Trends of Nepal's Import Duties: Implications with Future Trade Liberalization

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Nepal is accelerating the process of trade liberalization that had commenced in the mid-eighties; this is reflected in membership of WTO, agreement of a framework for a free trade area (FTA) in south Asia and entering an FTA with BIMST-EC. Since import duties are presently an important source of government revenue, the likely impact of trade liberalization on this important revenue source has to be evaluated. The study addresses this felt need through an elasticity and buoyancy analysis of import duties over the span of fiscal year 1980/81 to 2001/2002 as well as analyzing the responsiveness of Nepal's import duties through empirical regression and five year ahead projection. The paper finds low measure of elasticity and buoyancy as well as low elasticity of import duties, although five-year projections do not suggest a decline in contribution to government revenue. The prior indicate low productivity and responsiveness of the domestic tax base suggesting a need to accelerate reforms of the tax administrative system while the latter indicates that diversification of the import basket would be appropriate.

INTRODUCTION

Nepal has undertaken the process of trade liberalization that had commenced over two decades back (discussed in greater detail below). Some recent examples of this are Nepal's membership in the World Trade Organization (WTO);[15]

[*] *Remarks*: This paper is based on the Special Studies Division (SSD) Annual Project for 2060/2061 which had been completed through the joint effort put forward by members of the SSD namely Dr. Nephil Matangi Maskay, Deputy Director and Mr. Rajan Krishna Panta, Assistant Director along with the guidance of Dr. Govinda Bahadur Thapa, Director, Research Department. The views and suggestions made in this paper do not necessarily reflect the views of Nepal Rastra Bank.

[15] The fifth Ministerial Conference at Cancun, Mexico which took place on 10–14 September 2003 had approved the membership of Nepal into the World Trade Organization (WTO) on 11 September 2003 (WTO, 2003) with Nepal recently ratifying it.

adoption of the framework for a South Asian Free Trade Area;[16] and signing of a free trade agreement with BIMST-EC.[17] As trade liberalization in Nepal will have likely impact on import duties[18], which presently are an important source of government revenue contributing about one quarter of total tax revenue (Economic Survey, 2003), it is important to examine both the trends of Nepal's import duties and to determine likely scenarios resulting from trade liberalization.

The research objective is to assess the impact on Nepal's import duties with greater trade liberalization. Specifically:

- Examine the trends of Nepal's import duties;
- Assess the productivity of the Nepalese import duty base and calculate the historical responsiveness of import duties;
- Determine alternative scenarios for five-year perspective on import duties; and
- Put forward a discussion on implications along with some recommendations which fall out of this analysis.

The study is organized into seven sections: the first section gives a brief introduction, the rationale and expected outcomes of the study and an overview of trade liberalization measures taken in Nepal during the second half of the twentieth century; the second section reviews the relevant studies done with regard to both the impact of trade liberalization on custom revenue and the buoyancy and elasticity of Nepalese tax system; the third section outlines the analytical framework for the calculation of elasticity and buoyancy by proportional adjustment method using the standard functional relationship between tax revenue and the tax base, the section also gives the modified econometric estimation equation which is used for simple projection of possible impact of trade liberalization measures on import duties; the fourth section discusses the methodology and specific econometric equation used in the present study; the fifth section gives the detailed empirical results and analysis including the trend analysis; the sixth and the last sections give recommendations, summary and conclusion of the study.

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[16] The framework agreement for a South Asian Free Trade Area (SAFTA) was adopted at the 12th SAARC Summit held in Islamabad, Pakistan, on 4-6 January 2004 (SAARC, 2004), where Nepal is also one of the signatories.

[17] Nepal had signed a free trade agreement on 8 February 2004 with BIMST-EC [Bangladesh, India, Myanmar, Sri Lanka and Thailand Economic Cooperation].

[18] His Majesty's Government of Nepal defines custom's revenue as a commodity tax based on foreign trade and breaks it down into six components: (1) Import duties; (2) Indian Excise Refund; (3) Export Duties; (4) Other Income of Customs; (5) Agriculture Improvement Duties; and (6) Other Duties. However, for this study focus will be mainly on import duties (general, additional ….) levied and extracted on commodities imported from abroad to Nepal shown in the first Appendix [Arthic Nyam 2057, Duffa 2(1)].

Background to Trade Liberalization in Nepal[19]

Trade liberalization in Nepal has been an ongoing process since the mid 1980s with membership in the above mentioned organizations being simply a salient reflection of this trend. This subsection attempts to give a short background of this process of trade liberalization in Nepal.

The period prior to FY 1985 can be considered *a period of inward-looking import substitution with a restrictive trade and foreign exchange regime.* Nepal's trade and industrial policies have been shaped by its situation of access to the markets of the rest of the world;[20] secondly, Nepal has a long an open border with India and is surrounded by it on three sides with Nepal having granted almost free access to Indian goods ever since its first agreement on trade and transit with British India in 1923. More than formal provisions of trade treaties, the open border with India and the high cost of access to the markets of the rest of the world have been decisive factors in putting Nepal in the situation of *de facto* integration with India which has constrained policy choices for Nepal by compelling it to adopt a protection and incentive structure similar to that of India. Any attempt to create trading relations with the rest of the world through standard instruments of trade policy would be thwarted by unofficial and unrecorded movement of goods and services across the open border with India.

Lower tariff structure in Nepal provides incentive for trade deflection to India of the goods imported by it from the rest of the world causing drain in its foreign exchange reserves. If Nepal provides export incentive, Indian goods would be re-exported causing a fiscal drain. Thus, Nepal followed restrictive trade policies with respect to the rest of the world while maintaining relatively open trade relation with India ever since it embarked on the periodic development planning exercise in 1956. To attain its economic development goals, Nepal followed inward-looking, import-substituting industrialization with public sector planning and regulation of the private sector. These policies included stringent barriers to international trade, with many quantitative restrictions, high tariffs, export controls and taxes [but duty drawback and bonded warehouse], and regulated foreign exchange regime such as Exporters' Exchange Entitlement Scheme and Dual Exchange Rate System although later a trade-weighted basked].

This was followed by a period of Liberalization Initiatives: (FY1986-FY1990). In response to unsustainable and internal macro-imbalances, toward the beginning of the Seventh Plan (1986-1990), the government implemented a stabilization program, which was supported by an IMF standby arrangement in December 1985. Realizing that macroeconomic stability and structural adjustment would be vital to lead to accelerated growth, the government undertook a structural adjustment program to address some of the longer-term constraints to economic growth. The

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[19] This is a synthesized version of Karmacharya and Maskay (2004).

[20] The nearest port for access to world economy, other than immediate neighbors, is more than 900 kilometers away from Nepal's border.

program was supported by an IDA structural adjustment credits in 1987 and 1989 and IMF Structural Adjustment Facility in FY 1988. In addition, financial sector reforms were undertaken which included interest rate deregulation in 1989 among others. It should be pointed out that these developments occurred despite disruption caused by the lapse in March 1989 of the trade and transit treaties between Nepal and India. [21]

Finally, with a period of Substantial Economic Reforms: (1990/1991-2000/2001). A number of political and economic events in 1990 and 1991 provided Nepal with an opportunity to review its past economic policies and to devise new ways of approaching its development problems, in part, reflected in the re-establishment of cordial relationship with India and, later, the signing in December 1991 of the new trade and transit treaties of the Eighth Five Year Plan by the new elected government covering the fiscal years (1993-1997) signaled a major shift in Nepal's development strategy. The aim was to promote more open and market-oriented system, with increased reliance on the private sector for the production of goods and services with the public sector focuses on developing the necessary physical and social infrastructure. During the early 1990s, Nepal initiated a series of market-oriented economic reforms intended to facilitate its integration with the global economy and to spur economic growth. The comprehensiveness of the reforms clearly demonstrated the government's desire to radically change the prevailing business environment. This improved business confidence and the climate for private investment. Major reforms included liberalization of trade and industrial policies and rationalization of foreign exchange regime. Following trade liberalization, tariff rates were reduced, restructured and rationalized with quantitative restrictions and import licensing eliminated. Likewise the exchange rate was unified and made fully market-determined, and full convertibility was introduced for all current transactions; this is reflected in Nepal's acceptance of Article VIII of the IMF on May 30, 1994.

LITERATURE REVIEW

The examinations of revenue implications are important, especially to developing countries which obtain a significant amount from such. However, the revenue implications of trade liberalization are, in general, uncertain; this conclusion is drawn by Ebrill, Stotsky and Gropp (1999) and citations therein after

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[21] The trade and transit impasse, which lasted for about fifteen months, was expected to severely disrupt Nepal's external trade, lead to acute shortages of critical imports, curtail growth prospects for the economy particularly in the industrial, trade and construction sectors, and accelerate inflationary pressures. However, the impact of the impasse, while severe, was not as crippling as expected earlier. After a few months of shortages, the supply situation of key imports improved, both because of informal trade between the two countries were allowed to continue and because good weather led to good agricultural crops in FY 1989 and 1990.

examining the literature, in this regard. Ebrill et al. (1999) also estimate two equations relating to trade liberalization and revenue development – the discussion is limited to the first equation as they are based on a common framework and also have similar results. The first estimation equation takes the below form:

$$TR = b_0 + b_1 M + b_2 w + b_3 D + e$$

where *TR* is import (or trade) tax revenue as a percentage of GDP; *M* is imports as a percentage of GDP; *w* represents one or more other continuous variables, such as exports and the exchange rate; and *D* is the set of trade liberalization and other dummy variables. Specifically, the authors used for independent variables, imports as a percentage of GDP, exports as a share of GDP, per capita income in 1990 US Dollars, some dummy variables such as acceptance of IMF Article VIII (a possible indicator of liberalization of the trading regime) and a real exchange rate index. The authors estimate this equation for 27 countries from Africa, Asia and the Western Hemisphere with a data sample spanning 1980 to 1992. The results of this regression were largely that tariff reforms, for a given level of imports, have not been significant in reducing trade tax revenue.

The above conclusion concerning tariff reform and trade tax revenue may lean towards more advanced countries with alternative sources of financing. In a recent paper looking at South Africa, Matlanyane and Harmse (????) examine this question for the data span from 1974 to 2000, utilizing the theoretical underpinnings of revenue productivity. That is the specific equation estimated is:

$$\ln TR = \gamma_0 + \gamma_1 \ln M + \gamma_2 \ln w + \gamma_3 \ln D + \gamma_4 \ln r + \eta$$

where *TR* is customs revenue as a percentage of GDP, *M* is imports as a percentage of GDP representing the import base, *W* is the exchange rate, *D* is a dummy variable for liberalization and *r* is the average overall tariff rate and η is the error term. Their empirical results point to customs revenue as being highly productive with trade liberalization having a significant influence on customs revenue.

Looking at Nepal, there are a number of studies which look at the responsiveness of revenue to discretionary changes in taxes however they do not employ the previous empirical analysis utilizing the estimation equations, but mainly use the analytical tools of elasticity and buoyancy. Elasticity measures the relation between proportional change in tax revenue and a broad measure of national income or output, usually GDP or GNP. In strict usage, elasticity has come to refer to only a change in tax revenue that occurs automatically without any alternation in tax (also introduction and elimination) rates or administration. This is sometimes called “built in flexibility”. This is distinguished from buoyancy, which reflects both automatic response of revenue and discretionary changes in the tax system or administration. There have been a number of studies for Nepal such as

by Dahal (1983), Agrawal (1980), Reejal (1976), Pant (1991), Gurugharana (1993) along with that of IDS (1987) and have been reviewed by Nepal (1995).

It is useful to examine one fairly recent study in this regard by Adhikary (1995). The author first cleans the revenue series to correct for discretionary changes, by both the Chand and Sahota Proportional Data Adjustment Method,[22] over the time period 1974/75 – 1993-94. The author then utilizes simple bi-variate regressions of major taxes with respect to GDP. For example, the author does pair wise estimates of Import Duties; Tax on Consumption; Income Tax; and Total Revenue to GDP. The empirical analysis, of the whole sample period as well as for sub-samples, finds that the low level of automatic tax responsiveness (i.e. elasticity). The author concludes that this empirical result suggests that there is poor inbuilt flexibility of the Nepalese tax structure.

More relevant to this study is that of Shrestha (2001), who looks at Elasticity and Buoyancy of Nepalese Taxes – With Special Reference to Custom Duties in Nepal. The author produced annual data for FY 1980/81 – 1993/94 from the budget speeches, where discretionary changes were addressed (such as changes in tariffs, new tariffs etc.). The author then examined tax buoyancy and elasticity of tax with different variables such as Nominal GDP and Tax Base etc. through simple bivariate regressions. The authors' conclusion is similar to Adhikary (1995) who pointed to the poor built in flexibility and the importance of discretionary tax changes for the Nepalese tax system.

ANALYTICAL CONCEPTUAL FRAMEWORK

The above discussion suggests that the concept of the responsiveness of quantity produced to a change in price is essential for understanding revenue implications of trade liberalization in Nepal. Based on the textbook definition of elasticity of demand (or supply), Suppose that $x = f(p)$ is a demand (or supply) curve, where p = *price* and x = *quantity demanded,* then this is defined as:

$$\varepsilon = \lim_{\Delta p \to 0} \frac{\Delta x / x}{\Delta p / p} = \lim_{\Delta p \to 0} \frac{p}{x} \frac{\Delta x}{\Delta p} = \frac{p}{x} \frac{dx}{dp}$$

If $|\varepsilon| > 1$, the curve is called elastic reflecting that quantity is more responsive vis-à-vis price; if $0 < |\varepsilon| < 1$, the curve is called inelastic reflecting that quantity is less responsive vis-à-vis price.[23] The above concept is used in this study to examine revenue, movement of imported goods with changes in income [i.e. income

[22] See the second Appendix for a discussion.

[23] Note that supply and demand curves are usually plotted with the dependent variable x on the horizontal axis with the slope dx/dp is thus the reciprocal of the usual slope.

elasticity of demand][24], through two main perspectives (1) the concept of buoyancy and elasticity; (2) estimation of an equation for import duties; and finally (3) the coefficients from the previous section will be used for projections of import duties to examine the relevant trends.

Buoyancy and Elasticity

The concept of buoyancy and elasticity are intertwined as both are measures of tax productivity. However, elasticity of tax is relatively harder to measure as it involves estimation of the actual effects of discretionary changes in tax policy in the current year and subsequent year, while an estimate of buoyancy by definition does not control for discretionary changes in tax policy. In theory, tax revenue can change because of changes in the tax rates and rules that are discretionary (these are generally based on budget estimates and are generally made in the budget speeches) or from changes in the tax base and result from the growth of the tax base. The combined effect of these two factors gives the buoyancy of a tax. The automatic component of the total effect is the elasticity of the tax. On the other hand the buoyancy of a tax measures the responsiveness of tax revenue to changes in income without controlling for discretionary changes in tax policy. It is important to note that there are different methods to control for this. For example constant rate structure method, dummy variable technique, proportional adjustment method etc. The study utilizes proportional adjustment method using Sahota's formula, as discussed in the second appendix, because the "use of this method is relevant particularly in the context of developing countries where data arrangements are not very good" (Dahal, 2000). Once the revenue effects of discretionary changes have been excluded from a tax series (using Sahota's formula), the elasticity of this tax series with respect to GDP must be estimated. Generally, the elasticity concept assumes the following functional relationship:

$$T^* = \alpha Y^{\beta} \varepsilon$$

where T* is the tax revenue, y is the tax base (or GDP in aggregate level), α and β represent parameters to be estimated and ε is the multiplicative error term, assumed to be normally distributed. Here β is the income elasticity of the tax with respect to GDP. Taking logs the equation is linearized as below:

$$\log T^* = \log\alpha + \beta \log Y + \log\varepsilon$$

[24] Of course, import prices are composed of the price of the good as well as the tariff rate, thus customs revenue is simply the product of the quantity and the tariff rate.

which is of the standard form:

$$\log T_t^* = \alpha + \beta \log Y_t + v_t$$

To obtain T_t^*, the proportional adjustment (PA) method is used to eliminate (isolate) the discretionary effect from the series. The PA method is used because of its superiority over other available methods, which also explains its prevalence in earlier studies. Likewise, buoyancy of taxes with respect to their bases (or GDP) is derived from logarithmic regressions of unadjusted revenue data on their base (or GDP), such as:

$\log T_t = \beta_0 + \beta_1 \log Y_t + \varepsilon_t$, where β_1 is the buoyancy ratio.

In sum, the examination of buoyancy and elasticity essentially give an indication of the health, efficiency, productivity and responsiveness of the domestic tax base.

Econometric Estimation Equation

The above analysis on buoyancy and elasticity simply discusses the productivity of the tax base. An econometric estimation is essential to supplement the analysis and determine the magnitude by which revenue will respond to a change in taxes, with there being other control variables. In this regard, an econometric estimation will be used which is similar to that of Ebrill et al. (1999) and Matlanyane and Harmse (????) but will be modified for the Nepalese context, as produced below:

$$TR = b_0 + b_1 M + b_2 w + b_3 D + e$$

Simple Projection

The prior discussion suggests that the usage of both analytical methods of estimation equation and buoyancy and elasticity is appropriate for the analysis of the present situation. However, the above studies simply focus on an empirical assessment of past performance – i.e. the given figures during a determined time period. The paper attempts to take these concepts and project forward utilizing the coefficients from the above estimation equation, as well as a number of projected values.

It is important, however, to note that the time perspective is essential. This observation is because elasticity changes across time (from being inelastic to more elastic) and is similar to discussion on the J-curve which shows that in the short term goods are less responsive (i.e. low elasticity), while in the longer term they are more responsive (i.e. more elastic). This is, of course, in addition to the assumption that the past values help determine the future, with there being a *ceteris*

paribus assumption. While it is difficult to fully control for those, being aware of the possibilities will appropriately guide interpretations.

METHODOLOGY AND DATA SOURCES

The proposed methodology and data sources proceed as:

- The first objective will be achieved through examining annual import duty figures from 1980/81 till 2001/2002; these will be taken from the publications of International Monetary Fund, Ministry of Finance [various budget speeches], HMG/N and Nepal Rastra Bank and viewed from different perspectives (i.e. percentage of total revenue, total imports, GDP etc.) along with graphical (i.e. "eye-balling") analysis.
- The second objective will be achieved through an analysis of elasticity and buoyancy of the Nepalese import duties; along with the sum of import duty and Indian excise refund [with base of imports CIF and nominal GDP] using bivariate regressions for an assessment of the productivity of the Nepalese import duties.[25] This will in large part entail developing a time series from the budget speeches through cleaning the data series to determine automatic and discretionary changes, whose methodology is given in the first appendix.
- The third objective will be achieved via the application of an econometric estimation. The estimation equation to be used in the study will be similar to Ebrill et al. (1999), and will be as below:

$$\ln IMPY = b_0 + b_1 \ln MY + b_2 \ln REER + b_3 \ln DUMMY + e$$

  where *IMPY* is import duties as share of GDP; *MY* is imports CIF as a share of GDP; *REER* is the real effective exchange rate index (base 1990) of the Nepalese Rupee as provided by the International Monetary Fund; and DUMMY is the structural break to be determined by the data. For consistency over the period 1980/81 till 2001/2002, the data will be taken from *Economic Survey* of His Majesty's Government of Nepal, Ministry of Finance. Likewise prior to running OLS, the individual time series will be tested to make sure that they are healthy and do not have a unit root etc., along with suitable testing of the equation. The goal of this empirical estimation is to determine the values of the coefficients (e.g. b_1, b_2 and b_3), to be used for the next section.
- The fourth objective will be achieved through five year projecting import duties resulting from trade liberalization determined by the impact of volume of imports CIF utilizing the above estimating equation where values for b_1, b_2 and b_3 have been obtained along with projected values for *M* from concerned

[25] It is important to note that buoyancy for import duties and the sum of import duties and Indian excise refund will have similar elasticity. This is because the changes in IER are exogenous, thus there is no amount budgeted by the Nepalese government.

divisions in Nepal Rastra Bank and from other agencies, likewise REER will be linearly projected from historical ten year averages; these projections are assumed to be the best available projections which incorporate future possible scenarios.

- The final objective will be achieved through an analysis of the above information. Necessary discussion and feedback will be undergone with the relevant people at Nepal Rastra Bank and, if appropriate, outside. These will result in some recommendations.

EMPIRICAL RESULTS AND ANALYSIS

The following section provides the empirical results for the above objectives in three separate sections which include both discussion on data sources and empirical investigation. The next section first puts forward a discussion on trends.

Trends of Import Duties

The time series are provided in appendix third with the data being obtained for 1980/81 to 2001/2002 from various issues of *Economic Survey*. Some descriptive statistics of the ratios of import duties to: customs revenue; total tax revenue; imports CIF; and GDP are provided below:

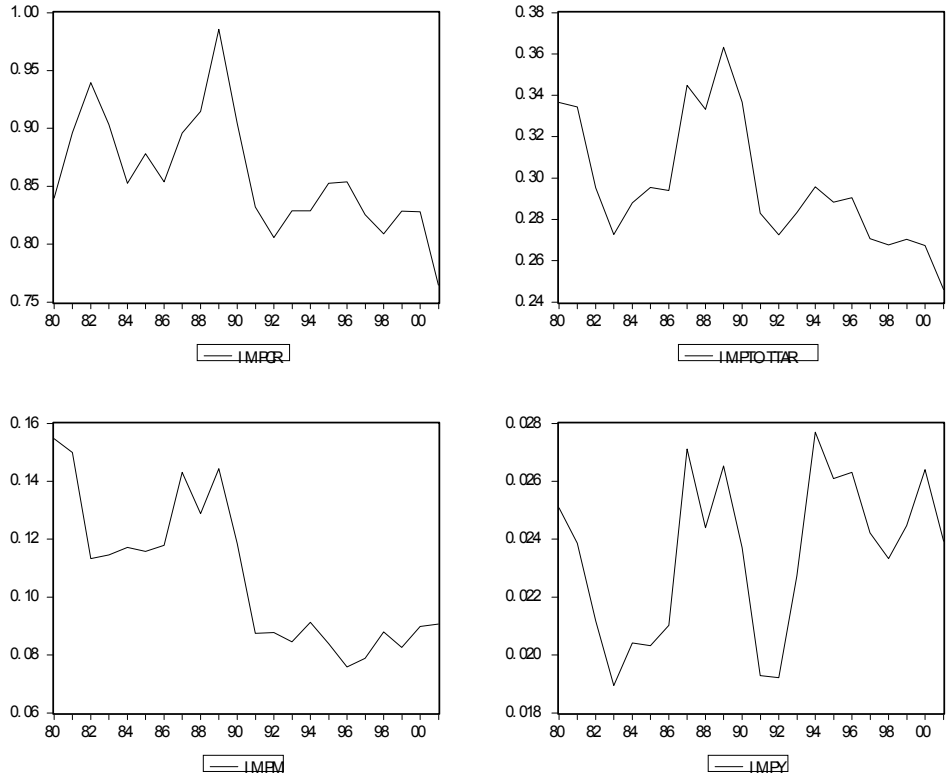
Table 1: Some descriptive statistics

	IMPCR	IMPTOTTAR	IMPM	IMPY
Mean	0.860037	0.296804	0.107216	0.023467
Median	0.852527	0.289348	0.102271	0.023897
Maximum	0.985505	0.363264	0.154722	0.027698
Minimum	0.764556	0.246077	0.075820	0.018943
Std. Dev.	0.050254	0.030903	0.025019	0.002732
Observations	22	22	22	22

Note: IMPCR is ratio of import duty to customs revenue; IMPTOTTAR is ratio of import duties to total tax revenue; IMPM is ratio of import duties to imports CIF; and IMPY is ratio of import duties to nominal GDP.

These trends are presented graphically below:

Figure 1: Some Graphical Trends



Note: Same as for the prior where first graph is IMPCR; second is IMPTOTTAR; third is IMPM; and last is IMPY.

The first two graphs of import duties to both customs revenue and total tax revenue, from "eye-balling" demonstrate a decreasing trend and is further suggested since the minimum for both IMPCRR and IMPTOTAR occur in 2001/2002 being 76.4% and 24.6% respectively. The decreasing contribution of import duties as a source of tax revenue may reflect greater levels of tariff reduction which have not been compensated for by the volume of imports suggesting that the import demand is inelastic. The third graph of the ratio of import duties to imports CIF, similarly shows such a trend up to the early 1990's, from whence it stabilizes at around 9% suggesting that economic liberalization had some effect on import duties and that perhaps liberalization stabilized during this time. The final graph suggests that it has been quite volatile in terms of GDP but that the trend, from "eye-balling", has been flat at around 2.3% of GDP – this suggests that the growth of import duties is fairly matched by the growth of national income.

Another aspect which is also important is to examine the above trends of import duties with that of Indian Excise Refund (IER), as shown below:

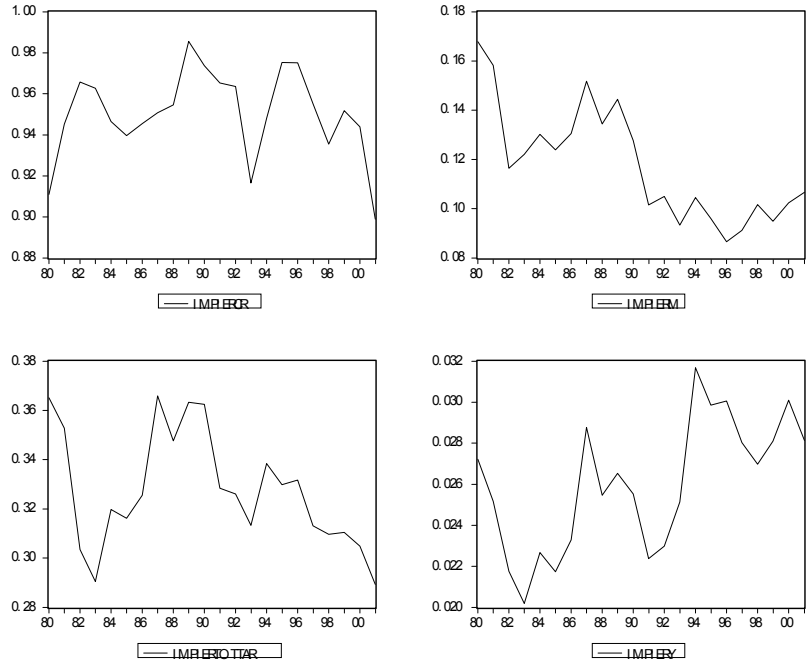
Table 2. Some Descriptive Statistics

	IMPIERCR	IMPIERM	IMPIERTOTTAR	IMPIERY
Mean	0.950472	0.117776	0.327622	0.025990
Median	0.951229	0.111497	0.325780	0.026033
Maximum	0.985505	0.167842	0.365977	0.031686
Minimum	0.898921	0.086606	0.289323	0.020187
Std. Dev.	0.021415	0.023141	0.023615	0.003211
Observations	22	22	22	22

Note: IMPIERCR is ratio of import duty to customs revenue; IMPIERTOTTAR is ratio of import duties to total tax revenue; IMPIERM is ratio of import duties to imports CIF; and IMPIERY is ratio of import duties to nominal GDP.

These trends are presented graphically below:

Figure 2. Some Graphical Trends



The first graphs of import duties including IER to both customs revenue, from "eye-balling" demonstrate a neutral. The second and third graph of import duties and IER to total tax revenue and imports CIF demonstrate a decreasing trend while the last graph in relation to GDP suggests a neutral, if not positive, trend.

The inclusion of IER into import duties seems to change the trends suggesting that IER seems to be an important contribution.

Buoyancy and Elasticity

The data for import duties (IMP), Indian Excise Refund (IER) and import duties – cleaned (IMPC), with the calculation over the period 1980 – 2001, are given in appendix 5.2.1 for the period 1980/81 to 2001/2002. These are taken from various budget speeches of His Majesty's Government of Nepal. The time series for IMP, IER, IMPC, Imports C.I.F. (M), and nominal gross domestic product (Y) over the period 1980 – 2001, are given the fourth appendix. These are taken from Budget speeches and various issues of *Economic Survey*, of His Majesty's Government of Nepal. Some descriptive statistics of the data in log levels, which are also supplemented by graphical representation, are given below:

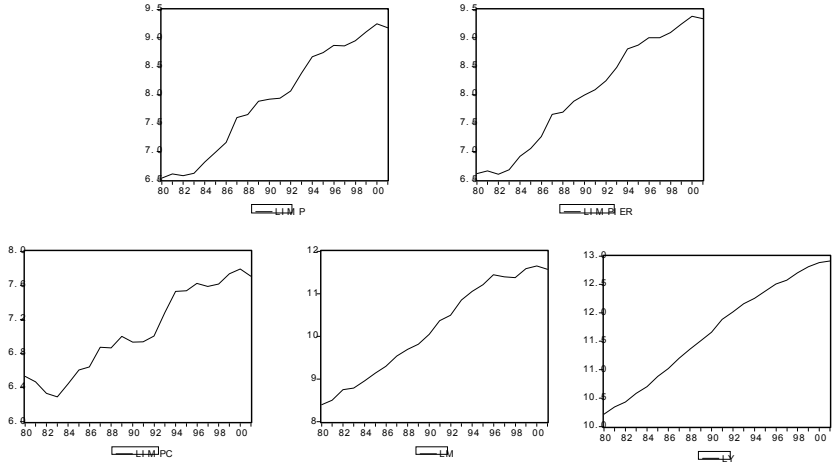
Table 3. Some Descriptive Statistics

	LIMP	LIMPIER	LIMPC	LM	LY
Mean	7.922961	8.024301	7.059935	10.18093	11.68177
Median	7.927985	8.039268	6.968149	10.21233	11.77323
Maximum	9.248778	9.379920	7.792463	11.65865	12.91036
Minimum	6.529623	6.599619	6.290608	8.395748	10.21490
Std. Dev.	0.953245	0.985920	0.508654	1.139206	0.902385
Observations	22	22	22	22	22

Note: in logs as explained above.

These trends are presented graphically below:

Figure 3. Some Graphical Trends



Note: As explained above.

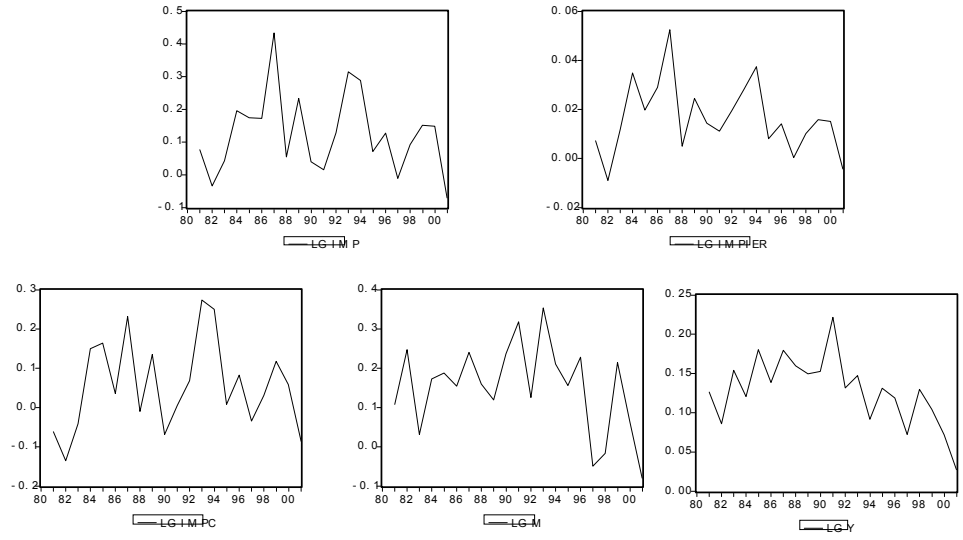
The time series are examined for unit roots. The results suggest the existence of a unit root in levels which are generally corrected for in growth with the results not being clear on the choice of log levels or growths.[26] Some descriptive statistics of the data in log growths, which are also supplemented by graphical representation, are given below:

Table 4. Some Descriptive Statistics

	LGIMP	LGIMPIER	LGIMPC	LGM	LGY
Mean	0.126096	0.016453	0.056043	0.151539	0.128355
Median	0.127123	0.014314	0.035970	0.159236	0.131092
Maximum	0.434214	0.052490	0.273945	0.353742	0.221587
Minimum	-0.071131	-0.008989	-0.135717	-0.080576	0.027358
Std. Dev.	0.122708	0.014471	0.114487	0.113362	0.043367
Observations	21	21	21	21	21

Note: As explained above.

Figure 4. Some Graphical Trends



Note: As explained above.

[26] Some Results Test of Unit Root in level and growths: LIMP (-0.856091, -2.784801*); LIMPIER (-0.861767, -2.910797*); LIMPC (-0.734845, -3.149741**); LM (-1.564621; -2.056434); LY (-2.009460; -0.473351). Note: LIMP, LIMPC and LY are series for import duties, cleaned import duties and nominal GDP; ****, ***, **, * are those significant at 1%, 5%, 10% and 15% respectively. -2.6467 is the 10% for NGDP thus the value is about 11% only, and may be acceptable.

Buoyancy and elasticity can be estimated for two bases - M and Y – whose empirical results and analysis are given below:

- Regressions are run on level and growth of LIMP, LIMPIER and LIMPC on LM. The regressions in levels have very high R2 and F statistics but indication of significant positive serial correlation (DW statistic). Likewise the regressions in growths suggest R2 [close to 20%] and F statistic significant at 5% level, with no statistically significant serial correlation for both LIMP and LIMPIER to LM although indeterminate presence of serial correlation for LIMPC to LM.

Table 5. Some preliminary regression results in log levels and growths base M

	Regression in Levels			Regression in Growths		
	LIMP	LIMPIER	LIMPC	LGIMP	LGIMPIER	LGIMPC
Variable	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
C	-0.529212	-0.736451	2.622607	0.052946	0.008552	0.039036
	(0.0390)	(0.0023)	(0.0000)	(0.2196)	(0.1045)	(0.7753)
LM	0.830196	0.860506	0.435847	0.482718	0.052143	0.208055
	(0.0000)	(0.0000)	(0.0000)	(0.0427)	(0.0660)	(0.0459)
R-squared	0.984368	0.988620	0.952855	0.198874	0.166847	0.193630
Adjusted R-squared	0.983587	0.988051	0.950498	0.156710	0.122997	0.151190
Durbin-Watson stat	0.912830	1.059226	0.833518	1.942835	1.967944	1.601314
F-statistic	1259.435	1737.400	404.2266	4.716629	3.804934	4.562389
Prob(F-statistic)	0.000000	0.000000	0.000000	0.042739	0.066009	0.045912

Note: Author calculation.

- Regressions are run on level and growth of LIMP and LIMPC on LY. The regressions in levels have very high R2 and F statistics but indication of significant positive serial correlation (DW statistic). Likewise the regressions in growths suggest low R2 and F statistic, with no statistically significant serial correlation for both LGIMP and LGIMPIER to LGM although indeterminate presence of serial correlation for LGIMPC to LGM.

Table 6. Some preliminary regression results in log levels and growth base GDP

	Regression in Levels			Regression in Growths		
	LIMP	LIMPIER	LIMPC	LGIMP	LGIMPIER	LGIMPC
Variable	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient	Coefficient
C	-4.333858	-4.675956	0.674687	0.010805	3.68E-05	-0.032348
	(0.0000)	(0.0000)	(0.0761)	(0.8980)	(0.9970)	(0.6869)
LM	1.049226	1.087186	0.546599	0.898220	0.127899	0.688636
	(0.0000)	(0.0000)	(0.0000)	(0.1608)	(0.0863)	0.2534
R-squared	0.986536	0.990166	0.940321	0.100773	0.146911	0.068044
Adjusted R-squared	0.985863	0.989675	0.937337	0.053445	0.102012	0.018994
Durbin-Watson stat	1.063383	1.092857	0.768691	1.836130	1.980940	1.532121
F-statistic	1465.483	2013.848	315.1268	2.129251	3.272006	1.387227
Prob(F-statistic)	0.000000	0.000000	0.000000	0.160847	0.086324	0.253417

Note: Author calculation.

- Given the positive indication of regressions in levels, and with regard to earlier studies done in Nepal, the empirical results in log levels are undergone: for base

M, suggest that buoyancy is 0.830196 and 0.860506 for LIMP and LIMPIER respectively and elasticity is 0.435847 – this is similar with Adhikari (1995) for 1974/75 to 1993/94 who obtained result of 0.8 and 0.4 for import duties in reference to value of import. The empirical results in log levels for base Y are consistent with this result and suggest that buoyancy is 1.049226 and 1.087186 for LIMP and LIMPIER respectively and elasticity is 0.546599 – this is much lower than that calculated by Shrestha (2001) who find for the period 1980/81 – 1993/94 buoyancy and elasticity of import tax of 3.194831 and 1.288670 respectively.

The results suggest that import duties are not very responsive to changes in merchandise imports although positively related when the base is taken to be GDP. This prior conclusion is also confirmed by the fact that despite a substantial increase in import in the early and mid-1990s, the import duties did not increase in that proportion. Thus, the potential custom revenue that could have been obtained due to increased trade was partially offset by the decrease in tariff rates, removal of quantitative restrictions and other measures taken to liberalize trade. It is surprising that elasticity for both base merchandise imports and GDP is about half of buoyancy. These results, therefore, suggests that there is low natural growth of the tax system [i.e. the "build-in flexibility"] and that the discretionary role of taxes has been able to contribute to overall revenue growth, but again still not similar to the growth of merchandise imports.

The reason for low elasticity and buoyancy of import duties also need an explanation, the details of which are beyond the scope of this study. A simple explanation may be due to the composition of imports where imported items such as raw materials, capital goods etc. form the bulk of imports which only attract low duties. Still another explanation may be the large informal trade between Nepal and India.[27] One other explanation may be the inefficiency and/or revenue leakages at various customs point. This last will be the source of some recommendations at the end of the paper.

Econometric Estimation Equation

The econometric estimation follows the above methodology. The span data is from 1980/81 – 2001/2002[28] and are provided in the first appendix; they include: actual import duties (IMP); nominal GDP (Y) and merchandise imports CIF (M) taken from various issues of *Economic Survey* from various budget speeches; the real effective exchange rate index (base 1990) of the Nepalese Rupee (as provided by the International Monetary Fund for 1979 – 2001) recalculated for fiscal year (i.e. July to June as mid months are not available). Some descriptive statistics of

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[27] A recent estimate by Karmacharya et al (2002) show the volume of informal trade is one third of formal trade – thus the volume of trade would be much higher if this channel could be captured.

[28] Note: 2001/2002 is provisional

the data in ratios, as described in the fifth appendix and are also supplemented by graphical representation, are given below:

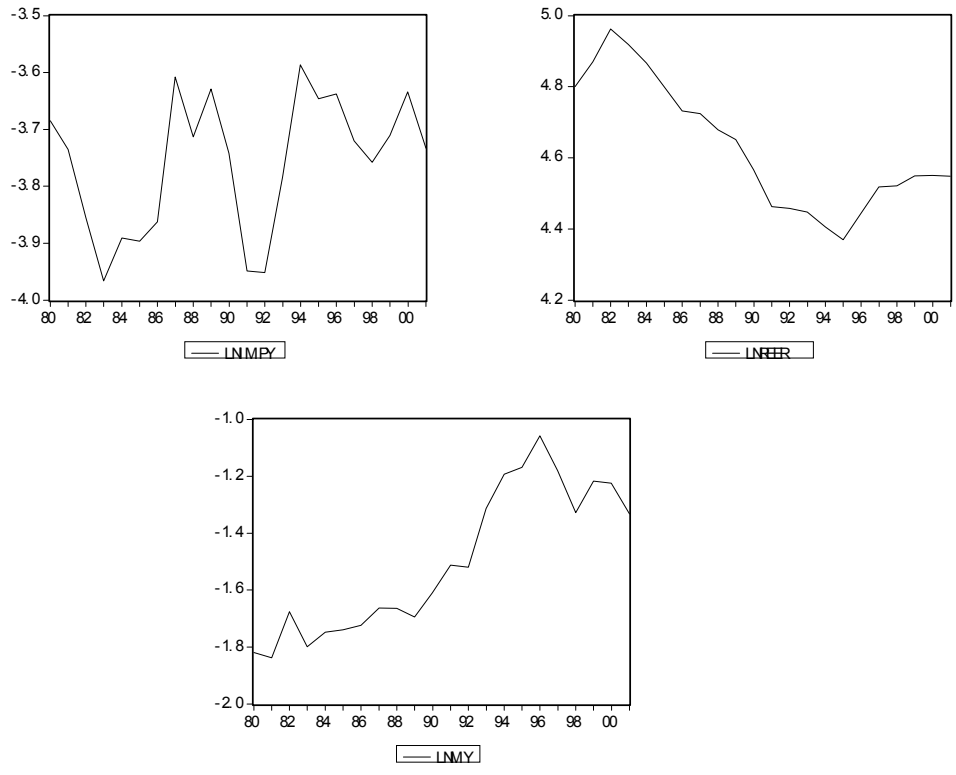
Table 7. Some Descriptive Statistics

	IMPY	MY	REER
Mean	0.023467	0.230040	104.0777
Median	0.023897	0.209486	95.42828
Maximum	0.027698	0.347047	142.9414
Minimum	0.018943	0.159104	79.01754
Std. Dev.	0.002732	0.059722	19.26749
Observations	22	22	22

Note: *IMPY* is actual import duties as a share of NGDP; *MY* is merchandise imports CIF as a share of NGDP; *REER* is the real effective exchange rate index (base 1990) of the Nepalese Rupee provided by the International Monetary Fund and calculated earlier

These are presented graphically below:

Figure 4. Some Graphical Trends



Note: As discussed above.

The time series are examined for unit roots. The results suggest the absence of a unit root in log ratios, at a looser level of confidence.[29] This suggests that the analysis in log ratios is in line with other empirical studies and can thus be considered as appropriate. Preliminary regressions are therefore run on the proposed estimating equation; that is of lnIMP to lnM, lnREER. The results are given below in Table 8 & 9, but have poor degree of fit, poor F-statistic (p=0.113887) with positive and significant serial correlation (DW statistic). Eyeballing the graph suggests a break in the early 1990's in line with the elimination of the trade impasse with India and acceptance of ESAF, not to speak of the ongoing trade liberalization which had been initiated in the mid-1980's namely being: removal of quantitative restriction on imports; lowering of the peak import tariff rates; and reform in import cash margin rates.[30] Chow test confirms that there is a structural break during this period, whose three years are given below:

Table 8. Chow Break Point test (1990 and 1992)

	1990	1991	1992
F-statistic	2.397612	5.630784	2.235801
(Probability)	(0.103573)	(0.007878)	(0.123503)
Log likelihood ratio	11.60413	15.85433	7.702251
(Probability)	(0.020551)	(0.001215)	(0.052583)

However, the most significant Chow statistics is chosen which is 1991/1992 – this is more significant than a factor of ten vis-à-vis 1990/1991 and 1992/1993. As such the estimating equation is modified such that lnCR is regressed on lnM, lnREER along and a dummy for fiscal year 1991. The initial regression has some degree of fit with significant F-statistic although still having positive and significant serial correlation (DW statistic). This is shown in the table below. The regressions are rerun as an AR (1), including lagged dependent variable, with greater fit and more power in F-statistic. As there is a lagged dependent variable in the regression, the DW statistic is no longer valid. Looking at the autocorrelation and partial autocorrelation function together with the Ljung-Box Q-statistics for higher order serial correlation, which suggest that the there is no serial correlation

[29] Some Results Test of Unit Root in ration levels: lnIMPY: -2.965987**; lnMY: -1.252762*; lnREER: -1.835011*. ****, ***, **, * are those significant at 1%, 5%, 10% and 15% respectively. The lower level of confidence may be acceptable given the limited degrees of freedom

[30] There are a number of publications which discuss on this, for example Karmacharya and Maskay (2004).

present at the 10% level of confidence.[31] The final estimation equation is represented as below:

$$\ln IMPY = b_0 + b_1 \ln MY + b_2 \ln REER + b_3 \ln DUM1991 + b_4 \ln IMPY(-1) + e$$

The results are given in the table below.

Table 9. Some preliminary regression results LNIMPY

	#1	#2	#3
Variable	Coefficient	Coefficient	Coefficient
C	-3.579850	-1.380902	-0.813382
	(0.0011)	(0.1865)	(0.4301)
LNMY	0.232995	0.641978	0.615149
	(0.1971)	(0.0030)	(0.0055)
LNREER	0.036878	-0.270345	-0.241607
	(0.8828)	(0.2350)	(0.2479)
D1991		-0.325725	-0.298604
		(0.0038)	(0.0067)
LNIMPY(-1)			0.202674
			(0.2633)
R-squared	0.204425	0.506864	0.629952
Adjusted R-squared	0.120680	0.424675	0.537440
Durbin-Watson stat	1.045401	1.240430	1.898454
F-statistic	2.441044	6.167039	6.809402
Prob(F-statistic)	0.113887	0.004529	0.002124

Note: Author calculation.

The analysis thus uses the second equation. The general implications of the second equation are that:

- Imports CIF to GDP has a positive [0.616149] and significant [greater that 1% level] relationship with the dependent variable;
- REER does not have has a significant effect on the dependent variable;

[31] These results are presented below:

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. | . |	. | . |	1	-0.036	-0.036	0.0308	0.861
. | . |	. *| . |	2	-0.057	-0.059	0.1142	0.944
***| . |	***| . |	3	-0.349	-0.355	3.3756	0.337
***| . |	***| . |	4	-0.355	-0.450	6.9467	0.139
. | . |	. *| . |	5	0.033	-0.171	6.9803	0.222
. |**. |	. |* . |	6	0.317	0.140	10.224	0.116
. |* . |	. | . |	7	0.174	-0.034	11.269	0.127
. | . |	. *| . |	8	0.049	-0.103	11.357	0.182
.**| . |	. *| . |	9	-0.243	-0.159	13.729	0.132
.**| . |	. *| . |	10	-0.212	-0.079	15.697	0.109
. | . |	. | . |	11	0.036	0.063	15.758	0.150
. | . |	. *| . |	12	0.064	-0.120	15.975	0.192

- D1991 has a negative [-0.298604] and significant [greater than 1% level] effect on the dependent variable;
- Lagged dependent variable does not have a significant effect on the dependent variable.

The first result suggests that greater imports CIF to GDP will have a positive effect on import duties to GDP; this makes sense as greater imports will result in more revenue from import duties. However, the elasticity of this is less than unity suggesting, in line with that of the previous section, that the basket of imported goods may be inelastic, thus any change in imports is not matched by a similar level of revenue from import duties.[32] The second result is surprising and suggests that the REER does not have a significant effect on import duties to GDP, which may be explained by levels of informal trade [explain]. The third variable suggests that the trade liberalization which had taken place in the early 1990's has had a negative effect on the ratio of import duties to GDP and supports earlier results implying that the basket of imported good are inelastic, thus trade liberalization would not have a positive effect on import revenue to GDP. The last variable supports the earlier conclusion that serial correlation has been addressed as there is no relationship between the present and lagged variables.

The analysis of the regression results, in general, is in line with our expectation; as such the coefficients for the regression will now be used in the following section to aid in the projection of import duties to GDP.

Simple Projection

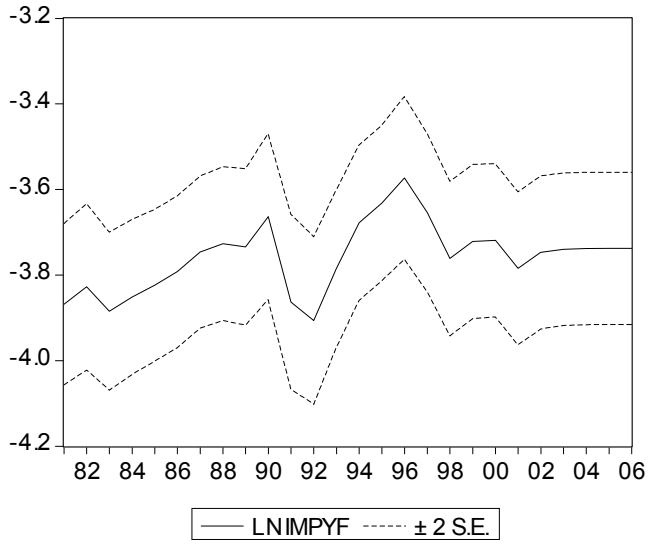
The projection follows the above methodology and uses the below equation from the previous section, and is reproduced below:

LNIMPY = -0.8133823006 + 0.6151486903*LNMY - 0.2416072088*LNREER - 0.2986041153*D1991 + 0.202674476*LNIMPY(-1)

The projected data for the independent variables (e.g. mainly LNMY and LNREER) are given in sixth appendix and are used to forecast the values of LNIMP. These forecasted values are shown graphically below:

[32] This is in line with imports being inelastic with respect to income in both levels [0.025709] and growths [0.464122 but not statistically significant].

Figure 5. Some Graphical Projections



The forecast is acceptable with Root Mean Square and Mean Absolute Error of 0.072333 and 0.060949 respectively. As such, it is appropriate to analyze the forecasted time series.

The forecasted time series, which are for the ratio of import duties to GDP, are in general stable except for 2002/2003 where there was a dip in the trend. It should be noted that this forecast is based on projection taken from official sources. As such, the results of the projection suggest, on average, that the ongoing process of trade liberalization will not have a significant effect on import duties (in relation to GDP).

SUMMARY AND CONCLUSION

An assessment of the impact on Nepal's import duties with greater trade liberalization has been made. Examining the trends of Nepal's import duties pointed out that it is a significant contributor to total revenue of HMG/N. However, buoyancy and elasticity analysis suggest that the Nepalese import duty base is not very responsive, suggesting a role for discretionary measures. One interpretation of this result is that there is inefficiency in the collection of import duties. An econometric examination further suggests that with liberalization, there has been a decreasing contribution of import duties based on five year ahead projection[33] and implying that there will be neutral contribution in line with growth of national income implying that *ceteris paribus* there will **not** be significant budget deficit.

[33] This is based on the official projections which are assumed to accurately capturing the future picture of Nepal.

As such, it is concluded that there will be limited pressure on the monetary authority and monetary policy, the limitations are put forward in the Nepal Rastra Bank Act, 2002. [34]

RECOMMENDATIONS

The recommendations put forth spring from the empirical results and analysis of the previous section.

1. The low measure of elasticity and buoyancy indicate the low efficiency, productivity and responsiveness of the domestic tax base. Further the measure of elasticity and buoyancy of import duties with respect to income being higher than with respect to the proxy base imports suggests that increased imports resulting from increase in income has not been able to increase import base. All these point to the importance of timely revision of rates structure [discretionary] although suggesting that implementation of various administrative reforms such as improving the customs valuation procedure, enhancing the activities of customs patrolling group, use of communication network and introduction of modern technology is also of essence.

2. Increase the diversity of the import base such that import demand will become more elastic. Since trade liberalization is decreasing the tariff rate and increasing trade facilitation, a more elastic demand will have a facilitating impact on import revenue. Likewise, it is also important that there be greater trading partners, as this will diversify the basket of trading partners.

3. Since there is a large amount of informal trade between Nepal and India and also Nepal and Tibet, a substantial amount of revenue is lost in this way. One of the reasons for this huge informal trade is the cumbersome administrative procedures and real cost involved in doing the trade through formal channel. This issue also needs to be addressed properly so as to facilitate the formal trade and discourage and minimize informal trade.

[34] This is more elaborately discussed in Article 75 to the mentioned Act.

APPENDIX I

Original text in Nepali of Arthic Niyam 2057, Duffa 2 (1)

आर्थिक ऐन, २०५७

२. भन्सार महसुल

१. विदेशबाट नेपाल अधिराज्यभित्र पैठारी हुने माल वस्तुहरुमा अनुसूची-१ बमोजिम भन्सार महसुल (साधारण भन्सार महसुल, थप भन्सार महसुल र समकारक महसुल) लगाइने र असुल उपरि गरनेछ ।

२. नेपाल अधिराज्यबाट विदेशमा निकासी हुने माल वस्तुहरुमा अनुसूची-२ बमोजिम भन्सार महसुल लगाइने र असुल उपर गरिने छ ।

APPENDIX II

Adjusting the Revenue Series with Focus on the Proportional Data Adjustment Method

There are a number of methods for obtaining adjusted revenue series viz. constant structure series; dummy variable technique; Divisia index; and Proportional adjustment method (see Dahal 2002 for a discussion). However the two popular methods presently utilized to clean time series are the Prest and Sahota proportional adjustment method. The method adjusts the revenue yield for each to derive a revenue yield based on the structure of rate and exemptions for a reference year. The Prest formula may be developed symbolically as follows:

- $T_1, T_2, ..., T_t, ...T_n$ are actual tax yields for a series of years
- $D_1, D_s, ...D_t, ...D_n$ measures the effect of discretionary changes in the year t^{th} year on the t^{th} year's revenue collection
- T_{ij} indicates the j^{th} year's actual tax yield adjusted to the tax structure that existed in year i

If i=1 is the reference year, the series T_{11}, T_{12}, T_{13} ... T_{1t} ... T_{1n} represents what the tax receipts would have been if the tax structure had remained as in year 1 with the years following year 1. It is this series that forms the basis for measuring the elasticity of a tax. The series is developed as follows:

$$T_{11} = T_1$$

$$T_{12} = T_2 - D_2$$

$$T_{13} = T_{23} \times \frac{T_{12}}{T_2}$$

$$T_{14} = T_{34} \times \frac{T_{23}}{T_3} \times \frac{T_{12}}{T_2}$$

.

.

.

$$T_{1j} = T_{j-1.j} \times \frac{T_{j-2.j-1}}{T_{j-1}} \cdots \frac{T_{23}}{T_3} \times \frac{T_{12}}{T_2}$$

Sahota Method:

$$NR_t = \frac{AR_t - DR_t}{AR_{t-1}} \times NR_{t-1}$$

Where,

NR_t = Net or adjusted revenue series in year "t"
AR_t = Actual revenue collection in year "t"
DR_t = Proportional revenue collection through discretionary change in year "t"
AR_{t-1} = Actual revenue collection in the preceding year (t-1)
NR_{t-1} = Net revenue series in preceding year (t-1)

Note: These two methods, while appearing quite different, yield the same estimates of income elasticity (Dahal, 2000).

APPENDIX III

Time Series of Trends

	Import Duties	Customs	Tot Tax Revenue	Imports CIF	NGDP
1980	685.14	815.80	2035.70	4428.2	27307
1981	739.54	825.10	2211.30	4930.3	30988
1982	714.82	760.90	2421.10	6314	33761
1983	746.16	825.90	2737.00	6514.3	39390
1984	907.57	1064.50	3151.20	7742.1	44441
1985	1081.13	1231.00	3659.30	9341.2	53215
1986	1285.33	1505.70	4372.40	10905.2	61140
1987	1984.23	2214.60	5752.90	13869.6	73170
1988	2094.36	2289.90	6287.20	16263.7	85831
1989	2645.98	2684.90	7283.90	18324.9	99702
1990	2752.66	3044.30	8177.40	23226.5	116127
1991	2795.17	3358.90	9875.60	31940	144933
1992	3178.06	3945.00	11662.50	36205.6	165350
1993	4356.05	5255.00	15371.50	51570.8	191596
1994	5815.87	7018.10	19660.00	63679.5	209976
1995	6246.45	7327.40	21668.00	74454.5	239388
1996	7093.20	8309.10	24424.30	93553.4	269570
1997	7019.41	8502.20	25939.80	89002	289798
1998	7698.28	9517.70	28752.90	87525.3	330018
1999	8959.90	10813.30	33152.10	108504.9	366251
2000	10391.86	12552.10	38865.10	115687.2	393566
2001	9678.36	12658.80	39330.60	106731.3	404482

Note: 1. 1980 represents fiscal year 1980/81 and so on
2. Import Duties (in millions Rs.) from various Budget Speech of HMG/N
3. Customs from various issues of Economic Survey and includes: imports, exports, Indian Excise Refund and others
4. Total Tax Revenue from various issues of Economic Survey
5. Import C.I.F. (in millions Rs.) from various issues of Economic Survey
6. NGDP (in millions Rs.) from various issues of Economic Survey

APPENDIX IV

Calculation of Cleaned Series

	ESTIMATED				ACTUAL			
FY	NG	ADJ	TOTAL	NG/TOTAL	NG	ADJ	Total	CLEANED
1980	556,977.00	46840	603,817.00	0.92242683	631991.5	53,148.48	685,140.00	685140.00
1981	774,128.00	114600	888,728.00	0.87105166	644174.1	95,361.94	739,536.00	644174.06
1982	990,000.00	106000	1,096,000.00	0.90328467	645681.4	69,133.57	714,815.00	562421.88
1983	850,000.00	75000	925,000.00	0.91891892	685658.7	60,499.30	746,158.00	539481.49
1984	700,000.00	32500	732,500.00	0.9556314	867299.5	40,267.48	907,567.00	627068.31
1985	1,125,400.00	12000	1,137,400.00	0.98944962	1069723	11,406.32	1,081,129.00	739107.08
1986	1,280,000.00	188000	1,468,000.00	0.8719346	1120725	164,606.55	1,285,332.00	766176.94
1987	1,383,500.00	310000	1,693,500.00	0.81694715	1621011	363,218.95	1,984,230.00	966272.75
1988	2,293,000.00	150000	2,443,000.00	0.93860008	1965766	128,593.53	2,094,360.00	957281.45
1989	2,130,000.00	220000	2,350,000.00	0.90638298	2398273	247,708.95	2,645,982.00	1096192.77
1990	2,215,200.00	252300	2,467,500.00	0.89775076	2471203	281,457.39	2,752,660.00	1023784.15
1991	3,020,000.00	30000	3,050,000.00	0.99016393	2767673	27,493.44	2,795,166.00	1029367.71
1992	3,240,000.00	200000	3,440,000.00	0.94186047	2993288	184,770.87	3,178,059.00	1102329.57
1993	3,553,140.00	150000	3,703,140.00	0.95949383	4179602	176,446.84	4,356,049.00	1449721.06
1994	4,820,800.00	190000	5,010,800.00	0.9620819	5595343	220,526.72	5,815,870.00	1862166.15
1995	6,830,000.00	450000	7,280,000.00	0.93818681	5860338	386,113.04	6,246,451.00	1876404.21
1996	6,630,000.00	300000	6,930,000.00	0.95670996	6786136	307,064.98	7,093,201.00	2038523.03
1997	8,160,000.00	200000	8,360,000.00	0.97607656	6851484	167,928.54	7,019,413.00	1969055.84
1998	7,865,800.00	500000	8,365,800.00	0.94023285	7238174	460,104.11	7,698,278.00	2030421.71
1999	9,093,400.00	313000	9,406,400.00	0.96672478	8661754	298,142.52	8,959,897.00	2284538.74
2000	10,245,879.00	961770	11,207,649.00	0.91418628	9500100	891,764.46	10,391,864.00	2422276.22
2001	11,772,000.00	175700	11,947,700.00	0.98529424	9536034	142,327.66	9,678,362.00	2222787.87
2002	12,360,000.00	250000	12,610,000.00	0.98017446	10397005	210,295.40	10,607,300.00	2387835.43
2003	11,312,000.00	780000	12,092,000.00	0.93549454				

Source: Calculated from various budget speeches of HMG/N

Note: "NG" is normal growth; "ADJ" are tariff adjustments and administrative reforms; "TOTAL" is the sum of "NG" and "ADJ"; and "NG/TOTAL" is the ratio of NG to TOTAL.

Time Series for Regression Analysis

Fiscal Year	Regression Time Series				
	Import Duties	IER	NGDP	Imports	REER
1980	685.14	58.10	27307	4428.2	121.5387
1981	739.54	40.40	30988	4930.3	130.4029
1982	714.82	20.00	33761	6314	142.9414
1983	746.16	49.00	39390	6514.3	136.7808
1984	907.57	100.00	44441	7742.1	129.8711
1985	1081.13	75.60	53215	9341.2	121.4683
1986	1285.33	138.30	61140	10905.2	113.4999
1987	1984.23	121.2	73170	13869.6	112.6737
1988	2094.36	91.6	85831	16263.7	107.6848
1989	2645.98	0	99702	18324.9	104.7148
1990	2752.66	211.7	116127	23226.5	96.22336
1991	2795.17	447.4	144933	31940	86.78105
1992	3178.06	623.5	165350	36205.6	86.31514
1993	4356.05	460.4	191596	51570.8	85.36669
1994	5815.87	837.5	209976	63679.5	81.94095
1995	6246.45	899.9	239388	74454.5	79.01754
1996	7093.20	1009.1	269570	93553.4	85.16989
1997	7019.41	1102	289798	89002	91.69997
1998	7698.28	1206	330018	87525.3	91.93909
1999	8959.90	1331.7	366251	108504.9	94.58363
2000	10391.86	1456.2	393566	115687.2	94.6332
2001	9678.36	1700.9	404482	106731.3	94.46258

Note:

1. 1980 represents fiscal year 1980/81 and so on
2. Import Duties (in millions Rs.) from various Budget Speech of HMG/N small differences came up in 1988 and 1994 between Budget Speech and Economic Survey which were 2133.9 and 5840.1 respectively
3. Indian Excise Refund (in millions Rs.) from Economic Survey
4. NGDP (in millions Rs.) from Table 1.1 of various issues of Economic Survey
5. Import C.I.F. (in millions Rs.) from Table 6.1 of various issues of Economic Survey
6. From monthly data provided from IMF for fiscal year average - thus 1980/81 is taken to be July 1980 to June 1981

APPENDIX VI

Time Series for Projection Analysis

Fiscal Year	Regression Time Series				
	Import Duties	Imports	NGDP	REER	Dummy
1980	685.14	4428.2	27307	121.5387	0
1981	739.54	4930.3	30988	130.4029	0
1982	714.82	6314	33761	142.9414	0
1983	746.16	6514.3	39390	136.7808	0
1984	907.57	7742.1	44441	129.8711	0
1985	1081.13	9341.2	53215	121.4683	0
1986	1285.33	10905.2	61140	113.4999	0
1987	1984.23	13869.6	73170	112.6737	0
1988	2094.36	16263.7	85831	107.6848	0
1989	2645.98	18324.9	99702	104.7148	0
1990	2752.66	23226.5	116127	96.22336	0
1991	2795.17	31940	144933	86.78105	1
1992	3178.06	36205.6	165350	86.31514	1
1993	4356.05	51570.8	191596	85.36669	1
1994	5815.87	63679.5	209976	81.94095	1
1995	6246.45	74454.5	239388	79.01754	1
1996	7093.20	93553.4	269570	85.16989	1
1997	7019.41	89002	289798	91.69997	1
1998	7698.28	87525.3	330018	91.93909	1
1999	8959.90	108504.9	366251	94.58363	1
2000	10391.86	115687.2	393566	94.6332	1
2001	9678.36	106731.3	404482	94.46258	1
2002		124352.1	434294	94.46258	1
2003		132061.9	461220	94.46258	1
2004		140249.7	489815	94.46258	1
2005		148945.3	520184	94.46258	1
2006		158179.9	552435	94.46258	1

Note:
1. 1980 represents fiscaly year 1980/81 and so on.
2. Import Duties (in millions Rs.) from various Budget Speech of HMG/N.
3. NGDP (in millions Rs.) from Table 1.1 of various issues of Economic Survey.
4. Import C.I.F. (in millions Rs.) from Table 6.1 of various issues of Economic Survey.
5. From monthly data provided from IMF for fiscal year average - thus 1980/81 is taken to be July 1980 to June 1981.
6. Figures for 2002/2003 are taken from Nepal Rastra Bank.
7. Figures for 2003/2004 - 2006/2007 are projected based on linear growth of 6.2% in line with 10th Plan.

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