AN EMPIRICAL ANALYSIS OF HOW INSTITUTIONAL QUALITY AND TRADE AFFECTS THE ECONOMIC GROWTH OF SIERRA LEONE

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Abstract

This paper aims to investigate how institutional quality and trade affects the economic growth of Sierra Leone. Vivid econometric and analytical research method has been applied to collect and analyze information of this study. The results from the empirical investigation show that there is positive and statistically significant relationship between institutional quality, trade volume and economic growth. The study also shows that a unit increase in institutions quality will increase economic growth by 0.32% and a unit increase in trade volume increases economic growth by 0.12%. The findings also show how Sierra Leone economic growth has been growing since time in memorial. This research finding has provided empirical evidence that Sierra Leone institutions are positively contributing to its economic growth through international trade.

Key words: institutional quality, Sierra Leone, trade, economy.

Introduction

Institutional quality is widely accepted by several scholars as an essential factor in creating and enhancing trade that resulted to promoting economic growth of a country. This perspective insists on the relevancy that normative framework and institutions have on fostering development. This institutional structure defines incentives and penalties, shapes social behavior and articulates collective action, thus conditioning development. In last year, a myriad of empirical studies has supported this relationship between quality and trade; and, though less conclusively, the one between institutional quality and growth (Aron,2000). The positive impact between of institutional quality on development has been pointed out by crossed section analyses (Hall and Jones, 1999; Acemoglu et al., 2002; or Easterly and levine) as well as case studies (for example, rodrik 2003). However, from the economic policy and view point it is not sufficient to acknowledge that institutions do matter. It is also necessary to identify the determinants of institutional quality. This is crucial task in order to implement policies aimed to at building better institutions. The objective of this paper is to try to shed some light on the relative importance of trade, institutions and also the acceleration of growth taking practical in Sierra Leone over the years. This will help Sierra Leone to develop valuable experience and in building much-needed capacity by supporting its priorities on the world stage. In this section a review of the Sierra Leonean economy, particularly of the sectors that implicated directly on trade performance for the period immediately preceding the formulation of the Trade Policy is attempted to provide a picture of the environment in which the policy was formulated and issues that it tries to address.

The purpose of this research is to evaluate the role of institutional quality and trade on the economic growth of Sierra Leone. This is because Sierra Leone has historically been a trading centre and the "Gateway of Africa".

Trade is among the lead sectors to the economic growth of Sierra Leone. In order to significantly contribute to Nigeria development it need to have well functioning institutional and legal frameworks. A well recognized problem

faced by the domestic institutions in Sierra Leone is the limitation in the operational flexibility available to the Government of Sierra Leone in framing policies that address the particular needs of the trade.

The aim of the study is to investigate how institutional quality affects trade volume of domestic institutions in Sierra Leone and also the acceleration of growth that has been taking place over the years.

The aim of the research is also to observe the relationship between institutional quality and trade with a change in economic growth as measured by GDP growth in Sierra Leone. The literature review thus far indicates that these factors are mutually supporting; therefore, the following hypotheses can be derived.

Hypothesis 1:

Increase in institutional quality implies a Strong economic growth. Gross domestic product (GDP) is a measure of the country's productivity thus a good representation of economic growth. It is hypothesized that the change in institutional quality will cause a change in economic growth.

$$H_1: \Delta GDP_{t+i} = \lambda_1 \, \Delta IQ_t + \varepsilon_1 \tag{2}$$

ε_1 denotes an error correction factor. All other factors that can influence Economic Growth are assumed to be included in this error correction factor. λ_1 denotes the slope and i denotes the time for the economy to react to the changes. Therefore it can be hypothesized that this is a positive relationship i.e. λ is positive.

Hypothesis 2:

An increase in trade volume may sense a high economic growth. Trade activity development can create employment opportunities; encourage investment both domestic and foreign etc all of which have the tendencies in generating economic growth. It is hypothesized that the change in the volume of trade will cause a change in economic growth.

$$H_2: \Delta GDP_{t+i} = \lambda_2 \, \Delta TD_t + \varepsilon_2 \tag{2}$$

ε_1 denotes an error correction factor. All other factors that can influence Economic Growth are assumed to be included in this error correction factor. λ_2 denotes the slope and i denotes the time for the economy to react to the changes. Therefore it can be hypothesized that this is a positive relationship i.e. λ is positive.

Literature Review

This section reviews literatures on countries abroad on the main role of institutional quality and trade in stimulating economic growth.

Institutional quality, trade and Growth

In trade theory, the relationship between openness and economic growth is a complex issue. The „gains from trade theories" (e.g. Heckscer-Ohlin-Samuelson theorem) argue that trade openness contributes to economic growth through comparative advantage and efficiency gains. On the other hand, „structural pessimist theories" (e.g. Prebisch, 1950; Singer, 1950; Nurkes, 1962) argue that openness may cause losses to the less developed countries in the long-run due to declining terms of trade as these countries export mainly primary products which are income inelastic. However, the disagreement is comparatively less in empirical literature. Sachs and Warner (1995), Frankel and Romer (1999), Dollar and Kraay (2003a), and Alcala and Ciccone (2004) have found a positive trade-growth relationship. Likewise, firm level studies, in general, have found positive impact of trade on productivity and wage through changing resource allocation towards the sector with higher returns under open economy situation (see Melitz, 2003; Amiti and Konings, 2007; Melitz and Ottaviano, 2008; and Topalova and Khandelwal, 2011).

Outward oriented countries experience high economic growth compared to the inward oriented countries and this difference is soaring when only Asian developing economies are considered (Dollar, 1992). Dollar"s outward orientation index combined both distortion and variability of the real exchange rates. Sachs and Warner (1995) performed an exercise in quest of finding the effect of trade liberalization on economic growth and concluded open economies perform far better than the closed economies. Using openness and growth data for 89 developing

countries for the period 1970-1989, they showed open economies experienced annual 4.49 percent per-capita income growth, while close economies experienced annual 0.69 percent for the same time period. They even asserted that globally integrated economies outperformed closed economies on avoidance of extreme macroeconomic crisis and structural change. However, an argument that economy with high GDP tend to trade more cast doubt over those conclusions of positive growth effect of trade, as endogeneity between openness and growth might have serious implications for these conclusions. Country"s trade is not determined exogenously; rather trade of a country is determined by the country"s own overall economic policies which also have direct role on the economic growth. As a result positive association between trade and growth doesn"t imply openness causes economic growth.

Frankel and Romer (1999) come up with different approach to measure the growth effect of trade openness, controlling endogeneity between openness and economic growth. They focus on the geographic component of trade which is assumed to be independent of income and economic policies of the country under consideration. Countries with proximity to the major markets, coastline, tend to trade more than those that are not. As literatures on gravity model of trade demonstrates that geography of a country contains considerable information about the country's trade performance, geographic component of trade has been used as instrument to identify the growth effects of trade. This trade component is independent of the country's income, and economic policies. Thus, Frankel and Romer (1999) estimated predicted trade share using Gravity model and used this predicted trade share to identify its impact on the country's economic growth. Using trade and GDP data for 1985, they concluded that trade lift up income per person and 1 percent increase in predicted trade-GDP ratio could at least raise 0.5 percent of per-capita income. Moreover, Frankel and Romer (1999) attempted to identify the channel through which trade affects growth following Hall and Jones (1999). Using the production technology where human capital, proxy by schooling years, augmenting labor, Frankel and Romer (1999) concluded that trade spurs GDP through the accumulation of physical capital and human capital.

A parallel literature has been documenting the role of institutions in long-run economic growth. There is growing consensus that institutions are one of fundamental causes of long-run economic development. Profitability of the firms depends on the costs, risks, and barriers to entry and competition. Institutions, as protection of property rights, can affect costs through the regulatory burden and red tape, taxes, levels of corruption, infrastructure services, labour market regulation, and finance. Institutions also can affect risks through policy predictability, property rights, and contract enforcement; while it can affect barriers to competition, through regulations controlling start-up and bankruptcy, competition law, and entry to finance and infrastructure markets.

Acemoglu *et.al.* (2002) is pioneer in developing theoretical framework that how institutions affects long-run growth and they asserted that institutions playing key role in development by shaping incentives of the key agents in an economy and influence investments and production organization. Acemoglu and Johnson (2005) carried out an empirical study on institutions growth relationship using instrumental variables approach in support of their theoretical framework. As institutions are endogenous to income level of a country, they used colonial history to overcome the econometrics identification problem. They used European settler mortality rate and population density before colonization as instruments for property rights institutions with the arguments that European colonizers were tend establish good property institutions, as a means of permanent settlements, at the colonies with less health hazards. They found property rights institutions have positive significant effect on long-run growth. They have found that countries with more protection against expropriation by powerful elites have substantially higher income per-capita. Dowson (1998) also has found a direct effect of institutions on total factor productivity and an indirect positive effect on investment. Total factor productivity and investment are higher in countries with better institutional settings. Hall and Jones (1999) found differences in institutions and government policies, which they termed as social infrastructure, cause large differences in income across countries as institutions cause large differences in human and physical capital accumulation. They use colonial origin of a country as an instrumental variable, as they argued that institutions of the countries, that have been colony once, have been much influenced by the Western Europe.

While both theoretical and empirical literature persuasively have found independent positive effect of trade and institutions on economic growth separately, an attention-grabbing debate has been started by Rodriguez and Rodrik (2001), and Rodrik *et al.* (2004) shading skeptical view about growth effects of trade openness and argued that institutions are playing the key role in economic growth and they deny independent growth effects of openness. Rodriguez and Rodrik (2001) claim that trade has no separate effects on economic growth when institutions is

considered in the empirical model. In response to Rodriguez and Rodrik (2001), Dollar and Kraay (2003a) examined trade, institutions and growth and had come up with opposite result of Rodriguez and Rodrik (2001) claiming that it is trade, not institutions, has significant role in the long-run per-capita income growth. Dollar and Kraay (2003a) concluded that, as trade and institutions go together; it is difficult to trace partial effects of trade and institutions on economic growth in cross-section studies, while they have shown substantial partial effects of trade, and a little role of institutions, on economic growth through decadal dynamic regressions. However, they end up with this result treating institutions as exogenous, which is not compatible to the standard institutions-growth literature where they are treated as endogenously determined (Acemoglou, 2003). Dollar and Kraay (2003b), in their following study, concluded that, due to interacting roles of trade and institutions and lack of proper instruments for trade and institutions, definitive answer cannot be achieved by the simple cross-country linear instrumental variables regressions. Alcala and Ciccone (2004) did an exercise to identify partial effect of trade on productivity growth controlling for institutional quality and concluded that trade openness has significant and robust positive effect on productivity growth. They use real openness, instead of current openness, to capture the productivity effect of growth and persuasively argued that real openness is the ideal measure of trade openness due to differences of prices of non-tradable goods between countries.

Methodology

The ordinary least squares (OLS) estimation is used. The choice of this model is based on the fact that OLS is best suited for testing specific hypothesis about the nature of economic relationship (Guajarati 2004). The time series properties of the variables were examined in the process. The method involves estimating an econometric model in which institutional quality and trade in Nigeria is investigated. In order to model this relationship for Nigeria we posit that:

$$GDP = F(IQ, TD) \tag{1}$$

The econometrics form of equation (1) can be written thus:

$$GDP_t = \beta_0 + \beta_1 IQ + \beta_2 TD + u_t \tag{2}$$

Where:

GDP = Gross Domestic Product proxies as economic growth

IQ = Institutional Quality

TD = Trade

u_t = Error term

β_0 is the intercept/constant and β_1 and β_2 are the coefficients to be estimated. The expected signs of the coefficients are: $\beta_1 > o$, $\beta_2 > 0$. E-Views 7.2 software was used in analyzing the data.

Data Analysis and Interpretations

Unit Root test Results

This section analyses the regression results. The empirical investigation commences with an analysis of the time-series properties of the variables of interest for the economic growth function (see Table 1). The augmented Dickey-Fuller (ADF) test is used to determine the order of integration of data compiled for each variable. This is followed by an analysis of the co-integration results and short run dynamics. The diagnostics test results are then analyzed.

Table 1; Stationary test using the Augmented Dickey Fuller Unit Root Test

Variables	Level/ΔLevel	Calculated ADF	ADF critical value 5%	conclusion
GDP	Level	-3.501506	-3.612199	Non-stationary
	ΔLevel	-4.485338	-3.632896	Stationary
IQ	Level	-0.056069	-1.956406	Non-stationary
	ΔLevel	-14.64883	-3.690814	Stationary
TD	Level	-2.196401	-3.658446	Non-stationary

	ΔLevel	-3.714227	-3.632896	Stationary

Source: computed using E-views software.

The unit root test result revealed that all the variables included in the model were found to be non stationary at level but became stationary after first difference. Therefore the concept of co-integration is relevant. Since the co-integration test requires variables must be non-stationary at level but when they are converted to first difference, then they become stationary-integrated of same order we therefore considered all the three variables because they are integrated of the same order.

Co-integration Test Results:

The stationary linear combination is called the co-integrating equation and may be interpreted as a long run equilibrium relationship between variables. The common objective is to determine the most stationary linear combination of the time series variables under consideration. Consequently, Johansen and Juselius (1988, 1990) co-integration technique has been employed for the investigation of stable long run relationships between institutional quality, trade and economic growth in Zanzibar by using both the Trace and Maximum-Eigen tests statistics. The results are presented in table 2 and 3.

Table: 2. Unrestricted Co-integration Rank Test Result (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.743343	34.34645	29.79707	0.0140
At most 1	0.391431	9.866161	15.49471	0.2912
At most 2	0.050172	0.926541	3.841466	0.3358
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: E-views output

Table: 3. Unrestricted Co-integration Rank Test Result (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.743343	24.48029	21.13162	0.0162
At most 1	0.391431	8.939620	14.26460	0.2912
At most 2	0.050172	0.926541	3.841466	0.3358
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Source: E-views output

The results of both the trace test (table 2) and the maximum-eigen test (table 3) indicate that at least one co-integrating equation exists at the 5% significance level. Therefore the null hypothesis of no co-integrating equation is rejected since the trace test statistics of 34.34645 is greater than the critical value of 29.79707 and the maximum eigenvalue test statistics of 24.48029 is greater than the critical value of 21.13162 at the 5% level of significance.

Therefore, it can be concluded that there is one significant long run relationship between the given variables. Since variables can either have long run or short run effects, then an error correction model (ECM) is used to disaggregate this effect.

Short Run Dynamic Model (Error Correction Model) Results

The results of the short run dynamic model are reported in Table 4. The coefficient of the error correction term indicates the speed of adjustment in eliminating deviation from the long run equilibrium. The coefficient has the

expected negative sign (-0.46681) and it is statistically significant at the 5% level. The significance of the coefficient further confirms the existence of the long run relationship between institutional quality, trade and economic growth. The magnitude of the coefficient implies that nearly 46% of the disequilibrium in the previous year's shock adjusts back to long run equilibrium in the current year. The graph of the error correction term (ECM) suggests that it is stationary.
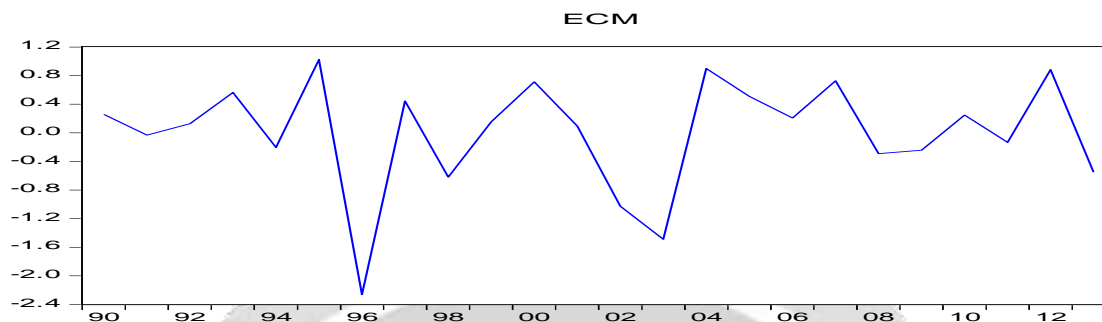

Figure 2; Graph of the error term

Table 4; Short run dynamics (ECM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.097246	0.373425	0.260417	0.7972
D(IQ)	0.321606	0.083198	3.865548	0.0038
D(TD)	0.123251	0.059034	2.087808	0.0498
ECM(-1)	-0.466810	0.196014	-2.381517	0.0273

R-squared	0.705337	Mean dependent var	0.145776
Adjusted R-squared	0.502483	S.D. dependent var	2.078163
S.E. of regression	1.827029	Akaike info criterion	4.194272
Sum squared resid	66.76073	Schwarz criterion	4.390614
Log likelihood	-46.33126	Hannan-Quinn criter.	4.246361
F-statistic	7.252491	Durbin-Watson stat	2.200744
Prob(F-statistic)	0.003302		

Source: E-views output

Institutional Quality and Economic Growth.

The first objective related to institutional quality and economic growth was to evaluate the effect institutional quality had on economic growth. The result in table 4 above shows that the coefficient representing institutional quality has a statistically significant positive effect on economic growth, which implies that an improvement in the institutional quality will induce economic growth. In other words, increasing institutional quality by 1 percent will increase economic growth by 0.32%. Since both variables are moving in the same direction, this validates the hypothesis that good institutional quality positively influences economic growth. This finding is in line with theories and previous findings as seen in the literatures.

Trade and Economic Growth.

The second objective that has been specified by the study is to establish the effect of trade on economic growth with the assumption that, trade increases economic growth. From the result in table 4 above, the coefficient representing trade is positive and statistically significant at the 5 percent level, which by implication, an increase in the volume of trade will enhance economic growth. In other words, increasing in trade volume by 1 percent will increase economic growth by 0.12%. Since both variables are moving in the same direction, it validates the assumption that trade positively affects economic growth.

Overall, the regression results accept the hypothesis of the study. The adjusted R- squared is 0.502483, implying that 50.2% of the variation in economic growth is explained by the independent variables (institutional quality and trade), which is an indication of a very good fit. In comparison to the R square, the adjusted R square is better and more precise good fit measure because it allows degree of freedom to sum of squares therefore even after addition of new independent variable(s) the residual variance does not change. The Durbin Watson statistic (2.200744) indicates the absence of autocorrelation among the variables. The overall equation is highly statistically significant as shown by the probability value of the F-statistic (0.003302).

Diagnostics and stability test results

Diagnostics and stability tests were also conducted to ascertain the robustness of the model used. The test results are reported in table 5.

Table 5; Diagnostics Test Result

Test	Type	Null Hypothesis	Statistic	Inference
Normality	Jarque-Bera	Errors are normally distributed	JB 0.444841 [0.800579]	Fail to reject Ho
Serial Correlation	Breusch-Godfrey L.M	No serially correlated errors	F 1.140918 [0.2592]	Fail to reject Ho
ARCH	F-Statistic	ARCH effect does not characterize model's errors	F 0.548030 [0.4444]	Fail to reject Ho
Heteroscedasticity	Breush-Pagan-Godfrey	Homoskedasticity	F 0.948152 [0.3934]	Fail to reject Ho
Functional Form Misspecification	Ramsey RESET	Model is correctly specified	F 4.301265 [0.0519]	Fail to reject Ho

Source: E-views output

The diagnostic test suggests good fit of the model. The model does not suffer from the problems of non-normality of the errors, serially correlated errors, ARCH effect, heteroskedasticity and functional form misspecification from the probability values greater than 5%.

With regards stability test, the results of both the CUSUM and CUSUMQ plots lie within the 5% critical band width which confirm the stability of the coefficients and the correct specification of the model.
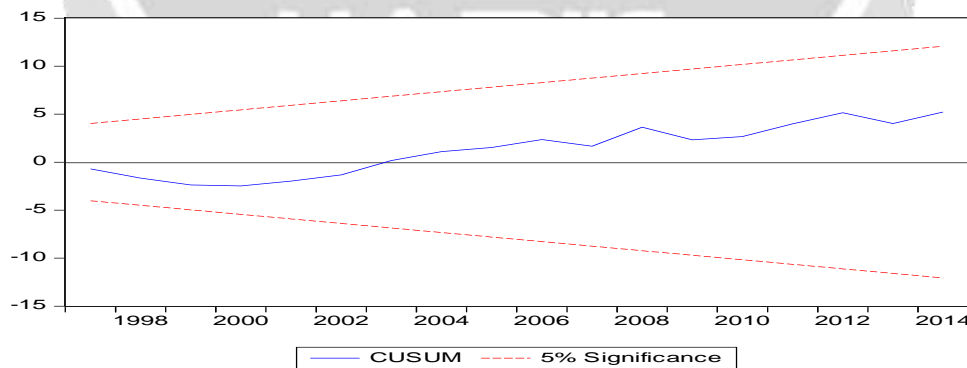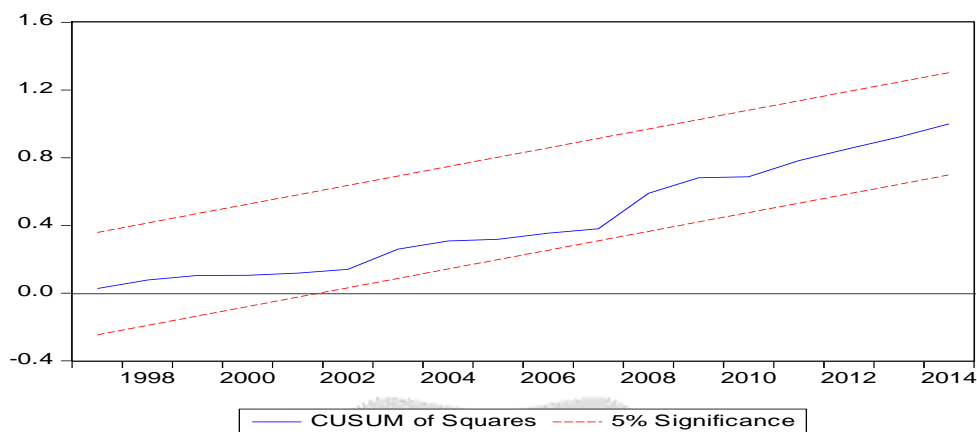

Figure 3: Plot of Cumulative Sum (CUSUM)

Figure 4: Plot of Cumulative Sum of Squares (CUSUMQ)

Summary and conclusions

The existence of a co-integrating relationship necessitated the estimation of the short run dynamic model. The results of the error correction model indicate that the error correction term has the expected negative sign and is statistically significant, which further confirmed the existence of a long run co-integrating relationship. The data findings analyzed from the short run also show that economic growth is greatly influenced by institutional quality followed by trade volume. Taking all other independent variables at zero, a unit increase in institutional quality, increases economic growth by 0.32 units while a unit increase in trade volume will result in a 0.12units increase in economic growth.

To ascertain the goodness of fit of the model, diagnostic test statistics were conducted involving normality, serial correlation, heteroscedasticity, ARCH effect and functional form misspecification tests. The results suggest a good fit of the model. Similarly, to determine the stability of the model over the study period, the CUSUM and CUSUMQ test were employed.

These tests suggest that the estimated conditional model of institutional quality, trade and economic growth in Sierra Leone is remarkably stable as it lies within the critical bounds. The results therefore accept the hypothesis of the study and conclude that institutional quality and trade are significant in influencing economic growth in Sierra Leone.

Recommendation

Intuitional quality and trade has become an increasingly significant engine for the government of Sierra Leone in promoting economic growth and enhancing job creation. 'To be able to embark on restoration of the country's economy, it is recommended that Sierra Leone needs to mobilize financial and human resources and technical knowhow from all possible sources – domestic and foreign. However, obtaining these resources is easier said than done as all countries in the world are seeking them, making it a very competitive arena. For Sierra Leone to succeed it has to usher in an environment which is as competitive and which offers the same if not greater returns – the Government should recognize this by committing to create the required environment through the reinforcement of its institutional quality.

The Government should concentrate on the establishment and strengthening of financial institutions, including micro-finance institutions, insurance and export credit guarantee facilities. All of these will enhance the trading capacities of commercial entities, encourage new investment and help trade ventures to prosper and contribute to economic development.

The success of a trading system largely depends on its human resources. A nature, talented and healthy community of enthusiastic men and women is needed to ensure economic success. The Government should put more emphasis on social welfare, education and trading, health care, gender sensitization, youth affairs, support for the disabled, sustainable use of environment community participation, culture and rule of law as parallel, but integral initiatives of the Trade Policy.

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