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Does Nepal's Financial Structure Matter for Economic Growth?

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Prepared by

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Abstract

Despite causality debate, a number of empirical literatures (Pagano, 1993 and Levine, 1997, among others) suggest a positive relationship between financial sector development and economic growth. Moreover, there remains further debate whether the country's financial structure exerts differential impact on economic growth. Empirical studies across the countries (Rajan and Zingales, 1999 and Arestis et. al. 2004) suggest that banking sector plays a key role in some countries while the capital market has a lead position in others for enhancing economic growth. In this context, this paper investigates the relative merits of banking sector vs. capital market in promoting economic growth in Nepal. The empirical results using Johansen's cointegrating vector error correction model based on aggregate annual data from 1993/94 to 2010/11 suggest that banking sector plays a pivotal role in promoting economic growth compared to capital market in Nepal. The role of capital market seems to be insignificant. It may be either the size of market is too small to seek the relationship or it is weakly linked to real economic activities. Our result is consistent with the earlier findings in other countries and it has two important implications. First, the policy should focus on banking sector development by enhancing its quality and outreach as it promotes economic growth. Second, in line with the banking sector, the scope of capital market should be further expanded to real economic activities to channelize its impact on growth.

JEL classification: C51, E44, E47

Key words: Financial Structure, Bank vs. Capital Market-based Financial System, Economic Growth, Error Correction Model

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CONTENTS

		Page
I.	Introduction	1
II.	Brief Overview of Structure of the Nepalese Economy and Financial System	2
III.	Methodological Framework	3
IV.	The Data and Empirical Analysis	5
V.	Conclusion	8
References		9
Annex I	Concept of Financial Structure	11
Annex II (A)	Sectoral Contribution to GDP (in percent)	12
Annex II (B)	Growth Rate of Real GDP (annual average, %)	12
Annex III	Key Indicators of Nepalese Financial System	12
Annex IV	Measurement and Source of Variables	13

I. INTRODUCTION

There have been extensive research works on the relationship between financial structure[1] and economic growth. A large number of literatures suggest that financial structure significantly matters for explaining economic growth, while many others find that the country's financial structure itself does not exert differential impact on economic growth. Moreover, there remains further debate, among the proponents of finance-growth nexus, whether bank-based or capital market-based financial system can contribute equally to the economic growth.

There are four competing approaches explaining the relationship between financial structure and economic growth: bank-based approach, market-based approach, financial services approach and the law and finance approach (Arestis et. al., 2001). The bank-based view highlights the positive role of banks in mobilizing financial resources, identifying good projects, monitoring managers, and managing risk (Levine 1997, 2000) and, therefore, said to be more growth promoting than market-based system (Arestis et. al., 2001). Banks have advantages over markets particularly in the countries with weak legal and accounting systems. In such situation, banks can make firms reveal information and pay back their debts thereby facilitating expansion and long-run growth (Rajan and Zingales, 1999). From a development perspective, a bank-based system outperforms a market-based one because financial intermediation creates an environment more conducive for transforming a traditional economy into a modern one (Vitlos, 2001).

In contrast, the market-based view expresses a significant role of capital market for promoting economic growth. Although banks can effectively eliminate duplication of information gathering and processing, they can have less success dealing with uncertainty, innovation, and new ideas (Allen and Gale, 1999). This view emphasizes the growth enhancing role of the market for ensuring innovation, market discipline and better corporate governance practices and this system is supposed to reduce the moral hazard problem inherent in bank-based system.

The financial services and law of finance view, on the other hand, argue that markets and banks are alternatives as they perform more-or-less the same functions but in different ways and possibly with different degrees of success (Boyd and Smith, 1996 and Allen and Gale, 1999). For them, what matters for growth is the overall level and quality of financial services and, therefore, the best way to examine the connection between financial structure and growth is not to study how markets and intermediaries can substitute for each other, but rather how markets and intermediaries complement one another (Dolar, V. and Césaire M.,2002). The law and finance view, put forward by La porta, Lopez-de-Silanes, Shleifer, and Vishny (1998), emphasizes the role of creditor and investor rights for financial intermediation. Evidence from cross-country growth analyses (Levine1999, 1998; Laporta *et. al*. 1998, 1997) supports this view. Further, Demiruc-Kunt and Levine (1996), using firm-level data, find that increase in securities market development actually tends to increase the use of bank finance in developing countries. This finding suggests that these two elements of the financial system may act as complements during the development process. Levine and Zervos (1998) show that higher stock market liquidity or greater bank development leads to higher growth, irrespective of the development of the other.

Demirguc-Kunt and Levine (2001), using a broad data set covering 48 countries from 1980 to 1993, find that the distinction between bank and market-based financial system is not important for explaining economic growth. Rather, elements of a country's legal system and the quality of its financial services are most important for fostering economic growth. Contrary to this, Tadesse (2001) finds significant difference between bank and market-based financial system in explaining economic growth. It suggests that for countries with underdeveloped financial

[1] Refer to Annex I for more about the financial structure.

system, bank-based system outperform market-based system, while for countries with developed financial system; market-based system outperform bank-based financial system.

Chakraborty and Ray (2001), in a model where financial structure arises endogenously, show that it is entirely possible for two countries to have distinctly different financial systems but enjoy similar growth rates over time (as in the case of Germany and the United States.) This supports Levine's (2000) and Demirguc-Kunt and Levine's (2001) empirical findings that the specific type of financial system is not important for explaining differential growth rates across nations. Both the panel as well as cross-section studies (Demirguc-Kunt and Levine, 1996; Levine, 2002 and 2003; Beck and Levine, 2002) find that financial structure is irrelevant to economic growth implying that neither bank nor the market-based financial system can explain economic growth. Rather, they argue that it is the overall provision of financial services which are important.

Given the countervailing arguments, this paper seeks to examine the relative merits of banking sector vs. capital market in promoting economic growth in Nepal. Although there is relatively a long history of evolution of the banking sector in Nepal, a formal and systematic capital market activities commenced from the early-1990s and data for the volume of market capitalization is available since 1994. Thus, the study uses time series data from 1993/1994 to 2010/11 and employs Johansen's cointegrating vector error correction model to investigate this issue. The empirical results suggest that financial sector development has positive impact in promoting economic growth in Nepal. Particularly, the banking sector development plays a pivotal role compared to the capital market. This suggests that the growth enhancing policy should focus on banking sector activities to channelize their impact on growth. The role of capital market seems to be insignificant. It may be either the size of market is too small to seek the relationship or it is poorly linked to real economic activities.

The structure of the rest of the paper is as follows: The subsequent section summarizes a brief overview of structure of the Nepalese economy and financial system followed by methodological discussions in section III. The section IV presents the data generating process and empirical estimates. Finally, section V concludes the paper.

II. Brief Overview of Structure of the Nepalese Economy and Financial System

With the initiation of economic liberalization policies in the mid-1980s; the structure of Nepalese economy witnessed a significant transformation, particularly in the 1990s. The share of agriculture sector to GDP came down from 69 percent in 1975, 50 percent in 1995 to 35 percent in 2011. As a result of increasing private sector involvement in the economic activities, the share of non-agriculture sector to GDP surpassed the dominance of agriculture thereby making services sector as a leading contributor to GDP since 2000. However, the share of industry sector has been stable over the period. Still, the agriculture sector is dominant with more than one third of its contribution to GDP.

The annual average real economic growth rate of Nepal remained at around 5 percent in 1990s and further below at 4 percent during 2000-10. The economic growth in the former decade was led by non-agriculture sector, whereas the situation was reverse in the later decade. In the former decade, the agriculture and non-agriculture sector grew by 2.5 percent and 7.0 percent respectively whereas in the later decade these sectors witnessed annual average growth rate of 3.3 percent and 4.1 percent respectively (Annex II). The main reasons for such a differential growth performance in the past two decades are mainly attributed to the country's macroeconomic policy initiatives as well as political environment. Economic liberalization policies along with the stable political situation led to a higher growth rate of non-agriculture sector in the 1990s. Contrary to this, internal conflicts, prolonged political transition and supply side bottlenecks decelerated the growth performance of industry and services sector in the subsequent decade.

On the finance front, the Nepalese financial system is highly dominated by banking sector, particularly commercial banks. Although the capital market is still passing through the early stage of development, the Nepalese banking sector has relatively longer historical foundation, established institutional settings and relatively better growth and development trend. Until 1984, there were only two state-owned commercial banks in the country and the financial system was highly regulated.

With the initiation of economic liberalization in the mid-1980s and increasing private sector investment in the financial sector from 1990s, the number of banks and financial institutions (commercial banks, development banks and finance companies) surged up from 38 in 1994 to 197 in 2011. Consequently, the ratio of total banking sector assets to GDP went up to 78 percent from 35 percent during this period. Likewise, the ratio of private sector credit to GDP increased from 20 percent in 1994 to 64 percent in 2011 (Annex III).

Although the evolution of Nepalese capital market dates back to 1976 with the establishment of Securities Exchange Center (SEC), the modern capital market began only after the conversion of SEC into Nepal Stock Exchange Limited (NEPSE) in 1993. As a result of some reform initiatives and gradual increment in the public participation in the market; the number of listed companies increased from 66 in 1994 to 209 in 2011. Likewise, the market capitalization to GDP ratio increased from 7 percent in 1994 to 24 percent in 2011 (mid-October). During this period, the paid up value of listed shares went up from Rs. 2.2 billion to Rs. 101.3 billion (Annex III). These indicators show that the Nepalese capital market, which was almost non-existent until 1994, witnessed a significant but steady growth path to arrive this stage. Nevertheless, in relation to its market share in the overall financial system, the Nepalese capital market is still passing through its infant stage of development.

Besides; insurance companies, Citizen Investment Trust, Employee Provident Fund and commodity exchanges are also a part of Nepalese financial system. Nepal Rastra Bank (NRB) is the apex regulatory authority to manage and supervise the banking sector activities, while the Securities Board of Nepal (SEBON) is the regulatory authority of capital market activities in the country. Insurance companies are regulated by "Insurance Board". Due to dominant presence of banking sector in the capital market, the policies and regulatory stances undertaken by the NRB largely affect the capital market activities and hence there is a sequential complementarity between capital market and banking sector development in Nepal.

As in other developing economies, there is also a large presence of informal financial transactions in Nepal. This sector comprises the local money lenders and credit & savings associations. This sector is poorly developed, limited in reach, and not integrated into the formal financial system. Its exact size and effect on the entire economy remain unknown and a matter of on-going research.

III. METHODOLOGICAL FRAMEWORK

The model

We start with specifying a general Cobb-Douglas production function, which states that output (Y_t) is the function of labour (L_t) and capital (K_t) as follows:

$$Y_t = e^A L_t^{\tau}, K_t^{1-\tau} U_t \qquad (1)$$

Where, t is the time subscription, e is exponential term, A is the constant term (shift factor), τ is the share of L_t and $1 - \tau$ is the corresponding share of K_t and U_t is an error term.

Dividing both side by L_t, taking log and re-arranging terms yields:

$$\log(y_t) = A + \tau \log(x_t) + u_t \qquad (2)$$

Where, A is the constant term, $y_t = Y_t / L_t$, $x_t = K_t / L_t$, τ is a coefficient of x_t and finally u_t is the white noise error term.

Eq. (2) is a Cobb-Douglas type of linear production function expressed in per capita labor term. This function, however, may be underspecified as recent literatures provide ample evidences that several factors such as factor productivity, technological progress, financial development and financial structure also affects the economic growth (Arestis, et.al.,2004). As this paper examines whether financial structure matters for economic growth, we define financial structure and then include them in the model on the assumption that overall financial system has a positive impact on growth. Our ultimate focus is, therefore, to examine the relative importance of financial structure[2].

The literatures offer various ways of classifying financial system although the classification varies country to country. One of the popular ways is to segregate the overall financial system into bank-based and market-based (non-bank) financial system (Demirguc-Kunt and Levine, 2001). The banking sector comprises financial transactions of deposit taking institutions while the non-banking sector mostly covers the transactions of capital market[3]. In this sense, we model Eq. (2) as:

$$\log(y_t) = A + \tau \log(x_t) + \lambda(NBS_t) + \gamma(BS_t) + e_t \qquad (3)$$

Where, BS_t represents a leading indicator of banking sector development while NBS_t represents an indicator of non-bank financial system. Following Beck et. al. (2002), we consider total assets and alternatively total credit of banks as a proxy for banking sector development while market capitalization is taken as a proxy for capital market development.

In this setting, a significant and positive sign of λ indicates that capital market development has a positive impact on economic growth while a significant and positive sign of γ signifies the same impact from the development of banking sector. A negative sign of parameters implies contractionary impact and insignificant coefficient of both parameters denote no effect on economic growth. More importantly, capital market has dominant role influencing economic growth if $\lambda > \gamma$ while the reverse case implies that banking sector has a dominant role relative to capital market.

As discussed in the previous section, capital market indicators such as market capitalization and NEPSE index is available only since 1994, it will be unusual defining a large scale model for such a small sample size. We further compressed Eq. (3) as follows:

$$\log(y_t) = A + \tau \log(x_t) + \varphi(s_t) + \nu_t \qquad (4)$$

Where, $s_t = BS_t / NBS_t$ is the ratio of banking sector to capital market development indicator and represents the structure of the financial system. A higher value of s_t indicates more bank-based and a lower s_t means more capital market-based financial structure.

Eq.(4) is the final specification in which the parameter φ plays an important role. Under this framework, a significant φ coefficient implies that financial structure matters for economic growth and an insignificant φ implies that the structure does not matter. Further, a significant parameter with negative sign implies that capital market has a dominant role over banking sector development while positive sign signifies that banking sector has dominant role relative to capital market.

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[2] The sample period we consider in this paper is not big enough to include other possible variables in the production function.

[3] In a broad classification, insurance companies, contractual saving institutions and investment companies may also include under the definition of capital market.

Econometric Approach

We employ a tri-variate cointegrated vector autoregressive model of order p to estimate Eq.(4) as follows (Johansen, 1988 and Johansen and Jueselius, 1990):

$$\Delta X_t = \sum_{i=1}^{p-1} \Gamma_i \Delta X_{t-i} + \prod X_{t-p} + \mu_t + \varepsilon_t \qquad (5)$$

Where, $X_t [y_t, x_t, s_t]$ is a 3×1 vector of the first-order integrated [I(1)] variables; μ_t is an 3×1 vector of deterministic term; ε_t is a 3×1 vector of normally and independently distributed error terms, i.e., $\varepsilon_t \approx NP(0, \Omega)$; Γ_i are 3×3 coefficient matrix of lag variables, defined as $-\sum_{j=i+1}^{p} A_j$ and finally, $\prod$ is an 3×3 long run impact matrix, $-(I - \sum_{i=1}^{p} A_i)$ where A_i is an 3×3 matrix of vector autoregressive of order p and I is an 3×3 identity matrix.

The rank of $\prod$ determines the number of cointegrating vectors (r) among the variables in X_t. The model does not give cointegrating relationship among variables if r = 0. On the other hand, if r = 3 there exists a full rank. If $\prod$ is of rank r such that $0 < r < 3$ then we can decompose $\prod = \alpha\beta'$ where α is an $3 \times r$ matrix of error correction coefficients which provide the speed of adjustment towards long run equilibrium and β' is an $3 \times r$ unrestricted cointegrating vectors. Now, Eq. (5) can be re-arranged as:

$$\Delta X_t = \sum_{i=1}^{p-1} \Gamma_i \Delta X_{t-i} + \alpha(\beta' X_{t-p}) + \mu_t + \varepsilon_t \qquad (6)$$

Testing number of cointegrating relationships (r) is an important issue in Eq. (6) because the long run relationship among variables cannot be indentified if $r \neq 1$. Following Johansen (1988), we employ two likelihood ratio tests namely eigenvalue [$\lambda_{\max}(r / r+1)$] and trace statistic [$\lambda_{trace}(r / p)$] tests for the determination of r as follows:

$$\lambda_{trace}(r / p) = -T \sum_{i=r+1}^{p} \log(1 - \hat{\lambda}_i) \qquad (7)$$

$$\lambda_{\max}(r / r+1) = -T \log(1 - \hat{\lambda}_{r+1}) \qquad (8)$$

where $\hat{\lambda}$ is computed eigenvalue up to p lags and p is chosen up to the level which removes serial correlation. Eq. (7) tests the null hypothesis that there are at most r cointegrating vectors against k where k is number of variables used in the model, whereas Eq. (8) tests the null hypothesis of r cointegrating vectors against the alternative of $r+1$. The critical values for examining the $\lambda_{\max}(r / r+1)$ and $\lambda_{trace}(r / p)$ are taken from Osterwald-Lenum (1992).

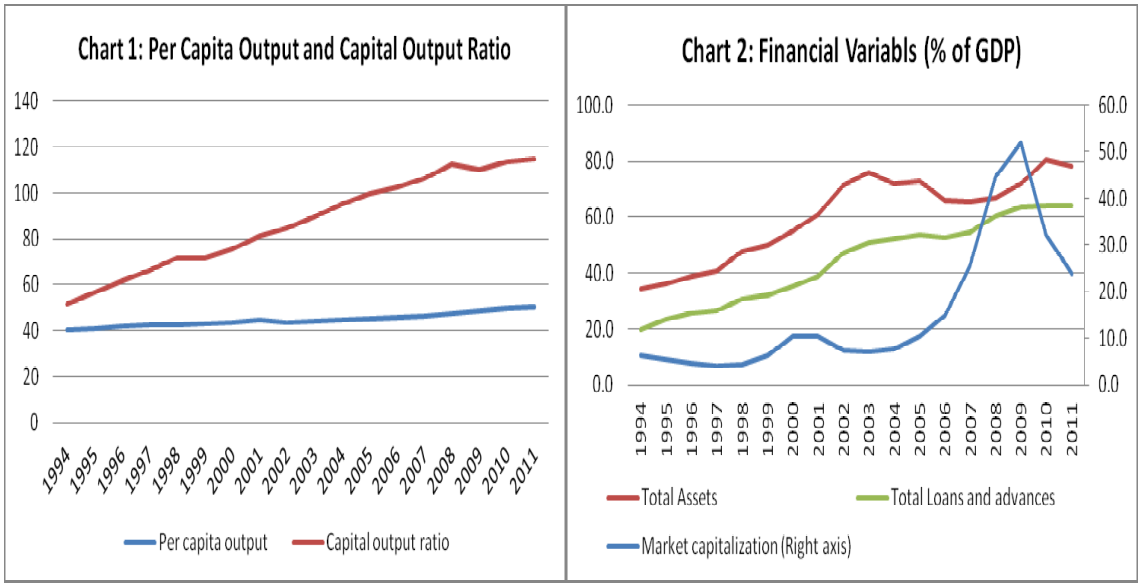
IV. THE DATA AND EMPIRICAL ANALYSIS

We use annual data from 1993/1994 to 2010/2011 for estimating the model as some of the data including market capitalization is unavailable prior to this period. As shown in Annex 3, output per capita, y_t, is defined as Y_t / L_t where Y_t is Gross Domestic Product (GDP) at constant price of 2000/01 and L_t is the total labor force. Again, as time series data of labor force is unavailable in Nepal; we obtained the series by interpolating discrete information available from population census 1991 and 2001 for the period from 1994 to 2001 and extrapolating from 2002 onwards using population census 2001 and Nepal Living Standard Survey, 2010. On the other

hand, capital labor ratio, x_t, is defined as K_t / L_t where K_t is the accumulation of total investment at constant price but without adjusting depreciation. As initial capital stock is unknown, we accumulate total investment from 1974/75 to obtain the figure (Kharel, 2012).

The structure of financial system (s_t) is defined as the ratio of banking sector to (BS_t) capital market (NBS_t) development indicators. Following Arestis et. al. (2004) and Beck and Levine (2002), we employ market capitalization over GDP as the representation of capital market development (NBS_t). On the other hand, total assets of commercial banks, development banks and finance companies over GDP is considered to be a leading indicator of the banking sector development (BS_t). As literature debates on the measurement, we also consider the total loans and advances of same institutions as an alternative indicator of the banking sector development (Levine, 2002). Therefore, we define $s_t = s_t^1$ when BS_t is the ratio of total assets to GDP and $s_t = s_t^2$ when BS_t is considered to be the ratio of loans and advances of banking system over GDP.

Chart 1 and 2 depict historical trend of variables, which sow that capital output ratio has been accelerating over the years while per capita labor has increased at a very slow pace indicating the fact that the growth of investment is not encouraging in Nepal compared to the growth of labor supply. Regarding the financial variables, the ratio of total assets to GDP and total loans to GDP of the banking sector increased from 34.5 percent and 19.9 percent respectively in 1994 to 78.3 percent and 64.1 percent in 2011. The market capitalization ratio, which had been increasing at a slower rate in the first decade since 1994, followed by a bullish trend and reached to 52 percent of GDP in 2009. It then started declining thereafter, mainly due to a crash in housing market, among others.



The plot of variables shows that they are auto-correlated at level except for market capitalization which seems to be mean-reverting in the first few years followed by a bullish trend till 2009 and then declined thereafter (Chart 1 and 2). Table 1 shows the time series properties of variables which confirm that variables are stationary at the first difference. This gives us a strong basis for employing cointegrating vector error correction model as discussed in the previous section.

Table 1: Augmented Dickey-Fuller (ADF) Test for Stationary

Variables	Level		First difference	
	Constant	Constant and Trend	Constant	Constant and Trend
y_t	0.22	-1.64	-3.89*	-4.16*
x_t	0.90	-1.20	-3.13**	-4.85*
s_t^1	-0.62	-1.02	-3.09**	-4.73*
s_t^2	-1.52	-2.70	-3.92*	-4.58*

*Note: Critical values for rejecting the null hypothesis at 1%, 5% and 10% significant level are -3.88, -3.05 and -2.66 respectively. * and ** indicate that the variable is significant at 1%, and 5% respectively.*

We then proceed to test the number of cointegrating relationship among the variables used in the model employing the Johansen's test procedure as discussed in Eq. (7) and Eq. (8) (Johansen, 1992). In this process, choosing lag order (p) of variables is crucial for which the literature proposes a number of alternative procedures. But superimpose p =1 not just because we are using annual data but also because our sample size is not big enough to expand the lag horizon.

Table 2 demonstrates the test result of number of cointegrating vectors. The estimated $\lambda_{\max}(r/r+1)$ and $\lambda_{trace}(r/1)$ are reported in column 5 and 8 respectively. Likewise, critical values of $\lambda_{\max}(r/r+1)$ and $\lambda_{trace}(r/1)$ are reported in column 6 and 9 respectively. The motivation of selecting variables in this particular order corresponds to the literature.

Table 2: Johansen Maximum Likelihood Procedure (p=1)

Model	H_0	Eigen-values	**Maximal Eigen Value**			**Trace**		
			H_1	λ_{max}	critical value	H_1	λ_{trace}	critical value
y_t, x_t, s_t^1	$r=0$	0.78	$r=1^*$	24.38	21.13	$r\geq 1^*$	33.82	29.79
	$r\leq 1$	0.43	$r=2$	9.25	14.26	$r\geq 2$	9.44	15.49
y_t, x_t, s_t^2	$r=0$	0.81	$r=1^*$	26.46	21.13	$r\geq 1^*$	35.73	29.79
	$r\leq 1$	0.39	$r=2$	8.07	14.26	$r\geq 2$	9.26	15.49

*Note: r denotes the number of cointegrating vectors. The critical values are obtained from MacKinnon-Haug-Michelis (1999). *denotes rejection of the null hypothesis at 5%.*

Starting with the null hypothesis of no cointegration $(r=0)$ for a model with $s_t = s_t^1$, the null hypothesis of r = 0 is rejected at 5% level of significance in favor of at least one cointegrating relationship (r = 1) suggested by both $\lambda_{\max}(r/r+1)$ and $\lambda_{trace}(r/p)$ criteria. Both tests, however, accept the null hypothesis that r = 2 or $r\geq 2$. Likewise, both tests exhibit the same phenomena for a model with $s_t = s_t^2$. Hence, based on the empirical literature and econometric properties, we confirm that there exists unique cointegrating relationship (r = 1) for determining y_t in both model.

Table 3: Cointegrating Vector and Loading Factor

Model	Cointegrating Vector		Loading Factor
	β_{12}	β_{13}	(α_{11})
y_t, x_t, s_t^1	0.281 (0.023)*	0.119 (0.010)*	0.031 (0.008)*
y_t, x_t, s_t^2	0.215 (0.091)*	0.071 (0.013)*	0.022 (0.005)*

*Note: Figures within parenthesis are standard errors. * indicates that the coefficient is significant at 1 percent level.*

Table 3 reports the cointegrating vectors normalized to y_t. As expected, we obtain a positive sign with significant coefficient of β_{12} (which is similar to τ in Eq. 4) in both models. The loading factor (α_{11}) which is also known as the speed of adjustment is significant at 1 percent and takes the negative sign in the original model which confirms that both models are stable and robust. The speed of adjustment is, however, relatively faster in a model with $s_t = s_t^1$ compared to the speed of adjustment in a model with $s_t = s_t^2$.

The coefficient of financial structure (β_{13}) is the central focus of this study which is found to be positive and significant in both models. This implies that financial structure matters for economic growth in Nepal. More specifically, financial development led by banking sector is more acute for economic growth in Nepal in relation to capital market. One of the reasons for getting this finding could be the fact that capital market in Nepal is concentrated in the capital city which is overwhelmingly dominated by the banking sector. On the other hand, banking service is relatively more diversified and expanded beyond the capital city. Thus, in the present scenario, banking sector development outperforms the capital market led financial development in Nepal.

We also verify our estimate in number of ways. First, we use gross national product (GNP) as an alternative to GDP. In another estimate, total labor force is replaced by total population. Further, banking sector development is measured by total assets and alternatively claims on private sector of commercial banks which excludes development bank and finance companies. Nevertheless, empirical results using the above mentioned variables, and hence the main conclusion, is similar to the reported estimates[4].

V. CONCLUSION

This paper focuses on the long standing debate regarding the relative merits of bank vs. capital market-based financial system in promoting economic growth and examines this particular issue in the Nepalese context. Using Johansen's cointegrating vector error correction model based on annual data from 1993/1994 to 2010/2011; this paper concludes that financial structure matters for economic growth in Nepal. Particularly, our empirical result suggests that Nepalese banking sector is more growth enhancing relative to capital market. Our conclusion is consistent with the earlier findings of some other countries (Tadesse, 2001; Arestis et. al., 2001).

The main implication of our findings is that the policy should focus on banking sector development by enhancing products and service quality along with the expansion of its outreach. The policy should focus on banking sector development as it better promotes economic growth compared to capital market. The banking sector development does not necessarily mean the increment of number of banks and financial institutions, but it is the expansion in the outreach of their financial services and product in terms of quality as well as quantity. The insignificant impact of capital market on growth may be attributed to its size and poor linkage with the real sector implying that capital market should be further expanded to real economic activities so as to channelize its impact on growth.

The conclusion of this paper, however, should be analyzed cautiously as we are working on a small sample size. We may obtain a different result while working with a large sample size or when the real sector dominates the capital market in future. Further, the study can be extended by incorporating the data of other financial institutions like provident fund and insurance companies, which have been excluded in this study.

[4] The alternative estimates are not reported in this paper to save the space.

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Annex I: Concept of Financial Structure

So far as finance-growth nexus is concerned, 'financial structure' and the 'financial system' are two different concepts as they exert differential impact on economic growth. It has been conventionally agreed that financial system development and economic growth are positively linked. However, the impact of financial structure on economic growth has been a long standing debate. This paper is focused on examining the growth impact of financial structure rather than that of financial system development.

Financial structure is an institutional framework of any financial system which may be either bank-based or capital market-based depending upon the different economic and financial indicators. 'Financial structure' is the mixture of financial instruments, markets, and institutions operating in an economy (Goldsmith, 1969). Financial system, on the other hand, is a set of specialized organizations and institutions dealing with the transfer of payments and mediating the flow of savings and investment (Vitlos, 2001). While all industrial societies have such a specialized financial system, cross-national comparison of these systems indicates considerable structural diversity (Zysman,1983). One key difference is the degree to which financial systems are bank-based or market-based.

In bank-based systems, the bulk of financial assets and liabilities consist of bank deposits and direct loans. In market-based systems, securities that are tradable in financial markets are the dominant form of financial asset. Bank-based systems appear to have an advantage in terms of providing a long-term stable financial framework for companies. Market-based systems, in contrast, tend to be more volatile but are better able quickly to channel funds to new companies in growth industries (Vitols, 2001). In the bank-based system intermediation plays a key role while in a market-based system, fund is directly created through the market.

The market capitalization and the total banking sector credit in relation to the size of respective economy, as measured by GDP, are commonly used indicators for quickly examining whether a country's financial system is bank-based or market-based. A higher ratio of market capitalization to GDP (Mcap/GDP) compared to that of bank credit to GDP (Loans/GDP) indicates a more market-based financial system, while a higher ratio of bank loans to GDP compared to that of market capitalization to GDP indicates a bank-based financial system. Based on this, and other indicators (Levin, 2002), a number finance-growth analyses have put Japan and Germany under bank-based systems, and the U.S. and UK as market-based systems. Following this tradition, Nepal's financial system can be categorized under bank-based system.

Annex II (A) Sectoral Contribution to GDP (in percent)

Sectors	1980/81	1990/91	2000/01	2010/11
Agriculture	65	48	37	35
Industry	6	18	17	15
Service	29	35	46	50

Source: Central Bureau of Statistics

Annex II (B) Growth Rate of Real GDP (annual average, %)

Particulars	1990-2000	2001-2010
GDP	5.1	3.7
Agriculture	2.5	3.3
Non-agriculture	7.0	4.1

Source: Central Bureau of Statistics

Annex III: Key Indicators of Nepalese Financial System

Indicators	1994	2005	2011*
Banking Sector			
Number of Banks	62	180	272
Commercial Banks	8	17	32
Development Banks	2	26	87
Finance Companies	28	60	79
Microfinance Development Banks	2	11	21
Cooperatives**	9	20	16
NGOs**	13	46	37
Bank Assets/GDP#	35	73	78
Bank Credit to Private Sector/GDP#	20	54	64
Capital Market			
Number of listed companies	66	125	209
Paid-up value of listed shares (NRs. in billion)	2.2	16.8	101.3
Market Capitalization (NRs. in billion)	13.9	61.4	302.1
Market Capitalization/GDP	7	10	24
NEPSE Index	226	286.7	331

** As of October, ** Licensed by NRB for limited banking, # Includes Commercial Banks, Development Banks and Finance Companies*

Source: Quarterly Economic Bulletin, Mid-Oct. 2011, Nepal Rastra Bank, Central Bureau of Statistics

Annex IV: Measurement and Source of Variables

Variables	Definition	Data Source	Measurement
Y_t	Gross Domestic Product (GDP) at 2000/01 price	Economic Survey 2011	Rs. in million
K_t	Capital stock at constant price. The capital stock is obtained accumulating the investment without adjusting depreciation from 1974/75 onward.	Economic Survey 2011	Rs. in million
L_t	Total labor force – interpolated from population census and Nepal Living Standard Survey (NLSS) as time series data on labor force is unavailable.	Population census (1991 and 2001) and NLSS, 2010	Number
y_t	Output labor ratio (Y_t / L_t)	Self computation	Ratio
x_t	Capital labor ratio (K_t / L_t)	Self computation	Ratio
s_t	Financial structure defined as the ratio of banking sector (BS_t) over capital market (NBS_t) development indicators	Self computation	Ratio
BS_t	Total assets of banks/GDP*100. Alternatively, it is defined as Total loans and advances of banks/GDP*100. Banks include commercial banks, development banks, finance companies, agriculture development banks and Nepal Industrial Development Corporation.	Self computation based on information available at Quarterly Economic Bulletin and Economic Survey, 2011	Ratio
NBS_t	Market capitalization/GDP*100	Self computation based on data available at Quarterly Economic Bulletin and Economic Survey	Ratio

Source: (a) Population Census, 1991 and 2001, Central Bureau of Statistics (b) Quarterly Economic Bulletin 2011, Nepal Rastra Bank, and (c) Nepal Living Standard Survey 2010, Central Bureau of Statistics