Impact of Financial Policy Reforms on Financial Development and Economic Growth in Nepal

Bhim Prasad Bhusal
Graduate School of Economics
Kyushu University
6-19-1 Hakozaki, Higashi-ku, Fukuoka, 812-8581
Japan

Abstract

This paper attempts to analyze the impact of policy reforms on financial development and economic growth in Nepal by employing the annual data spanning from 1965 to 2009. Based on the Augmented Dickey Fuller test and exogenous break test we examine the impact of policy reforms. Findings tell that all variables except domestic credit are non-stationary at the level. When time series properties of variables that help to detect the impact of policy reforms are examined with a structural break, only economic growth experienced a shock, growing positively after the liberalization. Similarly, domestic credit provided by banks experienced negative growth, and it decreased in pace after policy reforms, which implies that the role of government declined after the liberalization. However, there is no impact of policy reforms on some of the indicators. Some problems in the banking sector, such as inadequate expansion of commercial banks and their branches in the rural non-monetized sector, non-performing loans that discouraged credit allocation, and so on, may be the reasons policy reforms for financial development were ineffective.

Key Words: Financial development, Reform policies, Economic growth, Unit root test, Exogenous break test

JEL Classification: G20, G28, O40

1. Introduction

Nepal began to eliminate regulatory policies present in the financial and economic system and started to liberalize different sectors (such as financial, foreign trade and public enterprises) of the economy from the mid of 1980s (Shrestha and Chowdhury, 2006). The primary objective of liberalization was to minimize the role of government in the economy by increasing the private sector's role in stimulating economic growth. Some important financial indicators, such as liquid liabilities, and credit supplied by banks to the private sector have increased tremendously since liberalization. In addition, institutional development is also very much noteworthy. Also, the central bank of Nepal has implemented various reform policies to develop the financial system, especially, from 1980s. The main targets of implementing the policy reforms are to develop the financial system and promote economic growth. Therefore, it is necessary to investigate the impact of those policy implementations on financial development and macroeconomic variables.

Considering these facts, this paper focuses on estimating the impact of policy reforms on financial development variables and the macro-economy by utilizing unit root test and a structural break test. Testing the properties of a series such as unit root and presence of structural breaks are important steps therefore; it is worthwhile to discuss the model which will be employed to examine the stationarity and structural breaks of the variables. Meanwhile, explaining the causes of implementing policy reforms and causes of break occurrence is also another important step. To this end, highlighting the financial policy reforms is also vital.

I am grateful to Professor Kenji Iwata, Professor Hitoshi Osaka and the two anonymous reviewers of this journal for their valuable comments and Barassou Diawara and Priyanga Dunusinghe for their useful discussions. Besides, I also thank the participants (especially, N.S. Cooray) to the Japan Association for Applied Economics (JAAE) conference, Nagoya, Japan held on 25-26 June 2011 where an earlier version was presented. This research is supported by the Ministry of Education, Culture, Science and Technology (MEXT) of Japan.

The Unit Root test allowing for the possibility of existence of structural breaks provides valuable information on analyzing whether a structural change in macroeconomic variables is associated with the economic crisis, international shock, government policy implementation, or other factors. For this purpose, we employ the Perron (1989) exogenous break test for the case of Nepal.

To examine the stationarity properties of data, we employ the Augmented Dickey Fuller (ADF) test. However, existence of shocks leads to bias and it lowers the ability of rejecting the unit root test of the macroeconomic variables related to financial development variables and economic growth (Perron, 1989). To account for this problem we employ the unit root test with structural breaks in the data. By utilizing these methodologies we try to observe whether policy implementation from 1984 in the Nepalese economy could change the trend of macroeconomic variables. This research can be an important addition in the literature of finance growth relationship in Nepal because impact of policy reforms, especially on financial development, has not yet been investigated in such a deep way employing the structural break test.

To achieve the aim of this paper, unit root tests are employed to identify the nature of data and to investigate the impact of policy reforms on the macroeconomic variables on two grounds. First, the unit root test is performed assuming the absence of a structural break, then with a structural break. Then, while testing the unit root with structural break, we will test the impact of reformed policy implementations in the data.

The rest of the paper is organized as follows. The second section discusses the reform policy implementations for financial sector development and the third one briefly reviews the literature concerned with the relationship between financial development and economic growth and unit root tests. The fourth section deals with the data and methodology, while the fifth one briefly describes the impact of financial policy implementations resulted from empirical estimation and last section concludes.

2. Policy reforms implementation for financial sector development

Nepal has gradually experienced a series of economic reform measures since the mid 1980s. The reform measures have resulted in a widening and deepening of the financial system both in terms of the volume and the nature of financial business (Poudyal, 2005). Policies were introduced to reduce the high extent of government participation in the economy with private sector investment only after 1984. In addition, this decade is important for financial development because the government implemented several policies to ease private sector participation in the economy.

During the 1980s, Nepal needed to increase financial sector activities for economic growth and development. The existing situation prevailed in a highly controlled financial system through some direct policy measures by the central bank with the suggestion of government that the resisted private sector in order to take part in development activities. The entire financial sector was comprised of two government owned commercial banks, two development banks and some insurance companies (Nepal Rastra Bank; NRB hereafter, 2010). Hence, opening up the financial sector to private sector investment and decontrolling of the system seemed essential. The central bank and government started to liberalize the system through the adoption of free entry policy for banks and financial institutions. Then, first joint venture commercial bank Nabil Bank Ltd. was established in 1984. And, this bank played an important role to modernize banking services through technology transfers and to introduce managerial skills (Pant, 2009).

The central bank took steps to deregulate the financial system which constrained the banking sector to function freely in the market. In the first step of deregulation, the monetary authority removed existing entry barriers of banks and other financial institutions that could ease private sector to enter into the market. Opening up of a joint venture bank called Nabil Bank in the same year of policy reforms implementation was a result of liberalization. With the objective of promoting healthy competition among banks, the Commercial Bank Act-1974 was amended in 1984. Removal of entry barriers aimed at attracting private sector's investment in the commercial banking industry as well as attracting private joint venture banks with foreign collaboration. And, the entry of such types of joint venture banks was expected to bring more foreign capital and technical know-how, modern banking skills to domestic banks, and, widen and deepen the national financial structure (Acharya *et al*., 1998). Following the amendment of the Act, joint venture banks started to enter into the financial system. In 1985, the Finance Companies Act was enacted in order to allow finance companies to work in the financial system with the objective of serving small borrowers and meeting the demand for consumer credit.

This Act was amended in 1992. After the 1992 Act many financial companies came in the market and by 2009 the number of financial companies grew to 78 (NRB, 2010).

During the mid 1980s, macroeconomic imbalance reached to peak due to the unstable fuelling of inflation, due to adoption of expansionary monetary and fiscal policies, BOP imbalances on current account and trade imbalances. This led Nepal to adopt a stabilization program in 1985 that was followed by the Structural Adjustment Programs (SAPs) in 1987 (Osmani and Bajracharya, 2008). Then SAPs sped up liberalization activities with the help of the IMF. This program emphasized to increase the role of market activities in the financial system. One action of it was to introduce regular auction of treasury bills. The purpose of initiating treasury bills was not only to attract commercial banks to invest in bills but also was to bring flexibility in interest rate structures. Similarly, in 1988 a study called Commercial Bank Problems Analysis and Strategy Study (CBPASS) was held with the guidance of the IMF under SAPs to improve the financial conditions and organizational structure of two state owned commercial banks, NBL and RBB. Nepal entered to Enhanced Structural Adjustment Programs (ESAPs) in 1992 because SAP improved the activities of market forces (Pant, 2009).

In the changing financial environment, the central bank realized the need of development banks for development activities. For this, Agriculture Development Bank was allowed to carry out commercial bank activities since 1984 (Khatiwada, 1994). Consequently, such activities played an active role in mobilizing urban resource to lend in the undeveloped agricultural sector. The liberalized system mainly emphasized to mobilize the savings in investment activities. One of the actions relating to it was the establishment of Citizen Investment Trust (1991). Currently this trust is working to mobilize contractual savings. Similarly, the existence of non-monetization and lack of credit availability in the rural sectors were the problems noticed by the central bank and the government at that time. In the meantime, the concept of the Gramin Bikash Bank became popular to mobilize credit in rural areas. Therefore, these two factors have brought the idea of establishing the Regional Rural Development Banks (1993) to ultimately enhance accessibility of formal credit to rural people. Now, these banks are working under Development Bank Act -1996.

The credit control measures imposed before liberalization were gradually removed after liberalization, and commercial banks were left freer to allocate credit. For instance, the central bank removed the provision of Statutory Liquidity Ratio (SLR) in 1997, which stipulated until that time commercial banks had to maintain at a certain percentage of assets in the form of government securities and cash reserve ratio. It was rendering the lending capacity of commercial banks. The NRB Act 2002 made NRB more independent to execute its policy to ensure an efficient and healthy financial system through its prudential regulatory and supervisory mechanism. The central bank with the guidance of government imposed lending requirements to the private sector commercial banks. This provision was phased out from 2007.

Therefore, the importance of implementing financial liberalization policies cannot be disregarded, and testing the impact of these policy measures in the macroeconomic variables is also an important concern. More importantly this study tries to bridge the gap of non-availability of quantitative research on the impact of policy reforms on financial development and economic growth in Nepal.

3. Motivation and relation with the previous studies

Financial development consists of the development of financial intermediary, its expansion and reforms. And it is mainly proxied by credit supplied by financial intermediaries, liquid liabilities, their institutional expansion, and so forth in the finance growth literatures. Therefore, these proxy variables for the financial development are used as growth determinants in the growth literatures. In addition, recent literature assumes that financial liberalization is also an important factor of financial development because it magnifies the level of financial development and contributes to the economic growth (King and Levine, 1993). Hence, financial liberalization can also be a promoter of financial development. This section tries to shed light on the literature concerning the financial development and the economic growth.

The process of liberalization also has a key role in financial development and the economic growth. This process reduces the short run convergence speeds, implying that open economy should spread out significantly with less output volatility, but also longer transitions (Eicher and Hull, 2004). Interest rate deregulation is a main characteristic of liberalization policy. Therefore, the liberalization policy lets the market determine the rate of interest freely.

When financial intermediaries determine their rates under free competition it helps to raise the level of domestic savings. An increase in savings implies the increase in the level of investment and disposable income of the economy. Ultimately, it promotes economic growth. In addition, the rate of interest affects the real sector of the economy because financial liberalization allows foreign aid inflows which could have an important role to mitigate the crowding out effects of interest rate deregulation without declining the level of government investment (Gupta and Lensink, 1996).

Recent literature tries to identify the presence of shocks in time series data are becoming more crucial because the presence of shocks can have a permanent effect on economic trends. These shocks can cause a low power of ADF test and fails to reject the null of unit roots (Perron, 1989). Perron proposes three models with breaks and conducts Monte Carlo simulation methodology to detect the effect of shocks. From his findings he argues that with a significant structural shift and using the ADF test, rejection of unit root hypothesis is probably rare.

Kim *et al*. (2009) used time varying coefficient cointegration model to test cointegration structural shock for purchasing power parity of South East Asian currencies and to check shocks on it over the time. Their findings conclude that a major structural break occurred at the outbreak of the Asian currency crisis in 1997. Marotta (2009) employed the multiple unknown break test in Economic and Monetary Union (EMU) countries. He concluded that the pattern of date fits national banking systems adjusting slowly to the new monetary regimes and introducing Euro can have structural change. Romero-Avila (2009) investigated unit root hypothesis for per capita real GDP in 46 African countries under the panel techniques over the period 1950-2001. This analysis provides the evidence of regime-wise trend stationarity which rejects the null of unit root hypothesis. Similarly, it has been identified that most breaks are associated with the terms of trade shocks. Lee and Chien (2008) examine the issue of whether policy regime changes have broken down the long run relationship between tourism development and economic growth process of Taiwan during 1959-2003. They find that the variables taken in the regression have experienced shocks. Accounting for these shocks is essential to establish cointegration relationship between tourism development and economic growth of Taiwan.

Cross-country analyses employed to predict the effects of financial development on economic growth[1]that suffer from some shortcomings such as lack of appropriate accounting for the problem of heterogeneity in the system; difficulty in accounting for the long run relationship of the system. Therefore, individual country analysis based on time series is more important. The activities relating to financial system development have speeded up after the liberalization. In the early year of financial liberalization (i.e., in 1984), entry barrier for financial intermediaries in the financial system were removed and banks were allowed determining their rates partially by themselves (Bhetuwal, 2007).

Some researchers try to shed light on the impact of financial development on economic growth of Nepal. Since the speed of financial development and process of liberalization are not same in all countries (Rajan and Zingales, 2003), the degree of financial liberalization differs across the year. To measure the extent of liberalization within the countries or inside the country across the years, some researches constructed a financial liberalization index (FLI). Shrestha and Chowdhury (2006) constructed financial liberalization index for Nepal based on principal component methods. This index represents eight major financial liberalization components[2] and it examined the extent of financial liberalization during 1984 to 2005 and the degree of liberalization in Nepal was highest during 1984-19994.

Bhetuwal (2007) followed a way of testing the causality between financial development and economic growth of Nepal. He constructed a financial liberalization index to capture the policies implemented for liberalization and found a unidirectional causality from financial liberalization to financial development at 5 percent level of significance and bidirectional relationship at 10 percent level of significance. He argues that financial development is caused by policy changes in the financial sector and largely dependent on the demand for financial services. Therefore, the simultaneous growth of all sectors can raise more demand of financial services that stimulate financial development. There are very few studies related to the impact of financial liberalization policy and its implication in the Nepalese economy.

[1] See for example King and Levine, 1993; Odedokun, 1996.

[2] Their index includes; interest rate deregulation, pro-competition measures, reserve requirements, directed credit, bank's ownership, prudential regulation, stock markets and international financial liberalization

Khatiwada and Sharma (2002) focused on the impacts of these policies in relation with factor productivity growth during 1981 to 2000, in which they found the policy dummy is insignificant with the growth variable. This study still falls some sorts of limitations. First, the study period is limited to only 20 observations which are not sufficient to see the policy impact. Secondly, this study focuses on testing the impact on the level shift but does not test the impact on the growth of the variables. Finally, policies were implemented from the mid of 1980s not only from 1990s, setting the dummy for 1990 through 2000. Assuming the policy implementation year 1990 also contradicts itself because Shrestha and Chowdhury (2006) found that the extent of policy implementations were higher during 1984 to 1994. Therefore, this study takes a step towards investigating the impact of liberalization policy implementation in financial development variables and macro economy of Nepal from the start of policy implementation through 2009.

4. Data and methodology

4.1 Data

To examine the time series properties of economic growth and financial development variables, unit root tests and structural break test are employed. Data are extracted from the World Bank online database. Three indicators of financial development are selected for testing unit root test in the absence of structural breaks and in the presence of structural breaks. Among them one is liquid liabilities of the banking system which is represented by broad money (M2) represented by BM. Goldsmith (1969) and McKinnon (1973) referred it as a size of financial intermediary that measures the level of financial development. This variable proportionally relates to the accessibility of financial services. More specifically, liquid liabilities represents the pure size of the financial system (King and Levine, 1993). Another important indicator of financial development is domestic credit provided by banks (DCBS). It includes credit allocated by banks to the government and public enterprises. In the environment of the increasing role of the private sector, the financial system is an important source of borrowing for the private sector. In addition, financial system selects better projects, implements measures of risk pooling, and evaluates the managerial skills by funneling credit to the private sector rather than funneling credit to government and public enterprises (King and Levine, 1993). Therefore, credit provided by banks to the private sector (DCPS) can be a good proxy for financial development. And, log of real GDP is taken as a proxy for economic growth in this study. Data are also extracted from Nepal Rastra Bank and previous research to provide evidence for some results.

4.2 Unit root properties of variables without the presence of structural breaks

In the first step of time series analysis, we check the stationarity of the variables. Stationarity, generally, is an essential test for time series data and any series is said to be stationary if it has time invariant mean and variance. This test examines the order of integration of data in the long run. If the series is non-stationary and its first difference is stationary, it is said to have a unit root in its characteristic equation. The commonly used method to test the presence of unit roots is Augmented Dickey Fuller (ADF) test and it can be tested by using the equation;

$$y_t = \alpha + \beta t + \rho y_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta y_{t-i} + \epsilon_t \qquad (1)$$

where, ϵ_t = white noise error term, k= lag length and the optimal lag length can be determined by using Akaike information criteria. The null hypothesis for unit root is $\rho = 1$ against the alternative hypothesis of $\rho < 1$. The non-rejection of the null hypothesis implies that the series is non-stationary and the rejection of the null hypothesis implies the time series is stationary.

4.3 Unit root properties of the variables in presence of structural breaks

The ADF unit root test assumes that the shocks have a temporary effect and the long run movement in the data is not changed by those shocks. But, Perron (1989) reported that a time series cannot perform stationarity if any structural change is found in the sample period because unit root with breaks may lose the power of rejecting the null hypothesis of unit root test. Challenging the ADF test Perron argues that the presence of structural break in the data, the ADF tests are biased towards the non-rejection of the null hypothesis of unit roots.

Perron (1989) test is characterized by a single known (exogenous) break. This method concerns to the modified ADF test. And, it includes dummy variable to account for known break. According to this test method, three models can be used to test the unit root in the sample of time series data.

The first model allows for a break in the level of the series (model A) whereas second and third allow a break in slope (model B) and break in both intercept and slope (model C) respectively.

$$y_t = \alpha_0^A + \alpha_1^A DU_{TL} + \beta_t^A + \delta^A (TB)_t + \rho^A y_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta y_{t-i} + \epsilon_t \quad (A)$$

$$y_t = \alpha_0^B + \alpha_1^B DU_{TL} + \beta_t^B + \mu^B DU_{TS} + \rho^B y_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta y_{t-i} + \epsilon_t \quad (B)$$

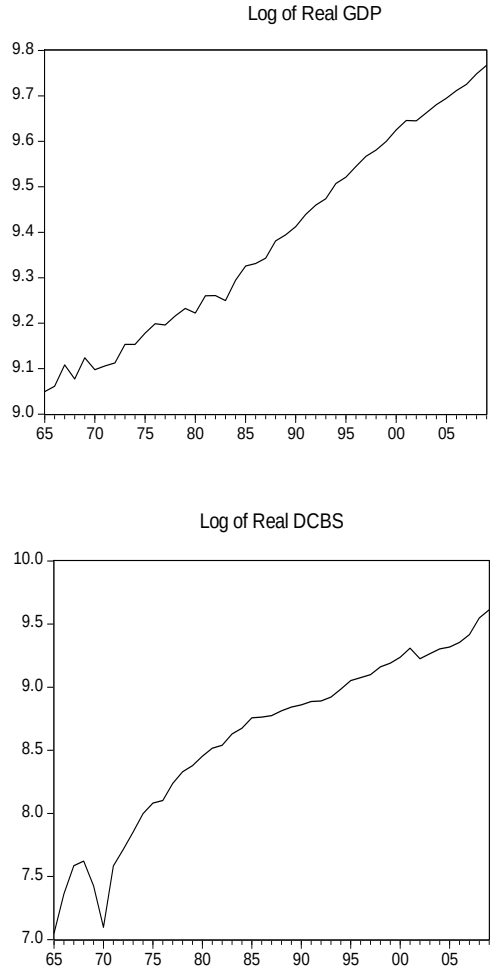
$$y_t = \alpha_0^C + \alpha_1^C DU_{TL} + \beta_t^C + \delta^C (TB)_t + \mu^C DU_{TS}^* + \rho^C y_{t-1} + \sum_{i=1}^{k} \gamma_i \Delta y_{t-i} + \epsilon_t \quad (C)$$

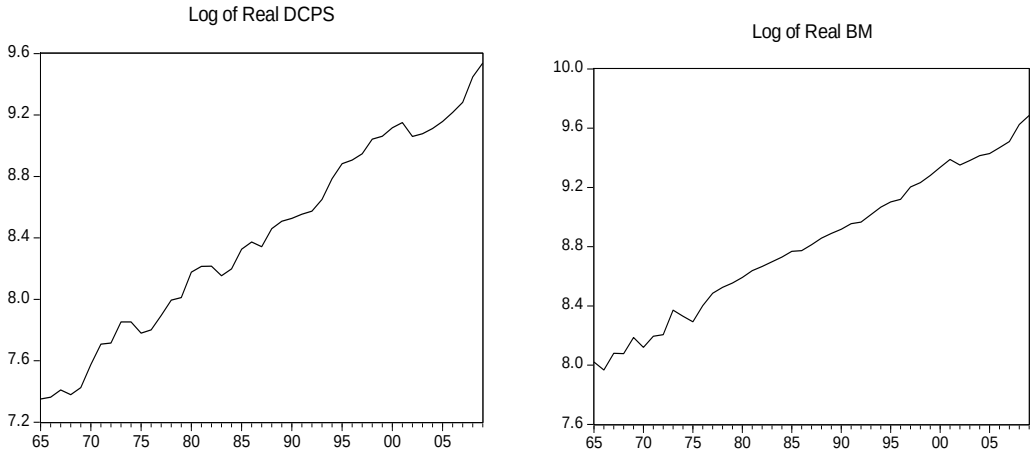
where, y_t is the variable of interest (financial development variables such as broad money, domestic credit by the banking sectors, domestic credit provided by banks to private sector and economic growth variable), DU_{TL} is an intercept dummy and it represents the changes in the level for a change occurring at exogenously determined break data (TB) and DU_{TL} =1, if t>TB and, 0 otherwise, DU_{TS} (slope dummy) = changes in slope = t if t > TB and, 0 otherwise and DU_{TS}^* = t - TB. Each of the three models has unit root with break under the null hypothesis.

5. Estimation of the model and analysis of the results

5.1 Graphical representation of data

Figure 1. Variables in Level





Graphs representing the level data are presented in figure 1. Most of the data are fluctuating more in the pre-liberalization period than in the post liberalization period. The proxy for economic growth represented by log of real GDP also shows the same trend. Figure 1 also indicates that all indicators have same trending behavior. Similarly, the series are trending more sharply in the post liberalization than in the pre-liberalization period. Whether the trending data are stationary or non-stationary could be detected by an ADF test. Further, the violation of an ADF test due to the presence of structural breaks could be analyzed by using the Perron exogenous break test in the following sub-section.

5.2 Unit root and financial development and economic growth

In order to examine the time series characteristics of financial development and economic growth variables, first the ADF test method is employed in the annual data ranging from 1965 to 2009. The null hypothesis for the test is that the variables contain a unit root and the alternative hypothesis is the variable is stationary. Results from the ADF test in level are presented in table 1. This test is performed using two models; with constant and with constant and trend in level data. First, we apply the ADF test for real GDP; none of the t-statistics is significant at the conventional level of significance. This indicates that log of real GDP as a proxy for economic growth is non-stationary. Similarly, the unit root test without structural breaks are employed to financial development variables such as domestic credit provided by banks, credit to the private sector and liquid liabilities proxied by broad money. These variables also show the non-stationarity except few cases of domestic credit supplied by banks and liquid liabilities. Data are annually presented and the number of observations is small. Therefore, we employed the unit root test until lag 3 to prevent from loss of information.

One can consider that the economy and the macroeconomic variables of Nepal could be subjected to regime shifts, such as financial policy regimes in 1984. And the presence of breaks in the time series data, the conventional ADF test is biased to the acceptance of unit root test (Perron, 1989). Therefore, it seems reasonable to test unit root in presence of shocks in the context of Nepalese economy. The next section tries to address the structural breaks test and unit root.

Table 1. ADF tests for unit root

***Variables* (in level)**	***Model*↓*(k)*→**	***1***	***2***	***3***
Real GDP	Intercept	1.210	2.083	1.340
	Trend & Intercept	-1.899	-2.885	-2.323
Domestic credits provided by	Intercept	-1.230	-1.127	-1.424
banks(DCBS)	Trend & Intercept	-2.330	-1.616	-1.221
Domestic credit provided by banks to the	Intercept	-0.176	-0.174	-0.605
private sector (DCPS)	Trend & Intercept	-3.761***	-3.273***	-4.048***
Broad Money (BM)	Intercept	-0.133	0.125	-0.243
	Trend & Intercept	-3.415**	-3.328**	-2.203
	for Model	1%	5%	10%
Critical Values	Intercept	-4.199	-3.524	-3.193
	Trend & Intercept	-3.601	-2.935	-2.606

Note: ***,** and * represent the level of significance at 1%, 5% and 10% respectively.

5.3 Impact of policy reforms on financial development and economic growth: results from estimation and discussion

Following to Perron (1989), an exogenous one break test is employed assuming that there is a break in 1983. Figure 1 shows that there is a high drop in real GDP in the year 1983. There are some reasons to believe the Nepalese economy experienced a shock in the 1980s. In the early 1980s, macroeconomic imbalances were created due to high budget deficit caused by higher investment in public enterprises. Similarly, the economy faced the problem of low revenue collection and high balance of payment deficit. Then economy faced a series of macroeconomic crises which resulted in low level of GDP growth (Khatiwada and Sharma, 2002). In 1983 the agricultural value added declined to -1.08 percent from 4.6 percent that of 1982. Similarly, the current account deficit increased to 5.9 percent from 3.6 percent in 1982. As a result there was a high drop in economic growth in 1983. In this year, aggregate GDP growth dropped to -2.9 percent from 3.8 percent in 1982[3]. To stabilize the economic system government took the efforts and actions by starting to implement reform policies in the economy. Therefore, reform policy implementation was the first step for liberalization. The major objective of this step was to achieve high economic growth through encouraging the private sector, reducing the role of government. It was also realized that the private sector could be involved through liberalizing the different sectors of the economy. Therefore, financial policy reforms were introduced after the crash in the economy i.e., after 1983.

The government implemented a number of policy reforms in the different sectors of the economy (such as the financial sector, foreign trade sector, public enterprises and so on) to increase private sector participation. Similarly, to include the private sector in the economy some deregulations were essential. Therefore, the government removed entry barriers of banks and other financial institutions in 1984 and interest rate partially deregulated from the same year. Especially the year 1984 is well known for the year of initiating financial policy liberalization in Nepal.

Structural change in the macroeconomic variables is an important issue in the time series analysis because the presence of shocks due to economic crises, policy changes, political changes, international shocks and so on can change the nature of data. Diagnosis of such shocks associates with the unit root test. Since the presence of structural change may be biased for the non rejection of non-stationarity, if some specifications are not followed (Perron, 1989). The financial policy implementations from 1980s as described in section two can suggest that there may be the possibility of presence of structural break in economic growth, banking and monetary variables. In this analysis number of observations is small and it is difficult to obtain coincided break date using different unknown break tests. Therefore, we cannot use unknown as well as multiple structural break tests. In this regard, one exogenous break test (Perron, 1989) is appropriate test that consists of determining the existence of a break in the data. It can be used to test not only a break but also is appropriate to test the impact of economic crises, policy shifts on variables and is useful to test their nature aftershocks. This model assumes one time change either in the intercept or in the slope of trend function or one time change in both trend and slope. The level of significance of t-statistics for ρ is evaluated by using Perron (1989). The test results using these three models are reported in Table 2, Table 3 and Table 4.

[3] Data are extracted from WDI online.

Table 2. Test of unit root and structural break: ***Model A***

Coefficients	*k*	*GDP*	*DCBS*	*DCPS*	*BM*
α_0^A	1	1.350(1.359)	1.782**(2.279)	3.511***(3.717)	5.218***(3.310)
	2	2.108**(2.265)	1.214(1.395)	3.622***(3.194)	5.888***(3.165)
	3	1.811(1.624)	0.750(0.802)	4.789***(3.987)	3.924*(1.878)
α_1^A	1	0.004(0.442)	0.011(0.156)	-0.023(-0.681)	-0.019(-0.839)
	2	0.005(0.509)	-0.020(-0.270)	-0.022(-0.634)	-0.016(-0.678)
	3	0.005(0.505)	-0.053(-0.697)	-0.023(-0.701)	-0.024(-1.074)
β^A	1	0.003(1.315)	0.010**(2.019)	0.024***(3.749)	0.025***(3.372)
	2	0.004**(2.223)	0.007(1.327)	0.025***(3.242)	0.028***(3.243)
	3	0.004(1.574)	0.004(0.763)	0.032***(3.973)	0.019*(1.941)
δ^A	1	0.006(0.366)	0.031(0.274)	0.019(0.314)	0.022(0.560)
	2	-0.003(-0.207)	0.028(0.243)	0.019(0.315)	0.026(0.657)
	3	-0.001(-0.050)	0.034(0.295)	0.027(0.470)	0.021(0.535)
ρ^A	1	0.851(-1.340)	0.769(-2.198)	0.520*(-3.679)	0.347(-3.278)
	2	0.767(-2.241)	0.847(-1.304)	0.504(-3.152)	0.261(-3.137)
	3	0.800(-1.605)	0.914(-0.679)	0.341**(-3.937)	0.513(-1.836)

Note: ***,** and * represent the level of significant at 1%, 5% and 10% respectively. Values in the parenthesis represent the t-statistics. The Critical values of t-statistics for ρ (Perron, 1989) are -4.34, -3.72and -3.44 at 1%, 5% and 10% level of significance respectively.

In model A (Table 2), one time shock is assumed in its intercept and α_1^A represents the coefficient of post break dummy. In this model α_1^A for none of the variable is significant. Our major concern is ρ. Coefficient of year dummy δ^A is also not significant in the model. Perron (1989) found that non-stationary data under ADF test were trend stationary after accounting the break. Here only the banking credit to the private sector gives the weak evidence of trend stationarity in lag one and lag three, but all other variables do not provide the evidence of trend stationarity.

Model B (Table 3) allows one time break in the slope of each function of the variable. This is used to explain whether the financial policy shifts were significant enough to have an impact on macroeconomic and financial variables used in the sample. The slope dummy for real GDP is positive and significant in lag one and lag three at least 10 percent level of significance. This implies that real GDP is growing positively in the post liberalization period. The null hypothesis of a unit root for GDP cannot be rejected at the conventional level of significance. The domestic credit supplied by banking sector is characterized more differently than other indicators.

Table 3. Test of Unit root and structural break: ***Model B***

Coefficients	*k*	*GDP*	*DCBS*	*DCPS*	*BM*
α_0^B	1	5.509***(2.948)	5.915***(5.359)	3.769***(3.849)	6.683***(3.652)
	2	4.651**(2.356)	7.483***(5.598)	3.912***(3.345)	8.601***(4.045)
	3	5.097**(2.306)	10.218***(6.452)	4.907***(3.901)	6.406**(2.496)
α_1^B	1	0.005(0.557)	0.006(0.115)	-0.032(-0.916)	-0.028(-1.240)
	2	0.003(0.296)	0.003(0.065)	-0.033(-0.900)	-0.029(-1.332)
	3	0.002(0.163)	0.004(0.087)	-0.025(-0.729)	-0.034(-1.510)
β^B	1	0.007**(2.842)	0.073***(5.080)	0.028***(3.514)	0.035***(3.526)
	2	0.007**(2.611)	0.098***(5.624)	0.029***(3.146)	0.046***(4.026)
	3	0.007**(2.373)	0.141***(6.595)	0.034***(3.366)	0.035**(2.517)
μ^B	1	0.004**(2.476)	-0.044***(-4.559)	-0.003(-0.882)	-0.004(-1.561)
	2	0.003(1.462)	-0.062***(-5.363)	-0.003(-0.908)	-0.007**(-2.329)
	3	0.003*(1.689)	-0.091***(-6.505)	-0.002(-0.429)	-0.005(-1.648)
ρ^B	1	0.391(-2.938)	-0.158***(-5.310)	0.481*(-3.801)	0.157(-3.619)
	2	0.485(-2.350)	-0.079***(-5.573)	0.460(-3.301)	-0.090**(-4.020)
	3	0.436(-2.298)	-0.492***(-6.427)	0.323*(-3.828)	0.191(-2.463)

Note: ***, ** and * represent the level of significant at 1%, 5% and 10% respectively. The values in the parenthesis represent the t-statistics. The Critical values of t-statistics for ρ (Perron, 1989) are -4.55, -3.94and -3.66 at 1%, 5% and 10% level of significance respectively.

First, the negative and significant coefficient of slope dummy implies that the growth of domestic credit has been reduced significantly after liberalization. Since this includes the part of credit supplied to the government and public enterprises, the decrease means that the role of government fell after liberalization because the government aimed at reducing its role in the economy through implementing the liberalization policies. Similarly, the government emphasized the privatization of public enterprises so that the state's responsibility to the public enterprises has gone down. Secondly, this variable is trend stationarity while accounting for a break. Policy reforms in the banking credit to the private sector (DCPS) was expected to have positive influence; however, results show the non significance of the slope of DCPS this implies there is not significant growth of credit supply to the private sector in the liberalization period.

In one case, broad money is decreasing after liberalization. This produces a controversy in the financial development argument because in general if financial intermediaries in the system develop excessively people have more chance to access financial instruments that increases the level of broad money. We could not achieve the positive growth of broad money as expected in this analysis; however, there is no such evidence as well as strong evidence of negativity.

Model C allows a change in intercept and in slope of the trend function together. The objective of policy changes is not only to shift level of the economic indicators but also is to change their growth path. Therefore, the impact of policy changes can be achieved through the change in the slope of the variables. When a break is allowed to the level of GDP it has reduced significantly but the slope of the function has increased. The break date is insignificant in all cases. Similarly, in the model B, there is a significant reduction in the domestic credit after introducing policy reforms and credit to the private sector could not increase as expected because government targeted to the private sector for its participation in the economy promoting credit through the banking sector. Another important indicator of financial development called broad money shows reduction in its growth after reform policy implementation. This also contradicts our expectation.

Table 4. Test of unit root and structural break: ***Model C***

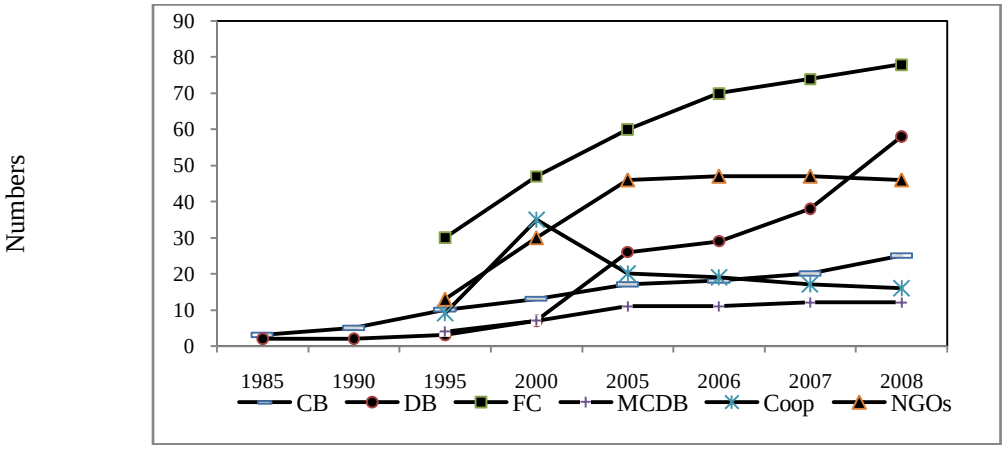
Coefficients	***k***	***GDP***	***DCBS***	***DCPS***	***BM***
α_0^C	1	4.227***(3.936)	2.884***(3.247)	3.425***(3.397)	6.578***(3.684)
	2	4.610***(4.678)	2.364**(2.384)	3.514**(2.897)	8.000***(3.863)
	3	4.317***(3.851)	1.809*(1.713)	4.464***(3.619)	5.811**(2.415)
α_1^C	1	-0.032**(-2.726)	0.169*(1.750)	-0.029(-0.703)	0.009(0.321)
	2	-0.029**(-2.557)	0.139(1.359)	-0.029(-0.665)	0.024(0.811)
	3	-0.028**(-2.398)	0.095(0.891)	-0.050(-1.232)	0.007(0.240)
β^C	1	0.006***(3.195)	0.028***(3.045)	0.023***(2.905)	0.033***(3.642)
	2	0.007***(4.085)	0.025**(2.534)	0.023**(2.506)	0.041***(3.898)
	3	0.006***(3.163)	0.021**(2.040)	0.027***(2.948)	0.030**(2.481)
δ^C	1	-0.008(-0.583)	0.047(0.427)	0.019(0.308)	0.028(0.717)
	2	-0.012(-0.886)	0.048(0.435)	0.019(0.299)	0.036(0.939)
	3	-0.010(-0.680)	0.053(0.482)	0.025(0.422)	0.030(0.774)
μ^C	1	0.003***(4.190)	-0.011**(-2.257)	0.001(0.271)	-0.002(-1.531)
	2	0.002***(4.094)	-0.011**(-2.118)	0.001(0.276)	-0.003**(-2.010)
	3	0.002***(3.973)	-0.010*(-1.914)	0.003(1.096)	-0.003(-1.501)
ρ^C	1	0.534(-3.9089	0.605(-3.200)	0.532(-3.330)	0.172(-3.653)
	2	0.490**(-4.649)	0.675(-2.349)	0.520(-2.831)	0.011(-3.753)
	3	0.523(-3.821)	0.755(-1.660)	0.390(-3.531)	0.270(-2.381)

Note: ***, ** and * represent the level of significant at 1%, 5% and 10% respectively. The values in the parenthesis represent the t-statistics. The Critical values of t-statistics for ρ (Perron, 1989) are -4.81, -4.22 and -3.95 at 1%, 5% and 10% level of significance respectively.

This estimation provides mixed results on the impact of policy changes on financial development and economic growth. Financial development variables are not strongly influenced by policy reforms whereas economic growth has been influenced. Liberalization helped to spread the financial system from urban to rural areas. After liberalization, the market was highly defined by new non bank financial institutions, new banks, branches of new and old commercial banks, development banks and so on.

At the same time, the financial market has been dominated by non-bank financial institutions, such as co-operatives and NGOs, finance companies and microcredit development banks rather than by banking institutions because non-bank financial institutions could be established easily at low cost, with low capital and less legal barriers. As the rate of monetization increased, the rate of establishing these non-bank institutions also increased at a rapid rate (see figure 2). However, banking institutions and their branches expanded at a very low rate in comparison to the non-bank financial institutions.

Figure 2. Trend of development of bank and non-bank financial institutions



Note: CB = commercial banks, DB = development banks, FC = Financial Companies, MCDB = Micro-credit Development Banks, Coop = Cooperatives, NGOs = Non-governmental Organizations.
Source: Quarterly Economic Bulletin (QEB), Nepal Rastra Bank, 2010.

At the same time, banking sector could not capture the market activities held through cash real estate activities, government and private educational institutions, monetary activities of government offices. This situation evolved due to various reasons. First, the central monetary authority initiated the open and liberal policies in the financial system but in the meantime it could not consider the effective policies to capture such types of activities. Secondly, the banking institutions and expansion of their branches could not grow at the appropriate level in rural areas and in the areas where the financial sector was still absent because the establishment of banks and their branches is constrained by high establishment cost, high capital requirement and lengthy legal process. So, people were unable to access the banking services and products, and the location of banks was easily captured by other small non-bank financial institutions. In a very short period, these institutions occupied a large sector of the financial market and the availability of these institutions was very high, so this could easily overcome the rate of non-monetization. Thirdly, the government and the central bank could not direct policies for banks to earn profit from productive investment in the economy rather than allowing earning activities without productive investment. This led banks to suffer from non-performing loans and it discouraged the private credit supply, in one hand. On the other hand, the intention of liberalization was to minimize the role of government replacing the public sector with the private sector, but the latter was found unable to capture this place. This led to a continuation of the role of public enterprises.

Similarly, liberalization created an appropriate environment to grow non-bank financial institutions to collect small deposits and mobilize at the local level. Local level savings were absorbed totally by these institutions. Therefore, it is a reason that time to time banking sector suffered from liquidity constraint that prevented banks to supply credit at the required level. Therefore, openness has contributed to monetization of the country through the rapid development of non-bank financial institutions rather than the development of banking institutions.

Although the central bank continued reform activities in the financial sector it could not leave a positive impact on the banking sector. One of the reasons may be non performing loans (NPLs) of commercial banks. Some figures of commercial banks such as capital adequacy ratio in 2005 remained at -6.3 percent and the accumulated loss of two state owned commercial banks born non-performing loans (NPLs) to 19 percent (Ferrai *et al.*, 2007).

Similarly, it is also obvious to raise the question, of why policy reforms have an impact on economic growth in a country but no impact on financial development. Macroeconomic theories state that economic growth is an accumulation process of several factors such as investment, foreign trade, human capital, public expenditure and so on and not only financial development. When the government introduced liberalization policies, the reform was not only in the financial sector but also in other sectors such as in the foreign trade sector, in public enterprises as a privatization policy and opening up the economy for foreign investment. Therefore, policy reforms are a package that has a cumulative impact on economic growth. Policy reforms in only one sector (i.e., reforms only on financial sector) may not have a direct impact on economic growth but the networking of policy works in the economy and liberalizing one sector needs to open another sector. For instance, when the government needs to open the foreign trade sector it needs to open the financial sector also (Baltagi *et al.*, 2009). Similarly, if the government implements privatization policies, it should open up to foreign trade that can ease the system for private investor and foreign investors. This networking of liberalization has a cumulative impact on the economy however, policy reforms of a system may not have a distinct impact for single sector and reforms on one sector may ease the other system which is essential for the economy.

6. Conclusion

The objective of this paper is to review policy reforms implementation in different time periods by the government of Nepal for financial development with the help of unit root test both with and without the presence of structural breaks. By taking into account, a structural break and policy shifts that we attempt to test whether the variables responded to policy changes or the behavior of variables. The conventional ADF test and Perron (1989) one break test method are employed to assess the properties of the annual time series data for the Nepalese economy. The conventional ADF test proves none of the series taken in the sample has failed to reject the evidence of unit root except for DCBS in the model with intercept and trend.

When we account for a break in data using Perron test, in most of the cases, the time series properties of data are found in line with Song *et al*. (2003) i.e., the non stationarity of the variables do not change, when we take into account a structural break. Real GDP shows a non-stationary path after accounting for the break. Excluding a few cases DCPS and BM also follow the non-stationary path. In most cases DCBS rejects the null of a unit root. This analysis identifies that all data follow a positive trending path in their general trend. The monetary and credit variables did not experience a significant structural break when GDP showed a break and it was a cause of implementing policy reforms in the economy. Domestic credit provided by the banking sector has also experienced impacts from the policy changes.

However, policy changes have no impact indicates that the policy reforms have no impact on financial indicators, such as on banking credit to private sector and liquid liabilities. This implies, the reduction of domestic credit supply could not be reflected in the private sector credit. The presence of some problems in the banking sector of Nepal is weakening the impact of liberalization. Among them, for instance, during the last two decades, banks suffer from a problem of a high ratio of non-performing loans and it is always discouraging banks from credit allocation. The expansion of commercial banks and their expansion seemed very low in comparison to other bank and non-bank financial institutions, and banks could not capture local savings. Similarly, commercial banks could not capture monetary activities held by the government and other service sectors.

This research suggests that the government policy makers should implement policies strictly for financial sector development and to promote growth. Similarly, more investigations to examine the impact of financial development on the economic growth process in Nepal are needed because the presence of a unit root in real GDP, private credit and broad money provides a way of estimating a long run relationship between them.

References

Acharya, K.P., Thapa, N.B. & Sharma, S. (1998). *Economic Liberalization in Nepal: Sequence and Process*, National Labor Academy: Kathmandu.

Baltagi, B.H., Demetrides, P.O. and Law, S.H. (2009). Financial Development and Openness: Evidence from Panel Data. *Journal of Development Economics*, 89(2), 285-296.

Bhetuwal, K.R. (2007). Financial Liberalization &Financial Development in Nepal. *Economic Review*, 19, Nepal Rastra Bank, Kathmandu, Nepal.

Eicher, T. & Hull, L. (2004). Financial Liberalization, Openness, and Convergence. *Journal of International Trade and Economic Development*, 13(4), 443-459.

Ferrai, A., Jaffrin, G. & Shrestha, S.R. (2007). Access to Financial Services in Nepal. The International Bank for Reconstruction and Development/ The World Bank, Washington, D.C.

Goldsmith, R. (1969). *Financial Structure and Development*. New Haven: Yale University Press.

Gupta, K.L. & Lensink, R. (1996). *Financial Liberalization and Investment*, Routledge, London and New York.

Khatiwada, Y.R. (1994). *Some Aspects of Monetary Policy in Nepal*, South Asian Publishers Pvt. Ltd. New Delhi, India.

Khatiwada, Y.R. & Sharma, S.K. (2002). Nepal: Country Study Report, South Asia Network of Economic Research Institute (SANEI).

Kim, B.H, Kim, H.K. & Oh, K.Y. (2009). The Purchasing Power Parity of Southeast Asian Currencies: A Time-varying Coefficient Approach, *Economic Modelling*, 26(1), 96-106.

King, R.G. & Levine, R. (1993). Finance and Growth: Schumpeter might be Right. *Quarterly Journal of Economics*, 108(3), 717-737.

Lee, Chien-Chiang & Chien, Mei-se (2008). Structural Breaks, Tourism Development, and Economic Growth: Evidence from Taiwan. *Mathematics and Computers in Simulation*, 77(4), 358-368.

Levine, R. (1997). Financial Development and Economic Growth: Views and Agenda. *Journal of Economic Literature*, 35(2), 688-726.

Marotta, G. (2009). Structural Breaks in the Lending Interest Rate pass-through and the Euro. *Economic Modelling*, 26(1), 191-205.

Mckinnon, R.I. (1973). *Money and Capital in Economic Development*, Brookings Institution; Washington D.C.

Nepal Rastra Bank (NRB) (2010). *Quarterly Economic Bulletin* (QEB), Kathmandu.

Odedokun, M.O. (1996). Alternative Econometric Approaches for Analyzing the Role of the Financial Sector in Economic Growth: Time Series Evidence from LDCs. *Journal of Development Economics*, 50(1), 119–46.

Osmani, S.R. & Bajracharya, B.B. (2008). *Handbook on the South Asian Economies*, Chowdhury, A. and Mahmud, W. (Ed.), Edward Elgar Publishing Ltd.

Pant, B. (2009). *Nepalese Financial System: Growth and Challenges*, Nepal Rastra Bank, Kathmandu.

Perron, P. (1989). The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis. *Econometrica*, 57(6), 1361–1401.

Poudyal, N.P. (2005). *Financial System and Economic Development; 50 years of NRB*, Nepal Rastra Bank, Nepal.

Rajan, R.G. & Zingales, L. (2003). The Great Reversals: the Politics of Financial Development in the Twentieth Century. *Journal of Financial Development*, 69(1), 5-50.

Romero-Avila, D. (2009). Multiple Breaks, Terms of Trade Shocks and the Unit Root Hypothesis for African Per Capita Real GDP. *World Development*, 37(6), 1051-1068.

Shrestha, M.B. & Chowdhury, K. (2006). Financial Liberalization Index for Nepal. *International Journal of Applied Econometrics and Quantitative Studies*, 3(1), 41-54.

Song, H., Witt, S.F. & Jensen, T.C. (2003). Tourism Forecasting: Accuracy of Alternative Econometric Models. *International Journal of Forecasting*, 19(1), 123-141.

World Bank, World Development Indicators Online Data Base (2010). Retrieved on December 2010, from data.worldbank.org/data-catalog.