

**EMPIRICAL ANALYSIS OF TRADE POLICY AND INSTITUTIONAL EFFECTS ON  
GROWTH: THE LONG RUN EVIDENCE FROM DEVELOPING COUNTRIES**

**By**

**ARIF, Md. Shamsul**

**THESIS**

Submitted to  
KDI School of Public Policy and Management  
in partial fulfillment of the requirements  
for the degree of

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2015

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## **ABSTRACT**

# **EMPIRICAL ANALYSIS OF TRADE POLICY AND INSTITUTIONAL EFFECTS ON GROWTH: THE LONG RUN EVIDANCE FROM DEVELOPING COUNTRIES**

**By**

**Md. Shamsul Arif**

Trade and better institutional quality play a significant role in growth for developing countries in the long run. This research tries to find out the institutional and trade policy effects on growth in the long-run in the context of developing countries. Last two decades, some developing countries have achieved fast growth due to trade openness as well as institutional reform. This research estimated such indicators empirically using last three decades data of 58 developing countries. In order to estimate coefficient instrumental variable approach adopted and found significant effects of institutional indices on growth. Trade policy has effects on growth, but not significant. This research also investigated the decadal change in institution variables' effects on trade using instrumental variable and found significant impact on trade.

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# 1. INTRODUCTION

## 1.1 Introduction

The accelerated growth in developing countries is a significant improvement in the world economic condition. Recent evidence points to a convergence in the growth of developing countries since 2000 suggested that developing economies have grown rapidly in the last decade. In fact, sustainable development is not just about growth and tapping growth. However, GDP growth helps countries generating the economic resources, i.e., increase the size of the pie which finally improves people's living conditions. According to economic literature, GDP growth is for mainly two reasons. The first is when countries accumulate resources (including investment in human capital and physical capital). The second one is efficient utilization of these resources. Technology, institutional framework or geographical characteristic are the key determinants of the ways of resource endowment utilization and therefore how a country's GDP growth is accelerated. Various intellectual literature have recognized the outcomes of trade in context of utilizing the deeper geographical factor of trade, which means that countries that are lands locked and/or far-off from main markets tend to trade a smaller amount than those that are not. However, the effects of better institutions and trade policy are also determinants to trade more and/or less. Some countries with better trade policy tend to trade more. Developing countries which have better institutions and countries that trade in a large amount grow faster. There is a role of trade policy and institution quality of growth. A number of developing countries which grow fast in the last two decades have also been poor countries before 1980.

## 1.2 Research Questions

- This research investigates the joint role of institutions and trade on growth controlling other factors of growth equation in the long-run for developing countries.
- Do better institution quality lead to economic growth?
- Is there any relationship between trade policy and economic growth?
- Is there any change happened in the trade growth while improvements in institutions over a decade?

## 1.3 Objectives

- To identify the relationship between GDP growth rate and institutions.
- To know the relationship between growth rate and trade policy.
- To capture the change happened in the trade growth while improvements in institutions over a decade.
- To suggest policy implications

## 1.4 Hypothesis (or claim)

The null hypothesis and the alternate hypothesis are:

### **Hypothesis 1:**

$H_0: \beta_i=0$  (There are no effects of institutional quality and trade policy on GDP growth rate in developing countries)

$H_1: \beta_i \neq 0$  (There are effects of institutional quality and trade policy on GDP growth rate in developing countries)

### **Hypothesis 2:**

$H_0: \beta_i=0$  (There is a no effect of change in institution on trade over a decade)

$H_1: \beta_i \neq 0$  (There is an effect of the change in institution on trade over a decade)

## 2. LITERATURE REVIEW

Trade policy (or trade volumes) and institutional quality are one of the discourses in growth and development literature. Some scholarly literature, have been provided many thoughts to investigate the current research. Frankel and Romer (1999) identified, “The geographically determined component of trade as a fraction of GDP exerts a strong positive effect on growth in the very long run”. In this research, the researchers incorporated trade fraction of GDP in current local currency units as trade variable. However, this research excluded trade variable from the research while using trade predicted by the gravity model as an instrument.

Acemoglu, Johnson and Robinson (2001) analyze, “The historically determined component of current institutional quality exerts strong effects on development in a similar framework.” Acemoglu, Johnson and Robinson (2005) demonstrate that institutional quality has a very large impact on long-run growth. These two researchers included institutional variables (risk of appropriation) but excluded trade variable while using “settler mortality” as an instrument. Researchers try to reveal the historical component (colonization) can play a role on the institution as well as growth.

Alcala and Ciccone (2002) estimated, “A variety of regression of GDP per worker on trade as a share of GDP and measures of institutional quality”. In this research, both trade and institutional variable are included using instruments as population, log (population), area, trade predicted by gravity model, log (trade predicted by gravity model), fraction of the population speaking English, fraction of the population speaking major European language. This research included Real GDP per Worker at Purchasing Power Parity (PPP), 1985 as a dependent variable to focus on labor productivity.

Cheptea (2007) empirically investigates that trade liberalization effects on domestic institution in Central and Eastern European (CEE) countries. Countries of CEE where most institutional change occurred were also those that most increased their trade with the EU. This paper also addresses reverse causality problem between trade and institutional variables.

Do and Levchenko (2005) demonstrate that trade openness may be detrimental to institutional quality when the productivity of firms are differing between firms and it affects political power. Bad institutions increase “political power” of a small elite of large exporter who prefer to continue such institutions.

Francois and Manchin (2013) empirically illustrate the joint impacts of institutions and infrastructure quality on trade. Low institutional quality and poor infrastructure of developing countries is determinant of trade flows.

Levchenko (2007) explores countries with better institutions-quality of contract enforcement, property rights, and shareholder protection- capture higher US import shares using institutions as a “source of trade”.

Ranjan and Lee (2007) focus on a particular aspect of institutions- enforcement of contract-and its impact on trade in different types of goods. Enforcement of contract has impact on international trade.

Anderson and Marcouiller (2002) explore institutions-enforcement of contract and the corruption-impact on trade. They found that, “Lower institutional quality has a substantial negative effect on trade.”

Given the emphasis on the quality of institutions as a determinant of international trade as well as economic development, it is perhaps surprising that trade policy and the quality of institutions have not been brought together in the empirical literature.

The objective of this research is to analyze both the indices together impact on growth and to investigate the change of institutions impact on trade in a decade.

### **3. DEFINITION, CONCEPT AND RELATIONSHIP**

#### **3.1 Institution**

The effects of good institutions on development have come to economic discourse from the last decades. Even today World Bank (WB) and International Monetary Fund (IMF) show great concern on institutional development. Not only these, United Nations and its body are providing importance of good governance i.e., good institutions. For example, during the 1997 Asian crisis, IMF put great emphasis on good corporate governance institutions and bankruptcy laws, while World Trade Organization (WTO)'s World Trade Report 2014 "Trade and development: recent trends and the role of the WTO" focuses on institutional development. However, the important question is the definition of institutions.

The most widely used and concrete definition is given by North (1990, p.3) "Institutions are the rules of the game of a society, or, more formally, are the humanly devised constraints that structure human interaction. As a consequence, they structure incentives in human exchange, whether political, social, or economic." In the current orthodox literature of institution and development discussed "forms" and "functions" of institutions.

*Forms* of institutions that they perform (e.g., independent judiciary system, democratic practice, the absence of state ownership) and the *functions* that they execute (e.g., rule of law, property rights, contract enforcement, maintenance of price stability, the restraint on corruption). This research focuses on some balance between

forms and functions in thinking about the role of institutions in economic development.

### **3.2 Trade policy**

All countries require goods and services to satisfy demands of their citizens. Ample resources are required for production of goods and services in sufficient level. Each country has suffered inadequate resources or lacks of resources. Any country cannot produce all the goods and services according to its requirement or can produce less than its requirements. It has to buy from the rest of the country what it cannot produce according to its requirement. Similarly, it sells the goods which it has in excess quantities to other countries that have lacks of such products. In general, every country has to depend on another country. It has to buy goods which are either non-available with it or are available in insufficient quantities to other countries through importing. Similarly, it can export goods, which are in excess quantity with it and are in high demand outside. This is well known as “international trade”.

Trade policies mean the policies that various governments adopt toward international trade. These policies have many actions, strategies and instruments make it effective.

Trade policies can be categorized on following way on the basis of taxes on imports or exports, quota, subsidies and many other policy tools:

- tariffs and
- non-tariff measures (NTMs).

Governments usually apply different combinations of policies to diverse imported or exported products in a country.

According to the WTO ‘trade policy’ means, “Rules for trade in goods, trade in services, and trade-related intellectual property rights. Trade policy included reduction or removal of obstacles to trade (import tariffs and non-tariff, other trade

barriers to trade) and agreeing on rules governing the conduct of international trade (e.g. anti-dumping, subsidies, product standards, etc.” WTO focused on open borders, the agreement of most-favoured-nation (MFN) principle and non-discriminatory treatment by and among member countries, and a commitment to transparency in the conduct of its activities through the guiding principles for its formation.

### **3.3 Growth and trade**

National income accounting for a country can be expressed as:

$$Y = C + I + G + X - IM$$

Where,  $Y$ =country’s output,  $C$ =household consumption expenditure,  $I$ =investment,  $G$ =government expenditure and  $X-M$ =the current-account balance, i.e. the difference between exports and imports. Each element on the right-hand side of the equation has two components, one of which is autonomous and the other a function of national income, which in turn equals output ( $Y$ ). Export and import will be related to an export-oriented growth strategy, while the other three parameters will be related to a more domestic-demand-oriented growth strategy.

Various economic growth models are supply-driven without paying much attention to the different parameters of national income accounting equation. Such models are supply-driven, with output growth being a function of factor inputs and factor productivity. Aggregate demand for output is assumed to be sufficient for full utilization of capacity. Trade is a one of the components of national income accounting equation that is an important parameter in supply-based growth analyses. Trade can be expressed as terms of trade (defined as the ratio of export prices to import prices), but more usually on the assumption that “trade openness” contributes to capital accumulation or productivity growth. Harrison and Rodriguez- Clare (2010) states, “Different studies measure openness differently: some through tariff rates or

non-tariff barriers, but most commonly as some ratio of trade flows to output”. Using the knowledge of supply-based perspective, “export-oriented growth” means a high ratio of exports and imports relative to output  $((X-M)/Y)$ , i.e., being very open to trade.

The national income accounting equation can be rearranged as:

$$1 = \frac{C}{Y} + \frac{(I + G)}{Y} + \frac{(X - IM)}{Y}$$

$$\frac{(X - IM)}{Y} = 1 - \frac{C}{Y} - \frac{(I + G)}{Y}$$

Therefore, any given share of household consumption, investment and government consumption in output (i.e.  $C/Y$ ,  $(I+G)/Y$ ) is compatible with an unlimited range of values of trade openness (i.e.  $(X+M)/Y$ ). A country can have a high share of consumption, investment and government consumption in output and still export most of its output.

### 3.4 Relationship among three key concepts

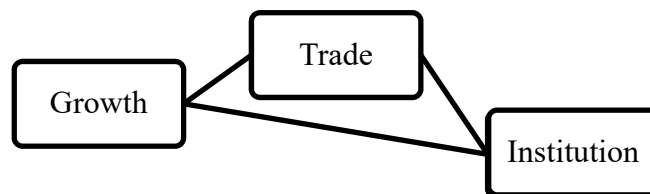


Figure 01: Trade, trade policy, growth and institution relationship

Institutions have a key role in growth and to generate more trade which led to growth. Recent economic research and literature has highlighted the contribution of institutions in sustained GDP growth rate. Research and Development (R&D) as well as invest in human and physical capital depends on the firm’s incentive. This type of incentive can be ensured by the quality of institutions such as, contract enforcement, property rights, rule of law, etc. For example, a well-known argument for innovation is “New technologies provide market power and that firms’ investments in R&D are motivated by the prospect of higher future profits derived from this market power”



(Schumpeter, 1942). In this circumstance, technological development as well as subsequent GDP growth is determined by the proper implementation of property rights. Both Acemoglu (2008) and Helpman (2004) illustrated, “Since firms underinvest in Research and Development when property rights are not enforced, economies with low institutional quality tends to grow more slowly than economies with higher institutional quality”.

Trade liberalization also affects GDP growth. On the one side, trade liberalization allows a country to allocate resources based on comparative advantage which makes production more specialized and finally rises up GDP. On the other side, technological spill-over and institutional reform are mandatory to cope with trade sustains investment and innovation. This thing can be occurred on the platform of open economy and eventually accelerated faster growth.

#### **4. DATA AND METHODOLOGY**

##### **4.1 Methodology**

In the econometric literature, three types of traditional growth regression have been used: panel data based on several period averages using lagged variables as Instrumental Variable (IV) regression; pure cross-country regression; and country specific regression. These analyses generally used OLS techniques and found static relationship.

Based on the longitudinal data of 58 developing countries (World Bank Classification)<sup>1</sup> from 1984 to 2014, this research, quantitative tests the impact of trade policy and institutions on growth. Instrumental Variable (IV) method has been used to get the result. Ordinary Least Square (OLS) growth regression:

$$(1)y_{it} = \beta_0 + \beta_1 y_{i,t-k} + \beta_2 x_{it} + \eta_i + \gamma_t + v_{it}$$

---

<sup>1</sup> According to specification by the World Bank, “Developing countries are defined according to their Gross National Income (GNI) per capita per year. Countries with a GNI of US\$11,905 and less are defined as developing.”

Where  $y_{it}$  is GDP growth rate of a country  $i$  at time  $t$ ,  $y_{i,t-k}$  is lagged dependent variable, which is  $k$  years lag ( $k= 10$  years decadal data using in this research) and  $x_{it}$  is a set of control variables. Both trade volumes/tariff and parameters of institutional quality will treat under the variables in  $x$ . The conventional formula is to Subtract lagged GDP growth rate from both sides of the equation in which the dependent variable is the GDP growth rate, regressed on initial GDP growth rate and a set of control variables. The error term in this regression consists of constant unobserved country effect over time,  $\eta_i$ , common unobserved time invariant effect across countries,  $\gamma_t$ , and years and countries effects that two varies components are assumed to be uncorrelated over time,  $v_{it}$ .

The inclusion of the lagged dependent variable in the specification means it is no longer possible to assume that all the covariates (i.e., the right-hand side variables in the equation) are independent with the disturbance term. The  $x_i$  may remain strictly exogenous, but  $y_{i,t-k}$  cannot be exogenous in the presence of an unobserved component. The additive structure of the linear panel models means that we can eliminate the confounding influence of  $\eta_i$  and  $\gamma_t$  by differencing or by the within-transformation. Taking the first difference of the specification yields an estimating equation as:

$$(2)y_{it} - y_{i,t-k} = \beta_1 \cdot (y_{i,t-k} - y_{i,t-2k}) + \beta_2(x_{it} - x_{i,t-k}) + (\gamma_t - \gamma_{t-k}) + (v_{it} - v_{i,t-k})$$

Differencing doesn't completely solve the problem; it eliminates the time-invariant component, but  $\Delta y_{i,t-k}$  will be correlated with  $\Delta v_{it}$ .

Here this research adopts the method of Caselli, Esquivel and Lefort (1996) to estimate the equation (1). Within-transformation of equations (1) using proper lags of the right-hand side variables of the equation as instruments.

This is just a regression of GDP growth rate on lagged GDP growth rate, and on changes in the set of independent variables. Or, subtracting lagged GDP growth rate from both sides of the equation, in this estimation changes in GDP growth rate from a decade to the next decade as a function of early decade GDP growth rate and changes in the independent variables. This method has several advantageous features of this research, and in particular helps to solve problems of measurement error, omitted variables, and reverse causality (endogeneity).

The key identification assumption is that explanatory variables trade volumes and institutional quality can be correlated with the current and lagged shocks to GDP growth rate ( $E[X_{it} \cdot V_{i,t+s}] \neq 0$  for  $s \geq 0$ ), they are uncorrelated with upcoming shocks to GDP growth rate, ( $E[X_{it} \cdot V_{i,t+s}] = 0$  for  $s > 0$ ). In regression analysis, this means that when using regress growth rate in the 1994s on growth rate in the 1984s and the change in explanatory variables trade volumes and the change in institutions quality between the 1984s and 1994s, it will be used the 5 year's lag of explanatory variables (trade volumes and institutions' quality) in 1984s as an instrument.

Specific model for capturing decadal institution's change in effects on trade:

$$(3) \overline{tgdp}_{i,t} = \beta_0 + \beta_1 \bar{y}_{i,t} + \beta_2 \bar{y}_{i,t-k} + \beta_3 \overline{ins}_{i,t} + \beta_4 tgdp_{i,k} + \alpha_i + \lambda_t + \varepsilon_{it}$$

where  $\overline{tgdp}_{i,t}$  indicates the decadal average in trade value from year 1984 for country  $i$  at period  $t$ ,  $\bar{y}_{i,t}$  is average GDP growth rate value from year 1984 for country  $i$  at period  $t$ ,  $\bar{y}_{i,t-k}$  is lagged growth rate ( $k=10$  years),  $\overline{ins}_{i,t}$ , the variable of interest, indicates the improvement of institutional quality, which is average from year 1984 for country  $i$  at period  $t$ ,  $tgdp_{i,k}$  stands for the percentage of trade to GDP, constant unobserved country effect over time,  $\alpha_i$ , an unobserved time invariant effects that are common across countries,  $\lambda_t$ , and  $\varepsilon_{it}$  for the error term. The lagged-dependent variable is now correlated to the composite error term through the contemporaneous

terms in period  $t - k$ . Instrumental variables (IV) are required to address such problem. The method this research adopts is to apply average of the past values of the independent variables as instruments in the regression, which is lagged value.

Since institution's quality, trade volumes, and GDP growth rate are collinear in the cross-section analysis, therefore, an alternate step is to apply the relationship between changes over time in these variables. During observing data set, it is found that GDP growth rate, trade volumes, and institutional quality – do reveal some amount of variability over time. Among these three variables of interest trade percentage of GDP is more constant over time than GDP growth rate, but still found substantial variation. However, true institutional quality change occurs very slowly.

#### **4.2 Data description**

It is important that there is adequate variation found in institutional quality within countries over time, so that dynamic regression of changes in GDP growth rate of changes in trade volumes and changes in institutions are potentially useful to capture the partial effects of both these explanatory variables. International Country Risk Guide (ICRG) data have been used for this research as institutions' data. According to ICRG methodology, the rating is done by providing points to a specific group of factors based on probable risk. These factors termed as "political risk components". Any components can get lowest point zero on the scale, while the highest point is related to fixed weight that any component can get into the overall political risk assessment. This rating pattern illustrated that lower the risk point in total considered the higher the risk, and the higher the risk point in total considered the lower the risk.

Table 01: ICRG institutional components.

No.	ICRG Components	Components points
1	Government Stability	12
2	Investment Profile	12
3	Democratic Accountability	6
4	External Conflict	12
5	Law and Order	6

Source: ICRG, 2015

These components have been chosen for the following reasons:

#### **4.2.1 Government stability**

Government stability has two parts: election manifesto and the possibility of continuing its office tenure. The ICRG rating consists of three underlying components such as government unity, legislative strength and popular support. Each component has a score of four points to 0 point scale. Very Low Risk means 4 points while Very High Risk means 0 points.

#### **4.2.2 Investment profile**

Investment profile also organized by three components such as, contract viability/expropriation, profit repatriation and payment delays. Each component has a score of four points to 0 point scale. Very Low Risk means 4 points while Very High Risk means 0 points.

#### **4.2.3 Democratic accountability**

This measure actually depends on the responsiveness of government to its people. On this basis, it seems that less responsive government more likely to fall, peacefully in a democratic society, but probably violently in a non-democratic society.

#### **4.2.4 External conflict**

The external conflict is the measurement of two elements:

1. foreign action from the different incumbent government, which is non-violent nature such as, diplomatic pressure, refuse to give aid, trade limits, territorial clash, sanctions, etc.
2. violent external activities such as, cross-country border conflicts, war, etc.

This type of activities may hamper trade and investment activities in different ways, limits trade activities and investment sanctions which are ultimate disallow efficient allocation of economic resources as well as an aggressive change in the structure in the society. The risk rating is provided based on summation of three sub-components; each component has scored on four points to 0 point scale. A score of 4 points reflects to “Very Low Risk” and a score of 0 points equates to “Very High Risk”. The sub-components are following:

- war
- cross-border conflict
- foreign pressures

#### **4.2.5 Law and Order**

“Law and Order” are a single component, but it has two elements which are assessed separately. Each element is being scored from zero to three point scale. To assess the “Law” element, the strength and fairness of the legal system are taking into account, while the “Order” element is an assessment of popular execution of the law.

#### **4.2.6 Trade volume as a proxy of trade policies**

There are not available cross-country data for overall trade policy. The most demanding indices (average tariff rates or non-tariff barrier coverage ratios data) have clear disadvantages. If anybody uses simple averages of tariff rates for different goods, it is likely to give undue weight to categories of insignificant goods for a country. If, in contrast, anyone averages imports weighting, then the effects of prohibitive tariffs

which stifle all imports are lost. In view of non-tariff barriers (NTB), the best obtainable data simply report the number of tariff lines on which a few would be easily identifiable NTBs is in effect. Pritchett (1996) described that this NTBs data were not provided any information about connection of such barriers, and surely eliminates a wide range of less-easily quantifiable barriers to trade, such as local procurement requirements. This procedure created important gaps between statutory rates and collected tariffs, due to lacks of tariff enforcement and legal exemption or corruption practice in custom administration. These limitations make obstacle to measure trade policy as explanatory variables.

#### **4.2.7 Variables and country coverage for regression**

58 developing countries (appendix A) 1984-2014 year panel unbalanced data have been used to analyze the regression model. Table 2 shows the list of variables and data source used in this regression model.

Table 02: Variables name and data source.

<b>Variables</b>	<b>Data Source</b>
GDP growth rate	World Bank Databank
Trade percentage of GDP	World Bank Databank
Government Stability	International Country Risk Guide (ICRG)
Invest profile	International Country Risk Guide (ICRG)
External conflict	International Country Risk Guide (ICRG)
Law and order	International Country Risk Guide (ICRG)
Democratic accountability	International Country Risk Guide (ICRG)
Gross capital	World Bank Databank, IMF and Penn World Tables 8.0
Households consumption	World Bank Databank, IMF and Penn World Tables 8.0
Government consumption	World Bank Databank, IMF and Penn World Tables 8.0

#### 4.2.8 Summary statistics

The following table describes the summary of the variables used IV regression for analysis. Summary statistics like mean, standard deviation, minimum, and maximum are included.

Table 03: Summary Statistics of Variables.

Variable	Obs.	Mean	Std. Dev.	Min	Max
GDP growth rate	1797	3.934916	4.534387	-29.589	33.73578
Trade percentage of GDP	1796	65.41714	33.89394	10.74832	220.4074
Government Stability	1782	7.333162	2.167571	1	12
Investment profile	1782	6.641267	2.03267	0	11.5
External conflict	1782	9.388853	1.977071	2	12
Law and order	1782	2.90064	1.102992	0	6
Democratic accountability	1782	3.345726	1.354739	0	6
Gross capital percentage of GDP	1796	21.69345	8.353389	-2.424358	63.85266
Households consumption percentage of GDP	1793	69.87204	14.45671	1.511768	152.1419
Government consumption percentage of GDP	1793	13.64964	5.75595	2.047121	86.90555

The above table clearly describes the mean growth rate of the developing countries is 3.94%. Institution variables government stability mean is 7.33 and the standard deviation is 2.17. This implies that there is huge variation in this data between countries. Investment profile also has a big difference between mean and standard deviation.



Table 04: Regression result.

Dependent variable: decadal average GDP growth rate

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	OLS	IV	OLS	IV	OLS	IV	OLS	IV
lgdpgr	0.21*** (7.69)	-0.08* (-2.47)	0.21*** (7.50)	-0.17** (-3.16)	0.21*** (7.51)	-0.12** (-3.20)	0.21*** (7.54)	-0.03 (-0.65)
trade	-0.01*** (-5.99)	0.01 (0.81)	-0.01*** (-6.19)	0.05** (2.75)	-0.01*** (-6.29)	-0.01 (-0.66)	-0.01*** (-6.08)	-0.01 (-0.64)
governme~y			0.08** (2.79)	0.97*** (3.97)				
inv_prof~e					0.03 (1.14)	0.64*** (3.55)		
democrat~y							-0.01 (-0.36)	0.99*** (4.21)
N	1160	1160	1160	1160	1160	1160	1160	1160

Table 04: Regression result (continue).

	(9)	(10)	(11)	(12)
	OLS	IV	OLS	IV
lgdpgr	0.22*** (8.16)	-0.23 (-1.41)	0.19*** (6.99)	-0.21 (-1.42)
trade	-0.01*** (-5.24)	0.06 (1.06)	-0.01*** (-6.23)	0.11 (1.03)
exter_conf	-0.13** (-3.12)	0.92 (1.02)		
law_order			0.25*** (4.62)	1.84 (0.88)
N	1160	1160	1160	1160

t statistics in parentheses, estimated with robust standard errors.

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Instruments:** Five years lagged levels of trade percentage of GDP, and institutional quality (government stability, investment profile, democratic accountability, external conflicts and law & order)

## 5. EMPIRICAL RESULTS

In the first column of the Table 4 represent the results, simply estimating Equation (2) by OLS. While this estimation method is inconsistent, it is a helpful way of summarizing the partial correlations in the data. It has been reported the estimated coefficients, and t-statistics in parentheses computed with robust standard errors and found robust to heteroskedasticity. The first-order serial correlation in the residuals is stimulated by differencing. The remarkable feature of this first column in regression result is that trade volumes are negative correlation with changes in GDP growth rate, with an estimated coefficient of 0.01 and a t-statistic more than 3 at the 1% level of significance. This result is not in line with expectation and real situation.

In the second column of the IV regression results, instrument for trade volumes is used to capture the exact condition. The coefficient on trade volumes changes to positive correlation and remains insignificant to 0.01. The magnitude of its coefficient shows that *ceteris paribus*, if 1% increases in the trade share to GDP, it will raise the growth rate by 0.01 percentage point over a decade. The coefficient on lagged growth has the expected negative sign (-0.08), and is significant at the 10% level of significance. The negative magnitude of lagged growth is consistent with the convergence to steady states. The insignificant effects of trade measures support this view. After the recession of 2007, it is revealed that the growth rate of developing countries is slowing down as well as international trade.

Next result is the partial effects of trade volume and institutions' quality in this dynamic regression framework. In the rest of the columns of Table 4 show each of the five time-varying indicators of institutional quality discussed above, and appropriate lag for each is used as an instrument. With government stability (columns 3-4), this institutional measure is significant in the OLS, but trade is negatively correlated and

significant. In IV regression both are positive and significant. The point estimates indicate that a 1 point improvement in government stability leads to 0.97 percentage points rise in growth rate in a decade at 1% level of significance. Trade is significant at conventional 5% level of significance and the magnitude is 0.05 that means a 1% increase in trade, share will rise growth rate 0.05 percentage points over a decade.

Investment profile is insignificant and trade variable is negatively significant with growth rate in OLS. But investment profile is positive and significant in IV regression while trade is negatively correlated and insignificant with growth rate. The apparent negative impact of trade on growth rate may be due to measurement inaccuracies of other growth components. The possible implication for this negative sign might be that other components of growth equation are not impacted enough on growth rate. However, the point estimates specify that a 1 point rise in the investment profile would have the effect of increasing growth rate by 0.64 percentage point over a decade.

Democratic accountability is insignificant whereas trade is negatively correlated and significant in OLS. However, in IV regression indicates that the 1 point rise in the democratic accountability would have the effect of increasing growth rate by 0.99 percentage point over a decade and highly significant. Trade is negative and insignificant.

External conflict is negative and significant in OLS while it is positive in IV regression but not significant. Law and order are positive and significant in OLS but positive and insignificant in IV regression. In both circumstances, trade is negative and significant in OLS. However, trade is positive and insignificant in IV regression in both cases.

Institutional variables are repeatedly tested with trade variables in this IV regression. The concept behind this approach is to identify the partial out the effects of different institutional variables because of institutional variables are persistence over decades. If all of the variables are persistent and tested at a time, then the dynamic analysis is not going to add much. However, the variable of interest- growth, trade, and institutional quality-do exhibit variability over time which can be seen from next figures.

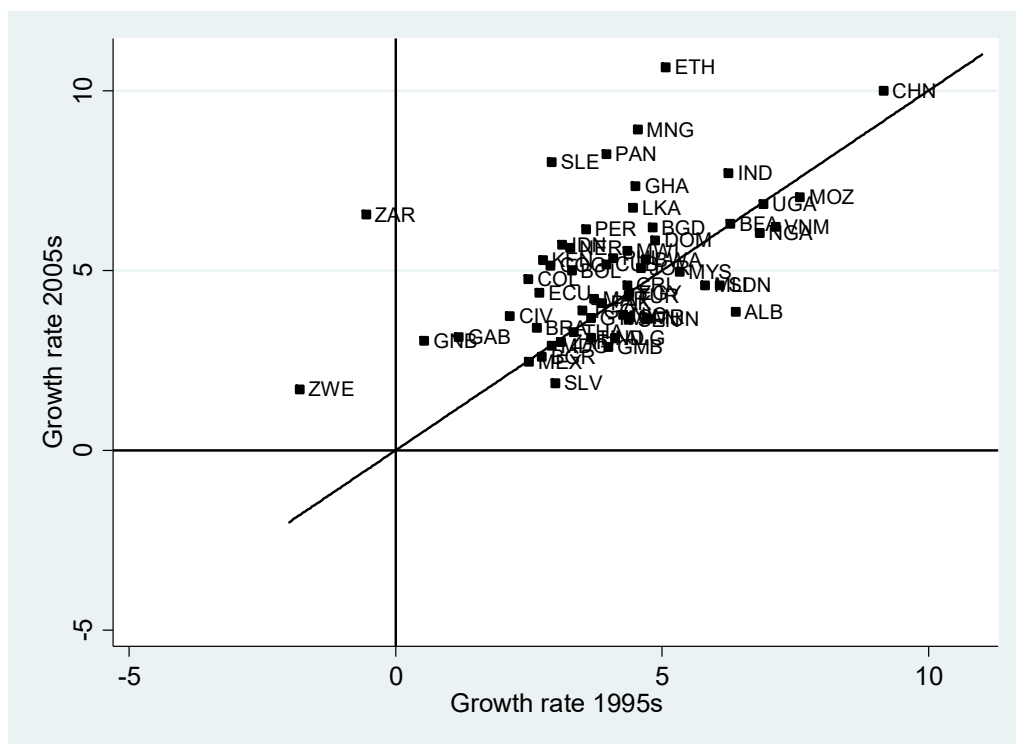
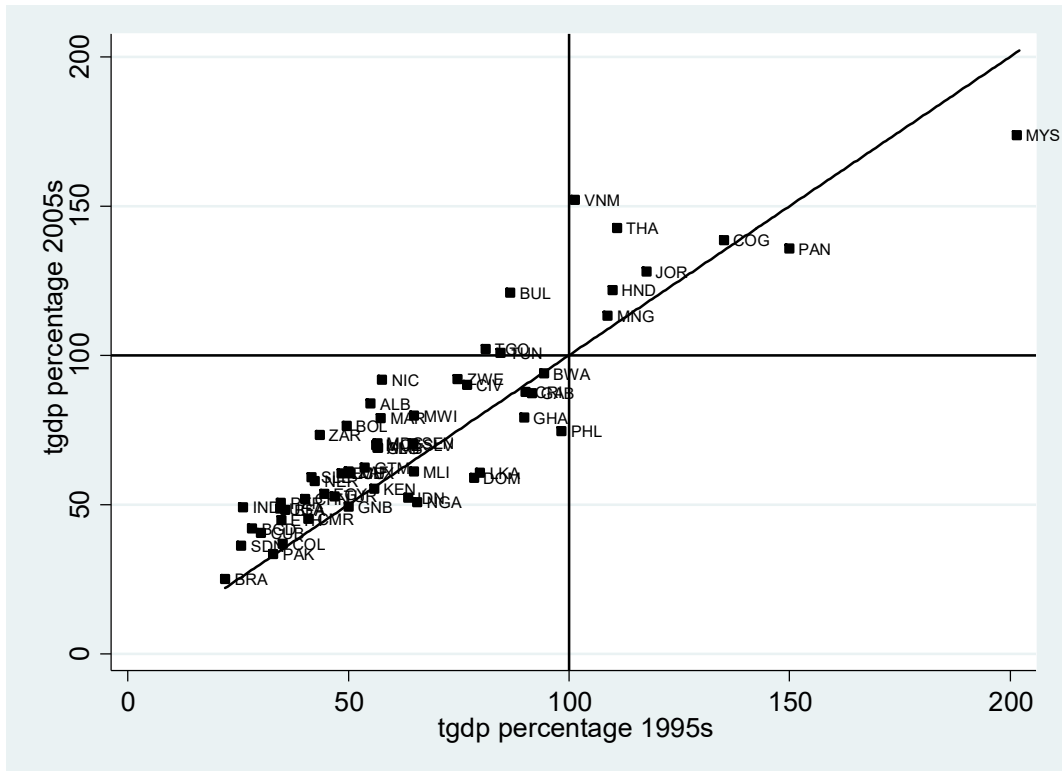


Figure 02: Persistence of growth rate in decades 1995s and 2005s.

The Figure 2 shows the relationship between 1995s growth rate and 2005s growth rate. Half of the countries are underneath the 45<sup>0</sup> line (slower growth in the 2005s than the 1995s). Conversely, the countries above the line is a significant cluster of countries, including China, Mongolia, India, and Bangladesh in Asia; Ghana, Sierra Leone, and Ethiopia in Africa; and Ecuador and Peru in Latin America.

Trade as a percentage of GDP is more constant than GDP growth rate, but still displays substantial variation over decades. The Figure 3 explains this. There are

some countries such as Vietnam that has seen a more than a 50 percentage-points increase, and other developing countries have found significant trade growth as well. Still, several developing countries trade volume a lesser amount of their GDP today than 20 years ago.



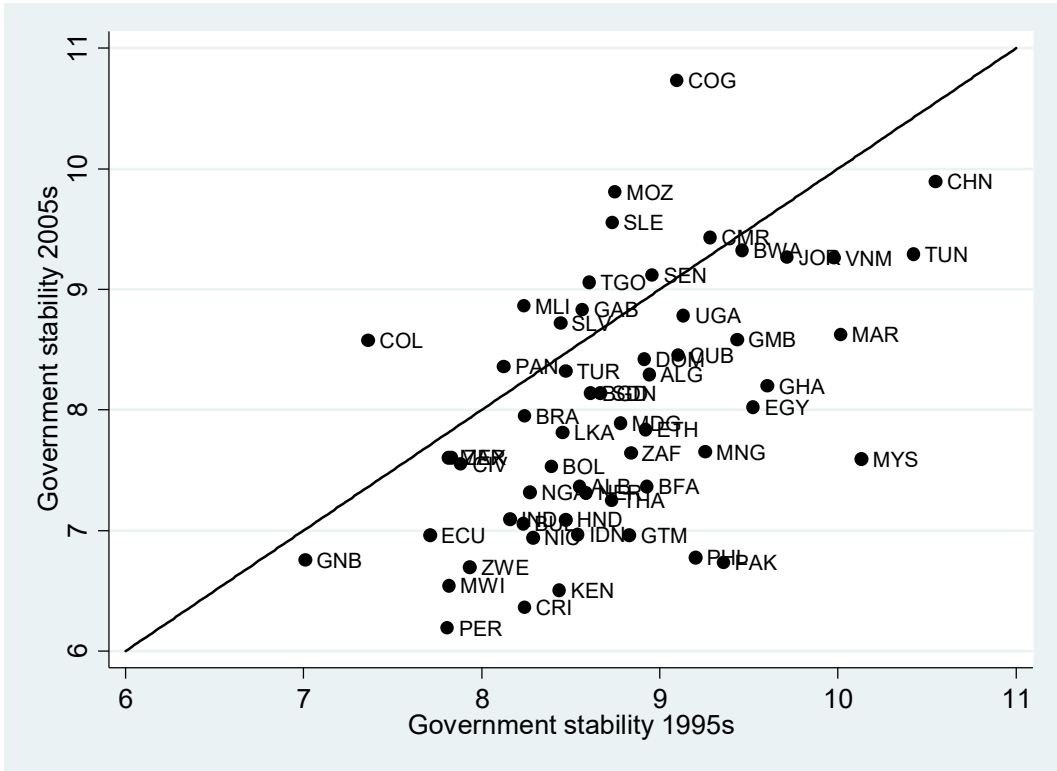


Figure 04: Persistence of government stability in decades 1995s and 2005s.

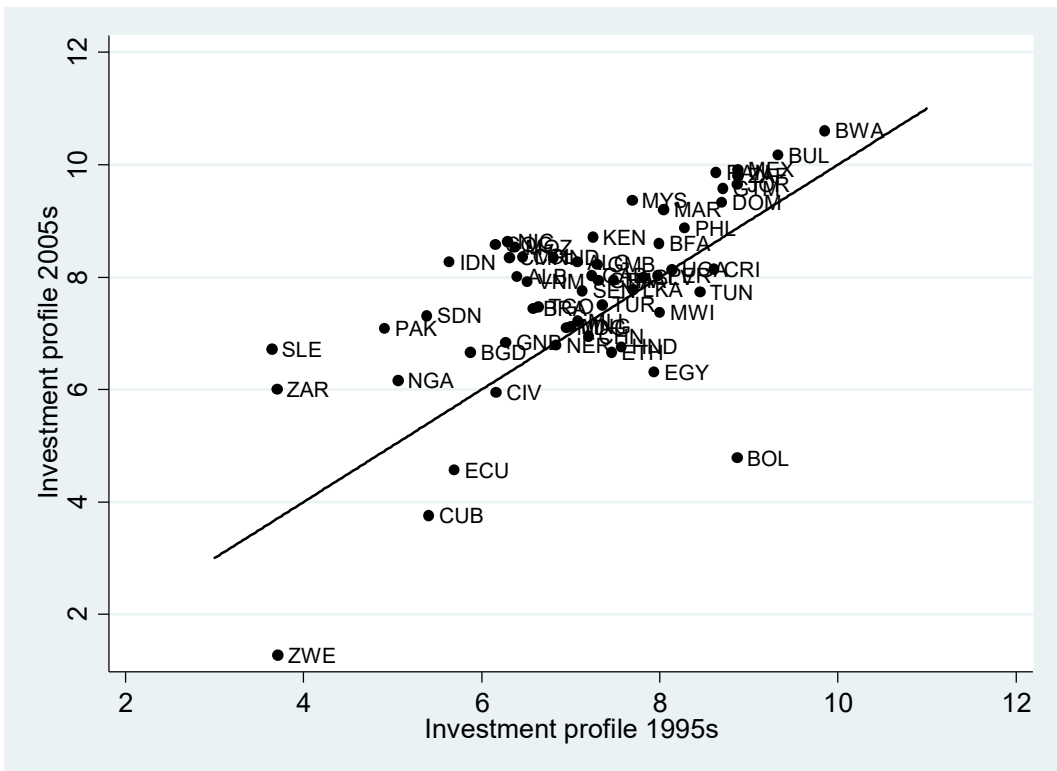


Figure 05: Persistence of investment profile in decades 1995s and 2005s.

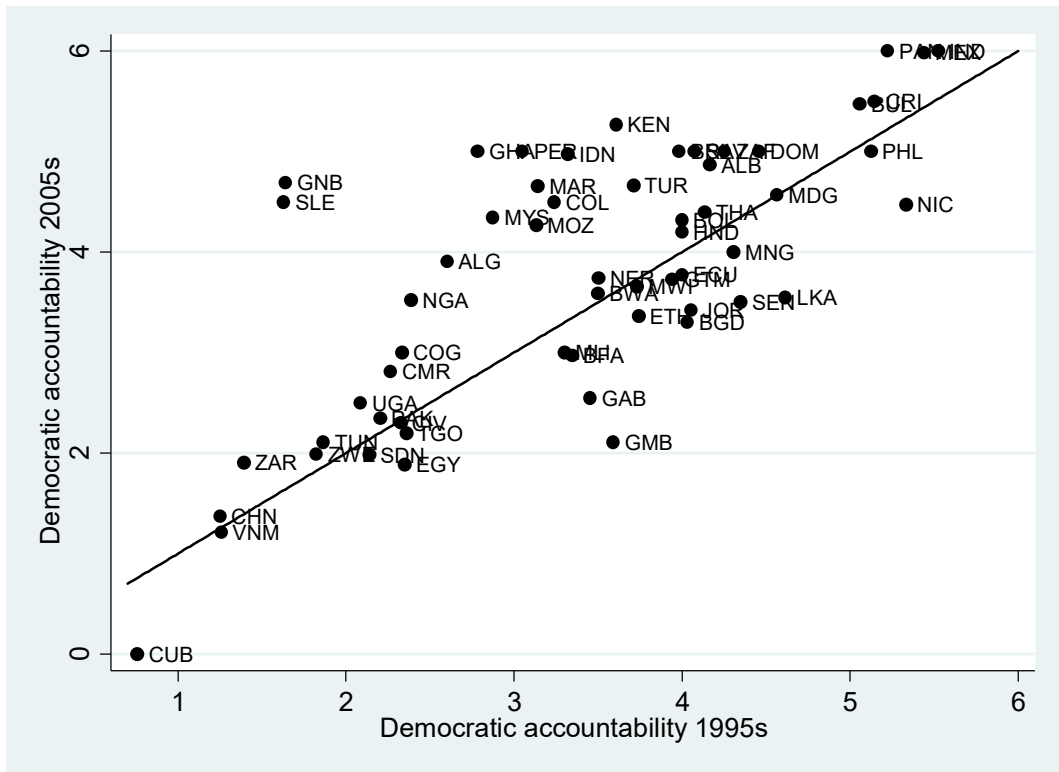


Figure 06: Persistence of democratic accountability in decades 1995s and 2005s.

Figure 4, 5 and 6 identifies each of the three significant measures of institutional quality in the 1995s against its corresponding value in the 2005s, depending on data availability. One explanation of this is that true institutional change occurs very slowly.



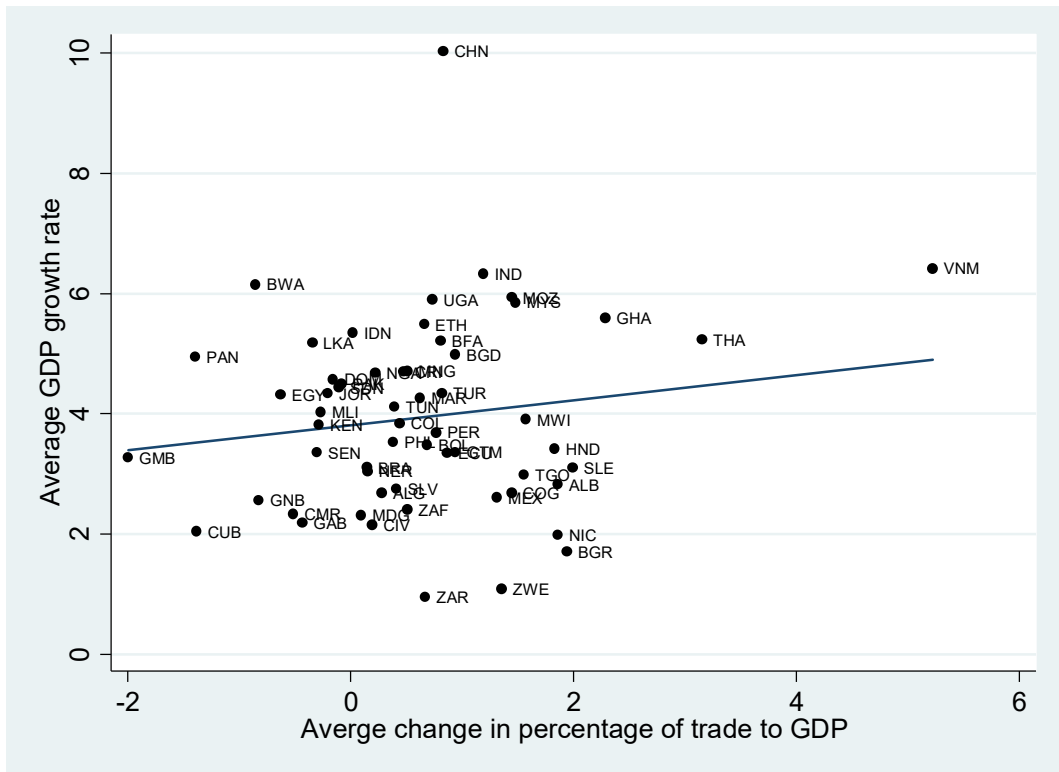


Figure 07: Effect of Trade on Growth

Figure 7 reports scatter between average trade volumes and average GDP growth rate corresponding to this instrumented regression, and confirm that there are two outliers China and Vietnam. The results are not changed much by such obvious outliers in the data. It is obvious that the result remains quite robust.

Table 05: Regression result.

Dependent variable: decadal average trade

	(1)	(2)	(3)	(4)	(5)
lgdpgr	0.97*** (5.56)	0.79*** (4.49)	1.00*** (5.96)	0.94*** (5.08)	0.98*** (5.67)
trade	0.49*** (18.88)	0.48*** (19.19)	0.49*** (18.41)	0.49*** (18.87)	0.49*** (17.73)
avg_gdpgr	0.51** (2.62)	0.23 (1.18)	0.25 (1.16)	0.48* (2.47)	0.46* (2.37)
avg_govs	0.99* (2.00)				
avg_invst		1.58*** (4.00)			
avg_democ			1.41* (2.01)		
avg_extconf				0.81 (1.13)	
avg_lawo					-1.05 (-1.14)
N	1160	1160	1160	1160	1160

t statistics in parentheses, estimated with robust standard errors.

\* p<0.05, \*\* p<0.01, \*\*\* p<0.001

**Instruments:** Lagged levels of institutional quality (average value of government stability, investment profile, democratic accountability, external conflicts and law & order).

The IV regression for institutional variables impacts on decadal trade average present pretty fine (Table 5). There is a positive correlation between initial levels of trade volumes and subsequent growth in trade. Lagged decadal average growth rate also has positive and significant effects on decadal trade average. Decadal average growth rate is a control variable in this IV regression.

Adding institutional quality to the regression, it is found that government stability has a positive and significant effect on trade. 1 score improvement in government stability rises to trade 0.99 percentage points over a decade at 10% level of significance.

Investment profile has positive and significant effects on trade. 1 point improvement in this institutional quality would increase trade 1.58 percentage points over a decade at 1% level of significance.

Democratic accountability has positive and significant effects on trade. Trade would grow 1.41 percentage points over a decade at 10% level of significance through improving 1 point in democratic accountability. Other two institutional measurements have no significant effects on trade over a decade.

## **6. CONCLUSION AND POLICY IMPLICATION**

This paper has analyzed different studies that examined the impact of trade policy and institutional quality on growth. To recognize the partial effects of trade and institutional quality, this research has conducted regression analyses to assess the effects of trade policy and institutional quality on growth and empirically found that trade policy and institutional quality may have a positive and significant effect on growth for developing countries. In cross-sectional results, it is found that a substantial partial effect of changes in trade shares in predicting changes in growth rates considerate to change in measures of institutions plays a smaller role. However,

IV regression showed that trade shares and measures of institutional quality vary substantially as well.

Moreover, this research conducted a regression analysis to capture the decadal change of institutional quality impact on trade which supposed to be affected on growth. Even though the institutional capacity aims to improve the trade shares of developing countries, institutional capacity may not be an easy solution for developing countries with bad institutional quality as well as the slow progress in institutional quality improvement.

The present study also suggests several policy implications. First, the explicit aim of policy makers should be to improve institutional quality without looking interest of vested groups.

Second, having institutional quality, long-run association with trade and economic growth, it provides an alternative policy option for achieving the aim of sustainable long-run economic growth for developing countries.

Third, the study suggests that developing countries should emphasize on trade based on comparative advantage and move from trade of traditional sectors to value-added manufacturing sectors for economic growth.

## **APPENDICES**

## APPENDIX A

### 1. Country Coverage of Data Set

Albania	Ethiopia	Nigeria
Algeria	Gabon	Pakistan
Bangladesh	Gambia	Panama
Bolivia	Ghana	Peru
Botswana	Guatemala	Philippines
Brazil	Guinea-Bissau	Senegal
Bulgaria	Honduras	Sierra Leone
Burkina Faso	India	South Africa
Cameroon	Indonesia	Sri Lanka
China	Jordan	Thailand
Colombia	Kenya	Tunisia
Congo, Rep.	Madagascar	Turkey
Congo, Dem. Rep.	Malawi	Uganda
Costa Rica	Malaysia	Sudan
Côte d'Ivoire	Mali	Togo
Cuba	Mexico	Vietnam
Dominican	Mongolia	Zimbabwe
Ecuador	Morocco	
Egypt, Arab Rep.	Mozambique	
El Salvador	Nicaragua	
	Niger	

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