Openness, Institutions, and Economic Growth: Empirical Evidence from Panel Estimation

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ABSTRACT

In this study, we look back to the decade old debate over the role of trade openness and institutions on economic growth which is yet unsettled. This paper explores the partial effects of openness and institutional quality on economic growth across countries in the world using panel data set utilizing the available panel series for institutional quality. Using generalized method of moments (GMM) which uses internal instruments, we estimate a specification for standard growth equation. Our estimates take into account the endogeneity of the explanatory variables. We find both trade openness and institutional quality have significant and robust role on economic growth. This result is new to the ongoing debate over growth effects of trade and institutional quality. We also find partial effects of openness on per-capita economic growth is higher for the developing countries, while neither openness nor institutional quality was found significant for developed countries. We also find significant differences in coefficients of real openness and current openness; however both were found statistically significant.

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1. Introduction:

Does foreign trade exert a causal influence on economic growth of the countries? Does institutional quality play a causal role on economic growth? And finally, do both simultaneously have partial effects on economic growth? Answering these three questions, voluminous researches, both in theory and empirics, have been carried out over the last two decades. Literatures, sought answer for the first question separately, have reached in a consensus with little disagreement that trade has causal effect on long-run economic growth (See Dollar, 1992; Sachs and Warner, 1995; Ades and Glaeser, 1999; Frankel and Romer, 1999; and Alesina et.al., 2000). Similarly, literatures dealing with the question of growth effect of institutions in isolation have also reached in wide consensus that institutions has momentous role on economic growth (See Acemoglu et. al. 2002, Hall and Jones, 1999; Acemoglu and Johnson, 2005). However, there is little consensus about the third question whether trade openness and institutions both have simultaneous partial effects on long-run economic growth. Rodrik (2000) has started the debate that openness has no separate effect on economic growth when institutions and geography are controlled for in empirical analysis. Following this paper, numerous other studies have been carried out on this debate; however, the debate yet remains unsettle (See Rodriguez and Rodrik, 2001; Irwin and Tervio 2002; and Dollar and Kraay 2003a, 2003b).

All of the studies, except Dollar and Kraay (2003a), mentioned above are cross section in nature. As trade, institutions and growth are believed to be endogenous; these previous studies relied on instrumental variable regression to avoid the reverse causality of growth towards openness and institutions. A bunch of instruments such as European settler mortality

rate (see Acemoglu and Johnson, 2005), percentage of people speaking in major European languages were used to instrument institutional quality (see Alcala and Ciccone, 2004), while predicted trade share by geography were used as exogenous instrument for trade openness (see Frankel and Romer, 1999). However, Albouy (2008) argued there is a serious measurement error in the constructions of European settler mortality rate by Acemoglu et. al. (2002) and empirical findings based on this data as instrument for property rights institutions is misleading and questionable. Albouy (2008) argued that the way Acemoglu et. al. (2002) combine mortality rates of labors, bishops and soldiers support their hypothesis. Moreover, both common historical and geographical factors could be useful to trace back the institutional quality and openness, use of historical and geographical factors as instruments would perform poorly to identify the separate partial effects of openness and institution (Dollar and Kraay, 2003a).

In this backdrop, availability of panel data set for institutional quality measure gives us scope to contribute this contentious literature. Using panel data enable us to use internal instruments for the endogenous regressors such as openness and institutional quality. Lagged values of the endogenous regressors are used for their own instrument. Recent methodological advancement in panel data model with endogeneity problem, i.e. use of system generalized method of moments (GMM), in growth empirics which use internal instruments efficiently motivate us to the work further. The broad objective of this study is to examine the partial effects of trade and institutions on per-capita income growth using cross-country panel data model. This would help us to contribute the on-going debate over the growth effects of openness and institutions in cross section literature.

Remainder of the paper is organized as follows. Section II is a brief discussion of literatures on the issue. Section III outlines the model specification and details of data used in the estimation. In section IV, we analyze our main results that estimated from the specified model, and section V contains a brief analysis on the robustness and consistency check of our main results. In section VI, we conclude our paper.

2. Openness, Institutions and Growth: A Literature Review

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 is 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.

From the above discussions on the previous literature, it is clear that the debate still remain unsettled which is the room for contributing to this debate. Thus, this study has two important contributions in current literature on the debate. First, this study use large cross-country panel data model to identify the partial effects of trade and institutions, exploiting recently available large panel data set on different institutional measures. Estimation using panel data has advantages over purely cross-sectional estimation as it would take into account, besides considering the cross-country relationship between institutions, openness and growth; how openness and institutional development over time within a country may have an effect on the country's growth performance.

Moreover, working with panel data model helps to overcome unobserved country-specific effects and thereby reduce biases in the estimated coefficients. Second contribution this study makes by checking the pattern and consistency of partial effects of openness and instituion for developing and advanced countries, and for alternative measures of trade openness, i.e. examine whether estimates for measures of real openness and current openness differ as predicted by Alcala and Ciccone (2004).

3. Model Specification and Data

3.1. Methods

In this section, we briefly discuss our basic specification of the model to be estimated. To estimate the growth effects of openness and intuitional quality, we use following dynamic panel specification of the growth equation.

$$\Delta y_{it} = \alpha + \delta y_{it-1} + \beta' X_{it} + \theta' Z_{it} + \eta_i + \gamma_t + \varepsilon_{it} \quad \text{.....(1)}$$

For i= 1,……., N. and t=1,….., T.

Where $\Delta y_{i,t}$ is the growth of per-capita real GDP of country i at time t and it is measured as change of log of per-capita real GDP between end of the period and start of the period. $X_{i,t}$ is a set of control variables that includes population growth rate and log of investment share in per-capita real GDP. $X_{i,t}$ also includes secondary enrollment rate as proxy measure of human capital, when we estimate above specification with human capital (an straightforward extension of augmented Solow model estimated by Mankiew et. al., 1992). Variable Z_{it} includes our variables of interest: openness and institutional quality. The disturbance term consists of the three components; η_i captures the unobserved country specific heterogeneity and constant over time, γ_t captures the unobserved productivity effect that varies over time and common across countries; and ε_{it} which captures the unobserved effects that vary over both time and countries. Distance from Equator and country size measured in terms of area were used in cross-section studies as geographic control variables, these types of geographic heterogeneity is captured by η_i in our specification. Moreover, measurement errors varying over time and countries could be captured by η_i and γ_t respectively. Equation (1) is just

straightforward extension for panel estimation of the basic specification used in cross-section studies (see Dollar and Kraay, 2003a; Rodrik et.al., 2004), where control variables are changed.

Equation (1) cannot be estimated consistently using simple ordinary least square (OLS) due to endogeneity between trade openness and economic-growth, so we may be capturing reverse causality . It is also widely argued that institutions are endogenous with trade and growth (see Dollar and Kraay, 2003a; Rodrik et.al., 2004; Alcala and Ciccone, 2004). Countries with high economic development for reasons other than institutions may improve institutional quality. Slowdown in economic activity may cause deterioration in institutional quality. Using instruments is the best option to get rid of possible problem of reverse cuasation from economic growth to openness, and from economic growth to institutional development. Due to lack of proper instruments for both openness and institutional quality that vary both accross countries and over time leads us not to choose two-stage least squares (2SLS). We use weak method of controling endogenity, using lag of the explanatory variables as instruments . However, with weak instrumenting, 2SLS would lead us to bias estimation same as OLS (Mileva, 2007).

We use system GMM developed and modified by Arrelano and Bover (1995) and Blundell and Bond (1998) to estimate equation (1) as system GMM handles well with endogeneity of the regressors by generating instruments from the lag value of the regressors. In addition, system GMM has following attractive features over other estimation strategies:

i) System GMM provides efficient estimates over least squares in the presence of heteroskedasticity in error variance, especially when the form of the heteroskedasticity is unknown (see Baum et. al., 2003). Though, estimation using two-stage least squares (2SLS) could give consistent estimate of equation (1), but it will not be efficient due to presence of heteroskedasticity[2].

ii) Per-capita real GDP at start of a period, investment, openness and institutional quality in equation (1) are assumed to be endogenous and these series may have association with the error component that varies over time and across countries. System GMM helps to avoid dynamic panel bias by instrumenting endogenous explanatory variables by using their own lag-values. Instrumenting by lagged-values of the endogenous regressors makes them exogenous and helps to satisfy our identifying moment conditions $E(X_{it}\ \varepsilon_{it+j})=0$ and $E(Z_{it}\ \varepsilon_{it+j})=0$, $j>0$. Hensen test for over-identification can be used to check the validity of instruments.

iii) Even system GMM performs better than differenced-GMM in estimating empirical growth models when time dimension of the panel data set is short and outcome variable shows persistence (Roodman, 2006). Under this backdrop, differenced-GMM estimators are weak and may lead to problematic statistical inference. Using lagged differences of the

[2] We check the presence of heteroskedasticity in OLS estimation of equation (1) and Likelihood-ratio test confirmed the presence of heteroskedasticity in error variance.

regressors as instruments for the equation in level along with the conventional use of lagged levels of regressors for the equation in first differences overcome the weak instrument problem and perform very well in terms of precision and bias (see Blundell and Bond, 1998).

After choosing system GMM as an estimation method, we still need to choose whether we are going to use one-step system GMM or two-step system GMM. Two-step system GMM provides more efficient estimators over one-step system GMM, both become asymptotically equivalent when the disturbances are spherical (Bond et.al. 2001). Though two-step GMM provides covariance matrix which is robust to heteroskedasticity and autocorrelation, standard errors show downward bias and using robust standard errors give consistent estimates in the presence of panel heteroskedasticity and autocorrelation (Mileva, 2007). Moreover, unlike one-step system GMM, two-step GMM gives robust *Hansen J-test* for over-identification. Thus we chose two-step system GMM procedure with robust standard errors to estimate our model.

To estimate equation (1) we need stationary series of per-capita real GDP growth, investment, population growth, openness, institutional quality and secondary enrollment rate. Though stationarity assumption of per-capita real GDP growth, population growth are quite consistent in literature; investment, openness, institutional quality, and secondary enrollment rate are not expected with stationary mean. Inclusion of time dummies that captures common productivity progress across countries over time make estimation of equation (1) possible with system GMM (Bond et. al., 2001).

3.2. Data Used in the Estimation

The data we use is an unbalanced panel for 133 countries over the period 1985-2009. Data for per capita GDP, investment-GDP ratio, openness, population are taken from Penn World Tables (PWT) 7.0. We use International Country Risk Guide (ICRG) data developed and maintained by Political Risk Service (PRS) for our institutional indicators. Though, it is always preferable to work with a panel data with extended time dimension in terms of efficiency of the estimated model, PRS provides ICRG data for 1984 earliest and this limits our sample for estimation from 1984-2009 [3]. Per-capita GDP is parchasing power parity (PPP) converted at 2005 constant prices. Investment-GDP ratio is the investment share of PPP Converted GDP Per Capita at 2005 constant prices. Data for secondary enrollment rate, a proxy measure of human capital, is extracted from World Development Indicators 2010 of the World Bank.

Openness is measured as the volume of exports plus imports as share of PPP converted GDP at 2005 constant prices. We also use PWT's measure of current openness which is measured as the volume of exports plus imports as share of GDP in local currency at current prices. In our base estimation, we use real openness measured at constant prices instead of conventionally used current openness, as there can be an inherent distortions in current openness measure due to cross-country differences in the prices of non-tradable goods (Alcala and Ciccone, 2004).

[3] The Fraser Institute provides data on institutional quality as Economic Freedom of the World since 1970. As this data is limited to 50 countries and with gap of five years, we use PRS's ICRG data set which has extended coverage.

We use ICRG's law and order ratings as our main proxy measure of institutional quality of a country. Using ICRG's law and order ratings as a measure of institutional quality is not new in relevant literature (see Acemoglu and Johnson, 2005; Dollar and Kraay, 2003a). ICRG's law and order ratings is the sum of two separate sub-components: law and order. Assessment of the strength and impartiality of legal system is reflected in the points of law sub-component; while assessment of the well observance of law is reflected in the points of order sub-component. Each sub-component is given point from zero to three; where zero is for worst scenario, and three is for best scenario.

We also use a variable, referred as ICRG, combining four ICRG's component that are directly related with the institutional quality, namely, corruption, investment profile, law and order, and democratic accountability. This indicator is a close measure to the government anti-diversion policy index (Government effectiveness, rule of law and graft) by Hall and Jones (1999). Investment profile component is measured in units ranging from 1 to 12, while the components of corruption, law and order, and democratic accountability are measured in units of ranging from 1 to 6; with higher ratings corresponds to better institutional quality outcome. Investment profile component represents the assessment of the situation in case of contract viability, profits repatriation and payment delays that reflects the situation of economic institutions of a country. The component of corruption is the assessment of a country's financial corruptions, such as demand for bribes for export and import license, tax filing, registration; and administrative corruptions, i.e. patronage, nepotism, secret party funding etc. Democratic accountability is the outcome of the assessment of government's responsiveness to its own people.

As using annual observations is not appropriate when objective of the study to study long-run growth rather than short-term fluctuations in economic activity (Dowson, 1998), data for the variables has been averaged over non-overlapping five years period[4]. Thus data are permitting at most five observations for a country, namely 1985-89, 1990-94, 1995-99, 2000-04, and 2005-09. Time subscript t will denote one of these time periods. Table B1 in appendix provides summary statistics of the major variables used in our estimation that include growth per-capita real GDP, population growth rate, real investment as share of per-capita real GDP, gross secondary enrollment rate, openness, law and order; and combined ICRG. Overall, average per-capita real GDP growth over 5-year period is around 7% and within country variation is higher than between countries variation. Overall average level of real openness is 73 percent while current openness is 75 percent. Overall average rating of law and order, the proxy measure institutional quality, is about 3.6, while 6 is the maximum possible rating. Figure 1 shows the likely relation between log of per-capita real GDP growth and its main covariates. The positive relation between per-capita GDP growth and its three covariates, namely log of investment as share of GDP, log of real openness, and law and order ratings; is illustrated Figure 1. Negative association is observed between per-capita real GDP growth and population growth rate in the upper right figure.

[4] We also check consistency of our results by using annual data as Rossana and Seater (1995) finds temporal aggregation of time series data loses substantial information about the underlying data process. Our results for institutions and current openness remain consistent and significant even using annual data series, however real openness appeared statistically insignificant. Result is presented in table B9 in Appendix B.

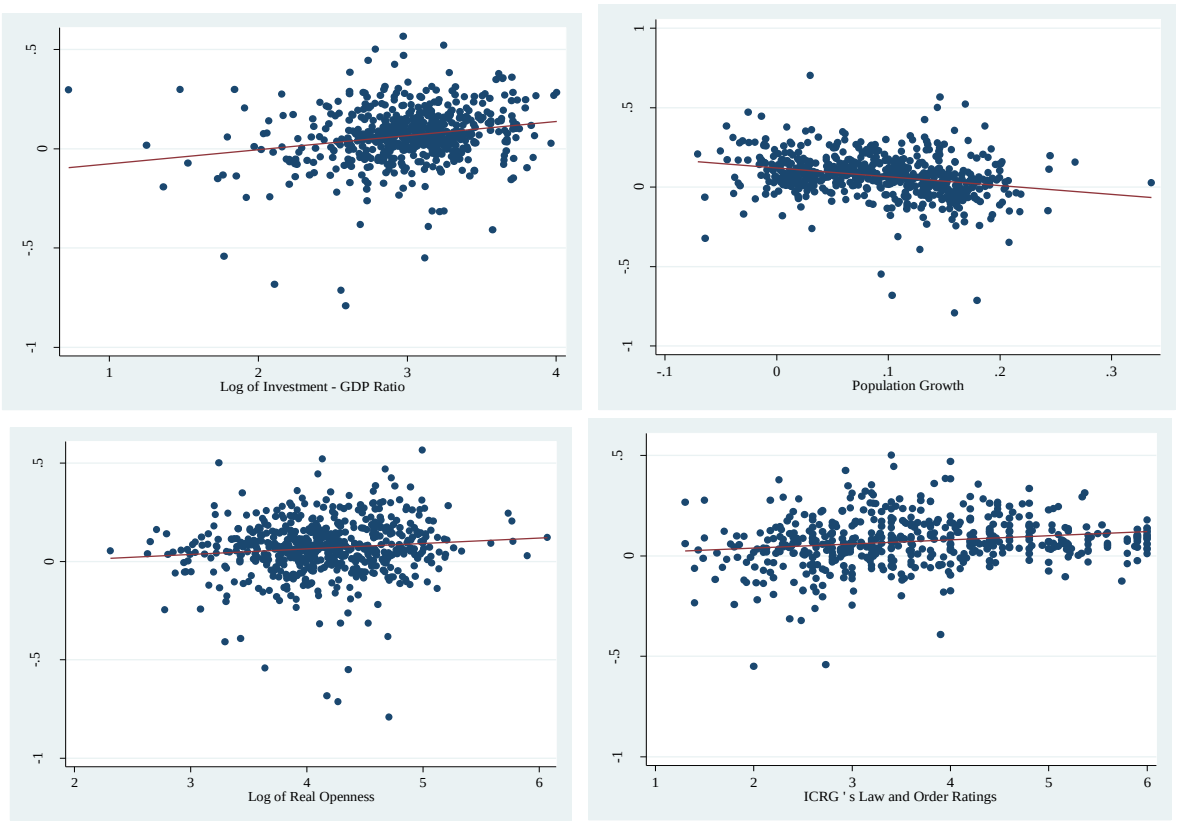

Figure 1: Growth of Per-Capita Real GDP and It's Covariates

4. Estimations and Results

Table 1 reports the main results of our interests using two-step system GMM. First two columns present results for the specification excluding human capital from our estimation; while third and forth column present results from the specification include human capital variable for which gross secondary enrollment rate is used as proxy measure. Caselli (1996) also used secondary enrollment rate as proxy for human capital[5]. All the relevant diagnostics

[5] Though Caselli (2008) used secondary school enrollment rate from Barro and Lee (1994), we used this this series from World Development Indicators of World Bank (2011).

for system GMM are reported in bottom part of the table. For validity of the instruments, we need to reject the test for second-order autocorrelation (AR(2)) in disturbances (Arrelano and Bond, 1991). Moreover, we need to reject the null hypothesis of difference-in-Hansen tests of exogeneity of instruments. It is evident from the table 1 that both Arellano-Bond test for AR(2) of disturbances and difference-in-Hansen tests fail to reject the respective nulls. Thus these tests support validity of the instruments used in our model and difference-in-Hansen tests imply exogeneity of our instruments.

We also reports *Hansen* test for overidentifying restrictions which outperform *Sargan* test in two-step system GMM. In our estimation process of two-step system GMM, 53 instruments have been used in the first two specifications; while 64 instruments have been used for the last two specifications reported in table 1. These instruments were generated as we use two lags for levels and three lags for difference in the data. However, as number of instruments used in estimations were far lower than our number of observation, it did not create any identification problem as reflected in *Hansen test.* Reported *Hansen* test results also fail to detect any problem in the validity of the instruments used in our estimation. In each specification, p value for *Hansen* test is quite high than conventional 5 percent level. Coefficients of per-capita GDP at the start of the period can also be used to check for the validity of our estimates. Bond (2002) suggests that absolute value of this coefficient should lie in between OLS and Fixed Effect Panel. Our results also confirm this requirement[6]. Thus

[6] We estimated both OLS and Fixed Effect Panel for our specified model and in each case, coefficient of Per-capita real GDP at the start of the period from system GMM lies in between OLS and Fixed effect estimates. Results from OLS and Fixed Effect estimates are reported in appendix.

all these diagnostics suggest that our model is correctly instrumented and estimated coefficients are reliable for inference.

In all four specifications, reported in table 1, control variables i.e. per-capita income at the start of the period, population growth rate, investment as share of GDP; and secondary enrollment rate, appeared with correct sign. However, investment share of GDP and population growth rate appeared statistically insignificant in each specification[7]. Secondary enrollment rate, a proxy measure of human capital, appeared highly significant and positive which is similar to the conclusion of Caselli et.al. (1996). However, high correlation of secondary enrollment rate with starting level of per-capita GDP, population growth rate; and law and order, as shown in table B2 in appendix, cast doubt over the precision of this coefficient due to likely multicolinearity problem. Presence of secondary enrollment rate might be capturing a part of growth effect of openness that leads our openness variable insignificant in the last two specifications[8]. Correlation between log of secondary enrollment rate and starting level of per-capita GDP is about 0.81 which implies that starting level of per-capita GDP also captures partial effect of human capital on growth. Thus we can keep aside specifications with secondary enrollment rate and focus our analysis on the first two columns of table 1.

[7] We test the joint significance of these two variables and find these variables even jointly insignificant. However, exclusion of these variables weaken our Hansen test statistics which indicate problem of over-identification. Thus we keep these variables into our model.

[8] We checked whether significance level of openness change for the same sample used n the last two column of table 1 excluding secondary enrollment from model and found openness remain significant at 10 percent level.

Table 1: Estimated Results for our base specification

	1	2	3	4
Dep. Var.: Change in per-capita real GDP	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM
Log (Per-capita real GDP at begin of the period)	-0.0621***	-0.0578**	-0.116***	-0.117***
	(-3.15)	(-2.49)	(-5.04)	(-5.83)
Log(Investment-GDP Ratio)	0.072	0.0515	0.0449	0.035
	(1.37)	(0.99)	(0.99)	(0.84)
Population Growth Rate	-0.194	-0.114	-0.377	-0.306
	(-0.63)	(-0.37)	(-1.08)	(-0.94)
Secondary Enrollment Rate			0.139***	0.156***
			(3.1)	(3.27)
Log (Real Openness)	0.0846**	0.0779**	0.0516	0.0436
	(2.38)	(2.11)	(1.37)	(1.08)
Law and Order	0.0664***		0.0531***	
	(4.73)		(4.44)	
ICRG		0.0203***		0.0131**
		(4.06)		(2.48)
Constant	-0.196	-0.269	-0.0108	-0.0585
	(-1.17)	(-1.49)	(-0.05)	(-0.28)
Arellano-Bond test for AR(1) (p-value>Z)	0.115	0.117	0.005	0.004
Arellano-Bond test for AR(2) (p-value>Z)	0.269	0.266	0.465	0.452
p-value for Hansen Test	0.52	0.22	0.36	0.22
p-value for Difference Hansen Test	0.839	0.924	0.371	0.331
Prob > F	0.000	0.000	0.000	0.000
Total number of observations	529	529	485	485
No. of Sample Countries	133	133	133	133

Notes: i) t statistics in parentheses. Robust standard errors were used obtaining these t statistics.

ii) * denotes significance at 10% level, ** denotes 5% level significance; and *** presents 1% level significance.

iii) All estimations were performed with time dummies and coefficients are not reported.

Now we turn our analysis to our main variable of interest i.e. openness and institutional quality. In first column, we use ICRG's Law and Order rating as proxy measure of institutional quality, while in the second column, a combined ICRG index has been used which is sum of four ICRG's political risk components. Using ICRG's Law and Order ratings as measure of institutional quality is not new in literature and this indicator were used as measure of institutional quality in Acemoglu and Johnson (2005) and Dollar and Kraay (2003a). Along with Law and Order rating, ratings on investment profile, corruption and democratic accountability were used to generate ICRG variable to have an close proxy measure of institutional quality variable used in previous literature (see Alcala and Ciccone, 2004; Rodrik at.el., 2004)[9]. In our preferred specifications (shaded), real openness appeared to be statistically significant at conventional 5 percent level with correct sign. Coefficients of 0.084 and 0.078 imply that 1 percentage point increase in real openness could cause raise in per-capita real GDP growth by 0.084 percent and 0.078 percent respectively.

Both institutional quality measures appeared highly significant with correct sign in our preferred specification. Increase of 1 point in law and order rating could cause 0.07 percentage point raise in per-capita real GDP growth over a 5-year period, while this magnitude is 0.02 for combined ICRG ratings. Though, results reported here are not directly comparable with earlier studies due to absence of panel data estimates except decadal dynamic regressions by Dollar and Kraay (2002), we could compare the direction of

[9] The advantage of using ICRG's rating as institutional quality is that it is available for longer time span i.e. 1984-2009. For example, widely used institutional quality measure is Kaufmann, Kraay, and Zoido-Lobaton's governance indicators which available for the period of 1996-2010, while PRS's ICRG data gives us the scope to extend our panel data set back to 1985. However, Rodrik at.el. (2004) have shown that correlation between these two measures is high for 79-countries and it was 0.78.

conclusions drawn in earlier studies. Dollar and Kraay (2002) have shown ICRG's law and order rating, as measure of institutional quality, is statistically insignificant in both of their reported cross-section and decadal dynamic regression estimates, while they found openness as highly significant determinant of growth in their estimates. In contrast, Rodrik et.al. (2004) have shown that their institutional quality measure is significant and robust for different specification and sample countries and openness did not appeared in statistically significant in any of their specifications. These findings lead them to conclude that "institution rule" and significant rule of openness shown in earlier studies capture the role of institutions on growth, not the role of openness itself.

Using panel data set and advanced technique of panel data model, namely two-step system GMM, that use internal instrument for endogenous regressors, we find that both institutional quality as well as openness have significant role on per-capita GDP growth.

5. Robustness Check of the Base Specification

Now we will focus to check the robustness of our main results. To check the robustness and sensitivity of our results presented in the table 1, we estimated our specifications for two different sample countries, i.e. Developing countries (non-OECD countries) and advanced countries (OECD countries) to see whether pattern of our estimates remain consistent. We also use alternative measures of openness in our estimations and whether our conclusion remains unaffected. Due to lack of alternative long panel data series for institutional measures, we could not use any alternative measure for institutional quality to check robustness of the estimates of institution measures.

We estimate our specifications using conventional current openness which is measured export plus import as a share of GDP in local currency at current market prices. Alcala and Ciccone (2004) first brought this issue in front that current openness measure is not an appropriate measure of openness due to cross-country differences in the prices of non-tradable goods. Before their study, all the major studies in trade and growth literature reviewed in earlier section used current openness as measure of trade openness (see Frankel and Romer, 1999; Rodriguez and Rodrik, 2000; Dollar and Kraay, 2002 and Rodrik et.al., 2004). Alcala and Ciccone (2004) showed significant difference in the estimations depending on whether current or real openness measure is considered and they found downward bias in the estimates of coefficient of openness when current openness is considered.

We also considered current openness in our specification and found difference in our estimates of coefficients which is reported in Table B3 in appendix. Diagnostics of the estimations still confirm the validity of our internal instrumens and coefficient estimates through two-step system GMM is valid. We find elasticity of openness to growth turn out to be doubled when current openness is considered in our preferred specification (column 2 of table B3). The elasticity of per-capita GDP growth with respect to current openness is 0.133; while it is 0.085 in case of real openness considered. However, direction of bias using current openness and the coefficients are not comparable with Alcala and Ciccone (2004), as their study was cross-section in nature and they used productivity per worker as dependent variable, while our study is panel in nature and growth of per-capita real GDP is our dependent variable. No other major changes in our other estimates were noticed due to change in the openness variable.

We also tried to examine the growth effect of trade liberalization by using trade liberalization dummy following the reference year of liberalization of a country is identified in Sachs and Warner (1995) and updated by Wacziarg and Welch (2008). Sachs and Warner (1995) classify countries as 'liberalized' or 'closed' based on the five criteria such as average tariff rate over 40 percent, non-tariff barriers cover more than 40 percent trade, black market premium, state monopoly; and socialist economy. If a country satisfy any of the above criteria, it has been categorized 'closed'. Otherwise it the country was considered as liberalizer. Sachs and Warner (1995) also established a reference year of liberalization for a country by using a comprehensive survey of country case studies and they identified reference year over the time span of 1950-1994. Wacziarg and Welch (2008) updated all the criteria used to classify a country whether it is liberalized or closed based available data taking care of the criticism of Sachs and Warner (1995) by Rodriguez and Rodrik (2000) for the period 1990s. They followed Sachs and Warner (1995) methodology closely . They also review the reference year of liberalization of countries based on their updated criteria spanning over 1950-2001.

We generate a liberalization dummy for each country for our panel data based on the updated reference year of Wacziarg and Welch (2008). We used this dummy in one of our specifications and the result is reported in table B4 in appendix. Table B4 reports that this liberalization dummy appeared statistically insignificant while our institutional measures remain statistically significant. Diaognostics of the model also have been weakened by the introduction of this variable instead of conventional openness measure. We cannot reject *Hansen test* for over-identification at conventional 5 percent level in our preferred

specification presented in first column. Two factors might play role for liberalization dummy insignificant. First, there is very little variation in the liberalization dummy within country; and two, use of the reference year for the time span 1985-2009 instead of the period 1950-2001 for which it has been originally generated[10].

We also test whether our main results hold for the developing country sample and results are reported in table B5 in appendix. Here we consider a country as developing if it is not a member of organization of economic co-operation and development (OECD), an advanced group of countries. Total 101 countries were included in this sample and we use same specification as our base specification Diagnostics presented in table B5 are very similar to the diagnostics of our main specification and support the validity of instruments in our estimation using system-GMM. These results suggest that our main results remain consistent and there is very little change in the coefficients of estimates except the coefficients of real openness measure. Coefficients of real openness measure increases which imply that real openness playing even critical role in the economic growth of developing countries which is consistent with earlier cross-section studies of Dollar (1995), and Sachs and Warner (1995). Figure A1-A6 also visually confirms this bi-variate positive association between growth and openness, and between growth and institutional measures for developing countries.

However, when we estimate our specified model for the advanced countries (OECD countries), we find significant change in our estimates. This sub-sample of countries includes 32 OECD economies and the results for this estimation is reported in table B6. Neither the

[10] Updating of the reference year of liberalization for countries is beyond of this study.

institutional measures nor the real openness measure appeared significant at conventional 5 percent significant level. However, ICRG combined ratings appeared to be significant at 10 percent level. Visual inspection of figure A1-A6 in appendix also shows the lack of association between economic growth and openness, and between growth and institutional measures. Less variation in openness measures as well as in institutional measure might be the cause of these results[11]. Over the whole sample period, these OECD countries enjoy high ratings in institutional measures and high openness measures, while slow economic growth. Moreover, we should interpret this result with caution as the sample size of this specification is quite small.

6. Conclusion and Scope of Future Works

This study first explores the partial effects of trade and institutions on per-capita economic growth using panel data set, exploiting recently available large panel data series on different institutional measures. Using system GMM technique which reduces bias in dynamic panel estimation and use internal instruments for the endogenous explanatory variables, we find statistically significant and robust partial growth effect of trade openness and institutional quality. This findings is a sort of bridge between the two pool of researches where one pool of researches showing trade not institions has playing pivotal role in economic growth and other pool is showing instutions not trade playing momental role in econoimc growth.While all the studies on both sides of the debate are based on cross section in nature, our study is

[11] While standard deviations of real openness, law and order; and ICRG for whole sample are 44.98, 1.12 and 4.09 respectively, standard deviations for these variables for advanced economies are 34.29, 0.85 and 2.85 respectively.

panel in nature and use supurior estimation technique, system GMM. Besides the cross-country variation in data, within country variation due to use of panel data raises the precision of the estimates.

This paper looks at the robustness and consistency of our main results by specifying different set of robustness check. Partial effects of openness and institutions were found stronger for the sample of developing countries compared to advanced countries. This paper also explore whether estimates of openness vary with different measures of trade openness, i.e. real openness and current openness, and found partial effects of real openness is lower compare to the partial effects of current openness.

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APPENDIX

Appendix A

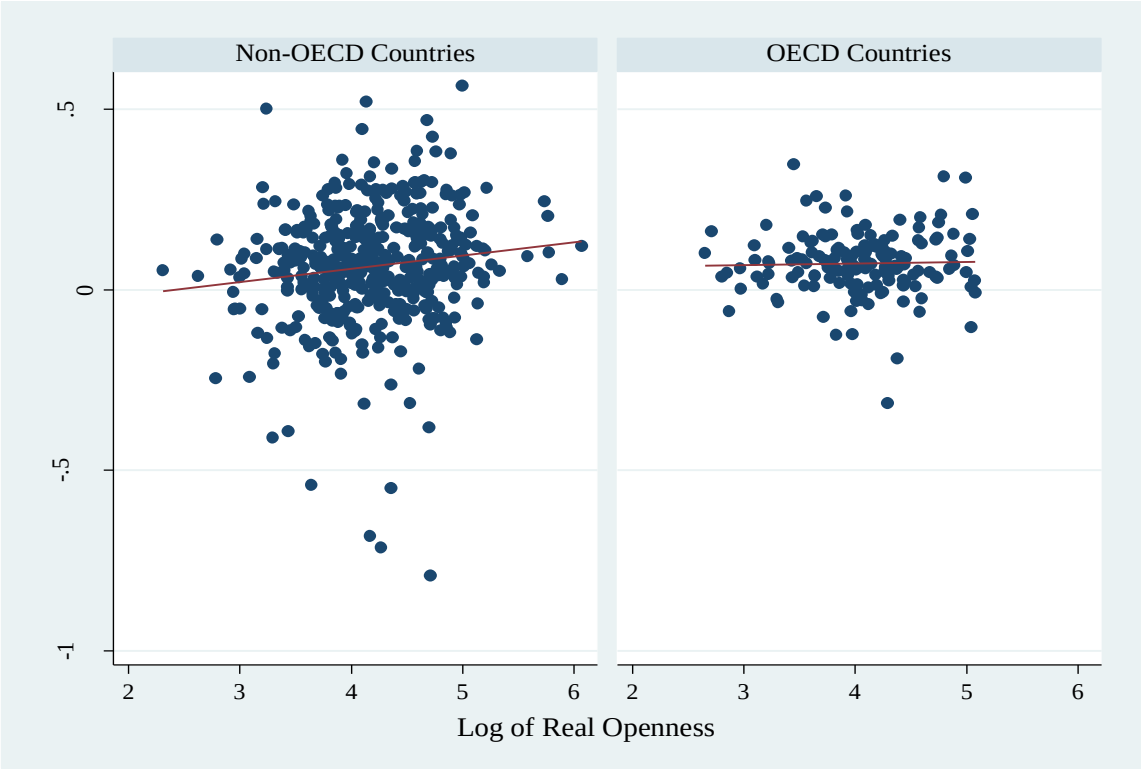

Figure A1: Growth of Per-Capita Real GDP and log of real Openness in OECD and non-OECD Countries

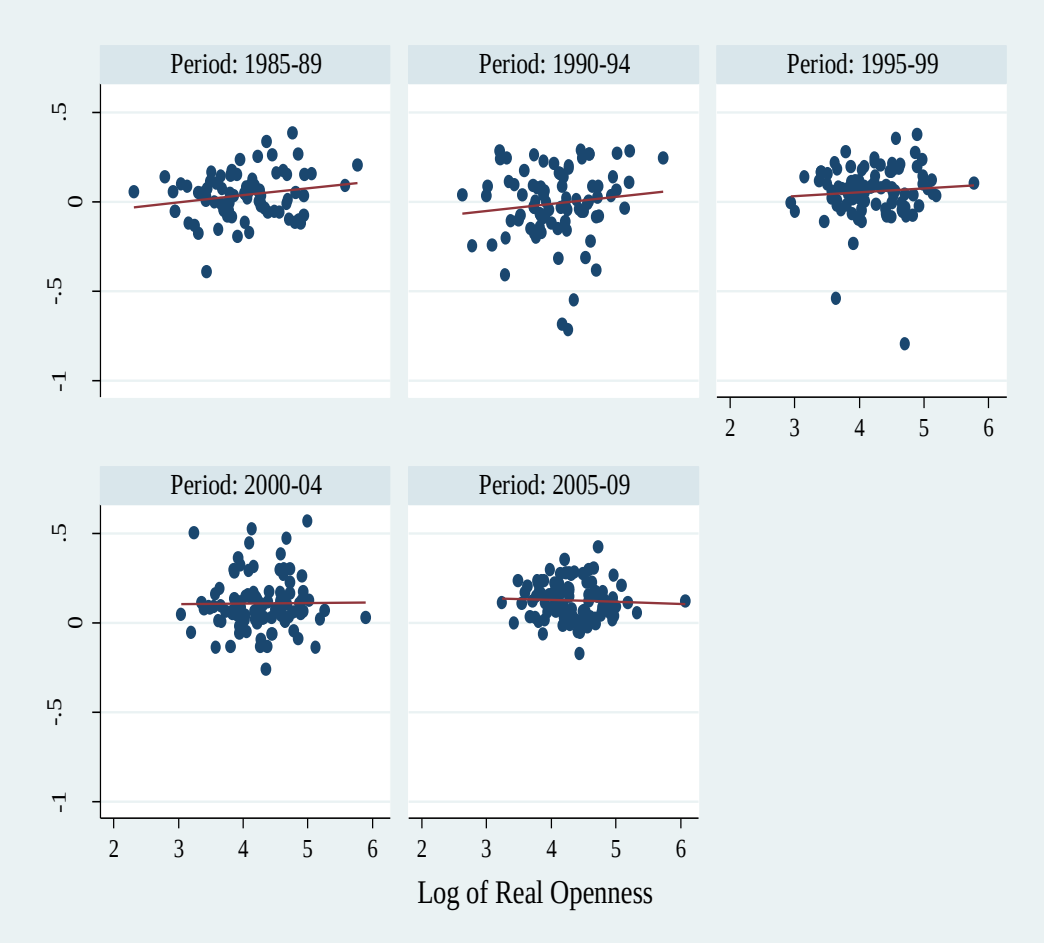

Figure A2: Growth of Per-Capita Real GDP and Log of Real Openness in non-OECD Countries

Figure A3: Growth of Per-Capita Real GDP and Log of Real Openness in OECD Countries

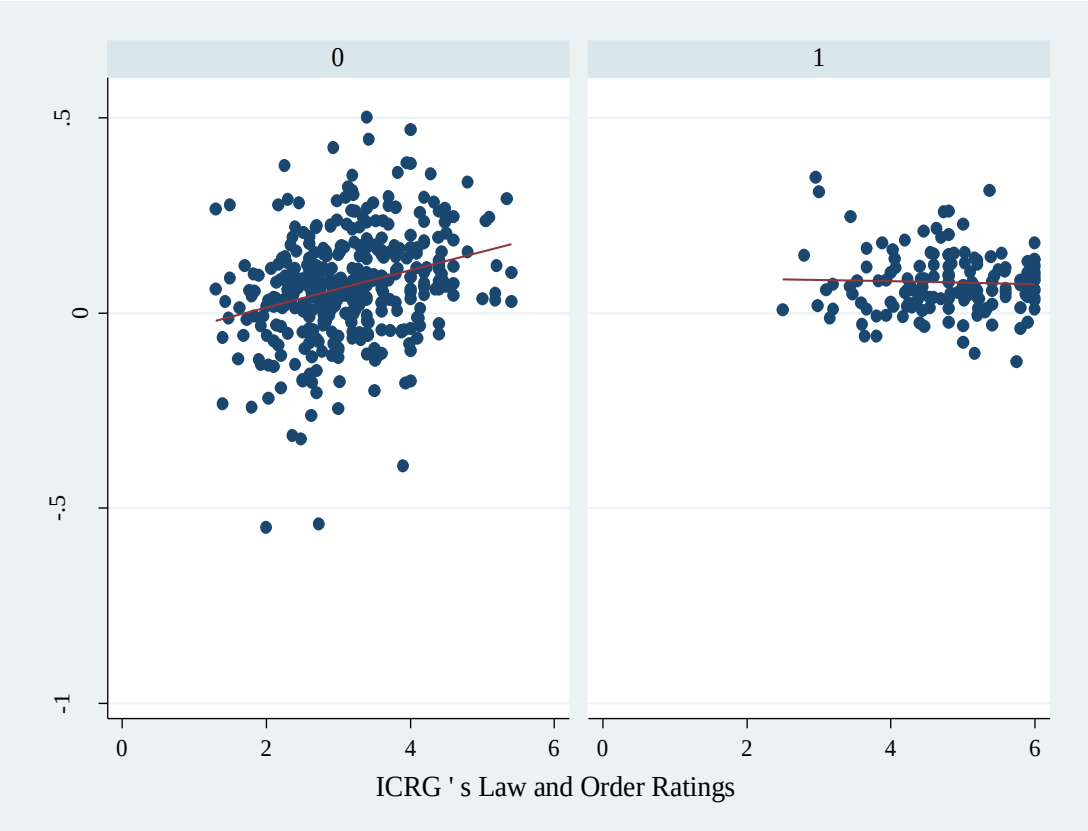

Figure A4: Growth of Per-Capita Real GDP and Law and Order Ratings in OECD and non-OECD Countries

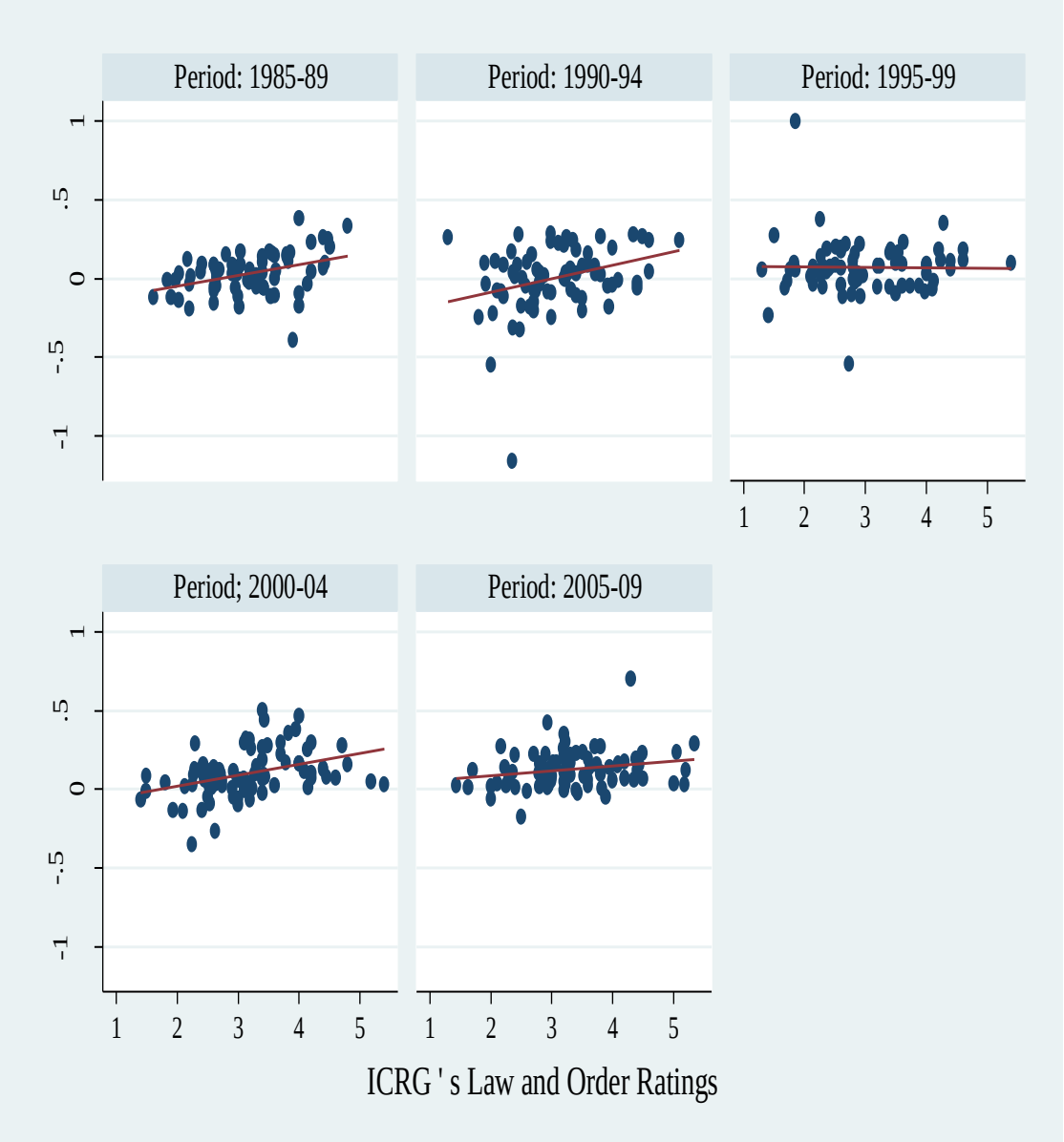

Figure A5: Growth of Per-Capita Real GDP and Law and Order Ratings in non-OECD Countries

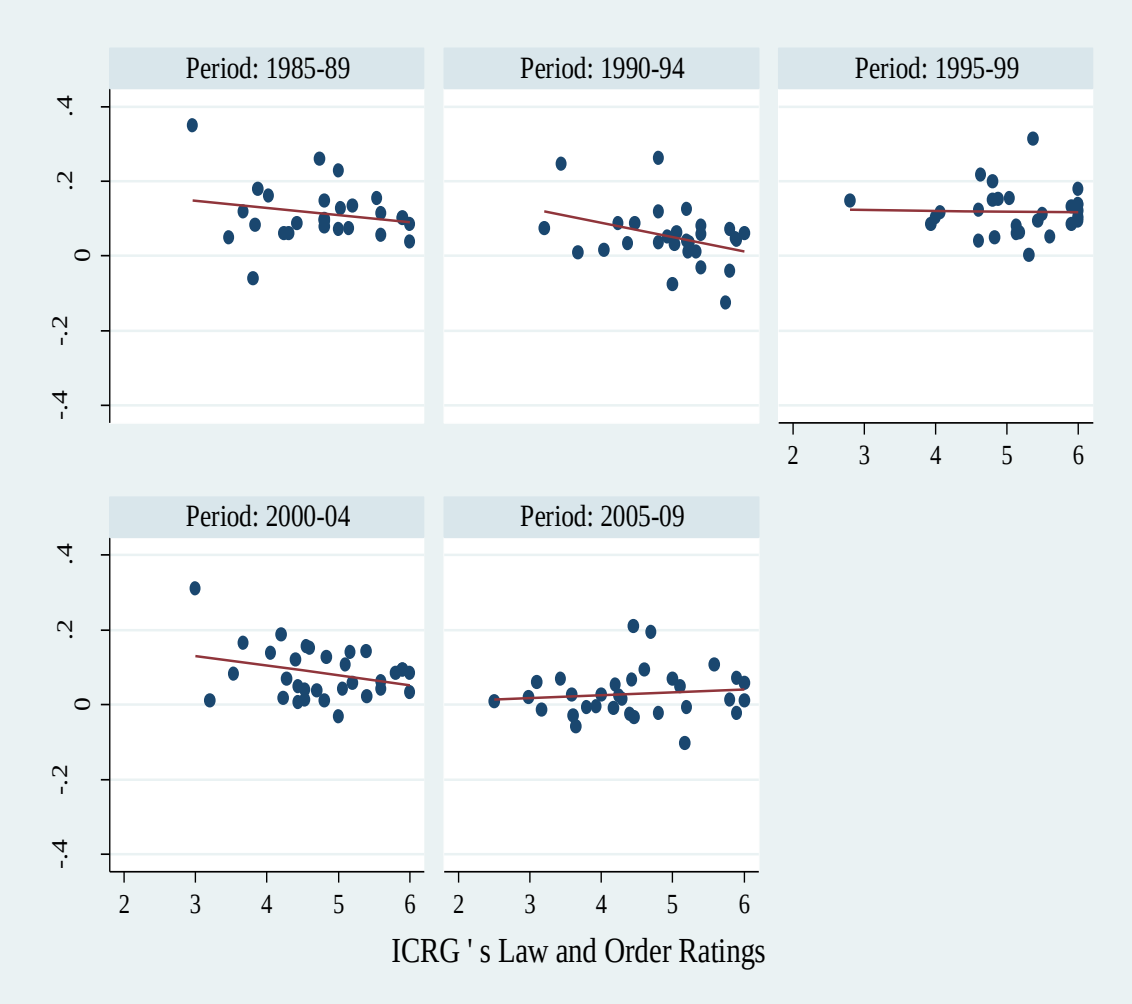

Figure A6: Growth of Per-Capita Real GDP and Law and Order Ratings in OECD Countries

Appendix B

Table B1: Summary Statistics of the major Variables used in the Estimations

Variables		Mean	Std. Dev.	Min	Max
Per-capita Real GDP Growth	overall	0.0669031	0.1578499	-1.158317	1.004414
	between		0.0795096	-0.1871994	0.39948
	within		0.1385275	-1.00893	1.153801
Population growth rate	overall	0.0882575	0.0800593	-0.3453469	0.9123331
	between		0.0727271	-0.1898507	0.4516776
	within		0.0475862	-0.372398	0.548913
Real Investment-GDP Ratio	overall	21.63767	8.340752	-2.248858	54.75346
	between		7.143645	4.540473	45.34543
	within		4.21377	2.643771	43.93556
Gross secondary Enroll Rate	overall	63.90631	34.10221	3.822144	155.1691
	between		33.07235	7.321306	145.3111
	within		9.036699	25.12804	98.55965
Openness as trade ratio to GDP at constant price	overall	73.09531	44.98526	1.662198	432.1443
	between		41.35926	2.155077	349.181
	within		17.04075	2.47633	190.4003
Openness as trade ratio to GDP at current price	overall	75.25291	45.40059	1.990605	428.2209
	between		42.69214	6.576912	366.4651
	within		15.20714	4.479851	193.5081
Law and Order	overall	3.620185	1.121965	1.3	6
	between		1.030527	1.428333	5.776667
	within		0.4016616	2.460185	5.036851
Combined ICRG	overall	18.00209	4.089471	6.583333	27.61667
	between		3.772562	10.02917	25.84333
	within		1.427808	13.18709	22.69209

Table B2: Simple Correlation among the Covariates

	$\Delta y_{i,t}$	$y_{i,t-1}$	n	ki	h	lopenk	lopenc	laword	ICRG
$\Delta y_{i,t}$	1								
$y_{i,t-1}$	-0.0035	1							
n	-0.1838	-0.4999	1						
ki	0.0687	0.1742	-0.0574	1					
h	0.1258	0.8182	-0.4975	0.2282	1				
lopenk	0.1016	0.1682	-0.0632	0.2252	0.2205	1			
lopenc	0.1128	0.2265	-0.1162	0.1859	0.273	0.8968	1		
laword	0.116	0.6265	-0.342	0.117	0.4721	0.0245	0.1006	1	
ICRG	0.0712	0.7247	-0.3717	0.1115	0.5661	0.0456	0.118	0.9016	1

Note: •$\Delta y_{i,t}$: change in log of per-capita real GDP. • $y_{i,t-5}$: Log of per-capita real GDP at the start of the period. • n: population Growth Rate. • ki: investment share of GDP at constant prices

• h: the log gross secondary enrollment rate. • lopenk: openness measured as (export+import)/GDP in constant prices. • lopenc: openness measured as (Export+Import)/GDP in current prices.

• laword: law and order ratings. •ICRG : combination of four ICRG components.

Table B3: Estimated results when Current Openness considered

1	2	3	4	5
Change in log of per-capita real GDP	S-GMM	S-GMM	S-GMM	S-GMM
Log (Per-capita real GDP at the start of the period)	-0.0747***	-0.0802***	-0.116***	-0.119***
	(-4.24)	(-3.51)	(-6.79)	(-6.40)
Log(Investment-GDP Ratio)	0.0721	0.0506	0.028	0.0231
	(1.51)	(1.03)	(0.62)	(0.52)
Population Growth Rate	-0.24	-0.213	-0.257	-0.261
	(-0.82)	(-0.64)	(-0.82)	(-0.85)
Secondary Enrollment Rate			0.169***	0.169***
			(3.72)	(3.51)
Log (Current Openness)	0.133***	0.143***	0.0801	0.0839
	(3.11)	(2.84)	(1.49)	(1.45)
Law and Order	0.0716***		0.0460***	
	(4.68)		(3.96)	
ICRG		0.0229***		0.0121***
		(4.55)		(2.83)
Constant	-0.321	-0.399*	-0.199	-0.224
	(-1.64)	(-1.83)	(-0.75)	(-0.85)
Arellano-Bond test for AR(1) (p-value>Z)	0.119	0.126	0.003	0.002
Arellano-Bond test for AR(2) (p-value>Z)	0.299	0.311	0.515	0.517
p-value for Hansen Test	0.75	0.46	0.44	0.365
p-value for Difference Hansen Test	0.874	0.944	0.671	0.722
Prob > F	0.000	0.000	0.000	0.000
Total number of observations	529	529	485	485
No. of Sample Countries	133	133	133	133

Notes: i) t statistics in parentheses. Robust standard errors were used obtaining these t statistics.

ii) * denotes significance at 10% level, ** denotes 5% level significance; and *** presents 1% level significance.

iii) All estimations were performed with time dummies and coefficients are not reported.

Table B4: Estimated results when we use Liberalization Dummy of Wacziarg and Welch (2008)

1	2	3	4	5
Dep. Var.: Change in log of per-capita real GDP	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM
Log (Per-capita real GDP at the start of the period)	-0.0368	-0.0327*	-0.126***	-0.131***
	(-1.60)	(-1.74)	(-6.18)	(-6.61)
Log(Investment-GDP Ratio)	0.0853	0.0627	0.0724	0.0686*
	(1.41)	(1.23)	(1.66)	(1.72)
Population Growth Rate	-0.0245	0.0531	-0.274	-0.25
	(-0.09)	-0.24	(-0.78)	(-0.75)
Secondary Enrollment Rate			0.185***	0.191***
			(3.86)	(3.88)
Liberalization Dummmy	0.00335	-0.0101	-0.00493	-0.00834
	(0.2)	(-0.58)	(-0.32)	(-0.49)
Law and Order	0.0589***		0.0537***	
	(4.04)		(3.98)	
ICRG		0.0182***		0.0149***
		(3.64)		(3.01)
Constant	-0.0754	-0.147	-0.00707	-0.0472
	(-0.45)	(-0.99)	(-0.03)	(-0.27)
Arellano-Bond test for AR(1) (p-value>Z)	0.105	0.107	0.007	0.006
Arellano-Bond test for AR(2) (p-value>Z)	0.257	0.255	0.450	0.453
p-value for Hansen Test	0.068	0.034	0.627	0.477
p-value for Difference Hansen Test	0.150	0.274	0.418	0.355
Total number of observations	529	529	485	485
No. of Sample Countries	133	133	133	133

Notes: i) t statistics in parentheses. Robust standard errors were used obtaining these t statistics.

ii) * denotes significance at 10% level, ** denotes 5% level significance; and *** presents 1% level significance.

iii) All estimations were performed with time dummies and coefficients are not reported.

iv) Liberalization dummy has been created using the liberalization reference year identified by Wacziarg and Welch (2008). As we used 5-year average of other series, we had to make necessary adjustment if the reference year is in between 5 years. We found 58 such observations and categorized them liberalized for the period if three years of the 5-year period the country was liberalized. Under this adjustment, 37 observations were brought into the category of liberalization. However, we check robustness of this adjustment by excluding those observations from estimation and the results remain mostly unaffected.

Table B5: Estimated Results for the sample of Developing Countries (non-OECD)

1	2	3	4	5
Dep. Var.: Change in log of per-capita real GDP	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM
Log (Per-capita real GDP at the start of the period)	-0.0669*	-0.0673**	-0.151*	-0.167**
	(-1.69)	(-1.99)	(-1.78)	(-2.51)
Log(Investment-GDP Ratio)	0.0539	0.0414	0.079	0.0887
	(1.13)	(0.95)	(1.38)	(1.63)
Population Growth Rate	-0.0784	-0.078	-0.269	-0.313
	(-0.29)	(-0.28)	(-0.74)	(-0.83)
Secondary Enrollment Rate			0.136*	0.166*
			(1.76)	(1.9)
Log (Real Openness)	0.107**	0.119***	0.0643	0.0701
	(2.09)	(2.64)	(1.35)	(1.34)
Law and Order	0.0627**		0.0296	
	(2.34)		(1.31)	
ICRG		0.0204**		0.00395
		(2.23)		(0.32)
Constant	-0.178	-0.324	0.209	0.196
	(-0.83)	(-1.48)	-0.56	-0.58
Arellano-Bond test for AR(1) (p-value>Z)	0.120	0.123	0.009	0.009
Arellano-Bond test for AR(2) (p-value>Z)	0.274	0.277	0.337	0.337
p-value of Hansen Test	0.519	0.225	0.484	0.438
p-value for Difference Hansen Test	0.455	0.837	0.180	0.267
Prob > F	0.000	0.000	0.000	0.000
Total number of observations	380	380	337	337
No. of Sample Countries	101	101	98	98

Notes: i) t statistics in parentheses. Robust standard errors were used obtaining these t statistics.

ii) * denotes significance at 10% level, ** denotes 5% level significance; and *** presents 1% level significance.

iii) All estimations were performed with time dummies and coefficients are not reported.

Table B6: Estimated Results for the sample of Advanced Countries (OECD)

1	2	3	4	5
Change in log of per-capita real GDP	S-GMM	S-GMM	S-GMM	S-GMM
Log (Per-capita real GDP at the start of the period)	-0.0695*	-0.0755**	-0.101	-0.0602
	(-1.93)	(-2.30)	(-1.43)	(-1.14)
Log(Investment-GDP Ratio)	0.0952	0.0905*	0.158**	0.139**
	(1.34)	(1.76)	(2.5)	(2.29)
Population Growth Rate	-0.252	-0.361	-0.154	-0.17
	(-1.14)	(-1.39)	(-0.57)	(-0.62)
Secondary Enrollment Rate			0.0937	0.0465
			(0.72)	(0.38)
Log (Real Openness)	0.0581	0.0491	0.0413	0.0445
	(1.26)	(1.6)	(0.89)	(1.35)
Law and Order	0.0229		0.0303*	
	(1.31)		(1.71)	
ICRG		0.00767*		0.00753*
		(1.97)		(1.7)
Constant	0.08	0.14	-0.193	-0.367
	-0.23	-0.42	(-0.42)	(-1.00)
Arellano-Bond test for AR(1) (p-value>Z)	0.021	0.019	0.050	0.025
Arellano-Bond test for AR(2) (p-value>Z)	0.158	0.168	0.229	0.215
p-value of Hansen Test	0.99	0.99	0.99	0.99
p-value for Difference Hansen Test	0.99	0.99	0.99	0.99
Prob > F	0.000	0.000	0.000	0.000
Total number of observations	149	149	148	148
No. of Sample Countries	32	32	32	32

Notes: i) t statistics in parentheses. Robust standard errors were used obtaining these t statistics.

ii) * denotes significance at 10% level, ** denotes 5% level significance; and *** presents 1% level significance.

iii) All estimations were performed with time dummies and coefficients are not reported.

Table B7: Ordinary Least Squares (OLS) and Fixed-Effect (FE) Results excluding Human Capital

	1	2	3	4
Dep. Var.: Change in log of per-capita real GDP	OLS	FE	OLS	FE
Log (Per-capita real GDP at the start of the period)	-0.0159**	-0.344***	-0.0204***	-0.346***
	(-2.01)	(-6.38)	(-2.72)	(-6.83)
Log(Investment-GDP Ratio)	0.0571**	0.0362	0.0576**	0.0333
	(2.25)	(0.78)	(2.28)	(0.71)
Population Growth Rate	-0.085	0.296	-0.099	0.28
	(-0.51)	(1.14)	(-0.61)	(1.09)
Log (Real Openness)	0.0177*	0.0631	0.0174*	0.0611
	(1.88)	(1.41)	(1.97)	(1.36)
Law and Order	0.0270***	0.0467***		
	(4.24)	(3.32)		
ICRG			0.00830***	0.0106**
			(4.06)	(2.48)
Constant	-0.14	2.348***	-0.152*	2.366***
	(-1.44)	-5.64	(-1.66)	-5.75
Total number of observations	529	529	485	485
No. of Sample Countries	133	133	133	133

Notes: i) t statistics in parentheses. Robust standard errors were used obtaining these t statistics.

ii) * denotes significance at 10% level, ** denotes 5% level significance; and *** presents 1% level significance.

iii) All estimations were performed with time dummies and coefficients are not reported.

Table B8: Ordinary Least Squares (OLS) and Fixed-Effect (FE) Results including Human Capital

	1	2	3	4
Change in log of per-capita real GDP	OLS	FE	OLS	FE
Log (Per-capita real GDP at the start of the period)	-0.0487***	-0.373***	-0.0478***	-0.374***
	(-4.14)	(-4.09)	(-4.22)	(-4.14)
Log(Investment-GDP Ratio)	0.0158	-0.00653	0.0174	-0.0098
	(0.81)	(-0.13)	(0.87)	(-0.19)
Population Growth Rate	-0.291	-0.0871	-0.303*	-0.0936
	(-1.61)	(-0.53)	(-1.67)	(-0.57)
Secondary Enrollment Rate	0.0481***	0.0493	0.0457***	0.0581
	(2.84)	(1.11)	(2.75)	(1.28)
Log (Real Openness)	0.0131	0.068	0.0125	0.067
	(1.34)	(1.38)	(1.26)	(1.36)
Law and Order	0.0256***	0.0369**		
	(4.38)	(2.47)		
ICRG			0.00616***	0.00733
			(3.32)	(1.6)
Constant	0.116	2.608***	0.0989	2.602***
	-1.34	-3.77	-1.14	-3.7
Total number of observations	529	529	485	485
No. of Sample Countries	133	133	133	133

Notes: i) t statistics in parentheses. Robust standard errors were used obtaining these t statistics.

ii) * denotes significance at 10% level, ** denotes 5% level significance; and *** presents 1% level significance.

iii) All estimations were performed with time dummies and coefficients are not reported.

Table B9: Results using Annual Data

	1	2	3	4
Change in log of per-capita real GDP	Sys-GMM	Sys-GMM	Sys-GMM	Sys-GMM
Log (Per-capita real GDP at the start of the period)	-0.00666	-0.0100**	-0.0105	-0.0144**
	(-0.74)	(-2.03)	(-1.52)	(-2.38)
Log(Investment-GDP Ratio)	0.0188	0.0199	0.0145	0.0125
	(1.17)	(1.45)	(1.18)	(0.89)
Population Growth Rate	-0.13	-0.146	-0.0347	-0.0418
	(-0.27)	(-0.27)	(-0.07)	(-0.09)
Log (Real Openness)	0.0116	0.0163		
	(0.86)	(1.53)		
Log (Current Openness)			0.0234*	0.0210*
			(1.69)	(1.88)
Law and Order	0.0111**		0.0107**	
	(2.62)		(2.44)	
ICRG		0.00237*		0.00307*
		(1.76)		(1.72)
Constant	-0.0623	-0.0581	-0.0656	-0.0319
	(-0.69)	(-1.65)	(-1.09)	(-0.70)
Total number of observations	2708	2678	2708	2678
No. of Sample Countries	133	133	133	133

Notes: i) t statistics in parentheses. Robust standard errors were used obtaining these t statistics.

ii) * denotes significance at 10% level, ** denotes 5% level significance; and *** presents 1% level significance.

iii) All estimations were performed with time dummies and coefficients are not reported.

Appendix C

Table C1: List of countries included in the sample

Angola	Gabon	Mali	Trinidad &Tobago
Albania	United Kingdom	Mozambique	Tunisia
Argentina	Georgia	Mauritania	Turkey
Armenia	Germany	Mauritius	Taiwan
Australia	Ghana	Malawi	Tanzania
Austria	Guinea	Malaysia	Uganda
Azerbaijan	Gambia, The	Niger	Ukraine
Burundi	Guinea-Bissau	Nigeria	Uruguay
Belgium	Greece	Nicaragua	United States
Benin	Guatemala	Netherlands	Uzbekistan
Burkina Faso	Guyana	Norway	Venezuela
Bangladesh	Honduras	Nepal	Yemen
Bulgaria	Croatia	New Zealand	South Africa
Bolivia	Haiti	Pakistan	Congo, Dem. Rep.
Brazil	Hungary	Panama	Zambia
Botswana	Indonesia	Peru	Zimbabwe
Central African Republic	India	Philippines	
Canada	Ireland	Papua New Guinea	
China Version	Iran	Poland	
Switzerland	Iraq	Portugal	
Chile	Israel	Paraguay	
Cote d`Ivoire	Italy	Romania	
Cameroon	Jamaica	Russia	
Congo, Republic of	Jordan	Rwanda	
Colombia	Japan	Senegal	
Cape Verde	Kazakhstan	Singapore	
Costa Rica	Kenya	Sierra Leone	
Cyprus	Kyrgyzstan	El Salvador	
Czech Republic	Korea, Republic of	Somalia	
Denmark	Liberia	Slovak Republic	
Dominican Republic	Sri Lanka	Slovenia	
Algeria	Lesotho	Sweden	
Ecuador	Lithuania	Swaziland	
Egypt	Latvia	Syria	
Spain	Morocco	Chad	
Estonia	Moldova	Togo	
Ethiopia	Madagascar	Thailand	
Finland	Mexico	Tajikistan	
France	Macedonia	Turkmenistan	