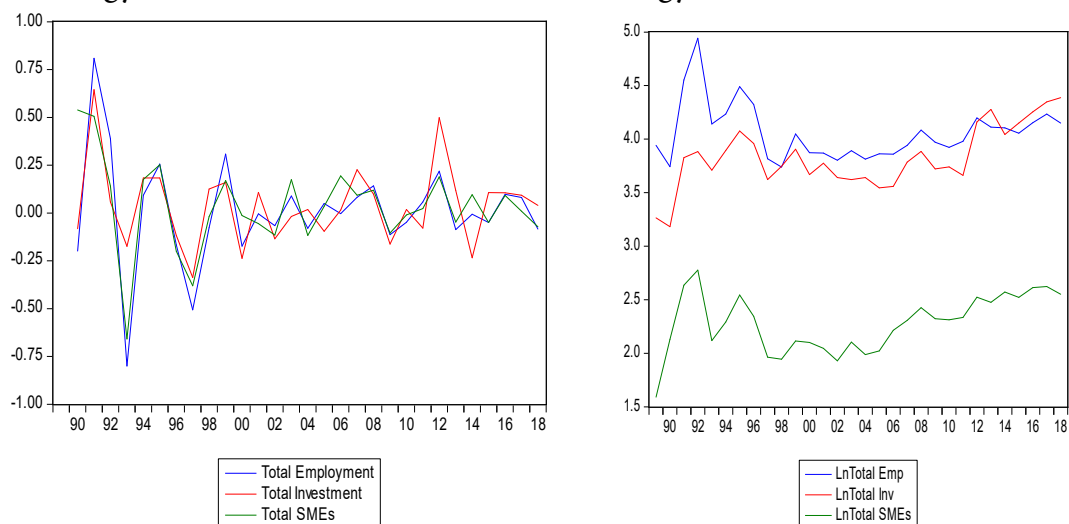


Figure 1: Growth Paths of Employment, Investment and Industry

Source: Author's Derivation based on Data of Department of Industry, Ministry of Industry, Nepal

4.5 Summary Statistics

It represents summary report of Mean, Standard Deviation, Maximum, Minimum, Skewness, and Kurtosis, which explains synopsis about the distribution, variability, and central tendency of a variable.

Table 3: Summary Statistics

Variables	Employment	Investment	SMEs
Mean	14672.00	8416.907	228.4333
Maximum	87508.00	24401.20	597.0000
Minimum	5490.000	1521.300	39.00000
Std. Dev.	15421.45	5950.628	134.4905
Skewness	3.768305	1.310269	0.796697

Kurtosis	17.94744	3.775800	2.996343
Jarque-Bera	350.2830	9.336353	3.173646
Probability	0.000000	0.009389	0.204575
Sum	440160.0	252507.2	6853.000
Sum Sq. Dev.	6.90E+09	1.03E+09	524543.4

Source: Author's Construction of the summary statistics of concerned variables.

For Employment, the mean value of employment is equal to 14672 and probability is equal to 0.000000. Jarque-Bera (Combine test of Skewness and Kurtosis) value near to zero refers normality. The variable shows positive Skewness indicating the higher probability of employment creation. Similarly the kurtosis shows that it is platykurtic (fat or short tailed) with lower than normal kurtosis (that is $K > 3$), which means that there is a higher probability than usual for extreme values (very good or very bad employment creation) to occur.

4.6 Correlation Matrix

In the correlation matrix in Table 4 shows that there is strong correlation between the variables. Hence, a correlation between variables signifies that as one variable changes in value, the other variable tends to change in a particular direction.

Table 4: Correlation Matrix

Variables	Employment	Investment	SMEs
Employment	1.000000	0.152236	0.727687
Investment	0.152236	1.000000	0.653604
SMEs	0.727687	0.653604	1.000000

Source: Author's Construction of the summary statistics of concerned variables.

4.7 Unit Root test

ADF test is common for stationary test for time series data. That's why let us observe the ADF test of level and first difference of SMEs, investment and employment (time series). According to ADF results of first difference, absolute calculated value of 'T' is more than absolute critical value of T at 1%, 5% and 10%. So, the null Hypothesis is rejected at 1%, 5% and 10%. It implies that there is no Unit Root problem. That's why; there is no Unit Root (i.e. stationary). Here, ADF results of level shows Unit Root Problems while its second difference has no Unit Root (i.e. stationary). They are given in detail as follows.

Table 5: Augmented Dickey-Fuller Test

Variables	At Level		At First Difference		At Second Difference	
	T- Statistics	p-values*	T- Statistics	p-values*	T- Statistics	p-values*
Employment	-2.368202	0.1615	-3.686177	0.0120	-28.36659	0.0001
Investment	-0.620051	0.8511	-5.961705	0.0000	-6.003575	0.0000
SMEs	-2.935978	0.0534	-5.558336	0.0001	-5.710969	0.0001

*MacKinnon (1996) one-sided p-values.

Source: Author's ADF test for the sample period 1989 to 2018 & Significant at the 1- percent level.

4.8 Cointegration

Engle and Granger (1987) determined that a linear combination of two (or more) non-stationary time series may be stationary and suggests that there is a long-run, or equilibrium, relationship between them if they are co-integrated. Therefore, linear combination of SMEs, investment and employment time series can be stationary despite being individually non-stationary. So it was employed to examine the dynamic relationship between these three variables. For this study, the Johansen Cointegration test is used by using EViews 9 software since it has been shown to have good finite model.

Table 6: Johansen Test for Cointegration

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob.**
None *	0.843859	94.79056	29.79707	0.0000
At most 1 *	0.631491	44.65176	15.49471	0.0000
At most 2 *	0.480807	17.69796	3.841466	0.0000

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value	Prob.**
None *	0.843859	50.13881	21.13162	0.0000
At most 1 *	0.631491	26.95380	14.26460	0.0003
At most 2 *	0.480807	17.69796	3.841466	0.0000

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's Construction of the time series cointegration tests using the Johansen's method for the sample period 1989 to 2018.

Above mentioned table shows that the critical values of both trace and maximum Eigen value tests reject the null hypothesis of no cointegration relation at 5% level of significance. MacKinnon p-values of both tests have significance. Similarly, both trace and maximum Eigen value tests indicate 3 cointegration equations at 5% level. Therefore, the long-run, or equilibrium, relationship between SMEs, investment and employment time series can be established despite being individually non-stationary. However, according to ADF test, they are stationary at first difference.

4.9 Vector Error Correction Model (VECM)

VECM (Vector Error Correction Model) is a suitable estimation technique if a set of given variables (Employment, Investment and SMEs) are found to have one or more cointegrating vectors which adjusts to both short run changes in these variables and deviations from equilibrium (from long run). Lag length criteria also suggest to choose one lag for estimating VECM.

A crucial parameter in the estimation of the VECM dynamic model is the coefficient of the error correction term, which measures the speed of adjustment of variables to its equilibrium level. Thus, all those variables are taken as endogenous (ΔY) and exogenous (ΔX), in order to establish the long and short run association between them. Similarly, the size and statistical significance of the coefficient of the error correction term measures the tendency of each variable to return to the equilibrium. A significant coefficient implies that past equilibrium errors play a role in determining the current outcomes to capture the long-run impact.

Table 7: VECM Estimates for Employment, Investment and SMEs

Error Correction:	D(EMP)	D(INV)	D(SMES)
Cointegrating Equation-1	-0.000890	0.000620	-8.17E-06
Standard Errors	(0.00098)	(0.00026)	(6.5E-06)
T-Statistics	[-0.90912]	[2.39963]	[-1.25180]
D(EMP)	-2.003937	-0.108299	-0.010038

Standard Errors	(0.33688)	(0.08894)	(0.00225)
T-Statistics	[-5.94851]	[-1.21765]	[-4.47094]
D(INV)	-0.263373	-0.189108	0.001880
Standard Errors	(0.74015)	(0.19541)	(0.00493)
T-Statistics	[-0.35584]	[-0.96775]	[0.38112]
D(SMES)	239.6764	14.49467	0.959898
Standard Errors	(47.1073)	(12.4371)	(0.31395)
T-Statistics	[5.08788]	[1.16544]	[3.05747]

Source: Author's Construction by using EViews 9 software.

The above mentioned table shows the results of VECM model of employment, investment and SMEs. There is cointegrating relationship in between them. In this regard, one period lag difference is considered based on Akaike AIC and Schwarz SC lag order selection criteria. According to the value of standard error, t-statistics of Cointegrating Equation-1 is significant. Similarly the value of standard error and t-statistics of employment, investment and SMEs implies that there is causality between them.

4.10 Granger Causality Tests

Granger causality is a way to investigate causality between two variables in a time series. It is closely related to the idea of cause and effect, although it isn't exactly the same. A variable X is causal to variable Y if X is the cause of Y or Y is the cause of X.

Table 8: Pair wise Granger Causality Tests

Null Hypothesis:	F-Statistic	Prob.
Investment does not Granger Cause Employment	1.60272	0.2230
Employment does not Granger Cause Investment	0.64083	0.5360
SMEs does not Granger Cause Employment	9.87533	0.0008
Employment does not Granger Cause SMEs	12.0782	0.0003
SMEs does not Granger Cause Investment	0.04758	0.9536
Investment does not Granger Cause SMEs	0.83012	0.4486

Source: Author's Construction by using EViews 9 software.

Above mentioned table shows that the main results obtained from the Pair wise Granger-causality analysis where six pairs of variables are considered as economic indicators. According to results there is no causality existing between

employment, investment and SMEs.

4.11 Model

A linear combination of SMEs of Nepal, total investment and total employment that generates in study period time series can be stationary despite being individually non-stationary. For this purpose EG test is used to test for cointegration. Cointegration of two (or more) time series suggests that there is a long-run, or equilibrium, relationship between them. So it was employed to examine the dynamic relationship between investment, employment and industries. The following steps were followed in this regard:

$$\text{EMP} = -1739.246 - 1.463108 \text{ INV} + 125.7526 \text{ SMEs} + 8575.580$$

$$\text{P-value} \quad (0.5901) \quad (0.0003) *** \quad (0.0000) ***$$

***Significant at the 1-percent level

Table 8: Regression Statistics

R-squared	0.712099	Mean dependent var	14672.00
Adjusted R-squared	0.690774	S.D. dependent var	15421.45
S.E. of regression	8575.580	Akaike info criterion	21.04586
Sum squared resid	1.99E+09	Schwarz criterion	21.18598
Log likelihood	-312.6880	Hannan-Quinn criter.	21.09069
F-statistic	33.39120	Durbin-Watson stat	1.319392
Prob. (F-Statistic)	0.000000		

Source: Author's Construction by using Eviews 9 software.

Here, overall model is significant as Prob. (F-Statistic) is equal to 0.000000. However, 71.21 % of total variation is explained by the model. Similarly, DW statistics is equal to 1.319392 which is near by 2.

The above estimated cointegration relationship of equation shows that employment has significant and positive relationship with the number of SMEs while employment has significant but inverse relationship with investment. So, this finding implies that industrial policy in Nepal has positive impact on employment and the positive relationship causes increase in number of SMEs, increases employment opportunities and thereby increases mass employment with an economy. On the contrary, industrial policy in Nepal has no effective impact on employment through investment and the inverse relationship (Above Graphs also approved) causes increase in investment decreases employment

opportunities and thereby thinks over the issues of an economy. It means investors mostly focus on capital intensive technology rather than labour intensive technology.

5. Discussion

In Nepal, SMEs cover almost 86.04% out of total industries in small investment i. e. 12.87% and provides mass employment i. e. 73.58 % in comparison to large scale industries as seen from table 2. But Nepal government is unable to flourish these sectors for employment creation as their potential capacity till now. Therefore to generate mass employment in local level Nepal government should promote and develop SMEs.

On the basis of regression analysis of 30 year's observations, there is significant and direct relationship in between total number of SMEs and employment of Nepal while there is significant but inverse relationship in between total capital investment and employment. The value of the coefficient (β_1) investment is - 1.463108, which shows that, a unit change in the investment leads to change in employment level by - 1.463108 units.

On the contrary, the value of the coefficient (β_2) SMEs is 125.7526, which shows that, a unit change in the number of SMEs leads to change in employment level by 125.7526 units. The results of f-statistics and p-value are also significant, which shows that results of coefficient are to be accepted with 99 % degree of confidence. R-square (R^2) = 0.712099, which shows that correlation exists between dependent variable (Employment) and its explanatory variables (Number of SMEs and investment). The value of R^2 indicates that 71% variation in dependent variable has been explained by variation in independent variables.

Accordingly, there is strong correlation between the variables. As a Johansen Cointegration test the long-run or equilibrium relationship between SMEs, investment and employment time series can be established. VCEM test also implies that there is causality between these variables. Finally, there is no Granger causality existing between employment, investment and SMEs.

Rotar et al. (2019) for the European Union countries, Al-Haddad et al. (2019) for emerging economy, OECD (2017) for global economy, Heyman, et al. (2017) for Sweden, Kok et al. (2013) for most developing and emerging countries, Herman (2012) for Romania, Dahal & Sharma (eds) (2004) for Nepal, OECD (2000) are also found significant and have direct relationship in between employment and SMEs in their study.

This study is based on only the relationship between employment, investment and number of SMEs, and does not include other control variables. So, there is space for further study by including other control variables.

The outcome of the study benefits both the investors and the regulators of SMEs. For the investors, the study helps in predicting the SMEs from key economic analysis and thereby takes the advantage of opportunities. On the other hand, the regulators of the SMEs (for instance Department of Industry, Ministry of Industry and Finance, Provinces along with Nepal Rastra Bank) are able to assess the implication of different factors on the SMEs development and thereby are able to formulate correct policy relating to the SMEs. Furthermore, general investors have become aware of economic fundamentals impact on the SMEs and thereby help in reducing the external activity and non-rational behavior on the SMEs. Moreover, Nepal being a founder member of the South Asian Association of Regional Cooperation (SAARC) can use the outcome of such study to compare the economic role of investment and SMEs in employment among the South Asian Countries.

6. Conclusion

This study used Johansen Cointegration, VECM Model and Granger Causality test to investigate relative changes in the position of the Nepalese SMEs and investment to the employment between 1989 and 2018. This was an important period of dynamic change for Nepal as trade liberalization and domestic economic reforms coincided with growing interdependence in the world economy through trade and capital flows. The main strength of employment analysis here lies in its simplicity in depicting broad changes in a country's SMEs.

On the basis of 30 year's observations, there is significant and positive relationship in between SMEs and employment of Nepal while inverse relationship in between investment and employment. It implies that number of employment is mostly influenced by number of SMEs rather than investment. Others are as follows:

6.1 SMEs and Employment of Nepal

Employment has positive and significant relationship with SMEs. It means total employment increases along with increase in number of SMEs. One of the reasons may be increase in SMEs of Nepal increases the domestic production along with domestic investment and that increases employment opportunities. In addition, the employment in small industry has predominance in the Nepalese employment.

6.2 Employment and Investment in Nepal

Employment has inverse and significant relationship with investment. It means total employment decreases along with increase in investment. One of the reasons may be increase in investment of Nepal does not focus on employment. Investors are seeking for more earning which causes bubbling in an economy. In addition, investors mostly put center of attention on capital intensive technology rather than labour intensive technology.

Accordingly, as a Johansen Cointegration test the long-run equilibrium relationship between SMEs, investment and employment and VCEM test implies that there is causality between them and there is no Granger causality existing between employment, investment and SMEs. On the basis of above mentioned study, SMEs are engines of employment growth which are also approved by the study of different scholars as mentioned in literature review. Overall, the presence of cointegration suggests that Nepalese SMEs have significant role in employment creation.

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An Essay on Investment Decision Practices of Money Market Instruments in Nepal

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ABSTRACT

The article provides an overview of the various aspects of investor's decision in money market instrument of Nepal. The inclusive research on money market practices has been done to inspect the problems and prospects of money market instruments in Nepal. The descriptive and analytical research design have been adopted. The source of information is the primary source. The primary data has been collected through the self-administered questionnaire. The respondents are the investors in financial assets. The usable sample has been confined to 110 based on the convenience sampling method. The descriptive, correlation and regression analysis have been used to analyze the data using SPSS software. The study have concluded that the majority of the respondent are new entrants and conscious on money market. The yield and maturity have no relation whereas the risk factor is found significant. The maturity period do not have an impact on investors' decision. The investors look after liquidity before investment. The capital market development and maturity do not have relationship.

Keywords: yield; risk factor; liquidity; decision; capital market; maturity

Introduction

The money market plays an essential role in providing and channelising the funds through money market instruments for investment and liquidity management. Money market instruments are those which have the life span of overnight to less than a year and ease for liquidity, marketable and have lower in risk as compared to the other securities. Money markets instruments are treasury bill, short term bank loan, federal funds, repurchase agreement, commercial bills, letter of credit, banker acceptance, Eurodollars etc (Thapa, et al., 2017). The money market instruments traded in Nepal are T-bills,

commercial bills, short-term bank loan and repurchase agreement. The T-bill is substantially deal by the central bank solely, where the small amount of money market instruments are being practiced by commercial banks (Shrestha, 2010). In the context of Nepal, the money market had played the vital role in banks self-sufficiency, effective implementation of monetary policy, attracting international investment, uniformity in interest rate, smooth operation of the financial market (Shankar and Tarun, 2013).

Traditionally, Nepali investors had invested the fund in purchase of land, saving in bank deposit, building houses but the attitude avenue of investment had been changing towards shares, debts, short term securities (Amit and Saroj, 2014). The terrible earthquake in 2015 a.d. had shaken the market of Nepal causing billions of dollar losses side by side reconstruction work had also created opportunities for investment and business (International Trade Administration, 2018). Money market of Nepal is slow as compared to the developed world. Nepalese money market is in the initial phase where central bank and commercial bank are the market player of limited player of money market instrument (Paudel, 2016). The commercial banks are the largest borrower and lenders of money market in Nepal. The remittance inflow had played the crucial role in the money market liquidity of the market, which accounted for 65 percentages credit balance payment and 25 percentages gross domestic product (Budha, 2015).

Nepal Rastra Bank had issued 91 days rupees 3.13 billion worth T-bill maturing on end of Falgun, 2075, which had served as lender of last resort auctioning through bidding process out of which 15 percentages was reserved to non-competitive bidders (Sharesansar, 2018). This had indicated the active practice of money market instruments in Nepal through government side. The central bank injected rupees 20 billion into the banking sector to cope up liquidity crunch by the bank using three tools i.e. standing liquidity facility at 7 percentages, repo rate at 5 percentages and term deposit at 3 percentages. In these period treasury bills were yielding returns over four percent (Ekantipur, 2017). The money market is the foundation for development of the capital market. The money market is the major component of financial system in Nepal. The money market has significant impact on socio-economic development in Nepal. Thus, the study aimed to evaluate the factors affecting investors perception toward money market instruments in Nepal. Furthermore, the study examined the problems and prospects of money market instruments in Nepal. The study is also focused on tracing out the determinants of investor decision towards money market instruments in Nepal.

Literature Review

The dependent variable is investors' investment decision and independent variables are yield, risk factor, liquidity, capital market development, and maturity. The framework has been developed based on literature review linking the investment theory, regret theory and intermediation theory. Money market facilitates the short term marketable debt securities/funds needed for the large fund users. Money market instruments help in development activities of the nation, efficient interbank activities which ultimately leads in the efficiency of central bank operation of monetary policy (Dodd, 2012). Hence, the factors affecting investment decisions should be find out so that the investment process becomes easy.

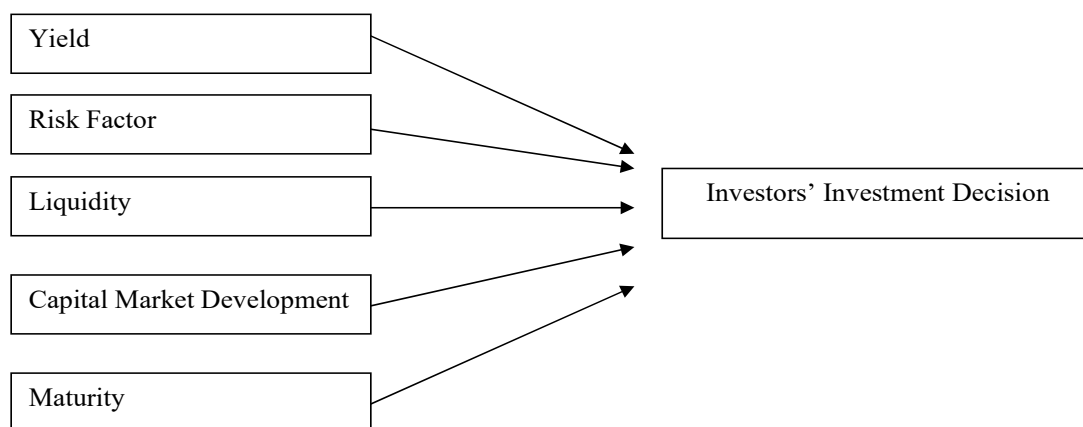


Figure 1 Conceptual Framework

The survey research had shown that the financial literacy tended to be related to high income and wealth respondents. Investor's behavior and attitudes towards saving and investment were depended on the credit risk, maturity, high returns and maturity (Conkova, 2014). Money markets had become the largest liquidity management tools in the world. If the investment community had renounced the investment opportunity in money market sector then the massive amount of fund of capital would leave creating liquidity vacuum in the capital market and whole financial market which entirely had affected the global market (Institute, 2012). Money market instruments played as the dollar provider to the global financial marketers which had played haven investment of reducing the volatility of the investor portfolio return as compared to risky funds equity, bond, and balanced mutual fund during the period of market stress (Blake, 2010).

The USA states and local government hold tax-exempt short term money which had assisted states and local government providing short term financing needs for industrial development organizations, infrastructure, schools, hospitals, low-income housing, and other public projects. Repo was the means of overnight funding for financial institutions and money market instruments were the primary source of funding for U.S government securities dealers (Perlow, 2011). In the study of the post-financial crisis sample period, commercial paper markets had become more responsive to the developments in the money market instruments fund market and repo. The money market instruments in the short run did respond to dynamic movements in the commercial paper and repurchase agreement (Kishor, 2017). The financial market had consisted of the capital market and money market where both significantly promoted, reinforced, assisted on the smooth operation of each other in developing, emerging and developed economy in the harmonious manner contributing the overall economic growth of nation (Boufini, 2017). The money market holders and investors were transparent other than data available from banks which leads to observe the daily change in money market and measure the characteristic of money market in the daily or weekly basis (Ana, 2009).

The money market had served to increase the liquidity in the financial market which was succeeded in credit turmoil period in Europe lowering interest rate and liquidity increased due to the reduction in redemption activity and new subscriptions and short term investments including the significant holding of overnight deposits in the money market (CESR, 2009). The central bank had played the vital shielding role in saving the national economy from the money market frictions i.e. central bank had the good grip of control over the money market instruments, stability on inflation, maintenance in liquidity, an effective monetary policy which had lead in securing investment of the investors (Fiorella, 2018).

The volatility in inflation could lead to the sharp rose and fall in demand for money market funds and also the steep decreased in investor's confidence in investment (Upadhyaya, 2013). The investors in Saudi had invested in money market instruments as to gain yield which assisted the government to solve the liquidity crunch caused by low oil prices (Business, 2016). The excessive withdrawals might place the sum of the fund in liquidity which was managed by withdrawals instruction and payouts ratio in such condition where the return to the investor was made up of interest received, any gain or loss made on particular investment (Sankar, 2018).

The investor was interested in those investment opportunities, at least maintaining their wealth with the principal guarantee which money market had possessed these features. During the pre and post global credit turmoil evidences from Africa showed that investors were shifted from capital market where their securities assets were crashing to investor's investment in money market that guaranteed yield, liquidity in the short period of time which created the investor to be more risk-conscious and consider the risk factor of the investment (Abiola, 2014). An investment firm had started fund investment in the money market instruments in Ghana to maximize income of the investors, to preserve capital, to maintain the risk and high degree of liquidity which were the features of the money market instruments (Jessica, 2016). Faure (2012) had found the logical starting point in defining the money market was that it had embraced all short-term lending and borrowing, direct and indirect via the financial intermediaries. In addition, money creation, that was, new bank lending and its corollary bank deposit creation, was firmly in the province on the money market. Based on literature survey, the hypothesis had been formulated to analyze the relationship between dependent and independent variables empirically.

Hypotheses

H1: The yield on money market instrument has a positive impact on investors' investment decision.

H2: The risk factor on money market instrument has a positive impact on investors' investment decision.

H3: The liquidity on money market instrument has a positive impact on investors' investment decision.

H4: The capital market development on money market instrument has a positive impact on investors' investment decision.

H5: The maturity on money market instruments has a positive impact on investors' investment decision.

Research Methods

The study had adopted the descriptive and analytical research design where collected data were presented and analyzed through descriptive and inferential statistics. The data of the study were collected through the survey questionnaire. The target population of the study was the investors in Nepalese financial market. The convenience sampling method had been used to col-

lect the data. The usable questionnaire was confined to 110 individual investors response. The data were entered in the SPSS V-20 software and analyzed mathematically, numerically or statistically. The descriptive statistics, correlation and regression analysis were done to analyze the data.

$$\begin{aligned}
 \text{Model} \quad Y &= \beta_0 + \beta_1(Y_i) + \beta_2(R_i) + \beta_3(L_i) + \beta_4(Ca) + \beta_5(Ma) + \varepsilon \\
 Y (I_i) &= \text{Investor's investment decision} \\
 \beta_1 (Y_i) &= \text{Yield} \\
 \beta_2 (R_i) &= \text{Risk factor} \\
 \beta_3 (L_i) &= \text{Liquidity} \\
 \beta_4 (Ca) &= \text{Capital market development} \\
 \beta_5 (Ma) &= \text{Maturity} \\
 \varepsilon &= \text{Random error}
 \end{aligned}$$

The 23 items questionnaire had been administered to the respondents. The questionnaire were scored in 5-point Likert scale method. Questionnaire contained multiple choices and five point Likert scale questions that were asked during the survey with the respondents. The scales used for five point Likert scale questions have been scored from Strongly disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly agree (5).

Table 1 Questionnaire Construction

Questionnaire Section	Number of Questions
Demographic information	5
Yield variable	3
Risk factor variable	4
Liquidity variable	2
Capital market development variable	3
Maturity variable	3
Investor's investment decision variable	3
Total	23

Results

Demographic Results

The majority of the respondent were from finance background that had consisted of two third of whole respondent and one third of respondent were of non-finance background. The majority of finance background respondent had the good knowledge of money market instruments. The respondent

were found shaken to invest their funds more than 10lakh as money market instrumentsweretheshorttermfunds. Themajorityoftherespondentswerestudents followed by professionals (job holders) and business person.

Table 2 Demographic Profile

Demographic Variables	Measure	Respondents	Percentage (%)
Gender	Male	66	60
	Female	44	40
	Total	110	100
Age Groups	Less than 30	77	70
	30-40	23	20.91
	More than 40	10	9.09
	Total	110	100
Education Background	Finance	74	67.7
	Non-finance	36	32.7
	Total	110	100
Investable Fund	Below 1 lakh	46	41.81
	1 lakh – 10 lakh	49	45.54
	10 lakh and above	15	13.65
	Total	110	100
Profession	Student	42	38.18
	Professionals	34	30.92
	Business	18	16.36
	Broker	8	7.27
	Others	8	7.27
Total		110	100

There were 66 male respondents and 44 female respondents. It had indicated easiness to interact with the male rather than female. The majority of the respondent were aged below 30. The 70 percentages of the respondents were aged below 30. It had indicated that the respondents fallen into less than 30 category who were the active investors in the money market instruments.

Descriptive Statistics

The mean score for each items for all the dependent and independent variables have been determined based on 5 point Likert scale ranging the score

from 1 strongly disagree to 5 strongly agree. The grand mean score for all the variables had been determined and presented in the Table 3. The three item questions had been asked to measure the yield variable. The grand mean score had depicted that the respondent were neutral to the yield factor and they were not interested to yield of the money market instruments. In risk factor variable, four questions were asked to the respondents. The analysis found that the risk factor had been considered by investors while investing in the money market instruments. The grand mean score of liquidity , capital market development and maturity variables had influenced the investors while investing in the money market instruments.

Table 3 Mean Score

Variables	Grand Mean Score
Yield	3.12
Risk Factor	2.30
Liquidity	3.62
Capital Market Development	3.37
Maturity	3.37

Reliability Analysis

Cronbach's alpha coefficient had been considered as the common way to measure the reliability of scales in the test. During research, it was assumed that an alpha value of 0.80 was probably reasonable good, 0.70 was adequate and 0.60 was satisfactory. The items of questionnaire for yield was found marginal to satisfactory level. The others variables Cronbach's alpha score had indicated average satisfactory reliability statistics.

Table 4 Reliability Analysis

Variables	Cronbach's Alpha
Yield	0.58
Risk factor	0.69
Liquidity	0.68
Capital market development	0.62
Maturity	0.62
Investor's investment decision	0.76

Correlation Analysis

The Pearson correlation analysis had been used to measure the linear relation between the two variables. The analysis had been done to describe the nature and the strength of relationship between the dependent and independent variables. The bivariate correlational analysis was done to test the hypothesis. The correlation coefficient between yield and investors' investment decision had deduced there was not significant relationship between yield on money market instruments and investors' investment decision. There was significant relationship between risk factor on money market instruments and investors' investment decision. The high degree of positive correlation i.e. 0.89 was found insignificant. The correlation coefficient had deduced that there was not significant relationship between liquidity on money market instruments and investor's investment decision. There was not significant relationship between capital market development on money market instrument and investor's investment decision. There was not significant relationship between maturity on money market instruments and investor's investment decision. On the given results of correlation analysis, the stated hypothesis rejection and acceptance have been presented in Table 6. In addition, the survey analysis had found that as money market instrument were of short maturity period instrument investors were usually hold for short period of time. Two third of respondent would like to hold their investment for short period of time whereas one third of the respondent would like to hold for long period of time participating risk for the higher return.

Table 5 Correlation Analysis

Investor Investment Decision	
Investor Investment Decision 1	
Yield	-0.54 (0.577)
Risk Factor	0.32 (0.000)
Liquidity	0.89 (0.357)
Capital Market Development	0.01 (0.920)
Maturity	-0.07 (0.412)

()The figures in the parenthesis indicated the level of significance at 1 percentages level of significance.

Table 6 Hypothesis Testing

Hypotheses	Pearson correlation	Results
H1: The yield on money market instrument has a positive impact on investor's investment decision.	-0.54 (high and negative)	Null hypotheses accepted
H2: The risk factor on money market instrument has a positive impact on investor's investment decision.	0.32** (low and positive)	Alternative hypotheses accepted
H3: The liquidity on money market instrument has a positive impact on investor's investment decision.	0.89 (high and positive)	Null hypotheses accepted
H4: The capital market development on money market instrument has a positive impact on investor's investment decision.	0.01 (low and positive)	Null hypotheses accepted
H5: The maturity on money market instruments has a positive impact on investor's investment decision.	-0.07 (low and negative)	Null hypotheses accepted

Regression Analysis

Table 4 Model Summary

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
1	0.346	0.125	0.077	0.487

Predictors: (Constant), Maturity Average, Capital Market development Average, Liquidity Average, Risk factor Average, Yield Average

The investors' investment decision in money market instruments surveyed inside the Kathmandu valley had been regressed with yield, liquidity, capital market development and maturity. Only risk factor was found significant with investors' investment decision in money market instruments. The model best fit as;

$$Y = \beta_0 + \beta_1(Y_i) + \beta_2(R_i) + \beta_3(L_i) + \beta_4(C_a) + \beta_5(M_a) + \varepsilon$$

$$Y = 2.772 + 0.006 Y_i + 0.320 R_i + 0.080 L_i + 0.010 C_a + 0.009 M_a + \varepsilon$$

The regression analysis resulted that 1 percentage increment in investor's investment decision in money market had lead to increase in 0.320 percentage risk factor in money market instruments. This entailed that the money market instruments were safe investment, despite of risk factor the investor invests in

money market because nearly half of the respondent of the research study were risk seeker and they had believed in higher the risk higher the gain in their investment wealth.

Table 5 Regression Analysis Results

Model	Coefficient	SE	t	P-value
(Constant)	2.772	0.481	5.762	0.000
Yield	0.006	0.066	0.086	0.932
Risk Factor	0.320	0.090	3.552	0.000
Liquidity	0.080	0.060	1.327	0.187
Capital Market Development	0.010	0.061	0.163	0.870
Maturity	0.009	0.062	0.141	0.888

Conclusions

The research aimed and successfully achieved the factors influencing investors' investment decision in money market instruments. The independent variable of the study yield, risk factor, liquidity, capital market development and maturity were regressed with investor's investment decision. The research was conducted among 110 respondent through structured questionnaire total of 23 questions out of which 5 questions were associated with respondent's profile and 18 questions were in terms of Likert scale. The individual investor was taken as the respondent for the research study. The independent variable yield and maturity were negatively correlated with the investor's investment decision whereas risk factor, liquidity, and capital market development were positively correlated with the dependent variable of the research study. The risk factor was positively significant with the investors' investment decision. The other four independent variables were not significant with the dependent variable. The money market instruments was in the infant phase in Nepal as discussed in the literature review section which was also seen in the result of the study by the response of the respondent. They were enthusiastic to invest in money market instruments as a safe means of the investment backed by the government funding.

Implication

The money market is the major component of financial system in Nepal. Government as well as concerned organisations should make the provisions, issue the securities and make the foundation of market strong. The factor in the money market should be carefully analyzed while making an investment decision on the money market, which leads investor on the safe zone of their investment. The investor should be able to interpret risk factor on the economy

and investment scenario, opportunity cost, volatility in the market, inflation rate, the objective of the investment. The investors should create the good investment portfolio, which influence their investment decision on the money market.

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The Effect of Stock Market on Economic Growth in Nepal

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ABSTRACT

This study investigated the causal relationship between gross domestic product and stock market for the period 2001-2019 using a Vector Error Correction Model (VECM). The purpose of this study was to investigate the short-run and the long-run relationship between the examined variables applying the Johansen co-integration analysis. Before that unit root tests were carried out for all time series data in their levels and their first differences. Johansen co-integration analysis was applied to examine whether the variables are cointegrated of the same order or not as all variables are stationary at first difference. Then a vector error correction model was selected to investigate the long-run relationship between gross domestic product and stock market. A short-run increase of market capitalisation per 1% induced an increase GDP by 4.24% in Nepal, while an increase of Paid up Capital per 1% induced an increase of GDP per 10% in Nepal. Similarly 1% change in total turnover will decreases GDP by 0.15%. The estimated coefficient of error correction term was statistically significant and had a negative sign, which confirmed that there was not any problem in the long-run equilibrium between the examined variables. The results of Granger causality tests indicated that there is a unidirectional causality between economic growth and market capitalisation. There is no granger causality between GDP and Paid up capital. There is no unidirectional causality between GDP and turn over. There is unidirectional granger causality between market capitalisation and turn over and from market capitalisation to turn over.

Keywords: Stock Market Development, Economic Growth, VECM Model, Granger Causality

JFL: G17, E22, C01

1.1 Background of the Study

The relation between Stock market development and economic growth has been examined issue in economic literature ever since the invention of stock market. Nowadays, it is safely concluded that economic growth is affected by development of stock market. However, Calderón and Liu (2003) were viewed

that the nature of this causal relationship remains unclear. Stock market plays vital role in the mobilization of domestic savings by enhancing financial instruments diversify investors portfolios providing an important source of capital at relatively low cost. Stock market and economic growth causal relations have been examined intensively in recent literature.

There is no widely accepted consensus about the direction, extent and nature of the causal relation between stock market and economic growth. For instance, Levine (2005) was of view that the stock market development leads to economic growth. On the contrary, Kindleberger (1978) thought that the economic growth to influence crucially the stock market. Similarly Khan (1999) is view that relationship between financial development and economic growth is mutually causal.

1.2 Objectives of the Study

To examine the long run relationship among economic growth, market capitalisation, paid up capital and turn over.

To apply Granger causality test based on a vector error correction model in order to examine the causal relationships between the examined variables taking into account the Johansen co-integration analysis.

The remainder of the study proceeds as follows:

Initially stationarity test and Johansen co-integration analysis are examined taking into account the estimation of vector error correction model. Finally, Granger causality test is applied in order to find the direction of causality between the examined variables of the estimated model. The empirical results are presented analytically and while the final conclusions are summarized.

In our study, it is examined the causal relation between the stock markets development and economic growth. In particular, the nature and causality direction is investigated in the analysis. Regarding the nature of the relation whether there a long run or short run causal relation between the stocks market development and economic growth and whether the stock market development leads to economic growth or opposite.

The nature and direction of causality between stock market development and economic growth is important for the investors' strategies, but also can bring important policy implications. The nature of indicated association is important for predicting economic growth. It might also shed some light on the question of how deeply economic growth is linked the stock market development.

The paper is structured as follows. The next section reviews the literature dealing with the relation between stock markets development and economic growth. Then the data and descriptive statistics are presented. In the next section, the methodology is explained. The final section concludes the paper.

2. Literature Review

Lot of study conducted on relationship between stock market development and economic growth has been going on and on ever since stock market emerged. In this paper we are confined to the literatures which are related to relationship between economic growth and stock market development. Duttal, Haider, Dasl (2017) investigated the causal relationship domestic investment and economic growth in Bangladesh over the period 1976–2014. In their study unit root tests, cointegration methods and Granger causality tests in Vector Error Correction Model (VECM) framework were used to investigate the relationships among the variables. The results of Granger causality test based on a stable VECM support bidirectional causality between domestic investment and growth in Bangladesh. The study showed the positive result. Narayan and Narayan (2013) conducted the study on the short-run relationship between the financial system and economic growth. In the paper, they examined the impact of the financial system on economic growth for a panel of 65 developing countries. The main findings are that while for the full panel of 65 countries there is evidence of financial sector-led growth; bank credit has a negative effect on economic growth. At the regional level, for the Middle Eastern countries evidence revealed that neither the financial sector nor the banking sector contributes to growth. Except for Asia, the role of financial sector development on economic growth is relatively weak. Rashid, Ouyand, Yapatake (2016) examined the impact of stock exchange on economic growth of Mauritius using time series secondary data covering the period of 1993 - 2015. The results showed that there is no long run causality running from market capitalization ratio, turnover ratio and value traded ratio to economic growth. However, there is a short - run causality running from turnover ratio to economic growth and the rest variables such as market capitalization ratio and value traded ratio have no short - run causality running to economic growth. Hasan, Sanaullah, Zaman (2012) conducted the research on short run and long run relationship between stock market development and economic growth in Bangladesh. They used data from 1981 to 2014. Study showed there is a long run positive relationship exists between real economic growth and stock market development in Bangladesh. The result also implies that real GDP growth in

Bangladesh takes only eight and half months to converge to its long run equilibrium. The Granger causality Wald tests suggest that there is bidirectional causality running between real GDP growth and stock market development in the short run. Therefore, real economic growth and stock market development in Bangladesh are seemingly dependent as economic growth leads to stock market development (market capitalization ratio and turnover ratio) and turnover ratio leads to economic growth. This study also investigated the direction of causal relationships between stock market performance and economic growth in Bangladesh. Cointegration test confirmed that the market capitalization ratio and turnover ratio have a positive long run effect on real GDP growth. So, they were view that stock market development based on MCR (market size) and TR (market liquidity) contributes to real economic growth in the long run. VECM result reveals that about 139% of disequilibrium is corrected each year by changes in real GDP growth. Athanasios and Antonios (2012) investigated the causal relationship between stock market development and economic growth for Greece for the period 1978-2007 using a Vector Error Correction Model (VECM). They examined whether stock market development causes economic growth taking into account the negative effect of interest rate on stock market development. The purpose of their study was to investigate the short-run and the long-run relationship between the examined variables. The result showed that a short-run increase of economic growth per 1% induced an increase of stock market index 0.41% in Greece, while an increase of interest rate per 1% induced a relative decrease of stock market index per 1.42% in Greece. The estimated coefficient of error correction term was statistically significant and had a negative sign, which confirmed that there was not any problem in the long-run equilibrium between the examined variables. The results of Granger causality tests indicated that there is a unidirectional causality between stock market development and economic growth with direction from economic growth to stock market development and a unidirectional causal relationship between economic growth and interest rate with direction from economic growth to interest rate. Similarly it can be inferred that economic growth has a direct positive effect on stock market development while interest rate has a negative effect on stock market development and economic growth respectively. Kajuroval and Rozmahell (2016) investigated the causal relation between the stock markets development and economic growth in the EU countries. In particular, the nature and causality direction is investigated. Panel data techniques including cointegration tests, vector error correction models and Granger causality tests were applied to indicate the nature and direction of

causality. Long-run effects of the economic growth upon stock market development was detected in the sample of the Euro area member countries. In the non-Euro area countries, only short-run impact of the stock market development upon economic growth was found. Regmi (2012) examined causal relationship between stock market development and economic growth in Nepal for the period 1994-2011. The finding suggests that stock market development has significantly contributed to the economic growth in Nepal. In this perspective, a refined policy measures should be adopted to strengthen and improve the role of stock market in order to maintain the strong growth of the economy. Lamichhane (2017) was of view that securities market turnover is one of the major behavioral phenomena of stock market. It always depends on the demand and supply of the securities, so the market turnover assumes a number of trading share units, values of share turnover and percentage share value of stocks. He analyze the different areas of stock units' turnover and value coverage of stock market. The market turnover represents those limited companies which cover huge weight of total value of shares trading. The study concluded that the portfolio of different companies is not idle so that the risk diversification is not possible in Nepalese stock market. Alghamedi, Ahmed, Misfer (2012) focused on the relationship between stock market development and economic growth has long been a significant subject of debate. Some argue that a well-functioning stock market can have an accelerating effect on economic growth by channeling more savings to investment and enhancing capital productivity through the efficient allocation of resources. In contrast, others hold that stock market development has little relevance to real economic activity or even that may be harmful to the economy. The majorities of empirical studies on this topic focus on advanced markets and developed emerging markets, and no major study exists for markets in petroleum-based economies, such as Saudi Arabia. This research therefore aims to conduct an empirical analysis of the overlooked role of stock market development in the economic growth process in the case of Saudi Arabia; thereby it aims to examine the effect of stock market development on economic growth in Saudi Arabia. In order to achieve the research aim, a mixed method approach is taken, combining quantitative and qualitative methods to enhance the study's validity and reliability. Results indicated that the Saudi economy in general still relies on oil revenues and fiscal policies. As part of the econometric analysis, the results of the Granger causality analysis produced inconclusive results, which revealed that the government plays an active role in the economy and intervenes when the macro-economic performance does not achieve the desired results. The

results of Error Correction Model or ECM with all the models for GDP showed that there is a bi-directional causality that runs from GDP, NOGDP, NOPSGDP, GFC and NOGFC to MCR, and to NST. The Error Correction Model of ECt-1 shows that the significant results indicate the speed of adjustment to the long-run equilibrium, and reveal the direction of causality.

3. METHODOLOGY

3.1 Data

The sources of the data are the sources of Nepal Rastra Bank and website of Nepal Stock Market. The dataset of GDP comes from Nepal Rastra Bank and share prices are from NEPSE website. The data are based on yearly basis from 2001 to 2019. All the data are converted into log so that result can be interpreted in the percentage.

3.2 Specification Model

In this study the method of Vector Error Correction Model (VECM) is adopted to estimate the effects of stock market components such as market capitalisation, paid up capital of listed companies and total turnover. The use of this method predicts the cumulative effects taking into account the dynamic response among economic growth and the other examined variables. In order to test the causal relationships, the following multivariate model is to be estimated as follows.

$GDP = f(MC, PUC \text{ and } TO)$

Where:

GDP = Gross Domestic Product

MC = Market Capitalisation

PUC = Paid up Capital

The variable of GDP is used as proxy of economic growth, while paid up capital is used as proxy of investment of listed companies in stock market. Another variable turnover is used as liquidity available in economy. Market capitalisation variable is used as proxy of confidence of investors.

The data that are used in this analysis are annual covering the period 2001-2019 for Nepal. All time series data are expressed in their levels and Eviews econometric computer software is used for the estimation of the model.

4. Econometric Analysis

Difference econometric tolls are used in the study. Unit root tests are used to test the stationarity and cointegration is used to analysis multiple long

run relationship. Granger causality is used to investigate the relationship and the direction of causality between the stock market development and economic growth. Vector Error Correction Model (VECM) is employed to test the long run causality, and short run to long run dynamic adjustment of the system of cointegrated variables. Wald tests are performed to test the short run causality among the variables.

4.1 Unit Root Tests

Economic theory does not often provide guidance in determining which variables have stochastic trends and when such trends are common among variables. If these variables share a common stochastic trend, their first differences are stationary and the variables may be jointly co-integrated.

For univariate time series analysis involving stochastic trends, Augmented Dickey Fuller (1979); Phillips and Perron (1988) and Kwiatkowski et al. (1992) unit root tests are calculated for individual series to provide evidence as to whether the variables are integrated. This is followed by a multivariate co-integration analysis.

Following the study of Seddighi et al. (2000), Augmented Dickey-Fuller (ADF) test involves the estimation one of the following equations:

$$\Delta X_t = \beta X_{t-1} + \sum_{j=1}^p \delta_j \Delta X_{t-1} + \varepsilon_t$$

$$\Delta X_t = \alpha_0 + \beta X_{t-1} + \sum_{j=1}^p \delta_j \Delta X_{t-1} + \varepsilon_t$$

$$\Delta X_t = \alpha_0 + \alpha_1 t + \beta X_{t-1} + \sum_{j=1}^p \delta_j \Delta X_{t-1} + \varepsilon_t$$

The additional lagged terms are included to ensure that the errors are uncorrelated. The maximum lag length begins with 2 lags. An appropriate lag is conformed with the help of the AIC and SC information criteria.

The null hypothesis is that the variable X_t is a nonstationary series ($H_0: \beta = 0$) and is rejected when β is significantly negative ($H_a: \beta < 0$). If the calculated ADF statistic is higher than McKinnon's critical values, then the null hypothesis (H_0) is not rejected and the series is non-stationary or not integrated of or-

der zero $I(0)$. Alternatively, rejection of the null hypothesis implies stationarity. Failure to reject the null hypothesis leads to conducting the test on the difference of the series, so further differencing is conducted until stationarity is reached and the null hypothesis is rejected (Dickey and Fuller, 1979).

In order to find the proper structure of the ADF equations, in terms of the inclusion in the equations of an intercept (α_0) and a trend (t) and in terms of how many extra augmented lagged terms to include in the ADF equations, for eliminating possible autocorrelation in the disturbances, the minimum values of Akaike Information Criterion (AIC) (Akaike, 1973) and Schwarz Criterion (SC) Schwarz (1978) based on the usual Lagrange Multiplier LM(1) test were employed.

Phillips and Perron (1988) test is an extension of the Dickey-Fuller (DF) test, which makes the semi-parametric correction for autocorrelation and is more robust in the case of weakly autocorrelation and heteroskedastic regression residuals.

Although the Phillips-Perron (PP) test gives different lag profiles for the examined variables (time series) and sometimes in lower levels of significance, the main conclusion is qualitatively the same as reported by the Dickey-Fuller (DF) test. Since the null hypothesis in the Augmented Dickey-Fuller test is that a time series contains a unit root, this hypothesis is accepted unless there is strong evidence against it. However, this approach may have low power against stationary near unit root processes.

Following the studies of Chang (2002); Vazakidis and Adamopoulos (2009) and Kwiatkowski et al. (1992) present a test where the null hypothesis states that the series is stationary. The KPSS test complements the Augmented Dickey-Fuller test in that concerns regarding the power of either test can be addressed by comparing the significance of statistics from both tests. A stationary series has significant Augmented Dickey-Fuller statistics and insignificant KPSS.

The distribution of LM is non-standard: The test is an upper tail test and limiting values are provided by Kwiatkowski et al. (1992), via Monte Carlo simulation. To allow weaker assumptions about the behavior of Q_t , one can rely, following Phillips (1987) on the Newey and West (1987) estimate of the long-run variance of Q_t which is defined as follows (Equation 3c, d):

$$S^2(1) = T^{-1} \sum_{t=1}^T e_t^2 + 2T^{-1} \sum_{t=1}^T w(s, 1) \sum_{t=s+1}^T e_t e_{t-k}$$

Where, $w(s,1) = 1 - s / (1+1)$. In this case the test becomes:

$$v = T^{-1} \sum_{t=1}^T S_t^2 / S^2(1)$$

Table 1: Augmented Dickey-Fuller Unit Roots Test

Variables	P-Value of Level Data	First Difference
GDP	0.9583	0.05
MC	0.6207	0.05
PUC	0.8281	0.01
TO	0.8889	0.00

Sources: Author's Calculation

The econometric software Eviews which is used to conduct the ADF tests, reports the simulated critical values based on response surfaces. The results of the ADF tests for each variable appear in Table 1. If the time series (variables) are non-stationary in their levels, they can be integrated with integration of order 1, when their first differences are stationary.

As per criteria whether level data are stationary or not we have used Augmented Dickey-Fuller test. The test shows that at level all the variables are not stationary at level. As shown in the table, p-values of all variables are more than 5%. so first difference have conducted. At first difference, p-values of all variables are less than 5%. So according to guide line Vector Error Correction Model (VECM) can be safely conducted.

4.2 Johansen Co-Integration Analysis

Following the studies of Chang (2002) and Vazakidis and Adamopoulos (2009), since it has been determined that the variables under examination are integrated of order 1, then the co-integration test is performed. The testing hypothesis is the null of non-co-integration against the alternative that is the existence of cointegration using the Johansen maximum likelihood procedure (Johansen and Juselius, 1990; 1992).

According to Chang and Caudill (2005) once a unit root has been confirmed for a data series then it is tested that whether there exists a long-run equilibrium relationship among variables. According to Engle and Granger

(1987), a set of variables, Y_t is said to be co-integrated of order (d, b) -denoted $CI(d, b)$ -if Y_t is integrated of order d and there exists a vector, L , such that LWY_t is integrated of order $(d-b)$. The method developed by Johansen and Juselius (1990) is applied for Co-integration tests.

Following the study of Chang and Caudill (2005); Johansen (1988) and Johansen and Juselius (1990) propose two test statistics for testing the number of cointegrated vectors (or the rank of X) the trace (Y_{trace}) and the maximum eigenvalue (Y_{max}) statistics.

The likelihood Ratio Statistic (LR) for the trace test (Y_{trace}) as suggested by Johansen (1988) is presented in equation :

$$\lambda_{trace}(r) = -T \sum_{i=r+1}^r \ln(1 - \hat{\lambda}_i)$$

Where,

$\hat{\lambda}_i$ = The largest estimated value of i th characteristic root (eigenvalue) obtained from the estimated Π matrix, $r = 0, 1, 2, \dots, p-1$

T = The number of usable observations

The λ_{trace} statistic tests the null hypothesis that the number of distinct characteristic roots is less than or equal to r , (where r is 0, 1, or 2) against the general alternative. In this statistic λ_{trace} will be small when the values of the characteristic roots are closer to zero (and its value will be large in relation to the values of the characteristic roots which are further from zero).

Alternatively, the maximum eigenvalue (Y_{max}) statistic as suggested by Johansen is presented in Equation:

$$\lambda_{trace}(r, r+1) = -T \ln(1 - \hat{\lambda}_{r+1})$$

The Y_{max} statistic tests the null hypothesis that the number of r co-integrated vectors is r against the alternative of $(r+1)$ co-integrated vectors. Thus, the null hypothesis $r = 0$ is tested against the alternative that $r = 1$, $r = 1$ against the alternative $r = 2$ and so forth. If the estimated value of the characteristic root is close to zero, then the Y_{max} will be small.

It is well known that Johansen's co-integration tests are very sensitive to the choice of lag length. Firstly, a VAR model is fitted to the time series data in order to find an appropriate lag structure. The Schwarz Criterion (SC) and the Likelihood Ratio (LR) test are used to select the number of lags required in the co-integration test. The Schwarz Criterion (SC) and the Likelihood Ratio (LR)

test suggested that the value $p = 2$ is the appropriate specification for the order of VAR model.

Table 2: Johansen Co- integration Test.

Series: LGDP LMC LPUC LTO				
Lags interval (in first differences): 1 to 1				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.935598	72.30331	47.85613	0.0001
At most 1	0.676335	28.42154	29.79707	0.0714
At most 2	0.354035	10.37279	15.49471	0.2531
At most 3	0.190460	3.380624	3.841466	0.0660
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Authors Calculation

As p-value of null hypothesis is less than 5%, null hypothesis is rejected which means there is cointegration among the variables. Trace test also indicates 2 cointegrating equations at the 0.05 critical values.

Table 3: Trace Test

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.935598	43.88177	27.58434	0.0002
At most 1	0.676335	18.04875	21.13162	0.1280
At most 2	0.354035	6.992165	14.26460	0.4901
At most 3	0.190460	3.380624	3.841466	0.0660
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: Author's Calculation

According to Max-Eigen value, there is cointegration among the variables as critical value at 5% level Max-Eigen are greater than the critical value.

Table 4: Johansen Normalized Cointegrating Coefficients

1 Cointegrating Equation(s):	Log likelihood	106.3668	
Normalized cointegrating coefficients (standard error in parentheses)			
LGDP	LMC	LPUC	LTO
1.000000	0.415759	-0.606437	-0.330585
	(0.04681)	(0.04364)	(0.02961)

Source: Author's Calculation

4.2.2 Johansen Normalization Interpretation:

In the long run lmc has a negative impact while lpcu and lto have positive impact on lgdp, on average, ceteris paribus. The coefficients are statistically significant at the 1% level. By rule, the signs of the coefficients are reversed in the long-run.

Conclusion: The null hypothesis of no cointegration is rejected against the alternative of a cointegrating relationship in the model.

4.3 Vector Error Correction Model

Chang and Caudill (2005) are of view that to specify and estimate a Vector Error Correction Model (VECM) including the error correction term to investigate dynamic behavior of the model since the variables included in the VAR model are found to be cointegrated. Once the equilibrium conditions are imposed, the VEC model describes how the examined model is adjusting in each time period towards its long-run equilibrium state.

In the short run the variables are co-integrated, deviations from this long-run equilibrium will feed back on the changes in the dependent variables in order to force their movements towards the long-run equilibrium state. Hence, the co-integrated vectors from which the error correction terms are derived are each indicating an independent direction where a stable meaningful long-run equilibrium state exists.

The size of the error correction term indicates the speed of adjustment of any disequilibrium towards a long-run equilibrium state (Engle and Granger, 1987). The error-correction model with the computed t-values of the regression coefficients are presented in following equations.

$$\Delta Y_t = \beta_1 \sum_i^n \Delta Y_{t-i} + \beta_2 \sum_i^n \Delta X_{t-i} + \beta_3 \sum_i^n \Delta Z_{t-i} + \lambda EC_{t-i} + \varepsilon_t$$

ECt-1 = The error correction term lagged one period

Δ = The first difference operator

λ = The short-run coefficient of the error correction term ($-1 < \lambda < 0$)

ε_t = The white noise term

Cointegrating equation and Long run model:

$$ECT_{t-1} = -0.019*(LGDP(-1)) + 0.415*LMC(-1) - 0.606*LPUC(-1) - 0.330*LTO(-1) - 4.028$$

Short run model:

$$D(LGDP) = 0.0325574627259*D(LGDP(-1)) + 0.0424155829355*D(LMC(-1)) + 0.104880433129*D(LPUC(-1)) - 0.00151943178677*D(LTO(-1)) + 0.0366340622812$$

4.4 Granger Causality Tests

The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. It is used for testing the long-run relationship between Gross Domestic Product and components of stock market such as Market capitalisation, Paid up Capital and Total Turn Over. The Granger procedure is selected because it consists the more powerful and simpler way of testing causal relationship (Granger, 1986). The following bi-variate model is estimated as follows:

$$\text{Where: } Y_t = a_{10} + \sum_{j=1}^k a_{1j} Y_{t-j} + \sum_{j=1}^k b_{1j} X_{t-j} + u_t$$

Y_t = The dependent

X_t = The explanatory variable

u_t = A zero mean white noise error term

$$X_t = a_{10} + \sum_{j=1}^k a_{1j} X_{t-j} + \sum_{j=1}^k b_{1j} Y_{t-j} + u_t$$

X_t = The dependent

Y_t = The explanatory variable

In order to test the above hypotheses the usual Wald F-statistic test is utilized.

Table 5: Granger Causality Test

Null Hypothesis:	F-Statistic	Prob.
LMC does not Granger Cause LGDP	4.44316	0.0385
LGDP does not Granger Cause LMC	4.88086	0.0304
LPUC does not Granger Cause LGDP	1.51910	0.2615
LGDP does not Granger Cause LPUC	0.52151	0.6076
LTO does not Granger Cause LGDP	0.94366	0.4186
LGDP does not Granger Cause LTO	3.82771	0.0547
LPUC does not Granger Cause LMC	2.52455	0.1252
LMC does not Granger Cause LPUC	9.99387	0.0034
LTO does not Granger Cause LMC	0.17348	0.8430
LMC does not Granger Cause LTO	6.91799	0.0113
LTO does not Granger Cause LPUC	4.37937	0.0399
LPUC does not Granger Cause LTO	2.59915	0.1190

Source : Author' Calculation

The results related to the existence of Granger causal relationships among GDP, MC, PUC and TO in Table. The estimated coefficient of ECt-1 is statistically significant and has a negative sign, which confirms that there is not any problem in the long-run equilibrium relation between the independent and dependent variables in 5% level of significance, but its relatively value (-0.0195) shows previous year deviation from long run equilibrium is corrected in current period are adjustment speed of 1.95 %. According to Granger causality tests there is a unidirectional causality between stock market development and economic growth with direction from economic growth to stock market development.

Table 6: Diagnostic Test

Test	P-value
Heteroskedasticity Test	
Breusch-Pagan-Godfrey	0.4190
Residual Test	
Breusch-Godfrey Serial Correlation	0.8746
Normality Test	
Jarque-Bera	0.6783

Source: Author's Calculation

Heteroskedasticity test is conducted with the help of Breusch-Pagan-Godfrey test. Here null hypothesis is "there is no heteroskedasticity". Table shows that the p-value is 0.41. So, null hypothesis cannot be rejected. It means there is homoskedasticity which is desired for good model.

Whether there is serial correlation or not is tested with the help of Breusch-Godfrey. Here null hypothesis is "there is no serial correlation". As p-value is 0.87 we cannot reject null hypothesis. So it is concluded that there is no serial correlation in the model, which is good sign for the model.

Residual is normally distributed as probability of Jarque-Bera is more than 5% which is 0.67. Here null hypothesis is "residual is normally distributed". P-value is more than 5% null hypothesis cannot be rejected or accepted. It is shown in the table.

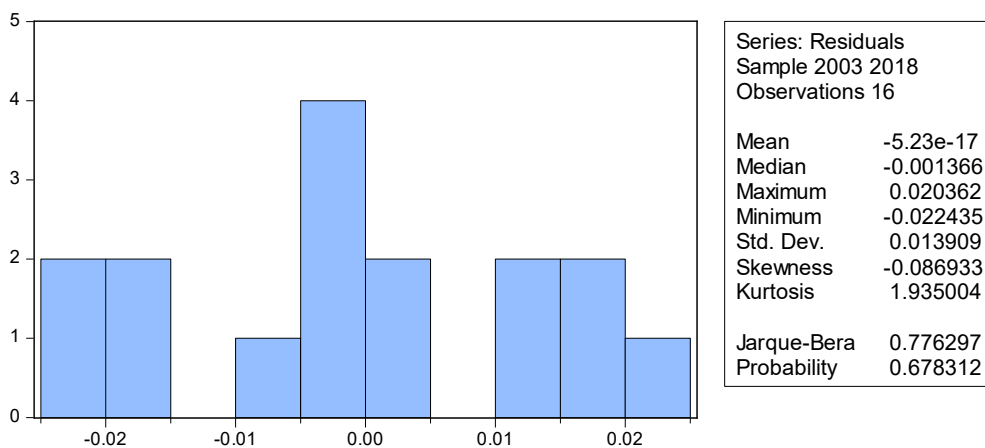


Figure1 : Normality

5. CONCLUSION

This study employs with the relationship between financial development and economic growth, using annually data for the period 2001-2019. The empirical analysis suggested that the variables that determine economic growth present a unit root. Once a co-integrated relationship among relevant economic variables is established, the next issue is how these variables adjust in response to a random shock. This is an issue of the short-run disequilibrium dynamics.

The short run dynamics of the model is studied by analyzing how each variable in a co-integrated system responds or corrects itself to the residual or error from the cointegrating vector. This justifies the use of the term error

correction mechanism. The Error Correction (EC) term, picks up the speed of adjustment of each variable in response to a deviation from the steady state equilibrium. The VEC specification forces the long-run behavior of the endogenous variables to converge to their cointegrating relationships, while accommodates the short-run dynamics. The dynamic specification of the model suggests deletion of the insignificant variables while the error correction term is retained. Economic growth has a direct positive effect on stock market development while interest rate has a negative effect on stock market development and economic growth respectively.

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Relationship between Stock Market and Economic Development: A Study on Nepal Stock Exchange Limited

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ABSTRACT

Generally, the stock market of the nation reflects the economic condition of the nation. If the economy is going well, the process encompasses within it are also going well. Hence, the stock market is considered as the barometer for measuring economic development. The market shows the sentiment of the economy both in the short-run as well as in the long-run. Similarly, the stock market works as a capital formation platform and helps in channeling funds through financial instruments in the economy. In my paper as per the context to Nepal, Karl Pearson's Correlation Coefficient result shows is a high degree of positive (significant) relationships between GDP, FDI, and HDI with the stock market (Nepal Stock Exchange Limited-Nepse) capitalization of Nepal respectively. But there is seen a negative (significant) correlation between HDI Ranking as well as with inflation rate (insignificant). Augmented Dickey-Fuller (ADF) Test suggested that the variables that determine stock market development present a unit root and turned out to be the stationary at second-order integration. The Johansen Co-integration Test concluded that HDI, GDP, and FDI co-integrated with the market capitalization (MKT CAP) of the stock market of Nepal. Similarly, negative impact is seen between the GDP and market capitalization in context to the Nepalese stock market whereas, HDI and FDI, on average have a positive impact on market capitalization in the long run.

Keywords: Stock market, NEPSE, economic development, correlation, co-integration

I. Background

Levine and Zervos (1996) stated that certain factors could be used as a measurement of stock markets' development and as such, they had a direct relationship with the economic growth of the country as well. Some of these factors include liquidity and stock market capitalization as well as the turnover of stocks in the market.

Arestis et al. (2001) studied the relationship between stock market development and economic growth using the time series methods. Data from five developed economies found that the effect of the banking system in comparison with the stock market development is more promoting economic growth. They argued that the contribution of stock market development on economic growth might have exaggerated in the literature.

Caporale et al. (2004) studied the causal link between stock market development and economic growth in seven countries (Argentina, Chile, Greece, Korea, Malaysia, the Philippines, and Portugal). Their findings argued that a well-developed stock market fosters economic growth in the long run. It also provides support to theories according to which well-functioning stock markets can promote economic development by fuelling the engine of growth through faster capital accumulation, and by turning it through better resource allocation.

Van Nieuwerburgh et al. (2006) accounted for strong evidence that stock market development caused economic growth in Belgium, especially during the period 1873 and 1935. G.C. and Neupane (2006) found that there were long-run integration and causality of macroeconomic variables and stock market indicator in Nepal.

Shaahbaz et al. (2008) found that there exist a very strong relationship between stock market development and economic growth in Pakistan. Engle Granger-Causality estimation confirms in the long-run, there is bi-directional causality between stock market development and economic growth. However, for short-run, there exist only one-way causality, i.e., from stock market development to economic growth.

Vazakidis and Adamopoulos (2009) examined the causal relationships between stock market development and economic growth for France for the period 1965-2007, using Granger causality tests based on a Vector Error Correction Model (VECM). The results of Granger causality tests indicated that economic growth in France caused stock market development. Therefore, it could be inferred that economic growth has a positive effect on stock market development, while the interest rate has a negative effect on stock market development in France.

Nazir et al. (2010) stated that the capital market plays an essential role in the growth of commerce and industry which ultimately affected the economy of the country to a large extent. This was the rationale that the industrial bodies, government advisors and even the central bank of the country keep a close

eye on the activities of the stock market. This paper explored the relationship between the stock market development and economic growth in Pakistan for the period of 1986 to 2008. They investigated the stock market development and economic growth relationship by using the two major measures of stock market development, namely: the size of the market and liquidity prevalent in the market in terms of market capitalization. The results revealed that economic growth can be attained by increasing the size of the stock markets of a country as well as the market capitalization in an emerging market like Pakistan.

Oskooe (2010) found that the level of real economic activity was the main factor in the movement of stock prices in the long run. The stock market played a role as a leading economic indicator of future economic growth in Iran in the short run.

Ahmad et al (2012) examined the relationship between stock market development and economic growth of two Asian developing countries, that is, Pakistan and Bangladesh, after the liberalization period of 1990s. The relationship measured were in terms of size (market capitalization), liquidity (total value of stocks traded and stock turnover ratio) and volume (total number of companies listed in the stock exchange of each of the country). The study of comparative analysis was done with the help of tables and charts. The econometric results of the study by employing the regression analysis showed that Pakistan stock markets contribute to the economic growth in terms of the large size of its stock market whereas Bangladesh stock market contributes to the economic growth in terms of the liquidity of its stock market. Bangladesh economic growth was found to be comparatively better than economic growth of Pakistan. The study revealed that the stock markets in Pakistan and Bangladesh do not play a major role in the economic growth but rather, these financial institutions are the driving forces for the economic growth of the country.

Regmi (2012) examined causal relationship between stock market development and economic growth in Nepal for the period 1994-2011, using unit root test, co-integration, and vector error correction models and developing NEPSE composite index as an indicator of stock market development. The finding concluded that stock market development had significantly contributed to the economic growth in Nepal for the period 1994- 2011.

Rana (2014) using Engle-Granger and Johansen's Co-integration test on the time series data from 1988 to 2013, found a long-run co-integrating relationship between stock market development and economic growth in Nepal.

Muktadir-Al-Mukit et al. (2014) found that market capitalization is the most influential factor and highly associated with the real economic growth of Nepal. However, there were some issues in sample size and analysis techniques associated with these studies in Nepal. Dagar (2014) stated that the stock market is one of the most vigorous sectors which plays an important role in contributing to the wealth of an economy. The growth rate of the stock market signifies a growth percentage rise in the economy. He concluded that there was a strong positive relationship between stock market development and economic growth and helps to efficiently direct the flow of savings and investment in the economy in ways that make possible the stockpiling of capital.

Ouma and Muriu (2014) investigated that the impact of the macro economic variables on stock returns in Kenya during the period 2003-2013, using the Arbitrage Pricing Theory (APT) and Capital Asset Pricing Model (CAPM) framework for monthly data. The Ordinary Least Square (OLS) technique was applied to test the validity of the model and the relative importance of different variables which may have an impact on the stock returns. The empirical analysis found two results. First, all variables are $I(0)$. Second, with the exception of interest rates, there exists a significant relation between stock market returns and macroeconomic variables. According to the findings of the study, money Supply, exchange rates and inflation affect the stock market returns in Kenya. Money supply and inflation were found to be significant determinants of the returns at Nairobi Stock Exchange (NSE). Exchange rates is however, found to have a negative impact on stock returns, while interest rates is not important in determining long run returns in the NSE

Bist (2017) indicated that market capitalization had a significant positive impact on the economic growth in both long as well as in the short run. However, results had shown that inflation had a negative and significant impact on GDP per capita in long as well as in the short run. Further, the study indicated that there was unidirectional causality and that runs from stock market development to economic growth in Nepal. Therefore, the study concluded that long-run policies should be formulated in such a way that they facilitated the development of the stock market to increase economic growth.

II. Introduction to Stock Exchange

A stock exchange is an organized marketplace, licensed by a relevant regulatory body, where ownership stakes (shares) in companies are listed and traded. Listing happens in the so-called 'primary market', where a portion of a

company's shares are made available to the public. The company often uses the listing to raise funds through issuing new equity shares (an initial public offering or IPO). Investors can then buy and sell these listed shares in the so-called 'secondary market'. While listing in the primary market may result in a flow of funds from investors to the firm, the trading between investors in the secondary market does not. The activity in both the primary and secondary market occurs within a framework of laws, rules and regulations, aimed at ensuring the existence of fair, transparent and orderly markets. To achieve these objectives, these rules and regulations will typically provide for the protection of investor assets, the process for transferring ownership of shares, the requirements with which companies that are listed on markets must comply, and processes for ensuring settlement of disputes. Exchanges also ensure that trading occurs according to predefined, public rules and that information about the prices at which investors are willing to buy and sell, and the prices at which instruments have sold (pre- and post-trade transparency) are publicly available. Exchanges are supervised by a securities market regulator. Different jurisdictions have different models of who is responsible for what element of market regulation. All markets with an exchange will stipulate:

- The listings requirements (the requirements that companies wishing to list on the exchange must meet initially and on an ongoing basis, and the information they are required to disclose to the public);
- The membership requirements (the financial, educational, conduct and other requirements that the entities who trade on the exchange on behalf of investors must meet);
- The trading rules (the rules according to which, for example, buy-and-sell orders are matched, the price determination process, what happens in the event of errors, the moment at which a binding transaction is concluded); and
- The process for clearing and settlement of transactions (e.g. how the transfer of ownership of shares and cash is affected, over what time period, and how defaults are managed). Regardless of the specific regulatory structure, all exchanges will have some responsibility for ensuring compliance with these aspects of market regulation and engaging in some level of market surveillance (UNCTAD, 2017).

III. Data and Methodology

The paper used the annual data of the market capitalization amount to see the relationship with the major macroeconomic variables of Nepal. The required secondary data was used from the date of establishment, i.e. 1994 till 2019 of the only secondary market of Nepal, Nepal Stock Exchange Limited (NEPSE). The amount of the total market capitalization during a specific fiscal year published by the NEPSE was used. At the same time, the published data by the Central Bureau of Statistics (Nepal) of the values of the macroeconomic variables namely, Gross Domestic Product (GDP) at Constant National Price, Foreign Direct Investment in amount, annual inflation rate were used. Human Development Index and HDI Ranking as published by UNDP were used for the study purpose.

For analysis of collected data, the concept of simple Karl Pearson Correlation Coefficient was used to see the basic relation between the dependent and independent variables. Similarly, the Augmented Dickey-Fuller (ADF) test was followed to test the stationarity (or non-stationarity) of the time-series data. Finally, the Johansen Test of Co-integration has been adopted to find out if two or more time series are co-integrated or not.

IV. Results

Karl Pearson's Correlation

Variables	Correlation Coefficient with Market Capitalization
GDP	+0.93**
FDI	+0.85**
HDI	+0.83**
HDI Ranking	-0.57**
Inflation Rate	-0.01

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

It is seen that there is a high degree of positive (significant) relationships between GDP, FDI, and HDI with the stock market capitalization of Nepal respectively from the result of Pearson's Correlation Coefficient. But there is seen a negative (significant) correlation between HDI Ranking, as well as with inflation rate (insignificant) and stock market capitalization. Among the above-tested variables, the GDP is seen very highly correlated with the stock market capitalization of Nepal. But in contradiction from the prima facie, there are no listed companies directly related to the basis of the economy (especially, agro-based companies) of Nepal at the secondary market. The agriculture sector

contributes more than 22 percent of the industry operating in Nepal.

ADF Test

Variable	p-value @5%	t-statistics	p-value	Order of Integration
D(MKTCAP)	-3.0049	-6.1884	0.0000	I(2)
D(FDI)	-2.9918	-7.8812	0.0000	I(2)
D(GDP)	-3.0049	-5.0474	0.0001	I(2)
D(HDI)	-2.9980	-11.1754	0.0000	I(2)
D(HDI_RANKING)	-2.9980	-8.1250	0.0000	I(2)
D(INFR)	-3.0649	-6.6509	0.0000	I(2)

Null Hypothesis (H₀): Variables has a unit root i.e. the series is non-stationary.

Since the calculated value t-statistics is higher than the tabulated value for all the variables, the series for each variable are not stationary at the second order of integration. However, the second difference of the variables is turned out to be stationary. These results support the contention that variables under investigation are all I(2) variables.

Johansen Test of Co-integration

Null Hypothesis (H₀): There is no co-integration equations for the series.

Sample (adjusted): 1996-2019

Included observations: 24 after adjustments

Trend assumption: Linear deterministic trend

Series: MKTCAP FDI GDP HDI HDI_RANKING INFR

Lags interval (in first differences): 1 to 1

Unrestricted Co-integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.944258	171.22097	95.75366	0.0000
At most 1 *	0.838374	101.93255	69.81889	0.0000
At most 2 *	0.755400	58.19321	47.85613	0.0039
At most 3	0.397118	24.39805	29.79707	0.1841
At most 4	0.257339	12.25326	15.49471	0.1451
At most 5 *	0.191874	5.11289	3.84147	0.0237

Max-eigenvalue test indicates 3 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Unrestricted Co-integration Rank Test (Maximum Eigen value)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigen value	Statistic	Critical Value	Prob.**
None *	0.944258	69.28842	40.07757	0.0000
At most 1 *	0.838374	43.73934	33.87687	0.0024
At most 2 *	0.755400	33.79516	27.58434	0.0070
At most 3	0.397118	12.14479	21.13162	0.5334
At most 4	0.257339	7.140366	14.26460	0.4727
At most 5 *	0.191874	5.112890	3.841466	0.0237

Max-Eigen value test indicates 3 co-integrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

3. Co-integrating equation(s):			Log likelihood	-407.7999	
Normalized co-integrating coefficients (standard error in parentheses)					
MKTCAP	INFR	HDI_RANKING	HDI	GDP	FDI
1.000000	0.000000	0.000000	-7625.717	0.032484	-91.20161
			(1571.60)	(0.00482)	(11.9018)
0.000000	1.000000	0.000000	35.19449	0.000279	-1.563197
			(29.7748)	(9.1E-05)	(0.22549)
0.000000	0.000000	1.000000	-232.2404	-0.001109	5.405944
			(121.254)	(0.00037)	(0.91826)

Economically speaking two variables will be co-integrated if they have a long-term, or equilibrium, relationship between them (Gujarati et al, 2014). From the above result, it was concluded only three variables, HDI, GDP, and FDI were co-integrated with the market capitalization (MKT CAP) of the stock market of Nepal. Similarly, the GDP had a negative impact on market capitalization in a long run in context to the Nepalese stock market whereas, HDI and FDI on average had a positive impact on market capitalization in a long run.

V. Results

This study employs the relationship between stock market development and economic growth for Nepal. Karl Pearson's Correlation Coefficient result shows there is a high degree of positive (significant) relationships between GDP,

FDI, and HDI with a stock market capitalization of Nepal respectively. But there is seen a negative (significant) correlation between HDI Ranking as well as with inflation rate (insignificant). For univariate time series analysis involving stochastic trends, ADF unit root tests are calculated for individual series to provide evidence as to whether the variables are integrated. The empirical analysis suggested that the variables that determine stock market development present a unit root. Therefore, all series are stationary and integrated of order one $I(2)$, in their second differences. Since it has been determined that the variables under examination are stationary and integrated of order 2, then the Johansen co-integration analysis is performed taking into account the maximum likelihood procedure. The Johansen co-integration tested HDI, GDP, and FDI co-integrated with the market capitalization (MKT CAP) of the stock market of Nepal. Similarly, the GDP has a negative impact on market capitalization in a long run in context to the Nepalese stock market whereas, HDI and FDI, on average have a positive impact on market capitalization in a long run. This shows that until and unless there is a capital inject from the stock market bringing an FDI in the various sector of the economy, the economic development of Nepal could not take a pace in the long-run. Similarly, it can be assumed that improvement in the HDI might attract a larger investment in the economy in the long run and boost the stock market.

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