Determinants of
Nepal's Export Trade Instability

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Abstract

Fluctuation in export earnings is a great concern to policy makers and can be caused by many factors. This study has analyzed the causes of export instability from 1980/81 to 2012/13 based on secondary data. Using Ordinary Least Square technique the empirical result shows that there is positive relationship between export instability index and three independent variables: commodity concentration index, geographic concentration index and openness index with coefficient of 1.619, 1.163, and 6.023 respectively. Furthermore, it again establishes the negative relationship between export instability index and four independent variables: consumption ratio, food ratio, instability index of real agricultural GDP and instability index of real nonagricultural GDP having co-efficients of -2.922, -7.633, -5.169, and -0.474 respectively.

Key Words: Export; GH Index; Commodity concentration index; Geographic concentration index; Exponential trend; Determinants of export instability

Introduction

The export trade refers to the nominal value of goods produced in one country but consumed by other countries. The nominal value of export trade is often called export earnings. The governments of all countries want to increase their exports as it contributes for economic development through foreign currency earnings, increase in employment, increase in wage rates, upliftment of the standard of living and poverty reduction. Acknowledging the given fact, Nepal has been shifting towards liberal and market oriented trade regime since the mid - 1980s with new export oriented policies replacing the import substitution policies. In addition to the shift in policy regime, the Government of Nepal (GoN) has developed several institutions and trade policies aiming at boosting up the export sector. In terms of institutional changes, the GoN has established Trade and Export Promotion Centre (TEPC) and dry ports. In 2009, the GoN announced a new trade policy by replacing the Trade Policy-1982. It has also been replaced by the Trade Policy-2015. Furthermore, the GoN has published Nepal Trade Integration Strategy (NTIS)-2010.

Size and Trend of Export Trade

The data on nominal export and import trade are presented in Appendix - A. The nominal value of exports trade increased from Rs. 889.6 million in 1974/75 to Rs. 91,991.4 million in

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2013/14 that became approximately by103.4 times. During the same time period, the rupee value of imports trade increased from Rs. 1,814.6 million to Rs. 714,365.9 million that became roughly by 393.7 times (NRB, 2015). It indicates that, the nominal value of export trade grew marginally while import trade increased to a greater extent. The trend of nominal export and import is presented in Figure 1.

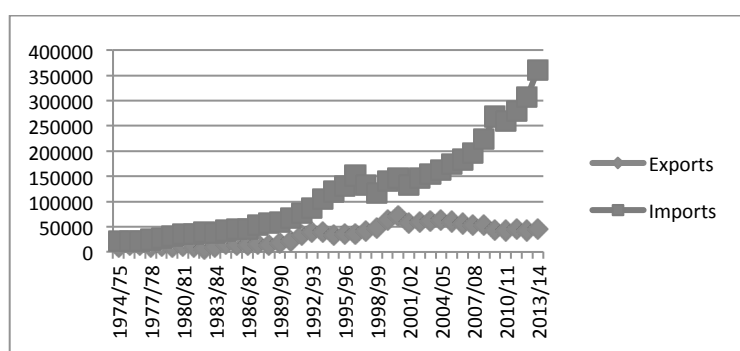**Figure 1: Trend of Nominal Export and Import Trade**
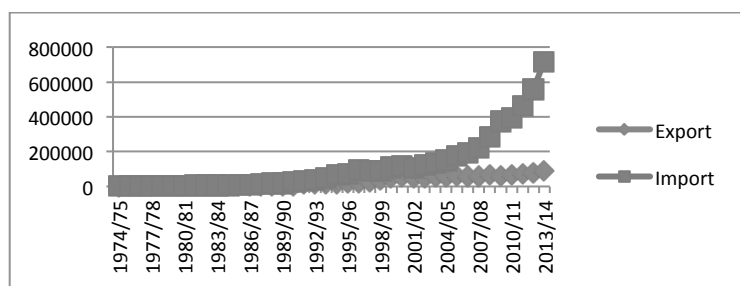
Source: Appendix-A.

The trend of nominal export and import trade shows that both the exports and imports are increasing over the years. It is also noted that the growth of import trade has exceeded export trade. Furthermore, the export trade is unstable and fluctuating during the study period.

The data on real exports and imports (Appendix-A) is the nominal value adjusted with price level taking particular year as a base year. The values of deflator for different years are presented in Appendix-B. At base year price of 2005/06, the real value of total exports increased by 4.6 times from Rs. 9,995.5 million in 1974/75 to Rs. 46,413.4 million in 2013/14. During the same period the real value of total imports increased by 17.7 times from Rs. 20,388.8 million to Rs. 360,426.8 million. The trend of real export and import trade is presented in Figure-2.

Figure 2: Trend of Real Export and Import Trade
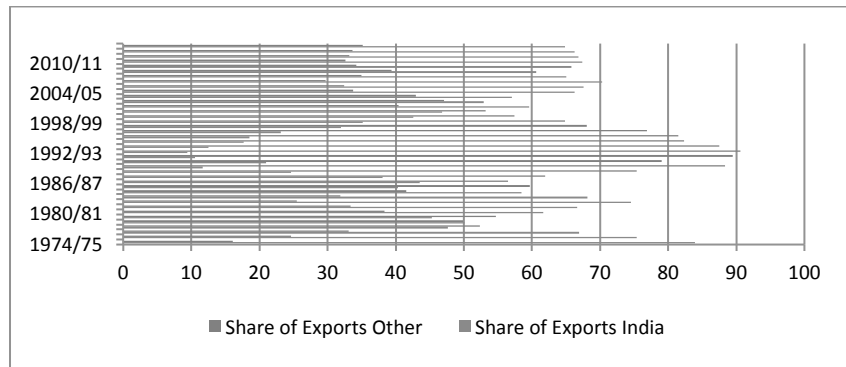

Source: Appendix-A.

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export trade. Furthermore, the export trade is unstable and fluctuating during the study period.

Direction and Growth Rate of Export Trade

The direction of Nepal's export trade is analyzed in terms of two directions: India and other countries. Columns 6 and 7 (appendix-A) present share of India and other countries to Nepalese exports. It indicates that the export share of India and other countries seems almost equal over the study periods. Specifically, the export share of India is about 49 percent and that of other countries is 51 percent on average. However, the data show fluctuating trend: initially the share of export trade with other countries has increased initially reached up to 90.6 percent in 1992/93 and then declined. The export share of India in Nepal's total trade was extremely high but later it fell down up to 9.4 percent in 1992/93 due to trade disputes between Nepal and India. There after, it grew again rapidly. On the basis of these data, it is observed that India is the largest trade partner of Nepal since 1974/75. Furthermore, after trade liberalization policy which was executed intensely in 1990s in Nepal, India's share increased again rapidly. Hence, it is concluded that the trade liberalization policy could not address Nepal's export dependence on India. The direction of Nepalese export trade is shown in Figure 3.

Figure 3: Direction of Nepal's Export Trade

Source: Appendix-A.

The growth rate of export trade refers to the rate of change of its size or volume. It is usually, measured in terms of percent per year. The growth rate of nominal and real value of export trade has been measured by using exponential equation, $Y = ae^{bt}$. The result of the nominal growth rate obtained from trend line fitting is presented in Table-1.

Table-1: Growth Rate of Nominal Exports and Imports (1974/75 – 2013/14)

Dependent Variable	Estimated values of parameters				Level of significance
	A	B	R^2	F-value	
Exports	717.2	13.6	94.2	613.0	0.000
Imports	1610.6	15.3	98.5	2576.0	0.000

Source: Author's calculation through SPSS:16 using data availed in Appendix-1.

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Table 1 presents estimated growth rate of exports and imports over the study period of 40 years. From the table, it is seen that the exports and imports are increasing at the rate of 13.6 and 15.3 percent per annum respectively. While comparing these growth rates, the growth rate of import (15.3 percent) is higher than that of export (13.6 percent).

Similar to the growth rate of nominal trade, the present analysis has also estimated the growth rate of real value of export and import. For this aim, the same exponential equation has been used. The result of the growth rate of real values of trade obtained from trend line fitting is presented in Table-2.

Table 2: Growth Rate of Real Exports and Imports (1974/75 – 2013/14)

Dependent Variable	Estimated values of parameters				Level of significance
	A	B	R^2	F- value	
Exports	8992.3	0.054	0.78	136	0.000
Imports	20194.7	0.071	0.98	1672	0.000

Source: Author's calculation through SPSS:16 using data of Appendix-1.

Table-2 presents the growth rate of real value of exports and imports from 1974/75 to 2013/14. The estimated growth rate indicates that the exports and imports increased at the rate of 5.4 and 7.1 percent per annum. It is important to note down herein that the growth rate of imports exceeded to that of exports.

Instability in Export Earning

As discussed above, the value of exports trade like other economic variables does not have a fixed trend and fluctuate over time. This fluctuation is called instability. Various alternative definitions of export instability are given in the trade literature. The first economist to define export instability was Coppock (1962). According to him, export instability is the volatility from the normal trend value of export. Similarly, Herrmann, (1989) defines export instability in terms of instability of export earnings, export prices, and export quantities. Export instability is often measured by an index which is calculated as relative changes in export earnings from a certain reference value (Abraha, 2004). Several methods have been used to estimate Export Instability Index (EII) ranging from a simple type that approximates instability to the average percentage deviation of export earnings from their five-year moving average (Macbean, 1966) to a complex one which is known as log variance index (Coppock, 1962). In between them, there are other indices of export instability as well. They include coefficient of variation method, standard normalization approach, and so on.

Different scholars have applied different formulae in different contexts. These formulae have their own strengths and weaknesses. But these formulae are not country specific. They are chosen depending on the availability of the data and researcher's own familiarity with the formula. The formula used in this study is common. It is based on average percentage of deviation of the observed values of export proceeds from an exponential growth path.

Causes of Export Instability: The Review of Literature

A number of studies are available in the literature which explains causes of export earnings instability. Generally, the causes of export instability can be categorized in two ways: external and internal. The important factors on the external side are low elasticity of

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demand for primary products, fluctuations in commodity prices and tariff and non-tariff barriers of importing countries. The crucial factors on the internal side are specialization in the export of primary products, concentration on a small range of commodities and market and other supply side rigidities.

Fluctuations in export earnings can be a great concern to many analysts and can be caused by many factors. In most of the empirical studies of export instability, the main issue is to examine the influence of the extent of commodity concentration and geographic concentration on export instability. Eminent scholars including Coppock (1962) and Macbean (1966) have carried out such studies. All these studies are based on cross section data of both developed and developing countries. These both studies show hardly any positive relationship between export instability and commodity and geographic concentration. However, Massell (1970) has presented positive relationship between export instability and commodity concentration.

Ozler and Harringan (1988) have found a negative effect of real export instability on growth of 26 developing countries. This implies that if export is more stable, then these countries would achieve economic growth. Tariq and Najeeb (1995) have examined the export earnings instability in Pakistan. With the help of the data from 1969/70 to 1990/91, they found the strong positive relationship between export instability and degree of commodity concentration in Pakistan. Their results showed that the relationship between export earning instability and degree of commodity concentration in Pakistan was found strong. It shows that commodity concentration explained a large portion of the instability in total export earnings. However, the geographic concentration and the instability in Pakistan's export earnings were not correlated at all. The primary products ratio and the raw materials ratio were not found in explaining instability in case of Pakistan. The strong negative significance of food ratio shows that the encouragement of food exports would reduce export earning instability.

In a similar context, Roy (2002) has analyzed India's changing export behavior from 1960/61 to 1999/2000 using demand-supply model of export determination using error-correction method. The study establishes the importance of demand factors such as world demand and real effective exchange rates in the determination of India's exports as against the relatively weak relevance of supply side determinants.

Abolagba et al., (2010) have attempted to establish the major determinants of rubber and cocoa exports of Nigeria from 1970 to 2005. Using the method of Ordinary Least Squares (OLS), the findings show that rubber export is positively influenced by domestic rubber production and producer price and negatively influenced by exchange rate, domestic consumption, and interest rate.

Abdullah (2012) has assessed the determinants of instability of the Malaysian palm oil export earnings by using generalized autoregressive conditional heteroskedasticity (GARCH) model. The result shows that the most significant factors are prices of crude palm oil (CPO) and soya bean oil. Both show positive relationship with export earnings instability. Malaysian export volume and CPO production also exhibit significant positive relationships with export earnings. For the GDP factor, GDP of China and the USA show negative relationship, while that of India, Malaysia and Pakistan are positively related.

Aidam and Anaman (2014) have investigated the effect of the instability of export earnings on gross fixed capital formation (total investment) in Ghana from 1981 to 2011. The analysis employs the autoregressive distributed lag (ARDL) method of cointegration to

evaluate a set of factors which affect investment as measured by the investment to gross domestic product (GDP) ratio. The results of the analysis confirm the expected negative relationship between export earnings instability and investment. Other factors that significantly influence investment in Ghana are real GDP growth, merchandise trade balance, real interest rate and gross domestic savings ratio.

In the context of Nepal, few researches have been done on factors influencing export earnings instability including Poudyal (1988) and Devkota (2003). Poudyal (1988) has analyzed the causative factors of Nepalese export instability covering the period from 1956/57 to 1981/82. Similarly, Devkota (2003) has examined the causes of export instability in Nepal using data covering the years from 1975 to1998. To estimate the causes of export instability, Poudyal (1988) has regressed commodity concentration index and geographic concentration on export instability. Similarly, Devkota (2003) has regressed commodity concentration index, geographic concentration index, instability index of agricultural GDP and instability index of nonagricultural GDP on export instability.

Both the studies have established positive relationship between commodity and geographic concentration index and instability index. However, both the econometric estimations are not free from auto correlation. Furthermore, these studies are based on smaller number of independent variables and limited number time period. On this background, it is desirable to develop an econometric model that explains causative factors of export earning instability of Nepal including longer time period and more explanatory variables by removing autocorrelation in the model. Thus, the objective of the study is to examine the determinants of Nepal's export trade instability.

Research Methodology

Research Design and Sources of Data

The study is an ex-post quantitative analysis based on secondary data. The data were analyzed through EXCELL and SPSS 16. In order to carry out the study, data were collected only from domestic sources including *Quarterly Economic Bulletin* published by Nepal Rastra Bank and *Economic Survey* published by Ministry of Finance. The sources of specific data are presented here upon.

The data on exports and imports were collected from *Quarterly Economic Bulletin Vol. 50, No.1* published by Nepal Ratra Bank in 2015. The data on the consumption goods were collected by adding the items/commodities of SITC group 3, 5, 6, 8 and 9. The percentage of consumption ratio is obtained by dividing the export value of consumption goods by total export. Similarly, data on food ratio were collected by aggregating SITC group 2 and 3. The percentage of food ratio is obtained by dividing the food ratio by total export. The data on Nepal's GDP as well as agricultural and non - agricultural GDP were collected from the various issues *Economic Survey* published by Ministry of Finance, Government of Nepal. The real agricultural and non - agricultural GDP were estimated with the help of the values of deflators (Appendix-B). Trade openness index is defined as the ratio of merchandise trade to GDP.

Theoretical Framework and Measurement Tools

Trade Concentration Index

In the context of foreign trade, trade concentration refers to the structural distribution of country's exports across different geographical markets or different commodity classes

(Dixon, 1984). Theoretically, the value of higher trade concentration creates trade shocks and instability in international trade and contributes to make the trade more unstable (Makonnen, 2012). Several indices have been developed to measure the trade concentration index. They include Gini Hirschman Index, Ogive Index, Aggregate Specialization Index, and Herfindahl Index etc. In this study, only Gini Hirschman index, as given in equation 1, has been used. The index is frequently suggested by researchers to draw reliable conclusions (Hirschman, 1945).

$$GH = \sqrt{\sum_{j=1}^{n} \left(\frac{X_{jt}}{X_t}\right)^2} \qquad \text{..............} (1)$$

Where,

GH = Gini Hirschman Index,

$x_{j,t}$ = Export value of specific commodity j in year t, and,

X_t = the country's total export in that year.

The Gini-Hirschman index ranges from 0 - 1. A value of GH index approaching 1 indicates high degree of export concentration and low degree of export diversification. A value approaching 0 implies low degree of export concentration and high degree of export diversification. On the commodity level, a value of GH index approaching 0 indicates that the share of all commodities in total export is more or less equal and hence high degree of export diversification. A value approaching 1 implies that the share of one commodity in total export is more or less 100 percent and hence low degree of diversification.

Export Instability Index

The formula used in the study to calculate the export instability index (EII) is given by equation 2. The instability indices of both real agricultural and non-agricultural GDP were similarly found.

$$EII = \left[\frac{Y_t - \hat{Y}_t}{Y_0}\right] * 100 \qquad \text{...............} (2)$$

Where,

EII = Export instability index,

Y_t = Actual value,

$\hat{Y}_t$ = Estimated trend value estimated by exponential trend equation,

Y_0 = Mean of the actual value.

In this study, the first consideration is given to find a trend of export earnings which fits the data well. The trend lines are linear (equation 3) and exponential (equation 4) respectively, and are measured as:

$$\hat{Y}_t = \alpha_0 + \alpha_1 t + u_t \quad \text{................................} (3)$$

$$\log \hat{Y}_t = \beta_0 + \beta_1 t + u_t \quad \text{..............................} (4)$$

The study has applied equation 4. The theoretical justification for this choice is that countries plan in terms of their growth rates and not in terms of absolute increments (Tarique and Najeeb, 1995). Also, the exponential trend provides a better fit than the linear trend in Nepal's case as argued by Poudyal (1988). The trend value for each year is calculated by taking the antilog of the exponential trend as presented by equation 5.

$$\hat{Y}_t = antilog\ (\beta_0 + \beta_1 t) \text{.....................} (5)$$

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Measurement of Explanatory Variables and Model Specification

As stated above, the models used by Poudyal (1988) and Devkota (2003) are not free from autocorrelation and fall on the indecision region. This may be because of misspecification of the model. Brundell, Horn, and Svedberg (1981) in a similar study have included other variables such as: food ratio, consumption ratio and openness index among other things and arrived at the right estimation. So, in the study, the model used by Poudya and Devkota has been extended by adding up consumption ratio, food ratio and openness index. The extended shape of equation is given in equation 6.

$$Y = f (Cx, Gx, Cr, Fr, IIagdp, IInagdp, Opp) \dots\dots\dots\dots \quad (6)$$

Where,

Y = Export instability index,

f = Functional notation,

Cx = Commodity concentration index,

Gx = Geographic concentration index,

Cr = Consumption ratio,

Fr = Food ratio,

IIagdp = Instability index of real agricultural GDP,

IInagdp = Instability index of real nonagricultural GDP,

Opp = Openness index.

Empirical Analysis

Geographic and Commodity Concentration of Exports

For the estimation of geographic concentration index for exports, the study has applied equation-1 and covered 39 countries covering time period from 1979/80 to 2012/13. According to Trade and Export Promotion Centre (TEPC, 2013), Nepal trades with more than 150 countries. For example, in 2013 Nepal's export trade partners were 170 and import trade partners 150. However, trade was not carried out with all these countries each and every year and only limited countries were included in the transaction annually. It is therefore, time-series data of only selected countries were available. Thus, to examine the geographic concentration index, only those countries were selected whose export data were regularly available since 1979/80. Such a long time-series data were available only for 39 countries that was concluded going after the publication of TEPC. Thus, these 39 countries are the population of the study and all of them were included as per census method. The names of these 39 countries are presented in Appendix-C.

As demonstrated in Appendix-D, the finding indicates that the lowest value of geographic concentration of export is 43.72 for the year 1989/90. The highest value for the same attribute is calculated as 75.63 for the year 1982/83. The geographic concentration index of export seems volatile. It is fluctuating during the study years like a seesaw sport of a park. It confers that there is no any consistent trend of Nepalese export trade. Like geographic concentration, the commodity concentration index is calculated with the help of the trade data following SITC classification. The SITC classification provides the trade data of 10 categories (from category zero to category nine) of exports. Based on the availability of data, the commodity concentration index of exports is calculated from the year 1974/75 to

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2012/13. The finding of the empirical calculation of commodity concentration index is also presented in Appendix-D. It is found that the value of concentration coefficient for export falls in between around 50 to 71. According to the quantitative data, the lowest coefficient is 49.66 in 1986/87 whereas the highest value is 71.02 in 1975/76. The quantitative data analysis indicates that Nepal's export is composed of only few categories of commodities and is fluctuating during the years.

Export Trade Instability

This section explains empirical analysis of export trade instability of Nepal. For this purpose, equation-2 has been applied. The regression result obtained by using equation-2 and Nepal's export data from 1974/75 to 2013/14 is:

$Y_t = 2.944 + 0.015t$,
and $R^2 = 0.924$, (F = 464.586, significant at 0.000)

The trend value for each year was calculated by applying equation-4. Each year's actual exports and export instability index from 1974/75 to 2013/14 is presented in Appendix-E. The export instability index has increased over the study period and found that the index ranges from -0.06 in 1974/75 to 232 in 2012/13. It concludes that the values of export instability are highly fluctuating during the period under study.

Causative Factors: The Determinants of Export Instability

Following the customary practices of causes of export instability, the study has presented an empirical analysis of Nepal's export instability by applying Equation-6 covering the period of 33 years from 1980/81 to 2012/13 is reported in Table 3. The data regarding the selected variables are shown in Appendix-F.

Table 3: Regression Equation (Dependent Variable: Export Instability Index)

Explanatory Variables	OLS Coef.	St. Error	t– value	Significant at
Constant	20.747			
C_x	1.658	1.678	0.988	0.332
G_x	1.188	0.652	1.822	0.080
C_r	-2.973	1.102	-2.697	0.012
F_r	-7.778	2.365	-3.289	0.003
Iiagdp	-5.250	1.147	-4.578	0.000
Iinagdp	-0.466	0.889	-0.524	0.605
Opp	6.106	1.075	5.677	0.000
$R^2 = 0.902$, D-W = 1.791, F-value = 32.872, F-sig = 0.000				

Source: Results of equation 6 and Table 4 using STATA 12.

The empirical results presented in Table 3 show the determinants of export instability index. On the basis of the values of R^2 (0.902) and F (32.872) – statistics, it can be concluded that the explanatory variables are powerful to explain the dependent variables. This model shows that there is a positive relationship between export instability index and three independent variables: commodity concentration index (Cx), geographic concentration index (Gx) and openness index (Opp). It again establishes the negative relationship between export instability index and four independent variables: consumption ratio (Cr), food ratio (Fr), instability index of agricultural GDP (IIagdp) and instability index of nonagricultural GDP (IInagdp). The coefficient of commodity concentration index is 1.658 that means when

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commodity concentration index increases by 1 unit, the export instability index increases by 1.658 units. Similarly, the coefficient of consumption ratio -2.973 means that when consumption ratio increases by 1 unit the export instability index decreases by 2.973 units. The coefficients of other variables can be explained in similar way.

Based on the calculated 't' values, the variables including Gx, Cr, Fr, IIagdp and Opp are significant. It confirms that geographic concentration index, consumption ratio, food ratio, instability index of real agriculture GDP and openness index are the strong determinants of Nepalese export instability. However, the variables: commodity concentration index and instability index of nonagricultural GDP are found insignificant. It means that the variables commodity concentration ratio (Cx) and instability index of real non-agriculture GDP (IInagdp) are not found as the determinants of Nepalese export instability. In addition to this, at 0.01 level of significance, the d-w statistics (at n = 33 and k = 7) is 1.776 and the calculated d-w statistics (at n = 33 and k = 7) is 1.791. It confirms that there is no auto correlation (Wooldridge, 2012) that means the determinants of export instability are verified. Thus, the Nepalese export instability is explained by the aforementioned variables and the model.

Conclusion

The study concludes that it has increased in terms of both nominal and real values during the study period. For example, the nominal and real size of export trade has increased nearly by 103.4 and 4.6 times from 1974/75 to 2013/14. During the same time period, the rupee value of imports trade increased roughly by 393.7 times from Rs. 1,814.6 million to Rs. 714,365.9 million. But, during the same period, the real value of total imports increased by 17.7 times from Rs. 20,388.8 million to Rs. 360,426.8 million. The study estimated exponential growth rate in terms of exports and imports trade over the study period of 40 years. From the trend line fitting, it is seen that the exports and imports grew nominally at the rate of 13.6 and 15.3 percent per annum respectively. The similar figure for real growth rates are 5.4 and 7.1 percent.

Thus, it confers that the nominal size and the growth rate of export trade of Nepal differs by more than double from real size and its growth rate. It indicates that almost more than half of increase in the size and growth rate of export trade is caused by increase in price level. Furthermore, it is found that the export trade, both in terms nominal and real value, is unstable and fluctuating during the study period. The geographic and commodity concentration index of exports with 39 countries concludes that Nepalese export is limited to small number of countries and few numbers of commodities.

The study on export instability from 1974/75 to 2013/14 shows that it has increased over the study period and found that the index ranges from -0.06 in 1974/75 to 232 in 2012/13. It concludes that the values of export instability are highly fluctuating during the period under study. The study on causes of export instability index concludes that the export instability index is positively related with commodity concentration index, geographic concentration index and openness index and negatively related with consumption ratio, food ratio, instability index of agricultural GDP and instability index of nonagricultural GDP.

Policy Implication

The analysis of Nepal's export trade concludes that the increase in import size has exceeded the increase in export size. It indicates that even though trade policies have been revised continuously with a time interval of a decade has not succeeded to increase the

export trade as expected. Thus, a new trade policy that addresses export performance of the export potential commodities with incentive measures need to be introduced. The new trade policy should cover specific incentives to the producers who earn even Indian currencies through exports in addition to foreign convertible currencies. The provision of the establishment trade financing institutions should be made.

The study found that half of the increase in export trade of Nepal is contributed by the rise in the price level. Besides, the direction and geographic composition of foreign trade is limited to India. Moreover, Nepal's export is limited to fewer numbers of countries. On this background, it seems appropriate that Nepal should adopt non-inflationary monetary policy at first, and then the country should gradually promote export diversification policy in terms of both geographic and commodity composition. In addition to the efforts of Nepal Rastra Bank, the government of Nepal should adopt some non-inflationary fiscal policy such as channelization of remittance to the productive sectors, cut down of expenditure to the non-productive sectors, down size regular expenditure, proper utilization of development expenditure and so on.

The conclusion of the determinants of export trade instability shows that Nepal's export trade seems volatile as a result of geographic, and commodity concentration as well as openness. Thus, it is recommended that Nepal should expand its export trade beyond present geographic location and commodity coverage. Similarly, openness policy should also be reviewed to match the export performance.

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Appendix-A

Nepal's Foreign Trade (Nominal Value) (1974/75 - 2013/14) (Rs. in million)

Fiscal Years	Nominal Value Ψ		Real Value ⬚		Export Share α	
	Export	Import	Export	Import	India	Other
1974/75	889.6	1814.6	9995.5	20388.8	83.94	16.06
1975/76	1185.8	1981.7	13475.0	22519.3	75.37	24.63
1976/77	1164.7	2008.0	12941.1	22311.1	66.94	33.06
1977/78	1046.2	2469.6	10358.4	24451.5	47.61	52.39
1978/79	1296.8	2884.7	12469.2	27737.5	50.13	49.87
1979/80	1150.5	3480.1	10092.1	30527.2	45.28	54.72
1980/81	1608.7	4428.2	12470.5	34327.1	61.69	38.31
1981/82	1491.5	4930.3	10430.1	34477.6	66.67	33.33
1982/83	1132.0	6314.0	6944.8	38736.2	74.50	25.50
1983/84	1703.9	6514.3	9849.1	37654.9	68.12	31.88
1984/85	2740.6	7742.1	15141.4	42774.0	58.44	41.56
1985/86	3078.0	9341.2	14727.3	44694.7	40.32	59.68
1986/87	2991.4	10905.2	12621.9	46013.5	43.54	56.46
1987/88	4114.6	13869.6	15644.9	52736.1	38.10	61.90
1988/89	4195.3	16262.7	14772.2	57263.0	24.67	75.33
1989/90	5156.2	18324.9	16526.3	58733.7	11.68	88.32
1990/91	7387.5	23226.5	21537.9	67715.7	21.01	78.99
1991/92	13706.5	31940.0	33027.7	76963.9	10.58	89.42
1992/93	17266.5	39205.6	38284.9	86930.4	9.40	90.61
1993/94	19293.4	51570.8	39214.2	104819.0	12.49	87.51
1994/95	17639.2	63679.5	33344.4	120377.0	17.71	82.29
1995/96	19881.1	74454.5	34696.5	129938.0	18.52	81.48
1996/97	22636.5	93553.4	36569.5	151136.0	23.09	76.91
1997/98	27513.5	89002.0	41064.9	132839.0	31.96	68.04
1998/99	35676.3	87525.3	47759.4	117169.0	35.12	64.88
1999/00	49822.7	108504.9	64537.2	140550.0	42.59	57.41
2000/01	55654.1	115687.2	70359.2	146254.0	46.77	53.23
2001/02	46944.8	107389.0	57671.7	131928.0	59.55	40.45
2002/03	49930.6	124352.1	58604.0	145953.0	52.93	47.07
2003/04	53910.7	136277.1	60847.3	153812.0	57.09	42.91
2004/05	58705.7	149473.6	63397.1	161419.0	66.29	33.71
2005/06	60234.1	173780.3	60234.1	173780.0	67.59	32.41
2006/07	59383.1	194694.6	56074.7	183848.0	70.27	29.73
2007/08	59266.5	221937.7	52448.2	196405.0	65.05	34.95
2008/09	67697.5	284469.6	53221.3	223640.0	60.57	39.43
2009/10	60824.0	374335.2	43632.7	268533.0	65.75	34.25
2010/11	64338.5	396175.5	42133.9	259447.0	67.39	32.61
2011/12	74261.0	461667.7	44897.8	279122.0	66.81	33.19
2012/13	76917.1	556740.2	42332.0	306406.3	66.30	33.70
2013/14	91991.4	714365.9	46413.4	360426.8	64.80	35.20

Note: Ψ= *Nepal Rastra Bank (2015).* Quarterly Economic Bulletin Vol. 50, No. 1.

⬚ & **α** = *Author's calculation using data from* Quarterly Economic Bulletin Vol 50, No. 1.

Source: *Nepal Rastra Bank, (2015).*

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Appendix-B

Value of Deflator (1974/75 – 2013/14), (Base Year: 2005/06 = 100)

S. No.	Fiscal Years	Trade Deflator		S. No.	Fiscal Years	Trade Deflator
1	1974/75	8.9		21	1994/95	52.9
2	1975/76	8.8		22	1995/96	57.3
3	1976/77	9.0		23	1996/97	61.9
4	1977/78	10.1		24	1997/98	67.0
5	1978/79	10.4		25	1998/99	74.7
6	1979/80	11.4		26	1999/00	77.2
7	1980/81	12.9		27	2000/01	79.1
8	1981/82	14.3		28	2001/02	81.4
9	1982/83	16.3		29	2002/03	85.2
10	1983/84	17.3		30	2003/04	88.6
11	1984/85	18.1		31	2004/05	92.6
12	1985/86	20.9		32	2005/06	100.0
13	1986/87	23.7		33	2006/07	105.9
14	1987/88	26.3		34	2007/08	113.0
15	1988/89	28.4		35	2008/09	127.2
16	1989/90	31.2		36	2009/10	139.4
17	1990/91	34.3		37	2010/11	152.7
18	1991/92	41.5		38	2011/12	165.4
19	1992/93	45.1		39	2012/13	181.7
20	1993/94	49.2		40	2013/14	198.2

Source: *Quarterly Economic Bulletin, Vol 48. Number 3, Nepal Rastra Bank*

Appendix-C

List of Sample Countries

Countries	Serial No.	Countries	Serial No.	Countries
Australia	14	India	27	Philippines
Austria	15	Ireland	28	Poland
Bangladesh	16	Israel	29	Russia
Belgium	17	Italy	30	Saudi Arabia
Brazil	18	Japan	31	Singapore
Canada	19	Korea R	32	Spain
China	20	Luxemburg	33	Sri Lanka
Denmark	21	Malaysia	34	Sweden
Finland	22	Mexico	35	Switzerland
France	23	Netherlands	36	Thailand
Germany	24	New Zealand	37	UAE
Greece	25	Norway	38	UK
Hong Kong	26	Pakistan	39	USA

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Appendix-D

Geographic and Commodity Concentration of Exports (1974/75 – 2012/13)

Fiscal Years	Geographic Concentration of Exports	Commodity Concentration of Exports
1974/75	NA	65.15
1975/76	NA	71.02
1976/77	NA	61.80
1977/78	NA	58.68
1978/79	NA	56.48
1979/80	NA	55.18
1980/81	58.56	53.79
1981/82	71.70	58.45
1982/83	75.63	52.43
1983/84	71.93	53.50
1984/85	62.11	50.44
1985/86	51.02	49.98
1986/87	50.67	49.66
1987/88	49.16	51.55
1988/89	46.08	58.02
1989/90	43.72	61.83
1990/91	48.48	63.63
1991/92	51.36	62.72
1992/93	54.79	65.72
1993/94	54.30	65.94
1994/95	51.44	62.57
1995/96	45.73	61.09
1996/97	49.78	58.25
1997/98	49.62	53.78
1998/99	74.85	52.29
1999/00	54.06	55.26
2000/01	56.36	54.72
2001/02	64.51	50.12
2002/03	61.93	52.31
2003/04	61.60	54.40
2004/05	69.39	56.02
2005/06	70.51	55.04
2006/07	73.01	56.61
2007/08	68.11	57.30
2008/09	65.19	54.68
2009/10	69.23	61.09
2010/11	69.73	59.46
2011/12	71.17	59.71
2012/13	70.29	59.03

Note: NA = Not available/not calculated

Source: *Researcher's calculation using data from* Quarterly Economic Bulletin 2014, vol. 48, No. 3 *published by Nepal Rastra Bank.*

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Appendix-E

Actual Export and its Instability (1974/75 to 2013/14)

Fiscal Years	Actual Exports∮ (in million Rs.)	Export Instability*
1974/75	889.60	-0.06
1975/76	1185.80	0.77
1976/77	1164.70	0.60
1977/78	1046.20	0.12
1978/79	1296.80	0.79
1979/80	1150.50	0.22
1980/81	1608.70	1.54
1981/82	1491.50	1.05
1982/83	1132.00	-0.21
1983/84	1703.90	1.46
1984/85	2740.60	4.59
1985/86	3078.00	5.51
1986/87	2991.40	5.09
1987/88	4114.60	8.47
1988/89	4195.30	8.57
1989/90	5156.20	11.40
1990/91	7387.50	18.30
1991/92	13706.50	38.00
1992/93	17266.50	49.10
1993/94	19293.40	55.30
1994/95	17639.20	49.90
1995/96	19881.10	56.70
1996/97	22636.50	65.20
1997/98	27513.50	80.40
1998/99	35676.30	106.00
1999/00	49822.70	150.00
2000/01	55654.10	168.00
2001/02	46944.80	141.00
2002/03	49930.60	150.00
2003/04	53910.70	162.00
2004/05	58705.70	177.00
2005/06	60234.10	181.00
2006/07	59383.10	178.00
2007/08	59266.50	178.00
2008/09	67697.50	204.00
2009/10	60824.00	182.00
2010/11	64338.50	193.00
2011/12	74261.00	224.00
2012/13	76917.10	232.00
2013/14	91991.40	204.00

Note: *An asterisk * denotes researcher's own calculation*

Source: ∮ *Quarterly Economic Bulletin*, 2015, Vol 50, No. 1 published by Nepal Rastra Bank.

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Appendix-F

Table 4: Values of EII, Cx, Gx, Cr, Fr, IIagdp, IInagdp, Opp (1980 - 2012)

Years	EII	IIagdp	Iinagdp	Cx	Gx	Cr	Opp	Fr
1980/81	1.540	-1.333	3.898	53.789	79.630	25.076	21.700	35.000
1981/82	1.050	-2.878	4.141	58.448	16.012	19.284	22.400	27.000
1982/83	-0.210	-6.034	-1.336	52.428	34.265	35.733	20.200	30.000
1983/84	1.460	-5.665	4.008	53.497	33.436	38.219	22.800	22.000
1984/85	4.590	0.644	-1.017	50.435	32.848	42.541	21.100	18.000
1985/86	5.510	-0.090	-0.743	49.982	46.030	56.185	23.400	13.000
1986/87	5.090	-1.353	-3.055	49.656	34.362	55.943	21.100	16.000
1987/88	8.470	-0.671	0.578	51.553	32.899	63.541	24.400	13.000
1988/89	8.570	1.374	3.944	58.024	32.992	77.956	25.000	6.000
1989/90	11.400	0.146	8.172	61.830	34.428	82.952	20.900	5.000
1990/91	18.300	3.839	5.783	63.630	36.947	79.535	24.100	4.000
1991/92	38.000	5.762	1.139	62.717	40.140	81.376	25.300	3.000
1992/93	49.100	8.904	-2.047	65.724	38.809	85.025	33.700	3.000
1993/94	55.300	10.128	0.062	65.938	40.545	90.911	34.800	2.000
1994/95	49.900	9.320	-3.499	62.568	41.654	86.897	37.300	3.000
1995/96	56.700	9.713	-2.084	61.086	38.359	84.852	38.100	4.000
1996/97	65.200	8.938	-1.120	58.249	43.123	83.600	39.400	3.000
1997/98	80.400	5.593	-8.010	53.783	34.221	78.848	42.700	2.000
1998/99	106.000	0.126	-5.763	52.290	29.611	77.746	35.400	1.000
1999/00	150.000	2.406	-2.796	55.264	29.984	82.875	40.200	1.000
2000/01	168.000	3.723	-4.104	54.716	30.857	81.940	43.300	1.000
2001/02	141.000	-5.117	-3.996	50.119	27.730	70.921	36.800	1.000
2002/03	150.000	-10.663	-5.763	52.313	28.888	76.914	32.800	2.000
2003/04	162.000	-9.626	-4.742	54.404	30.609	79.518	38.200	1.000
2004/05	177.000.	0.294	-1.908	56.023	33.776	77.541	37.200	2.000
2005/06	181.000	0.336	-7.091	55.038	33.331	76.878	38.700	2.000
2006/07	178.000	0.736	-9.141	56.614	32.867	76.195	36.700	2.000
2007/08	178.000	0.787	-9.869	57.295	34.723	70.447	38.800	2.000
2008/09	204.000	-0.815	-0.207	54.680	36.803	66.821	36.000	3.000
2009/10	182.000	-3.203	17.984	61.093	38.901	72.647	40.400	4.000
2010/11	193.000	-10.069	30.022	59.458	44.057	73.195	37.400	3.000
2011/12	224.000	-11.296	22.505	59.712	43.845	74.107	35.500	3.000
2012/13	232.000	-19.508	12.237	59.028	47.054	71.118	38.100	4.000

Source: *Researcher's calculation*

References

Abdullah, R. (2012). An examination of sources of instability in export earnings of Malaysian palm oil. *Oil Palm Industry. Economic Journal.* Selangor: Malaysian Palm Oil Board. 11 (2).

Abolagba, E. O., Onyekwere, N. C., Agbonkpolor, B. N., & Umar, H. Y. (2010). Determinants of agricultural exports. *Journal of Human Ecology, 29* (3), 181 - 184.

Abraha, G. A. (2004). Export instability and economic growth in Ethiopia. African Institute for Economic Development and Planning (IDEP), Working Paper.

Aidam, P. W., & Anaman, K. A. (2014). *Export earnings instability and investment in Ghana, 1981 to 2011.* Legon, Accra, Institute of Statistical, Social and Economic Research, University of Ghana, Ghana.

Brundell, P., Horn, H., & Svedberg, P. (1981). On the causes of instability in export earning. *Oxford Bulletin of Economics and Statistics.* Department of Economics, Oxford University, *43* (3).

Coppock, J. D. (1962). *International Economic Instability.* New York: Mc Graw – Hill, USA.

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Devkota, S. C. (2003). Causes of export instability in Nepal. *The Economic Journal of Nepal*, Kathamndu: Central Department of Economics, T.U., Kirtipur, *26 (1)*.

Dixon, W. J. (1984). Trade concentration, economic growth and basic human needs. *Social Science Quarterly*. Texas: University of Texas Press, USA.

Herrmann, R. (1989). The effects of partial international price stabilization of national exports earnings. *The Developing Economies,* 27(4).

Hirschman, A. O. (1945). *National power and structure of foreign trade*. Berkeley: University of California Press, Los Angeles.

Macbean, A. I. (1966). *Export instability and economic development.* New York: George Allen and Unwin.

Makonnen, T. (2012). Determinants of export commodity concentration and trade dynamics in Ethiopia. Addis Ababa: Ethiopian Economic Association (EEA) / Ethiopian Economics Policy Research Institute (EEPRI).

Massell, B. (1970). Export instability and economic structure. *American Economic Review*, New York: American Economic Association, USA.

NRB (Nepal Rastra Bank) (2015). *Quarterly Economic Bulletin*, Kathmandu, Research Division, Nepal Rastra Bank, 50 (1).

Ozler, S., & Harringan, J. (1988). Export instability and growth. Working paper, Department of Economics, University of California, No. 486, June 488.

Poudyal, S. R. (1988). *Foreign trade, aid and development in Nepal*. New Delhi: Commonwealth Publishers, India.

Roy, S. S. (2002). The determinants of India's exports: A simultaneous error-correction approach. New Delhi: RIS-DP, India.

Tariq, A., & Najeeb, Q. (1995). Export earnings instability in Pakistan. *The Pakistan Development Review.* Islamabad: Pakistan Institute of Development Economics. 34 (4), 1181 - 1189.

TEPC (Trade and Export Promotion Center) (2013). *Foreign Trade Statistics of Nepal*. Kathmandu, Nepal.

Wooldridge, J. M. (2009). *Introductory econometrics: A modern approach* (4th ed.). South-western Cengage Learning.