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Research Article

Relationship among Export, Import, Investment and Economic Growth: Experience from Nepal

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ABSTRACT

This paper intends to study the relationship among the imports, exports, investment (capital) and economic growth during 1974/75 to 2019/20 A.D. by using time series econometric tools. The stationarity of all variable have been examined to determine the order of integration, for this ADF and PP tests have been applied, variables are found to be stationary at first. Johensen co-integration test, Vector error model (VECM), Wald test and Granger causality (GC) test have used to show the relation among the variables and residuals diagnostic tools (serial LM test, Heteroscedasticity test and normal distribution test) have also tested to make estimation free of spurious. The study has shown there is short and long run association among the investment, export and GDP but not with import.

Keywords: Stationarity; Johensen co-integration test; VECM; Wald test; GC test; Serial LM; Heteroscedasticity; Normal distribution

INTRODUCTION

The important role of exports and imports in the economy cannot be overemphasized. Exports and imports play an integral role in determining the trade balance (BOP) in the economy of any nation. It is seen that exports of any nation is considered as an engine of economic and social development because of their ability to influence economic growth, poverty reduction and minimizes social disparities. They are the subject of growth strategies adopted by developing countries like Nepal. Recent endogenous growth models, neoclassical models, Classical growth model (Harrod-Dommar model, Solow-Swan model, Keynesian model, Structural theory etc) and their analysis have emphasized the importance of imports as an important channel for foreign technology and knowledge to flow into the domestic economy. Because new technologies could be embodied in imports of intermediate goods such as machines and equipment and labor productivity could increase over time that workers acquire the knowledge of the new embodied technology. Nepal had a total export of 740,742.91 in thousands of US$ and total imports of 10,037,840.17 in thousands of US$ leading to a negative trade balance of -9,297,097.26 in thousands of US$ The trade growth is 3.66% compared to a world growth of 5.68%. GDP of Nepal is 30,641,380,604 in current US$, (Nepal trade statistics. The country's foreign trade is largely in deficit or balance of payment is negative. The aim of this work is to investigate the relationship between exports, imports and economic growth of Nepal, through employing yearly data for the period 1974/75 to 2018/19 A.D. In particular, this work tries to empirically find and explore an answer for the question of whether exports lead economic growth or imports lead economic growth or investment leads economic growth or economic growth leads exports, imports and investment to achieve this objectives.

From the theories of international trade since the study [1], it has been argued that, trade plays an integral role in national capital formation (investment). Trade (Imports and Exports) increases specialization in productions which leads to the efficient productions and optimum allocations of resources. Furthermore, the neo classical growth theories have analyzed that, trade (import and export) was a main determinant of growth and has long run relationship with economic growth. From this fact, group of economists had skeptical views toward the exports, as it was seen as the main engine of the economic growth. It has believed and experienced that, export through relieving the constraints of foreign exchange reserves, will increase competition in production or create competition, and in turn will lead to efficiency in productions, enhances the productivity and optimum allocation of resources. This would result to economies of scale and economies of scope through specializations in productions and promoting the diffusion of advanced technology. Furthermore, the export growth relationship received a special priority in modeling the economic growth by the World Bank report. So many studies related to the economic growth have suggested that, the imports are more crucial for those countries which are based on manufacturing industries

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or export oriented. For example, if the country has enough foreign exchange reserve, it can import high capital goods, ideas, input which in turn, increase productivity in domestic economy and promote more exports. On the other hand, the imports of capital goods, intermediate goods and inputs and advanced technology can expand the efficiency of mobilizing of domestic resources and production more products which ultimately leads to higher exports.

Furthermore, if we consider the endogenous growth theory, it emphasizes the role of imports in economic growth. The theory suggests that, imports can attract foreign technology into the domestic economy and increase the availability of intermediate goods and inputs including machines, human capitals, skilled and experienced labors, equipment which in general increase productivity in the economy of county. In this case, imports received considerable attention in determining the long run economic growth especially for developing countries. Even so, one key subject is ignored in determining the relationship between export and economic growth which is capital formation. This situation necessitates the need for the new empirically justifications which is the main purpose our study. Capital formations refer to the net additions of investment in the economy, which present the real picture of the goods and services are produced and present growth of "real economy". Capital formations (investment) can have relationship with the exports, because when the investment demand increases, the export demand also rises. In the same case, there is argued that, besides export, rapid increases in economic growth of Newly Industrialized Countries (NICs) were highly contributed due to the development of the investment policies. Specifically, the endogenous growth theories have shown that, export, import capital formation and economic growth have long run relationship with the economic growth. The main research is as,

- To analyze the relationship among economic growth, export, import and investment in Nepal.

LITERATURE REVIEW

This paper has analyzed the associations between exports, imports, and economic growth in Panama [2]. In order to achieve this purpose, yearly data series from FY 1980-2015 have collected and analyzed using the Johansen co-integration analysis of Vector Auto Regression Model and the Granger-Causality tests. Result of this analysis, it has found that there is no relationship between exports, imports and economic growth in Panama. On the other side, study has found that there is a strong statistical evidence of bidirectional causality from imports to economic growth and from exports to economic growth .This paper has focused on the casual relationship between export, import and Gross Domestic Product (GDP) for Bhutan using the fiscal year data from 1980 to 2005 A.D [3]. The Granger causality (GC) test and Co-integration Models are applied taking care of stochastic properties of the variables. The result of the co-integration analysis suggests that there is a long-run equilibrium relationship. The results of Granger causality and co-integration model test have shown that there is a causal relationship between the variables. The causal nexus analysis is also unidirectional from export to import and GDP, and GDP to import only. Here export had led growth is empirically proven in Bhutan.

This research paper investigates the nexus exports, imports, and economic growth for the Brazilian economy during the accounting year1970-2017, using the VECM methodology [4]. In the short-run, this empirical study results found out that import, exports cause economic growth in the country. Exports, imports, and economic growth jointly cause domestic investment. However, our results have shown that domestic investment and exports have a positive effect on economic growth in long run and imports have the negative effect on economic growth and domestic investment. The results analyzed a positive effect of economic growth and import has on domestic investment. This paper analyses the associations among export, import, investment and economic growth (GDP) in Egypt economy [5]. For this study yearly data series for the periods between 1965 and 2015 has analyzed by using Johansen co-integration and Vector Error Correction Model to determine the association or the long run and the short run relationships between different variables. This empirical analysis shows that in the long run domestic investment and export has negative impact on economic growth, but import has positive effect on economic growth. In the short run, empirical analyses show that only imports cause economic growth and no effect of other variables. This article investigates the causality among exports, imports, and economic growth over the period between fiscal year 1865–1998 [6]. Granger's causality is emphasized, enabling one for testing to the cases direct causality, indirect causality, and spurious causality between export and output growth. These empirical study outcomes do not confirm a unidirectional causality between the variables considered. It has also found that there is a feedback effect between exports–output growth and imports–output growth. This research is based on Export-promotion policies as a superior development strategy for semi-industrialized countries (SICs) and study have found that there is support in the statistically significant correlations established between export expansion and output growth [7]. This positive export-GDP relation is often assumed to the possible externalities of competition in world. In addition, it has another contribution of this paper, which is the development of a simultaneous equations model to deal with the simultaneity problem between GDP and export growth rates.

This paper has focused on the effect exports and imports on economic growth in the Arab countries during the period 1995 to 2013 [1]. In this paper panel data has been used of 17 nations. The study results found that the effect exports and imports have positive effect of economic growth in the Arab countries during the period fiscal year 1995 to 2013. There should be increased in the import of technology for increasing labor productivity which can directly promote economic growth, and thus improve the standards of living in the Arab countries. Most of previous researches have only focused on the effect of export expansion on economic growth while ignoring the potential of import in developing economic growth. This paper has attempted to examine the associations among trade and economic growth in Malaysian economy with the emphasis on both the role of exports and imports volume [8]. In this study Granger causality test has been done and impulse response functions conducted to examine whether growth in trade stimulates economic growth. The results suggests that the singular focus of on imports and exports as engine of growth and the results confirm the bidirectional long run associations among the economic growth and exports, economic growth and imports and exports and imports. In this paper researcher investigated the impact and relations among the exports, imports and economic growth over the period of 1977-2012 in Tunis economy [9]. The study has conducted the Granger Causality and Johansen Co-integration approach for long run relationship Using Augmented

Dickey-Fuller (ADF) and Phillip-Perron (PP) for stationarity test. Similarly, Pairwise Granger Causality has carried to determine the direction of causality among the variables in the short run. The results has shown that there is unidirectional causality between exports and imports and between exports and economic growth.

In this research paper, researchers have applied VAR method between import, export and economic growth over the period 1962-2011in Iran [2]. The role of the import and export variables in the investigation of economic growth output co-integration analysis is emphasized, enabling one to test for the cases direct long run relationship, indirect long run relationship, and impulse, response function between export and import and economic growth. The empirical study results found a long run relationship between the variables considered. Based on results, export had direct and positive relationship with economic growth in long run. Also import has a significant negative relationship with economic growth then import had negative effect on economic growth in long-term as well. This paper studies the short and long run association between export, import and Gross Domestic Product (GDP) by using annual data series for the period between 1984 and 2012in Albania [10]. This paper has found there is a positive association between the net export and economic growth. This paper has investigated the relationship among mining export, industrial production (export) and economic growth in India using annual time series data from 1981 to 2010 [11]. The multivariate co-integration technique has applied to explore the long run equilibrium relationship among variables. Further, Granger causality based on vector error correction model (VECM) has used to explain both short run and long run causality among the variables. The co-integration results confirm that mineral exports, industrial production and economic growth are co-integrated, similarly, the VECM Granger causality result showed that there is a long-run relationship.

In this paper explores the relationship between exports growth and economic growth (GDP), growth equation on the basis of cross–country data, and using OLS and random coefficient (RC) methods [12]. The relationship has been estimated for two separate periods, i.e. 1965–80 and 1980–90. The estimates obtained using a RC method indicates that while there exists a positive association between exports and economic growth, the relationship is significant only for the period 1980–90. DF test suggest for VECM. This paper has focused on exploring the relationship between import and GDP growth of Bangladesh fot the time period (1981-1992) of time series data [13]. From the analysis, the researcher has concluded that there is negative relation between the import and GDP or import is negatively related with GPD growth as well as GDP growth rate is also negatively related with Import.

DATA & METHODOLOGY

The analysis used in this study cover annual time series of 1974/75 to 2018/19 A.D. in Nepal. The data set consists of observation for real GDP, exports, imports and investment. The GDP is the endogenous variables and rest variables imports, exports and investment are the exogenous variables. Data have been taken from Economic survey published by ministry of Finance. All the data used in this study are in logarithmic form, which minimizes the problem of heterocedasticity in the time series data [14]. To establish the relationship between independent and dependent variables economic growth function is used which is like this:

GDPt = f (Exports, Imports, Capital) (1)

The function can also be represented in a log-linear econometric format thus:

$$\ln GDP = \beta 0 + \beta 1 \ln(X)\, t + \beta 2 \ln(M)t + \beta 3 \ln(C)t + \mu t \quad (2)$$

Where,

$\beta 0$: Constant term (Intercept)

$\beta 1$: Coefficient of variable (Exports)

$\beta 2$: Coefficient of variables (Imports)

$\beta 3$: Coefficient of variable (Investment or capital)

t: The time trend.

μt: The random error term assumed to be normally, identically and independently distributed.

Unit Root test

Before estimating for co-integration and causal relationship between the time series variables, the first and foremost step is to test their stationarity (invariant mean and variance) for evading any spurious model. Hence, this study applied one of the Augmented Dickey-Fuller (ADF), Philips Perron (PP) test to examine stationarity. The formula of this test is as follows:

$$Y_t = \rho Y_{t-1} + U_t$$

$$-1 \leq \rho \leq 1$$

Where,

Yt is a variable of interest

ut is white noise error term.

This test follows the calculation of t-statistics which is tested under the null hypothesis: Ho: ρ = 1 (that is we have a unit root or time series under consideration is non-stationary) against an alternative hypothesis: Ha: ρ ≠ 1. Subtract Yt-1 from the both side of equation-1.

$$Y_t - Y_{t-1} = \rho Y_{t-1} + U_t$$

$$\Delta Y_t = (\rho - 1) Y_{t-1} + U_t$$

$$\Delta Y_t = \delta Y_{t-1} + U_t$$

Where

δ = (ρ-1) and Δ is the first difference operator.

In practice, therefore instead of estimating equation-1, we estimate equation-2 and test the null hypothesis that δ=0. (If δ=0, then ρ=1). Null hypothesis Ho: δ = 0. Alternative hypothesis Ha: δ≠0. Though if ut are correlated the DF test is to be modified by adding, as an additional lagged value of the dependent variable (ΔYt-1) which then it becomes ADF, which is as follows:

$$\Delta Y_t = \beta 1 + \beta 2 + \beta 3 + \delta Y_{t-1} + \beta 0 \sum \Delta Y_{t-1} + U_t$$

Where 't' is time trend, U_t is white noise error term and β1, β2, δ and β0 are the parameters, which are to be estimated. It is an important question in time series data analysis whether each variable is stationary in levels or stationary after the first differencing. If the time series in levels are found to be non-stationary and stationary only after its first differencing, it means they are integrated to an order of 1, i.e. I (1). Thus, if the data series are stationary after the first differencing then it can be essential to test for co-integration.

Test of Co-integration

Before going to check the long run relationship among the variables it is crucial to check the stationarity test of the variables in order to avoid spurious as well as bias result. After confirming the stationarity of the data series we then proceed to the co-integration analysis in order to examine the long-run relationship between the variables considered. Once the order of integration is defined it is helpful to check the long run relationship among the variables. To study the relationship between the economic variables co-integration test is extensively used in the empirical literature. Since the variables under study are found to be I (1), the co-integration method is suitable to estimate the long-run relationship between the exports, imports and economic growth. The model of co-integration is that nonstationary time series are co-integrated if a linear combination of these variables is stationary. The present study used the test to check the co-integration among the variables [15]. The details of the test are shown below. Johansen suggests two test statistics to test the null hypothesis that numbers of characteristics roots are insignificantly different from unity.

$\lambda_{trace}(r) = -T \sum_{i=r+1}^{n} \ln(1 - \lambda_i)$

$\lambda_{max}(r, r+1) = -T \ln(1 - \lambda i + 1)$

where, λi estimated characteristic and T is the number of usable observations. The $\lambda trace$ test the null hypothesis is $r = 0$ against the alternative of $r > 0$ and λmax test the null hypothesis is $r = 0$ against the alternative of $r = 1$. The null hypothesis for this test is that there are r co-integrating vectors in.

Test of Granger causality

For examining the causal relationship between exports, imports, investment and economic growth the study have used Granger causality technique proposed [16]. Granger causality method regresses a variable y on a lagged value of itself and other variable x. If x is considered to be statistically significant, it explains some of the variance of y which is not defined by lagged values of y. This shows that x is causally preceding to y and said to dynamically cause y. The present study employed the following model specification of Granger causality.

$$Yt = \sum_{i=1}^{n} \delta i Yt - i \sum_{i=1}^{n} YiXt - i + \mu t$$

The null hypothesis (Ho) in each case is that the variable under consideration does not Granger cause the other variable. Then null hypothesis tested against the alternative hypothesis and we apply the F-test which follows the F-distribution. If the computed F-value exceeds the critical F-value at the chosen level of significance, the null hypothesis will be rejected and vice versa. The Granger causality test depends critically on the number of lagged terms introduced in the model.

DISCUSSION AND RESULTS

Unit Root result: At the first phase researcher check the stationary of the data or determine that whether the variables used in the study are stationary or not which is an essential test for time series data and a time series data is said to be stationary if it has invariant mean and variance. This test will examine the order of integration of the data and eradicate the problem of spurious regression. Augmented Dickey- Fuller test has been applied to test stationarity of the data as suggested [17]. If data are non-stationary at I(0), then ADF test is executed on the first difference of X (i.e. ΔX). If the is found to be stationary, then the series is said to be integrated to order I(1). There was huge political and economic fluctuation during that time, so ADF test for measuring the stationary of the variables misguide the process and may lead to spurious regression. A structural change in the mean of a stationary variable tends to bias the standard ADF test toward non-rejection of a hypothesis of a unit root [18]. Therefore, we performed the Phillips Perron (PP) unit root test also to check the stationarity of the data set used in the study.

Null hypothesis (H0): Variables are not stationary.

Alt. hypothesis (H1) Variable is stationary (Tables 1 and 2).

The result of unit root test (ADF and PP) of Gross domestic product (Ln GDP), Export (Ln X), Import (Ln M) and Investment (Ln C), all these variables are not stationary at level. It suggest to check the stationary at the first difference and tested by Augmented Dickey Fuller and Phillips Perron (PP) test and all variables are found stationary at first difference where p value is less than 5%. If the variables are significant at first difference then co-integration is done to show the association among the variables.

Johensen co-integration test

Johensen co-integration test use two type of statistics i.e. Trace value and Max Eigen value statistics. The optimal lag length of the level VAR system is determined 1 lag using the Akaike's Information Criterion (AIC) (Annex-I). That mean all our four variables are integrated of same order. All the variables are found stationarity at first difference, the methodology suggests for Johensen test of co-integration [19]. So a researcher here test for the number of co-integrating relationship using the approach proposed [15,20].

Null hypothesis (H_0): There is no co-integration or there is no co-

Table 1: Unit Root Test Result by ADF procedure.

Variables	At level		At first diff.		Conclusion
	Intercept	Trend &intercept	Intercept	Trend &intercept	
Ln Export	-1.1730 (0.6780)	-1.1835 (0.9019)	-4.9945*** (0.0002)	-5.0683*** (0.0009)	I(1)
Ln Import	-1.5135 (0.5177)	-0.6599 (0.9700)	-5.5917*** (0.0000)	-5.6671*** (0.0001)	I(1)
Ln Investment	-0.3546 (0.9081)	-1.8638 (0.6565)	-6.6239*** (0.0000)	-6.5057*** (0.0000)	I(1)
Ln GDP	-0.0456 (0.9490)	-1.7960 (0.6901)	-6.75080*** (0.0000)	-6.6635*** (0.0000)	I(1)

Source: *Author calculation. (Numbers in the parenthesis are probability values) & superscripts *** represents the acceptance of alternative hypothesis 1% significance level.*

Table 2: Unit Root Test Result by PP procedure.

Variables	At level		At first diff.		Conclusion
	Intercept	Trend &intercept	Intercept	Trend &intercept	
Ln Export	-1.1541 (0.6859)	-1.2804 (0.8801)	-4.9976*** (0.0002)	-5.0683*** (0.0009)	I(1)
Ln Import	-1.5046 (0.5221)	-0.7469 (0.9630)	-5.5759*** (0.0000)	-5.5610*** (0.0002)	I(1)
Ln Investment	-0.3566 (0.9077)	-1.8491 (0.6639)	-6.6239*** (0.0000)	-6.5057*** (0.0000)	I(1)
Ln GDP	-0.0235 (0.9512)	-1.8203 (0.6782)	-6.7763*** (0.0000)	-6.6811*** (0.0000)	I(1)

Source: *Author calculation. (Numbers in the parenthesis are probability values) & & superscripts *** represents the acceptance of alternative hypothesis 1% significance level.*

Table 3(a): Unrestricted Co-integration Rank test (Trace).

Hypothesized No. of CEs	Eigen value	Trace Statistic	0.05 Critical Value	Prob. **
None*	0.515526	59.06196	47.85613	0.0032
At most 1	0.295218	27.17551	29.79707	0.0974
At most 2	0.230356	11.78136	15.49471	0.1677
At most 3	0.005914	0.260973	3.841465	0.6095

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level. *denotes rejection of hypothesis at 0.05 level. **MacKinnon-Haug_Michelis (1999) p-values.

Table 3(b): Unresticted Cointegration Rank Test (Maximum Eigenvalue).

Hypothesized No. of CEs	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob. **
None*	0.515526	31.88645	27.58434	0.0131
At most 1	0.295218	15.39415	21.13162	0.2622
At most 2	0.230356	11.52039	14.26460	0.1300
At most 3	0.005914	0.260973	3.841465	0.6095

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level. *denotes rejection of hypothesis at 0.05 level. **MacKinnon-Haug_Michelis (1999) p-values.

integration among the four variables.

Alternative hypothesis (H_1): There is at least one co-integration.

Based on the above hypothesis, Johensen co-integration test output as follows

Sample (adjusted): 3.46

Included observations: 44 after adjustment.

Trend assumption: Linear deterministic trend.

Series: LRGDP LN LM LX

Lags interval (in first differences): 1 to 1

Tables 3a and 3b have shown the results of Johansen Co-integration test. Results of both Trace and Maximum Eigen value tests reject the null hypothesis or there is co-integration among the variables. The probability value is less than five percent (5%) level of significant and says that the existence of at least 1 co-integrating relationship among the variables in the series at 5% level of significance. The result states that the series under consideration are driven by at least 1 common trend. Hence, the long run equilibrium relationship between GDP, Import, capital and Export. Now co-integration follows the VECM model.

Vector error correction model

Since, from the result of co-integration test, variables have long run relationship, VECM model is eligible for further analysis. The term error-correction relates to the fact that last-period deviation from a long-run equilibrium, the error, influence its short-run dynamics. Imposing known unit roots and known co-integration restrictions VECM may improve the power of statistical test such as Granger causality test. This study uses ECM model as reconfirmation of the co-integrating relationship among the variables to estimate the long run causality between GDP, import, export and investment. Now researcher check two issues i.e. long run causality by VECM and short run causality by Wald test.

Dependent Variable: D (LRGDP)

Method: Least Square (Gauss-Newton / Marquardt steps)

D(LRGDP,2)= C(1)*(D(LRGDP (-1) +0.10058124608*D(LN(-1)) +0.0349824839839*D (LM(-1))-0.141567100055*D(LX(-1)) – 0.0389957318468) + C(2)*D (LRGDP (-1),2) + C(3)*D (LN (-1),2) + C(4)*D(LM(-1),2) + C(5)*D (LX(-1),2) + C(6)

From the result of VECM, Table 4, C(1) is error correction term or speed of adjustment within which the model will restore its equilibrium following any disturbances. The coefficient C(1) is negative and significant, this states that there is long run causality running from export (LX), import (LM) and investment (LN) to real gross domestic product (LRGDP). It explores that the result conformed to our prior expectation. In above result only three C(1) at 1%, C(3) at 10% and C(5) 10% are significant here C(6) is intercept term. This is the log linear model (Log-Log) model where coefficient C(3) represents that 1% increase in investment increase in real GDP by 0.067% and coefficient C(5) represents that 1% increase in export reduces in real GDP by 0.0711% at 10%

Table 4: VECM model.

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-1.039317	0.208725	-4.979359	0.0000 ***
C(2)	0.016634	0.186495	0.089193	0.9294
C(3)	0.067725	0.0348	1.946128	0.0593*
C(4)	0.024606	0.021897	1.123754	0.2684
C(5)	-0.071166	0.036075	-1.972737	0.0560*
C(6)	0.000244	0.003468	0.070248	0.9444
R-square		0.515067		
Adjusted R-square		0.449536		
F-stat		7.859854		
Prob(F-statistic)		0.000040***		
DW test		2.09872		

Source: *Author calculation. (Numbers in the parenthesis are probability values) & superscripts ***, **, * represents the acceptance of alternative hypothesis 1%, 5% & 10% significance level respectively.*

significance level C(4) is coefficient of import which is insignificant which indicates that import has no role in achieving economic growth. It means both export and domestic investments have significant impact on GDP. Prob. of F-stat i.e. 0.00040 is also less than 5% which indicates that these three variable export, import and domestic investment jointly influence to real GDP. R- Square 0.515067 means 51.50% explained by these independent variables to dependent variables. D-W test 2.098720 is close to 2 which also indicate normally there is no serial correlation.

Wald test

Generally to check the short run causality of every independent variable to dependent variable Wald test is applied. The result of the Wald test is as follows,

H0: There is no short run causality running from investment to GDP or C (3) = 0.

H1: There is short-run causality running from investment to GDP or C (3) ≠ 0.

From the above result of Wald test of investment C(3), table states we cannot reject null hypothesis as the probability value of F-stat (0.0516) and Chi-square (0.0593) are greater than 5%. This results state that there is no short run causality between investment and real GDP. However, this results state that there is short run causality between investment and real GDP at 10% level of significance.

H0: There is no short run causality running from import to GDP or C (4) = 0.

H1: There is short-run causality running from import to GDP or C (4) ≠ 0 (Table 5a).

From above the result of Wald test of import C(4), table states we cannot reject null hypothesis as the probability value of F-stat (0.2684) and Chi-square (0.2611) are greater than 5%. This results state that there is no short run causality between import and real GDP. However, this results state that there is short run causality between investment and real GDP at 10% level of significance

H0: There is no short run causality running from import to GDP or C (4) = 0.

H1: There is short-run causality running from import to GDP or C (4) ≠ 0 (Table 5b).

Table 5a: Wald Test result.

Test statistics	Value	d.f.	Prob.
t-statistics	1.946128	37	0.0593*
F- statistics	3.877415	(1.37)	0.0593*
Chi-square	3.787415	1	0.0516*

Source: *Author calculation. (Numbers in the parenthesis are probability values) & superscripts ***, **, * represents the acceptance of alternative hypothesis 1%, 5% & 10% significance level respectively.*

Table 5b: Wald Test result.

Test statistics	Value	d.f.	Prob.
t-statistics	1.123754	37	0.2684
F- statistics	1.262824	(1.37)	0.2684
Chi-square	1.262824	1	0.2611

Table 5c: Wald Test result.

Test statistics	Value	d.f.	Prob.
t-statistics	-1.972737	37	0.0560*
F- statistics	1.262824	(1.37)	0.0560*
Chi-square	1.262824	1	0.0485**

Source: *Author calculation. (Numbers in the parenthesis are probability values) & superscripts ***, **, * represents the acceptance of alternative hypothesis 1%, 5% & 10% significance level respectively.*

From the above result of Wald test of export C(5), table states we can reject null hypothesis as the probability value of Chi-square (0.0485) are less than 5%. This results state that there is short run causality between export and real GDP.

H0: There is no short run causality running from import to GDP or C (4) = 0.

H1: There is short-run causality running from import to GDP or C (4) ≠ 0 (Table 5c).

From the above result of Wald test of export C(5), table states we can reject null hypothesis as the probability value of Chi-square (0.0485) are less than 5%. This results state that there is short run causality between export and real GDP.

Granger Causality test

Series X causes Y if the past values of X can more accurately predict

Y than simply the past values of Y (Granger, 1969). Here, the directions of causality between GDP & Export, GDP & Import, and Export & Import have been tested using Granger Causality test (Table 6).

Residual diagnosis

Residuals diagnostic tools (serial LM test, Heteroscedasticity test and normal distribution test) have also tested to make estimation free of spurious. If the P-value of respective testis greater than 5% then hypothesis is accepted and model is assumed to free from the wrong regression and data are fitted for the test (Table 7).

Table 6: GC test.

Null Hypothesis	F-stat	Prob.
D(N) does not Granger cause D(RGDP)	9.37372	0.0039***
D(RGDP) does not Granger cause D(N)	3.19461	0.0813*
D(N) does not Granger cause D(RGDP)	8.56184	0.0056***
D(RGDP) does not Granger cause D(N)	2.48908	0.1223
D(M) does not Granger cause D(RGDP)	7.44154	0.0093***
D(M) does not Granger cause D(RGDP)	2.75479	0.1046
D(M) does not Granger cause D(N)	4.49222	0.0402**
D(N) does not Granger cause D(M)	0.70158	0.4071
D(X) does not Granger cause D(N)	1.04362	0.3130
D(N) does not Granger cause D(X)	4.90921	0.0323**
D(X) does not Granger cause D(M)	1.26929	0.2665
D(M) does not Granger cause D(X)	8.85685	0.0049***

Source: *Author calculation. (Numbers in the parenthesis are probability values) & superscripts ***, **, * represents the acceptance of alternative hypothesis 1%, 5% & 10% significance level respectively.*

Table 7: Result of serial correlation, heteroscedasticity and Normal distribution.

Particulars	F-stat	P-value
BG serial correlation LM test	1.0039	0.3230
Heteroscedasticity BPG test	1.7289	0.1099
Normality JB test	-	0.8376

In Table 3, B-G serial LM test depicts that the residuals are free from serial correlations as p- value of observed R-square is 0.3230 which is more than 5% level of significance. Similarly, BPG test shows that the residuals are homoscedastic where p-value of observed R square i.e. 0.1099 is greater than 5% level of significance. Finally, JB test also shows the residuals are normally distributed where p-value i.e. 0.8376 is also than 5% level of significance.

CONCLUSION

The main result as equation of this paper confirms that there is short and long run association of investment and export in achieving high economic growth. This paper has also hypothesized import of the advanced technology, materials and other resources also influence to the economic growth but no short and long run association of import in achieving economic growth in the context of Nepal. This study also recommends no more focused on import flexible policy with the aim of achieving rapid economic growth.

REFERENCES

1. Hamdan BS. The effect of exports and imports on economic growth in the Arab countries: A panel data approach. J Econ Bibliog. 2016 Mar 18;3(1):100-7.
2. Taghavi M, Goudarzi M, Masoudi E, Gashti HP. Study on the impact of export and import on economic growth in Iran. J Basic Appl. 2012;2(12):12787-94.
3. Uddin G, Khan S, Alam M. An empirical study on export, import and economic growth in Bhutan. Indian Dev Rev (ISSN 0972-9437). 2010;8(1):95-104.
4. Bakari S, Fakraoui N, Tiba S. Domestic Investment, Export, Import and Economic Growth in Brazil: An Application of Vector Error Correction Model.
5. Bakari S. The relationship between export, import, domestic investment and economic growth in Egypt: Empirical analysis. Euro Economica. 2017;36(02):34-43.
6. Ramos FF. Exports, imports, and economic growth in Portugal: evidence from causality and cointegration analysis. Econ Model. 2001 Dec 1;18(4):613-23.
7. Esfahani HS. Exports, imports, and economic growth in semi-industrialized countries. J Dev Econ. 1991 Jan 1;35(1):93-116.
8. Hashim K, Masih M. What causes economic growth in Malaysia: exports or imports?.
9. Saaed AA, Hussain MA. Impact of exports and imports on economic growth: Evidence from Tunisia. J Emerg Trends Edu Res Policy Stud. 2015 Feb 1;6(1):13-21.
10. Turan G, Karamanaj B. An empirical study on import, export and economic growth in Albania. Acad J Interdiscip Stud. 2014 Aug 5;3(3):428.
11. Sahoo AK, Sahoo D, Sahu NC. Mining export, industrial production and economic growth: A cointegration and causality analysis for India. Resources Policy. 2014 Dec 1;42:27-34.
12. Burney NA. Exports and economic growth: Evidence from cross–country analysis. Applied Economics Letters. 1996 Jun 1;3(6):369-73.
13. Uddin H, Khanam MJ. Import, export and economic growth: the case of lower income country. J Biz and Mgmt. 2017;19(1):37-42.
14. Gujarati DN, Porter DC, Gunasekar S. Basic econometrics. Tata McGraw-Hill Education; 2012.
15. Johansen S, Juselius K. Maximum likelihood estimation and inference on cointegration—with appucations to the demand for money. Oxf Bull Econ Stat. 1990;52(2):169-210.
16. Granger CW. Investigating causal relations by econometric models and cross-spectral methods. Econometrica: journal of the Econometric Society. 1969 Aug 1:424-38.
17. Dickey DA, Fuller WA. Distribution of the estimators for autoregressive time series with a unit root. J Am Stat Assoc. 1979 Jun 1;74(366a):427-31.
18. Perron P. The great crash, the oil price shock, and the unit root hypothesis. Econometrica: J Econometric Soc. 1989 Nov 1:1361-401.
19. Engle RF, Granger CW. Co-integration and error correction: representation, estimation, and testing. Econometrica: J Econometric Soc. 1987 Mar 1:251-76.
20. Johansen S. Cointegration in partial systems and the efficiency of single-equation analysis. J Econometrics. 1992 Jun 1;52(3):389-402.