Impact of trade liberalization on economic growth in small developing economies: Bhutan as a case study

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Abstract

This paper examined the relationship between trade liberalization and economic growth in the context of Bhutan's fragile economy. The study used a cross-country growth regression analysis under a fixed-effects model using dynamic panel data. A sample of 20 homogenous countries from different regions was used in the analysis. The countries were selected based on the following criteria: land size, population, economy, geography, and resource dependence. Given the complexity of constructing a trade openness index in the absence of adequate data, the study used the ratio of total trade (exports + imports) to real GDP as a proxy for trade liberalization. Accordingly, a country with a higher trade openness index was considered more liberal and outward-oriented in terms of international trade than a country with a lower openness index. Regression results show that trade liberalization has a positive and significant effect on growth, which is consistent with much of the earlier theoretical and empirical literature in the field. This suggests that efforts to pursue outward-oriented trade policy regimes may be beneficial for long-term economic growth in Bhutan and other similar economies.

Keywords: Trade liberalization, growth, fixed-effects model

Introduction

Global economic integration is increasing every year. According to the 2013 World Trade Report (WTR, 2013), world merchandise trade and trade in commercial services were worth in 2011 about USD 18 trillion and USD 4 trillion, respectively, despite global economic adversities, natural disasters, and political upheavals around the world. In the last three decades, world trade has grown dramatically and much faster than global output. Between 1980 and 2011, world merchandise trade was increasing by more than 7% and trade in commercial services, by about 8% per year (WTR, 2013). With such unprecedented growth in global trade, it is said that the world is experiencing the second age of globalization after the long and deep fall in the global economy that occurred between 1914 and 1945 due to two world wars and the Great Depression (WTR). However, although the volume of global trade appears impressive, individual countries have mixed experiences and views about the impact of trade liberalization on their economic performance. On the one hand, developed economies and multilateral institutions promulgate liberal trade regimes as a way for developing countries to strengthen their domestic industries and stimulate economic growth (International Monetary Fund [IMF], 2008; Organization for

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Economic Cooperation and Development [OECD], 2012; World Trade Organization [WTO], 2013). On the other hand, studies have shown that many low-income countries, particularly in the Sub-Saharan region and Latin America, have seen slow export growth and in some cases, even de-industrialization (Dollar, 1992; Shafaeddin, 2005). As for Bhutan, a country with limited natural resources and a small domestic market, it has always been in the interest of the government and policy makers to pursue outward-oriented trade policies. However, Bhutan has been experiencing increasing trade deficits over the past few years (Royal Government of Bhutan [RGOB]; Ministry of Economic Affairs [MoEA], 2012).The trade deficit in 2012 stood at about 28% of gross domestic product (GDP); it has contributed significantly to the sustained imbalance of the current account and placed pressure on the limited hard-currency reserves. The current account deficit has now reached more than 20% of GDP (Royal Monetary Authority [RMA], 2013), posing a serious macroeconomic challenge for Bhutan. This has raised considerable doubts among the industrialists, policy makers, and the general public over the impact of trade liberalization[2] on the overall economic performance of Bhutan.

The impact of trade liberalization on growth has always been a controversial issue among economists. Some say that free trade brings economic growth through increased imports of capital goods, which help to boost productivity and investment. It also increases exports through better market access. Indeed, many studies have shown that trade liberalization has a statistically significant and positive relationship with economic growth (David, 1993; Dollar, 1992; Edwards, 1998; Rutherford & Tarr, 1998; Sachs &Warner, 1995; Salinas & Aksoy, 2006; Wacziarg, 2003). However, others have argued that a strong positive correlation between trade liberalization and growth is doubtful (e.g., Rodriguez & Rodrik, 2001; Sarkar, 2008; Yanikkaya, 2003). The most influential critical review to date has been done by Rodriguez and Rodrik (2001), who highlighted the methodological shortcomings of the statistical techniques used in the four most representative empirical studies on the impact of trade openness on growth: David, 1993; Dollar, 1992; Edwards, 1998; and Sachs & Warner, 1995.

Although different authors have used different methodologies and statistical techniques to analyze the effect of trade liberalization on economic growth, most studies have been based on cross-country growth regression analysis conducted within the framework of the neoclassical growth model and the endogenous growth model. Furthermore, a review of the literature reveals that most empirical studies have used a sample of large and medium-sized economies in their analyses. As a result, very few studies have included Bhutan because of the small size of Bhutan's economy and population. For example, although the World Bank paper by Salinas and Aksoy (2006) identified Bhutan as one of the developing countries, the country was not included in their analysis because the criterion they used for grouping countries postulated a minimum population of one million. Thus, it appears that there have been no studies measuring the impact of trade openness on economic growth in Bhutan. At the same time, inferences drawn from the findings of many cross-country studies may not necessarily be relevant to a small economy like Bhutan because small economies have their own set of socio-economic challenges that are very different from those of bigger economies. To clarify to what extent the claim that trade liberalization positively affects growth may hold true for small developing economies, this paper investigated the relationship between trade liberalization and economic growth using panel data from 20 homogenous countries including Bhutan.

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[2] In this paper, trade liberalization is used synonymously with outward orientation and trade openness.

Literature review

Theoretical background

The theoretical relationship between trade liberalization and economic growth has a long history. The notion that international trade is an engine of growth was first proposed as early as the 18th century by Adam Smith (Edward, 1993). The classical trade theory by David Ricardo says that countries will benefit by establishing free trade between them (Feenstra & Taylor, 2012) because free trade helps countries to specialize in areas where they have comparative advantage. A similar idea was expressed by Heckscher-Ohlin in his 2x2x2 model, in which the numbers refer to two countries, two goods, and two factors of production. This model predicts that the pattern of trade between two countries will depend on their factor endowments. The specific factor model (Feenstra & Taylor, 2012) is another well-known trade model, which states that although a country as a whole may be better off from opening its trade, free trade creates winners and losers among different areas of production in the economy. The model predicts that opening trade will generally benefit certain areas in export industries by allowing them to sell at higher prices internationally, whereas certain areas in import industries will lose (Krugman *et al.*, 2012). This implies that trade liberalization may lead to unfair income distribution. The standard trade theory commonly referred to as a new trade theory (Krugman, *et al.,* 2012) says that under monopolistic competition, firms will not only influence market price to a certain extent, but also enjoy increasing returns to scale (i.e., their average cost will fall as their output increases) from the opening of trade with foreign countries. However, with the entry of new firms into the market and with increasing competition, the profit margin is expected to become zero in the long run. As a result, inefficient and uncompetitive firms will exit the market, thereby creating unemployment in the short run (Krugman, *et al.,* 2012). As the above discussion indicates, all classical and new trade theories agree that although countries as a whole gain from free trade, there are potential risks of unfair income distribution and unemployment in the short run. More importantly, the growth theories propounded by Romer and Lucas in the 1980s provided a theoretical link between trade openness and growth (Edward, 1998), which serves as a good basis for most of the analyses of trade liberalization and its impact on economic growth. Against this theoretical background, I will now review some prominent empirical studies on trade openness and economic growth.

Empirical literature

A vast pool of existing empirical literature provides mixed results for the impact of trade liberalization on economic growth. Although some studies have found a positive and robust relationship between trade openness and economic growth, others have found the relationship to be less robust, and, in some cases, negative. David (1993) provides an analysis of the positive relationship between trade and income convergence among countries in the context of the European Economic Community (EEC) and the European Free Trade Association (EFTA). He explains that the relationship is clearly evident from the decrease in income disparity among the member countries following the removal of trade restrictions within the EEC and among the EFTA members during the post-war period. He argues that the positive effect of trade liberalization is also clear from the income convergence within the OECD. However, David's work was criticized by Rodriguez and Rodrik (2001), who argued that the exclusion of Germany from the analysis led to a biased estimation showing that post-war trade liberalization within the EEC had decreased the level of income dispersion. Moreover, when we look closely at the long-term trend of the standard deviation of income dispersion, we can see that, even without Germany, the income in the five EEC members started converging after WWII, whereas the transition period of trade liberalization under the EEC occurred only later, between 1959 and 1968. Given this pre-existing trend, it may not be correct to claim that convergence is solely an effect of trade liberalization. In another empirical study (i.e., Dollar, 1992), the reason for

regional growth disparity (-0.3% in Latin America, -0.4% in African countries, and 3.4% in Asian economies) observed between 1976 and 1985 and the debt crises in Latin America and Africa in the 1980s was said to be mainly due to the countries' inward-oriented policies. Dollar established an outward-orientation index using the combined effects of real exchange rate distortion and the variability of the real exchange rate to measure the impact of trade openness on growth. He measured the impact in 95 countries using a cross-country regression analysis and found that outward orientation was highly correlated with per capita GDP growth. However, Dollar (1992) found very little effect of investment on economic growth. Therefore, it was concluded that trade liberalization, devaluation of the real exchange rate, and maintenance of a stable real exchange rate could greatly help countries, especially poor countries, to grow. Unlike many earlier studies in the field, Sachs and Warner (1995) came up with a comprehensive and robust measure of openness based on five criteria: tariffs, non-tariff barriers, socialistic system, state monopoly, and black market. The results of their cross-country regression analysis support a positive relationship between an open trade orientation and economic growth. They found that within the group of developing countries, open economies grew by 4.49%, whereas closed economies grew by only 0.69%. In the developed countries' group, open economies grew by 2.29%, whereas closed economies grew by 0.74%. In both cases, open economies seem to be doing far better than closed economies. This finding indicates that trade liberalization may be an important determinant of economic growth in the long run.

However, some researchers disagree with the existence of a strong positive correlation between trade openness and economic growth (Rodriguez & Rodrik, 2001; Sarkar, 2008; Yanikkaya, 2003). The empirical works by David (1993), Dollar (1992), Edward (1993), and Sachs and Warner (1995) have been heavily criticized by Rodriguez and Rodrik (2001).They argued that the findings were less robust than the authors had claimed. Although Rodriguez and Rodrik did not demonstrate sufficient evidence to dispute the effect of trade liberalization on growth, they strongly disagreed with the popular notion that global integration is an effective way to encourage economic growth.

Some authors claim that the relationship between trade openness and economic growth is ambiguous. One such claim has been made by Sarkar (2008), who conducted an empirical study using both panel data and time-series data for a number of developing economies. Although Sarkar showed, using between effect and a random-effects model within a panel data for 51 less developed countries covering a period from 1981 to 2002 that countries with higher trade shares to GDP performed economically better than those with lower trade shares. However, this positive relationship was not evident when he conducted country-specific time-series analyses for a period between 1961 and 2002. The empirical results showed that for most of the developing countries, including the East Asian countries, there was no positive long-term relationship between trade openness and economic growth. In the region-wise analysis, only the middle-income group showed a positive relationship. These results raise doubt over the strong positive relationship obtained by earlier studies. In another cross-country study, Yanikkaya (2003), which used data from 100 countries covering a period from 1970 to 1997, results were mixed. On the one hand, the researcher did show a positive and significant relationship between trade openness and economic growth, which is in line with the findings of many other empirical and theoretical growth studies. On the other hand, the estimation for trade barriers also showed a positive relationship between economic growth and trade barriers, which is contradictory to the conventional view of the effects of trade restrictions on growth. This result implies that trade barriers in the form of tariffs can actually be beneficial for economic growth. Overall, Rodriguez and Rodrik (2001), Sarkar (2008), and Yanikkaya (2003) concluded that the strong and positive relationship between trade openness and economic growth claimed by earlier studies is doubtful.

Taking into account such controversial arguments over the impact of trade liberalization on economic growth, I have investigated the impact of outward-oriented trade policies across 20 small developing economies. Based on the estimation results, I made inferences about the relationship between trade openness and economic growth in the context of Bhutan's economy.

Methodology

I conducted a cross-country growth regression analysis using dynamic panel data for 20 countries covering a period from 1998 to 2011.The study used three-year averages to eliminate the business cycle effect, which reduced the time dimension to seven observations, resulting in a total of 140 observations. A fixed-effects model was found more appropriate based on Hausman test (Appendix A) with p-value equal to 0.0041, which is less than 5% significance level. Accordingly, fixed-effects model was used for this study.

The sample countries were selected based on several criteria. As explained earlier, most of the empirical studies have focused on the analysis of trade liberalization and economic growth using samples of economies that were very different from Bhutan in terms of income, population, geography, and resource endowment. To ensure that the findings of this study were relevant to Bhutan, 20 homogenous countries were selected based on the following five criteria: per capita GDP, land size, population, geographical location, and resource dependence (measured as the share of the main export product in total exports).Countries that satisfied any two of the five criteria were included in the sample. Only two matches to the criteria were required to ensure that the criteria did not become too restrictive. The list of countries and criteria used for sample selection are shown in Appendix B.

With regard to explanatory variables, I used a mix of relevant variables from Barro (2003) and Leon-Gonzalez and Vinayagathasan (2013). The general model I used is shown below.

$$Y_{it} = \beta_0 + \beta' X_{it} + \mu_i + \varepsilon_{it} \qquad \text{............................ (1)}$$

Here, the subscript i denotes the cross-sectional dimension ($i = 1,…,N$), and t represents the time dimension ($t = 1,…,T$). The dependent variable Y_{it} is the per capita GDP growth for country i at time t; X_{it} is a vector of explanatory variables that vary across countries; β_0 is the intercept, and β' represents the vector of coefficients to be estimated. The μ_i is included to take into account the effect of unobserved individual country-specific heterogeneity. The above general equation is further specified as follows.

$$gdppcg_{i,t} = \beta_0 + \beta_1 ln(gdppc_{i,t-1}) + \beta_2 fdi_{i,t} + \beta_3 ms_{i,t} + \beta_4 edu_{i,t} + \beta_5 govexp_{i,t} + \beta_6 inf_{i,t} + \beta_7 pop_{i,t}$$
$$+ \beta_8 topen_{i,t} + \beta_9 tot_{it} + \mu_i + \varepsilon_{it} \qquad \text{.............................. (2)}$$

As explained above, the vector of control variables includes nine explanatory variables: initial per capita GDP in logarithmic form ($lngdppc_{i,t-1}$), foreign direct investment ($fdi_{i,t}$), money supply ($ms_{i,t}$), educational attainment ($edu_{i,t}$), government expenditure ($govexp_{i,t}$), inflation ($inf_{i,t}$), population growth rate ($pop_{i,t}$), trade openness ($topen_{i,t}$), and terms of trade ($tot_{i,t}$). Unlike in Leon-Gonzalez and Vinayagathasan (2013), in this study, initial per capita GDP is assumed to be exogenous. I used foreign direct investment (FDI) rather than domestic investment because FDI is said to be important for transferring technology via human capital to the host country, boosting economic growth faster than domestic investment (Borensztein, Gregorio, & Lee, 1995).

The most important regressor in this study is trade openness. Thus, it was important to construct

a good measurement index for trade openness. I reviewed a number of prominent studies related to trade openness indices, but there seems to be no consensus among researchers on this issue. Different authors have used different approaches and criteria. Thus, for the purpose of this study, the ratio of total trade (exports plus imports) to real GDP was used as a proxy for trade openness. This is one of the most widely used trade-openness indices (OECD, 2011). Although it may be somewhat misleading because a low ratio does not necessarily mean high barriers (tariff and non-tariff ones), its calculation is less complex and this index is commonly used as a measure of trade openness to see the weight of trade in an economy. It is particularly relevant for small underdeveloped economies because this ratio is influenced by imports rather than exports.

Imports, in turn, would depend on the degree of trade restrictions; a higher volume of imports would imply less restrictions. For this reason, the ratio of total trade to GDP seems to be an appropriate measure of trade openness for Bhutan. Now, before we move to the empirical part, let me provide a brief overview of Bhutan's economy and trade.

## Bhutan's economic overview and trade performance

Bhutan is a small Himalayan country in south Asia with a population of about 0.750 million spread over an area of 38,394 sqkm. It is a landlocked country, sandwiched between two giant economies, China in the north and India in the south. Bhutan has seen a steady economic growth for many years and has experienced an average annual GDP growth of 7% in the last 30 years (RGOB, MoEA, 2012).The sustained growth is primarily driven by the country's hydropower sector (World Bank [WB], 2010). However, the growth rate has been declining in recent years, which may be partly attributed to the turbulence in the financial market as a result of the liquidity crunch and souring current account deficits as indicated by the Royal Monetary Authority (RMA, 2013).

Bhutan has seen positive and steady growth of its overall trade in the past one and a half decades. Many policy documents underscore the important role played by trade in the socio-economic progress of Bhutan. The share of exports in the GDP increased from 27% in 1998 to 37% in 2011. Similarly, the share of imports in the GDP increased from 33% in 1998 to 57% in 2011. Overall, the total share of trade in the GDP increased from 60% to 94% in 2011 (RGOB, Department of Revenue & Customs [DRC], 2012). However, unlike in many similar economies, trade performance in Bhutan should be analyzed with some caution. This is mainly because of the dominance of trade on the export of hydroelectric power to India. Hydroelectricity generation has been the single biggest contributor to the economy since the start of its operation. It constitutes on average about 40% of the total exports and 15% of the total trade (RGOB, DRC, 2012). For this reason, in this paper, separate analyses were conducted with and without the contribution from the sale of electricity. Figures1 and 2 show the trends in the overall trade (dotted line), which appears to be following closely the nominal GDP. The downside of the trade pattern is the increasing trade deficit as shown by the downward-trending trade balance. The trade deficit has become even more pronounced in recent years, reaching almost 30% of GDP in 2012 (RMA, 2013).
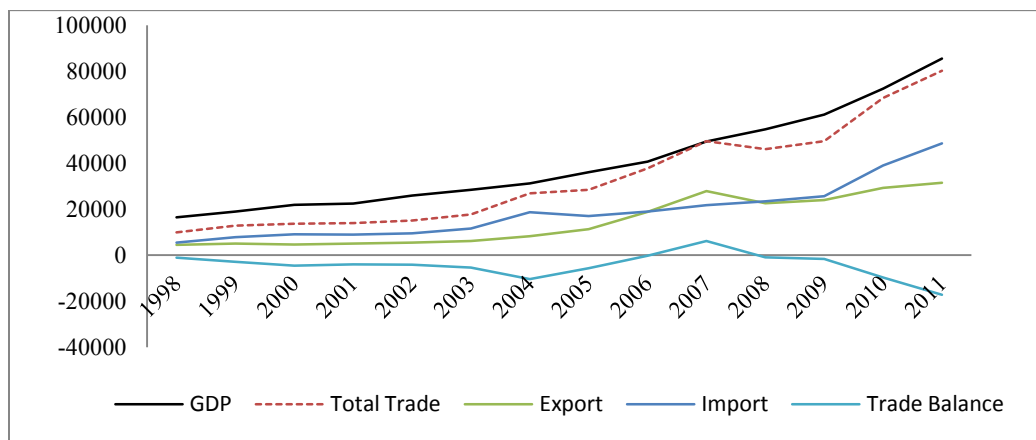
Figure 1: Trends in nominal GDP and trade with the contribution from the sale of electricity
Note: Data were retrieved from department of revenue and customs and national statistical bureau (NSB), RGOB.
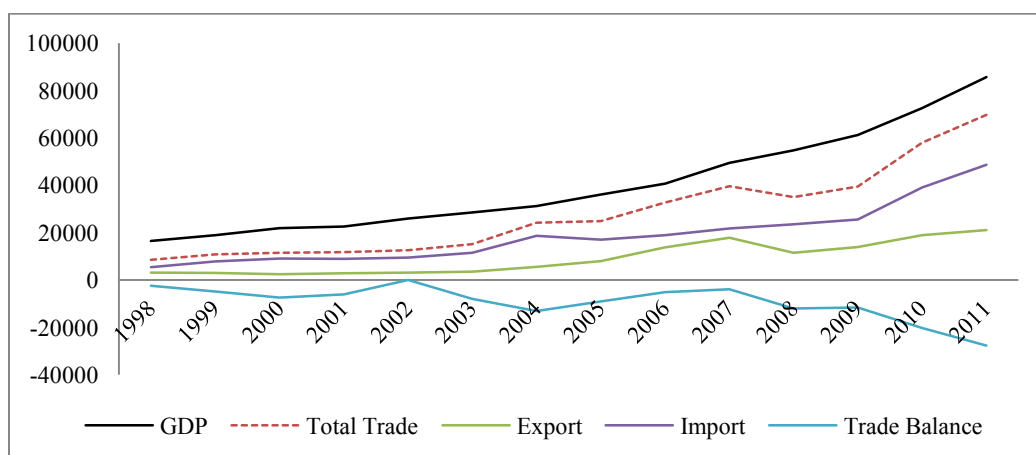
Figure 2: Trends in nominal GDP and trade without the contribution from the sale of electricity
Note: Data were retrieved from department of revenue and customs and national statistical bureau (NSB), RGOB.

Given Bhutan's small domestic market and limited consumption capacity, it is imperative to pursue an outward-oriented trade regime for better market access. Bhutan's trade is highly concentrated in the South Asian region. At the bilateral level, Bhutan currently has a free trade agreement (FTA) with India and a preferential trade agreement (PTA) with Bangladesh. Negotiations on two additional bilateral trade agreements--with Nepal and Thailand--have been initiated. Bhutan has also been active in regional negotiations and trade talks. It is a founding member of the South Asia Free Trade Area (SAFTA), which came into effect in January 2006. Bhutan is also a member of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC), which is still under negotiation. At the multilateral level,

Bhutan has been an observer member of the WTO since 1999, and it now intends to accede as a full-fledged member, for which several rounds of negotiations have already taken place.

These bilateral, regional, and multilateral trade agreements and negotiations attest to the pursuit of a free and liberal trade regime by Bhutan. Under each of these trade arrangements, both tariff and non-tariff barriers are being progressively liberalized. However, until now, it remained unclear if Bhutan's open trade regime has contributed to the country's economic growth. This relationship is examined in the regression analysis described below.

Empirical findings
The table in Appendix C shows Pearson's product-moment correlation coefficients for the variables used in the analyses. As shown in the table, FDI and trade openness are positively correlated with growth; on the other hand, initial per capita GDP, money supply, primary education, government expenditure, inflation, population, and terms of trade all show negative correlations. As expected, the correlation between trade openness and growth is positive and is equal to 0.092. Although this is a weak correlation, it is stronger than that of the other variables. This relationship, however, does not, in itself, show any causal effect of trade openness on economic growth.
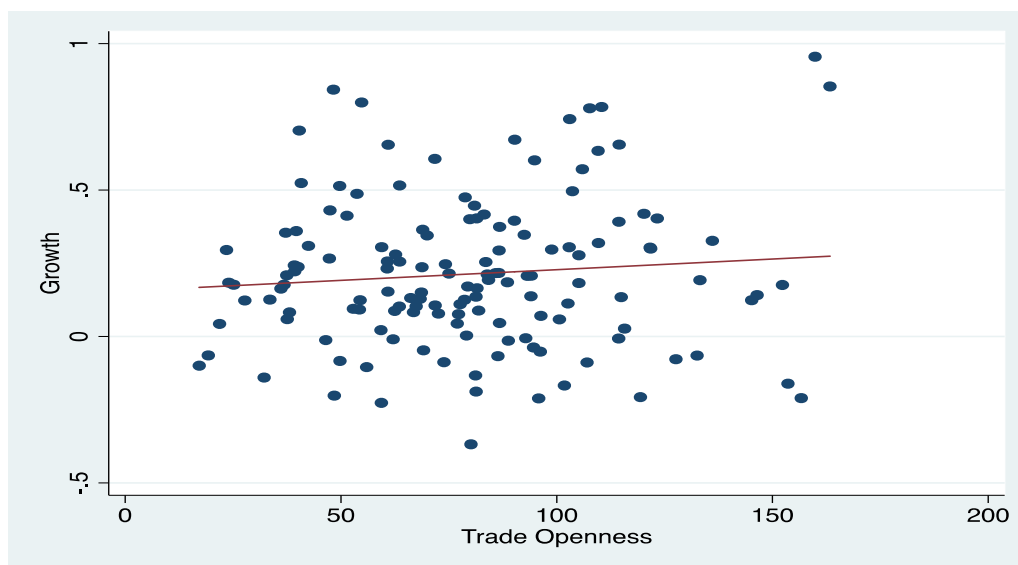
Figure 3: Correlation between trade openness and GDP growth
Note: This figure is based on sample data from 20 countries covering a period from 1998-2011.

Figure 3 shows the relationship between trade openness and GDP growth. The trade-openness index, measured by the ratio of total trade to GDP, seems to be moving in the same direction as the GDP growth in the sample of 20 homogenous countries, even though the line is much flatter than expected, indicating a weak relationship.

Table 1 shows the results of cross-country growth regression analysis. The regression results were obtained (a) under a fixed-effects (FE) model and (b) with bias-corrected least square dummy-variable correction (LSDVC). The FE model controls for omitted variables in panel data when the omitted variables vary across entities (Stock & Watson, 2012); it takes into account the heterogeneity among the countries in the sample, which is captured by μ_i in the equation.

However, in a dynamic panel regression, if the estimation is based on a small set of time-series data, the resulting standard dummy-variable estimation may be biased (Kiviet, 1995). In order to correct for such bias and compare the estimation results with those obtained under a standard fixed-effects model, LSDVC was applied.

Discussion

Regression was performed with and without the contribution of the electricity sector to the ratio of total trade to GDP for Bhutan. This was done to see if the effect of trade openness on economic growth in Bhutan is influenced by the export of hydroelectricity, which is the main export commodity in Bhutan. There was no significant change in the results, which could be accounted for by the use of panel data, rather than time-series data for Bhutan. Under the fixed-effects model, growth appears to be affected by some macroeconomic variables included in the model. For instance, the log of initial per capita GDP is negatively related to growth at an estimated coefficient of -0.284 (t =-3.66) and it is significant at the 1% significance level. This suggests the existence of convergence among the countries in the sample. Hence, this result is consistent with the neoclassical theory, which says that poorer countries grow faster than richer countries overtime. It also appears to be consistent with the findings of Barro (2003), but the size of the coefficient in this analysis (-0.284) is much larger than in Barro's study (i.e., -0.023). Although both Barro (2003) and Leon-Gonzalez and Vinayagathasan (2013) used only inflation as a monetary effect in the model, I used both money supply and inflation. The effect of money supply on growth was also found to be positive and highly significant at the 1% significance level (coefficient = 0.011). However, inflation was found to be significant at the 10% significance level and it was negatively associated with growth, which is again similar to the findings of Barro (2003) and other earlier studies. It is important to note that the model used in this study can only describe a linear relationship between inflation and growth and it cannot take into account the non-linear nature of inflation as explained by Leon-Gonzalez and Vinayagathasan (2013). These researchers found in an analysis of 27 Asian developing countries that the threshold above which inflation began to exert negative influence on growth was 5.43%. More importantly, trade openness, which is a key explanatory variable in this study, seems to be positively related to growth at the 5% significance level. The coefficient for trade openness was 0.005. This result was same with or without the inclusion of Bhutan's electricity's share in the total trade, and it supports the studies by David (1993), Dollar (1992), Edwards (1998), and Sachs and Warner (1995), who claim that outward-oriented trade policy positively affects growth. It is also interesting to note that FDI does not seem to be related to growth. This is also in line with the findings of Dollar (1992), who found in a sample of 95 countries, that outward orientation was highly correlated with per capita GDP growth and that there was very little effect of investment on growth.

To ensure that the estimation results were robust, another estimation was conducted based on LSDVC, as shown in columns 3 and 4 of Table 1. In this estimation, initial per capita GDP was highly significant at the 1% level of significance and trade openness appeared to marginally affect growth, with a coefficient of 0.004 (t =1.62 with electricity and 1.64 without electricity). Although most of the variables included were found to be insignificant, the fact that trade openness was marginally significant at the 10% level of significance, even under the LSDVC, confirms the positive effect of trade liberalization on economic growth obtained under the FE model.

Table 1: Regression results

Variables	Fixed-effects model (gdppcg)				LSDVC (ln_gdppc)			
	-1		**-2**		**-3**		**-4**	
Constant	1.472***	-2.75	1.459***	-2.71	-	-	-	-
Log (per capita GDP)	-0.284***	(-3.66)	-0.284***	(-3.64)	-	-	-	-
Foreign direct investment	0.001	-1.33	0.001	-1.33	0.001	-0.66	0.001	-0.66
Money supply	0.011***	-2.61	0.011***	-2.63	-0.003	(-0.48)	-0.003	(-0.47)
Primary education	-0.005	(-0.38)	-0.005	(-0.36)	0.018	-0.95	0.018	-0.97
Government expenditure	-0.003	(-0.39)	-0.003	(-0.37)	-0.008	(-0.72)	-0.008	(-0.71)
Inflation rate	-0.006*	(-1.79)	-0.006*	(-1.78)	0.002	-0.17	0.002	-0.16
Population	0.027	-0.38	0.024	-0.33	-0.1	(-1.08)	-0.104	(-1.14)
Terms of trade	0.079	-0.58	0.085	-0.62	0.142	-0.66	0.149	-0.7
Trade opennes_elec	0.005**	-2.31	-	-	0.004	-1.62	-	-
Trade openness_noelec	-	-	0.005**	-2.28	-	-	0.004*	-1.64
ln_gdppcc.L1	-	-	-	-	1.023***	-12.8	1.023***	-12.84

Note: t-statistics are provided in parentheses; ***indicates $p < 0.01$; ** indicates $p < 0.05$; and * indicates $p < 0.1$.

Conclusion

This study investigated the relationship between trade liberalization and economic growth. Overall, under the FE model, it was found that growth was largely influenced by initial per capita GDP, inflation, money supply, and trade openness. The strength of the relationship, however, varied depending on the individual variable. The relationship between growth and initial per capita GDP and between growth and inflation was found to be negative and significant at the 1% and 10% levels of significance, respectively, whereas the relationship between growth and money supply and growth and trade openness was found to be positive and statistically significant at the 1% and 5% levels, respectively. On the other hand, the estimation results showed no evidence of a growth effect from FDI, primary education, government spending, population growth, and terms of trade. However, it may be premature to conclude that these variables do not affect growth. There could be many factors influencing this estimation, such as lack of quality data in the sample countries because data in small developing countries are usually poor or due to a small number of observations.

The most important relationship in this study is the one between trade liberalization, measured by a trade openness index, and economic growth. The FE estimation showed that the relationship is positive and statistically significant at the 5% level. The effect was also confirmed under the LSDVC estimation. Overall, it can be inferred from the empirical estimation results that even though the strength of the relationship between trade openness and growth is weak; there exist a positive relationship between the two. This positive relationship suggests that pursuing outward oriented trade policies may still be helpful in driving the economic growth.

The estimation results also showed that money supply was statistically significant at 1%, indicating that monetary policy may have some influence on growth even though its coefficient is small at 0.011 under the FE method. However, because inflation appears to have a negative effect on economic growth, it may be recommended for Bhutan to pursue accommodative monetary policy and ensure that inflation stays below a certain threshold. In Leon-Gonzalez and Vinayagathasan (2013) and Vinayagathasan (2013), the inflation threshold above which inflation started to affect negatively economic growth was found to be 5.43% in cross-country analyses of Asian economies including Bhutan. It may thus be imperative for Bhutan to give priority to reducing the rate of inflation (the annual average inflation in 2013 was about 8.6 % [RMA, 2013]).

These policy interventions may increase the benefit for Bhutan from its outward-oriented trade policy and help the country achieve sustainable economic growth in the long run. These results may also apply to other small economies included in the sample. However, one limitation of this study is the use of a trade-openness index measured by the total trade ratio to GDP, which may not be an adequate proxy for trade liberalization. Future research should focus on constructing a more comprehensive index that takes into account the heterogeneity across small developing economies.

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Appendix A: Hausman test

	Fixed Effect (b)	Random Effect (B)	Difference (b-B)	sort(dig (V_b - V_B)) (S.E.)
log (per capita GDP)	-0.284	-0.047	-0.238	0.072
foreign direct investment	0.001	0.000	0.000	0.000
money supply	0.011	0.012	0.010	0.004
primary education	-0.005	-0.004	-0.001	0.013
government expenditure	-0.003	-0.003	-0.001	0.008
inflation rate	-0.006	-0.002	-0.003	0.001
population	0.027	-0.031	0.059	0.064
terms of trade	0.079	0.029	0.050	0.002
tradeopenness	0.005	0.001	0.004	0.132

chi2(9) = (b-B) ` [(V_b-V_B) ^ (-1)] (b-B) = 24.14; Prob > chi2 = 0.0041

Appendix B: **Sample selection criteria**

Sl.	Region	Country	Population (<=5,000,000)	Land area (<=60,000sqkm)	GDP per capita (<=$3,600)	Geographical location (landlocked or not)	Share of the main export sector(goods only)	Export product
1	Asia	Bhutan	741,822	38394	2,398	Landlocked	32%	Hydro electricity
2	Asia	Nepal	27,474,377	143,350	707	Landlocked	94%	Carpet and textile for floor covering
3	Asia	Maldives	338,442	300	6,567	Island	9%	Fish products
4	Asia	Laos PDR	6,645,827	230,800	1,399	Landlocked	23%	Copper and articles thereof
5	Asia	Brunei	412,238	5,270	41,127	Land & Water	96%	Mineral fuel, oil products
6	Asia	Mongolia	2,796,484	1,553,560	3,673	Landlocked	49%	Mineral products
7	Asia Pacific	Fiji	874,742	18,270	4,438	Island	28%	Mineral fuels, oils, distillation products
8	Middle East	Armenia	2,969,081	28,480	3,338	Landlocked	20%	Ores, slag and ash
9	Middle East	Georgia	4,555,911	69,700	3,490	Land & Water	27%	Vehicles other than railway, tramway
10	Central Asia	Tajikistan	7,910,041	141,510	872	Landlocked	65%	Aluminum and articles thereof
11	Central Asia	Kyrgyzstan	5,548,042	199,951	1,160	Landlocked	34%	Pearls, precious stones, metals, coins
12	Africa	Lesotho	2,051,545	30,360	1,193	Landlocked	46%	Pearls, precious stones, metals, coins
13	Africa	Swaziland	1,230,985	17,200	3,044	Landlocked	22%	Sugars and sugar confectionery
14	Africa	Togo	6,642,928	54,390	574	Land & Water	26%	Salt, sulphur, earth, stone, plaster, lime and cement
15	Africa	Burundi	10,888,321	27,830	251	Landlocked	75%	Coffee, tea, mate and spices
16	Africa	Botswana	2,127,825	581,730	7,238	Landlocked	81%	Pearls, precious stones, metals, coins
17	Europe	Macedonia	2,105,575	25,220	4,568	Landlocked	19%	Iron and steel
18	Europe	Estonia	1,266,375	45,228	16,316	Land & Water	18%	Electrical, electronic equipment
19	Europe	Moldova	3,559,541	32,854	2,038	Landlocked	10%	Beverages, spirits and vinegar
20	Europe	Albania	3,011,405	28,748	4,000	Landlocked	27%	Mineral fuels, oils, distillation products

Note: Maximum values: population, 5million; land area, 60,000 sqkm; per capita GDP, $3,600. Geographical location referred to whether the country was landlocked or not. Resource dependence was measured as a share of the main export commodity to total exports in 2012. Twenty countries across the world satisfying at least two of the criteria were identified as countries homogenous with Bhutan and were included in the sample.

Appendix C: Pearson's correlations between the variables

	gdppcg	ln_gdppci	ln_gdpcc	fdi	ms	priedu	govexp	inf	pop	Topen	tot
gdppcg	1										
ln_gdppci	-0.0377	1									
ln_gdppcc	0.1209	0.9871	1								
fdi	0.1189	-0.0082	0.0081	1							
Ms	-0.0033	0.5757	0.5763	0.0862	1						
priedu	-0.1472	-0.1612	-0.1798	-0.2851	0.0359	1					
govexp	-0.0846	0.2600	0.2457	0.0599	0.1354	0.3105	1				
Inf	-0.0258	-0.3529	-0.3584	0.0829	-0.3132	-0.0206	-0.1616	1			
pop	-0.1634	-0.2924	-0.3112	-0.2521	-0.0629	0.6154	0.1302	0.0786	1		
topen	0.0925	0.3183	0.3255	0.1600	0.0225	0.0756	0.4159	-0.0142	-0.1993	1	
tot	-0.0133	0.5165	0.5098	-0.0849	0.2411	0.0529	0.0975	-0.1194	0.1855	0.2538	1

Appendix D: Data description and sources

Variables	**Description and Source**	**Source**
$gdppcg_{i,t}$	GDP per capita(%growth)	WDI
$gdppc_{i,t-}$	Initial GDP per capita:	WDI
$fdi_{i,t}$	FDI share of GDP	WDI/ADB/AfDB
$ms_{i,t}$	Money supply/GDP	WDI/ADB/AfDB
$edu_{i,t}$	Educational attainment(primary school enrollment)	UIS
$govexp_{i,t}$	Government expenditure	WDI ADB/AfDB
$inf_{i,t}$	Inflation rate	WDI
$pop_{i,t}$	Population growth rate	UN Data
$Topen_{i,t}$	Trade openness ratio	ITC/COMTRADE
tot_{it}	Terms of trade	ITC/COMTRADE

Note: WDI = World Development Indicator, ADB = Asian Development Bank, AfDB = African Development Bank, UIS = United Nations Educational, Scientific and Cultural Organization Institute for Statistics, UN Data = United Nation Data, ITC = International Trade Center, and COMTRADE = United Nation Data on Commerce and Trade.

Appendix E: Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
gdppcg	140	0.21	0.25	-0.37	0.95
ln_gdppc	140	7.14	1.29	4.76	10.52
fdi	140	15.7	58.09	-0.05	507.1
ms	140	38.77	19.01	7.4	80.7
edu	140	12.52	5.6	3.5	27.6
govexp	140	17.24	7.29	6.3	38.3
inf	140	7.44	8.08	-0.4	81.5
pop	140	1.12	1.06	-0.87	3.47
topen	140	79.23	32.16	17.17	163.33
tot	140	0.73	0.7	0.07	4.1

Note: All figures are three-year averages for the period from 1998 to 2011.