

CHAPTER - XI

SUMMARY, CONCLUSIONS AND FUTURE SCOPE

11.1 Summary

11.1.1 The first chapter of the present research study has focused on a brief introduction of the basic feature of Nepalese economy and policy issues. The characteristics of Nepalese economy, current trend and tendencies of macroeconomic variables of the economy have been analyzed. A brief scenario on global economy for the comparison with Nepalese economy has also been mentioned. As per the analysis, performance of the Nepalese Economy has been found poor compared to those of global and neighboring economies. Objectives of the study, hypothesis and plan of the study have also been stated in this chapter.

11.1.2 The second chapter delineated the findings from the literature review in the present research work. In this process, the conclusions of several works related to the present study in developed and developing economies have been reviewed. Reviewing those works, it has been found that the *twin deficit hypothesis (TDH)* has demonstrated mixed results. Some results have supported the *reverse proposition of TDH* and some have shown even no relationship between budget deficit and trade deficit. However, TDH has been supported in most of the studies.

11.1.3 The third chapter has concentrated on the methodological issues as well as data and variables of the present research study. The introductions of several econometric methods related *Stationarity test*, *Co-integration test*, *Vector Error Correction modeling*, *Causality test*, *VAR modeling with Intervention Analysis through Impulse response Functions and Variance Decomposition* have been presented in detail.

11.1.4 The fourth chapter is focused on analyzing the nature of stationarity of model variables (trade deficit and budget deficit). Summary findings form the stationarity tests of the variables concerned are being presented as follows:

(i) *real times series for BD and TD datasets at level are non-stationary*

(ii) *these variables attain stationarity upon first order differencing i.e.*

$$BD \text{ (Real)} \sim I(1)$$

and, $TB \text{ (Real)} \sim I(1)$

(iii) *first order differencing ensures stationarity for BD (Nominal) dataset, i.e.*

$$BD \text{ (nominal)} \sim I(1)$$

(iii) *TD (Nominal) dataset fails to attain stationarity even upon second differencing (as given by the Unit Root Tests)*

11.1.5 The fifth chapter is concerned with the cointegration test for examining the existence of long-run relationship of the variables concerned. It is observed that

- (i) real dataset of TD_t and BD_t series at level are not cointegrated i.e. TD and BD are not CI (1, 1). Consequently, there exists no long-run equilibrium relationship between real TD_t and BD_t series at level.
- (ii) real datasets of TD_t and BD_t series upon first differencing are cointegrated i.e., TD_t and BD_t are CI (1, 0). Consequently, there exists a long-run equilibrium relationship between real TD_t and real BD_t series.

11.1.6 The sixth chapter is devoted to the study of the nature of stability of long-run relationships between TD and BD with the *Vector Error Correction Modeling*. It has been observed from the tests that

- (i) ΔTD_t is the endogenous variable while ΔBD_t is exogenous variable. In such case, TD maintains a long-run equilibrium relationship with BD.
- (ii) The shocks significantly affected the long-run equilibrium relationship between TD and BD in the short-run.

The ‘long-run equilibrium relationship’ that TD maintains with BD is ‘stable’ since the ‘short-run dynamics’ displays a converging pattern.

10.1.7 The seventh chapter examines the *nature and direction of Causal relation* between TD and BD in the Nepalese economy over the period of study. The study shows that

- (i) Trade Deficit has been found ‘not to Granger Cause’ Budget Deficit in the Nepalese economy over the period of study.
- (ii) Budget Deficit, on the other hand, has been found to ‘Granger Cause’ the Trade Deficit in this economy.

Consequently, the ‘Unidirectional Causality’ is found to occur from the ‘Budget Deficit’ to ‘Trade Deficit’. However, Budget Deficit has been found to be ‘exogenous’ in the system.

10.1.8 The eighth chapter involves the estimation of the *Vector Auto Regression (VAR) Modeling* for further verification of causality between BD and TD.F findings from this chapter are presented below:

- (i) LR and AIC statistics for lag 6 found significant at 5% level and FPE, HQ and SIC statistics for lag 0 lag at 5% level. We, therefore, chose 6 (six) lags for each endogenous variable in their **autoregressive and distributed lag structures** in VAR model.
- (ii) we found six characteristic roots (eigen values) for $A(L)$ and six characteristic roots (eigen values) for $B(L)$. Absolute values of the roots (modular) of the roots are less than unity and ten of the roots are not statistically different from zero; five of the roots are positive, and other five roots have negative values. These all indicated that the VAR model was stable.
- (iii) VAR residuals (\hat{u}_{1t} and \hat{u}_{2t}) are multivariate normal.
- (iv) Serial Independence test and Portmanteau Test verified that \hat{u}_{1t} and \hat{u}_{2t} residuals are free from autocorrelations of any order.
- (v) no cluster in the time plot of \hat{u}_{1t} was found, and the time plot of \hat{u}_{2t} , confirmed the absence of any cluster implying the model is in homoscedasticity of concerned residuals.

- (vi) *the auto-regressive and distributed lag structures in equations (8.3) are consistent.*
- (vii) *BD significantly affected TD, even in the presence of TD_{t-i} ($i = 1, \dots, 6$) in the vector of regressors. Consequently, BD, the Budget Deficit, Granger Caused Trade Deficit in the economy of Nepal over the period of study.*
- (viii) *variations in budget deficit did not lead to an immediate variation in Trade Deficit. On the other hand, it was affected by the variations in four and five period back deficits in the budgetary provision.*
- (ix) *variations in 4-period and 5-period back budget deficits led to more than proportionate variation in trade deficit in the economy of Nepal.*
- (x) *trade deficit at any period reduced the volume of trade deficit in the next period. Thus, trade deficit at any period was negatively related to trade deficit in the previous period.*
- (xi) *trade deficit failed to Granger Cause the budget deficit in the economy of Nepal over the period of study.*
- (xii) *budget deficit at any period was not related significantly to budget deficits which occurred at any previous periods.*

Consequently, these findings confirm that

- (a) ***budget deficit Granger Caused trade deficit***
- (b) ***trade deficit failed to Granger Cause budget deficit and***
- (c) ***budget deficits appeared to be completely exogenous in the VAR model***

11.1.9 The ninth chapter is concerned with *Intervention Analysis* through the study of *Impulse Response Functions* of the endogenous variables under study. It analyzed the nature of responses of the variables in response to shocks transmitted through the channel of different endogenous variables.

The findings from this chapter are as follows:

- (i) ***budgetary deficit shocks were the predominant cause behind the short-run variations in Budget Deficit***
- (ii) ***budgetary deficit accounted for increasingly large part of short-run variations in Trade Deficit***
- (iii) ***shocks, transmitted through budgetary deficit, changed the equilibrium base of Trade Deficit. Consequently, budgetary shocks were not short-lived for Trade Deficit***
- (iv) ***shocks, transmitted through the channels of Budget Deficit and Trade Deficit, failed to change the equilibrium base of Budget Deficit. Consequently, both these shocks were short-lived for Budget Deficit.***

11.1.10 The tenth chapter analyzed *Variance Decomposition* to find out the *n-period ahead forecast variations* of the endogenous variables under study. It has been observed that

- (i) ***shocks transmitted through the budget deficit took a significant role in constituting the long-run equilibrium levels for both budget deficits and trade deficit profiles.***

- (ii) shocks transmitted through the budget deficit channel dominated over the trade deficit channel in generating short-run variations in short-run in both budget deficit and trade deficit profiles.

All these findings, therefore, confirm that Causality running from ‘trade deficit’ to ‘budget deficit’ is ‘weak’. On the other hand, ‘budget deficit’ shocks contributed significantly to the constitution of trade deficit profile. Consequently, Causation running from ‘budget deficit’ to ‘trade deficit’ was ‘stronger’ and dominant.’

11.2 Conclusions

Initial main objective of this study was to analyze whether *Twin Deficits Hypothesis (TDH)* is supported or ‘otherwise’ in Nepal. Along the course of several time series econometric tools used in the study and findings derived, following conclusions are drawn:

- (i) **Trade Deficit has been found to be Granger Caused by Budget Deficit**
- (ii) **Change in Budget Deficit Granger Caused more than proportionate change in Trade Deficit**
- (iii) **Budget Deficit has been ‘exogenous’ to the VAR (2, n) system. It is not Granger Caused by Trade Deficit.**
- (iv) **Budget Deficit being the ‘exogenous’ to the system implies that other fiscal and socio-economic policies considerations took the leading role in establishing Revenue-Expenditure schedules. Consequently, Budget Deficit has been the outcome of the other socio-economic-political considerations and exercises in the economy of Nepal.**

- (v) Since the Trade Deficit has been ‘Granger Caused’ by Budget Deficit, rational economic measures for containing Trade Deficit must come in the form of containing Budget Deficit.

11.3 Public Policy Implications

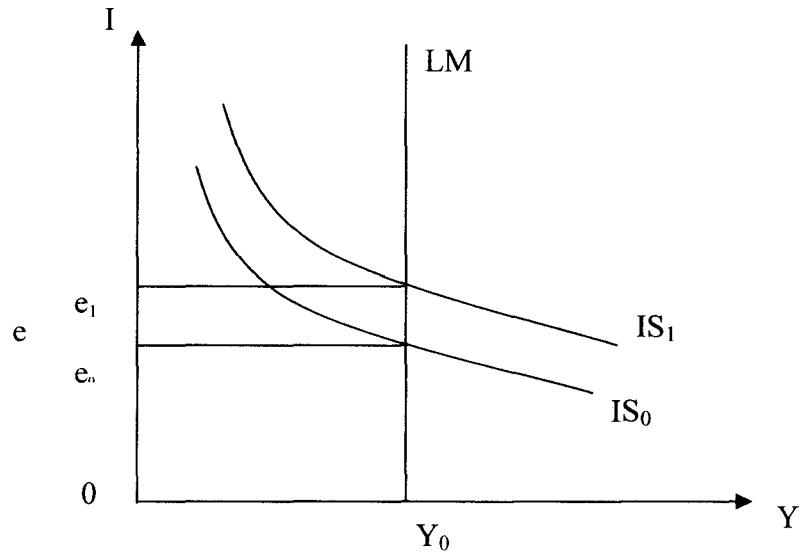
Trade Deficit has been Granger Caused by Budget Deficit. This indicates that any measures, in the presence of Budget Deficit, like import substitution or export promotion, deficit control etc, for containing Trade Deficit may not be effective. *The effective measure in this direction would mean reducing Budget Deficit through bridging the gap between expenditure and revenue.*

However, one may wonder if such reduction of Budget Deficit would have any adverse effect on economic growth. Such concern may appear to be baseless in view of the fact that fiscal policy measures, under globalization and flexible exchange rate regime, would have every little perceptible effect on economic growth.

Mundel-Flemming set-up has adequately proved ineffectiveness of fiscal policy in such event. This arises from the fact that LM curve becomes a vertical straight line under globalization and movement of IS curve fails to produce any change in income. This is explained below:

Figure: 11.1

IS-LM Framework under Flexible Exchange Rate System and Globalization



where, e = foreign price of domestic currency

With Budget Deficit escalating, IS_0 shifts to IS_1 , leading to no change in income but a rise in the price of domestic currency. Consequently, domestic goods become dearer which leads to rise in import and fall in export. This causes trade deficit to rise.

Direct control policies are also not very effective under flexible exchange rate system and globalization. Quota or import restriction raises $NX = X - M$ at the current period. As a result, IS_0 curve shifts to IS_1 because given the $Y = C + I + G + (X-M)$, Y rises following rise in NX . However, ultimately income remains unchanged with rise in ' e '. Consequently, import (M) rises and export (X) falls and the initial improvement in the current A/Cs vanishes.

10.4 Future Scope

This research work has been done for the first time in the Nepalese context, purely on the basis of time series modeling by applying recent state-of-the-art econometric tools. Nepalese data on trade deficit and budget deficit have been used to test the Twin Deficit Hypothesis and data cover time series from 1964 to 2004. Though the latest IFS series of 2007 (Year Book) is available till to the date of thesis preparation and submission, the related data have not been found updated in it. That's why we have been unable to incorporate the latest data. Trade figures prior to 1964 were not available in the series of IFS so that only data for 41 years have been used to run the models. Initial assumption of "budget deficit being the source of trade deficit" has been accepted in the Nepalese perspective. However, scholars have a scope of testing this hypothesis in future by employing the longer horizon data to predict the more refined results.

This research paper has future policy implications to Nepal. As our finding has supported the twin deficit hypothesis, it has posed some inquisitive responses for policy reframing to the Nepalese economy in addressing the ill effects of twin-deficit cycle (vicious circle). Nepal Government may consider adopting a position more vigilant on its fiscal policy front. This research results indicate a need for fiscal tightening by curtailing unproductive expenses, broadening tax base, reforming tax administration, prioritizing the investment projects and adopting export-led growth policies, and proper import management.

Vector Autoregressive Moving Average (VARMA) Modeling is one of the predictions technique in time series analysis that follows the decline of traditional Macroeconometric modelling in the 70s and precedes its rise again more recently. It is the analysis that tries for predicting the reality of data movements on the basis of

autoregression of the model variable and its moving average trends within the concerned vectors. The idea further be tested through the *VARMA Analysis* as in Sims (1972) “Money Income and Causality”, AER (62):540-552 and Sims (1980) “*Macroeconomics and Reality*” *Econometrica* (48):1-49. However, owing to some technical reasons, we could not incorporate the vector autoregression moving average (VARMA) model and its analysis in this research paper. Any enthusiastic scholar can add the VARMA model to his future research work regarding on *Twin Deficit Hypothesis (TDH)* for the Nepalese time series.

Similarly, any scholar use *Spectral Analysis* in time series for the study for *Twin Deficit Hypothesis* for verifying *periodicity*, *spectral density function* and *cyclical pattern of datasets* of trade deficits and budget deficits in the Nepalese context.

