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Does Institutional Quality Matter for the Success of Export-Led Growth?

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ABSTRACT

This study aims to examine the influence of institutional quality on Export-led Growth (ELG) strategy with 125 countries' results. Toda and Yamamoto (1995) approach is employed to ascertain their causality between exports and growth, while both contingency table and binary logit models are for determining the influence of institutional quality on ELG from three dimensions, namely political, legal, and economics. This study finds that only 35 countries are supported by ELG hypothesis, while institutional quality does not really matter for the success of ELG, except for economic institutional quality. The results have important implications to policymakers and for further research in this field.

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INTRODUCTION

Exports sector has been advocated by an Estonian economist, Ragnar Nurkse as an engine-of-growth upon studying nineteenth century history during the period between 1815 and 1914. He observed that expansion of demand for food and raw materials in Western Europe contributed significantly to the development of countries such as United States, Canada and Australia – so much so that Nurkse cited trade in this period to be an engine-of-growth for these then developing countries (Kravis, 1970, p. 851). Following Ragnar Nurkse's analysis of nineteenth century history, numerous theoretical arguments have been put forth to support the role of export sector in promoting economic growth or Export-Led Growth (hereafter, ELG) hypothesis.

As Dreger and Herzer (2013) point out, there are numerous channels through which exports can promote economic growth beyond a mere change in export volume. Firstly, exports can provide the foreign exchange earnings needed to finance imports of capital goods (Chenery and Strout, 1965). Such imports can facilitate the learning-by-doing process in exporting countries through reverse engineering or imitation, leading to technology diffusion supported by export-led imports of technologically sophisticated capital goods from advanced countries (Chuang, 1998). This process is known as "trade-induced learning." Secondly, Kunst and Marin (1989) postulate that exports promote productivity and hence, growth in exporting countries through several means: (i) exports concentrate investment in efficient sectors in which countries have a comparative advantage; (ii) exports allow countries to exploit economies of scale by gaining access to larger markets; and (iii) exporting countries are exposed to international competition that forces them to innovate and adopt better technology, management expertise and more efficient production techniques in order to keep production costs low and stay competitive in the global market. Lastly, improvements in technology, management know-how and production techniques experienced by export sectors in response to international competition also generate positive externalities for non-export sectors.

ELG was pioneered by the Governments of Germany and Japan as their economic strategy in the 1950s and 1960s, followed by the four East Asian Tigers (i.e. South Korea, Taiwan, Hong Kong and Singapore) in the 1970s and 1980s, and subsequently by South East Asia, Latin America and China in the 1980s and 1990s (Palley, 2011). ELG is often seen as one of the important "engines" of growth in the East Asian economic miracle. Over the period of 1965 to 1990, East Asia grew faster than any other region in the world with eight East Asian economies (Japan, Korea, Hong Kong, Singapore, Taiwan, China, Indonesia, Malaysia and Thailand), in particular recording impressive growth rates (World Bank, 1993). According to World Bank (1993), rapid export growth as a result of export promotion strategies (such as preferential financing, tax incentives and incentives to attract FDI) is cited as an important factor that contributed to the high growth rates achieved by East Asian economies between 1965 and 1990.

According to the World Bank's *2016 Global Economic Prospects* report (World Bank, 2016), the global trade slowdown witnessed in 2015 can be attributed to the decline in import demand from large emerging economies such as China, Brazil and Russia. Also, the said report highlights that reduced import demand from these emerging markets could potentially have negative growth effects on other developing countries. According to World Bank (2016), a one percentage point decline in growth of BRICS countries (Brazil, Russia, India, China and South Africa) can lead to up to 0.8% decline in growth of other developing countries over the next two years (see, Figure 1.18B in World Bank, 2016, p.26). There are several channels through which this spillover effect can occur including trade. The report by World Bank (2016, p. 16), highlights that "*Persistent weakness in global trade diminishes export opportunities but also the scope for productivity gains through increasing specialization and diffusion of technologies. This could continue to put a cap on growth prospects, particularly among smaller and more open developing economies.*"

This study intends to contribute to existing ELG literature in a number of ways. This study re-examines the ELG hypothesis with global evidence of 125 countries. A recent study by Busse and Koeniger (2015) have been the ones to come closest to a global ELG study. They test the ELG hypothesis for 108 countries, as compared to 61 and 45 developing countries by Bahmani-Oskooee and Economidou (2009), and Dreger and Herzer (2013), respectively. However, Busse and Koeniger (2015) use panel data approach that delivers a common finding on ELG, although some of the countries have no evidence of ELG individually. Sathyamoorthy and Tang's (2018) study more generally looks at the causal linkages between exports, institutional quality, and growth; and their (i.e. former two variables) impacts on economic growth for a panel data of 119 countries (by three income groups i.e. high, middle, and low) without testifying the existence of

ELG hypothesis. This study considers a sample of 125 countries in the world in order to provide global yet country-specific evidence for the ELG hypothesis, then examines the impact of institutional quality on the success of ELG.

This study is structured as follows. The next section reviews the selected empirical studies on ELG, and institutional quality. Section 3 gives the ELG findings of 125 countries. Section 4 tests the influence of institutional quality on ELG findings, and section 5 concludes this study.

LITERATURE REVIEW

The early ELG studies such as Haring and Humphrey (1964) and Emery (1967) test the ELG hypothesis using simple least squares (OLS) regression. These studies provide evidence of a statistically significant positive relationship between exports and economic growth. Another set of studies in the 1970s such as Kravis (1970) and Michaely (1977) used rank correlation coefficients instead to validate the ELG hypothesis. The ELG hypothesis was supported as the estimated correlation coefficients between exports and economic growth were statistically significant with a positive sign. In general, early cross-sectional ELG studies that employed correlation and OLS regression techniques were followed by time series studies. The advanced econometric methods that have been employed in ELG time series studies include Granger non-causality, cointegration tests and dynamic models (such as error correction model, ECM). For example, Bahmani-Oskooee and Alse (1993) pioneered the application of cointegration and ECM techniques in re-validating the ELG hypothesis for nine less developed countries (LDCs). Over the past decades, the volume of ELG studies have increased remarkably. Giles and Williams (2000a; 2000b) have provided a comprehensive survey of over 150 ELG-related empirical studies over the period of 1963 to 1999. They observed that the results from ELG time series studies over the three decades examined are mixed and inconclusive.

This study has initially reviewed 50 past studies published between 2004 and 2015[1], but only a few of them and those selected in 2019 are presented in this section in order to avoid overlengthened in this section. Other 'new' direction of ELG studies use panel data approach. Among recent work is Busse and Koeniger (2015) that considers 108 countries for 1971-2005. The variables included are GDP per capita growth, export, investment share of real GDP per capita, average population growth of educational attainment, inflation rate, and political regime instrument. The system GMM results vary with different export measures, in which total export volume, and export share of GDP are insignificant, but export growth is significant in explaining GDP growth. An early work by Dawson and Hubbard (2004) considers a panel data of 14 Central and East European countries (CEECs) for 1994-1999. They consider GDP growth, exports growth, investment-income ratio, and labour growth, and the estimated least squared models support ELG. Using 22 Asian and African countries for 1969-1999, , the panel cointegration tests by Reppas and Christopoulos (2005) show no cointegration among real GDP, real exports, share of investment in GDP, and number of employed in the GDP equation. Using similar methodology (including fully-modified OLS), Parida and Sahoo (2007) investigate the ELG hypothesis for a panel of 4 South Asian countries (1980-2002) with a set of variables, namely real GDP, real exports, gross fixed capital formation, public expenditure on health and education, and manufacturing imports. They find empirical evidence of ELG. Applying panel cointegration, and panel causality tests on real GDP, real exports, and real imports, Mishra, et. al. (2010)'s study supports ELG for 5 Pacific Island countries (1982-2004).

Turning to the most recent studies those published in 2019, for example Abosedra and Tang (2019) have looked at the ELG hypothesis for Egypt, Jordan, Morocco, Tunisia, and Turkey. ELG hypothesis is supported only in Jordan, Morocco, and Turkey for the period 1980-2012 (quarterly data), but their ELG finding is found to be unstable. Furuoka, *et al*. (2019) proposed a five-step statistical procedure to examine the relationship export diversification, mean-reversion of exports, and stability of export–growth causality for France, Norway, and Switzerland for quarterly observations between 1980 and 2016. They found a stronger mean-reversion tendency of exports in France and Switzerland than of Norway. Meanwhile, causality between exports and economic growth in Norway was more unstable than in France, but more stable than

[1] They have been summarized and tabled as available at https://www.dropbox.com/s/jy6ofkop35d4dul/ELG%20Appendix%20Lit%20Review.pdf?dl=0

Switzerland's. Lastly, Barros Jr., *et al.* (2019) found that foreign exchange real revenues from coffee exports were important for the onset of industrialization in Brazil from 1869 to 1939.

From the related literature on institutional quality, Rodrik's (2008) discussion on how a "second-best" institutional landscape is often conducive for growth in developing countries is of great relevance here. He discusses how numerous countries in Sub-Saharan Africa and Asia face inefficient and corrupt courts along with unreliable contract enforcement. Evidence from firm-level surveys reveal that firms operating in countries with poor judicial quality rarely resort to courts in the case of contractual disputes. Instead, these firms resort to relational contracting, i.e. building long-term relationships with suppliers and consumers based on trust, gathering information and screening firms prior to engaging in business dealings and renegotiating contract terms when problems arise. The study (Rodrik, 2008) discusses how people often perceive the best solution in such circumstance to be one of costly judicial reforms that aim to strengthen judicial quality and contract enforcement and achieve "first-best" legal institutions. Also, he highlights that often times, especially for developing countries, it is more effective to just enhance relational contracting (i.e. the "second-best" alternative) than to undertake costly institutional reforms. Efforts to strengthen judicial quality in the presence of relational contracting could be counter-productive and result in adverse effects. With legal reforms, firms will begin to think that they can now rely on courts and be less cautious in their business dealings (i.e. contracting and screening of suppliers). This provides incentive for opportunistic behaviour on the part of suppliers, thus, increasing transaction costs for firms.[2]

Rodrik (2008) also touches on the growth-enhancing role of "second-best" economic institutions. In a first-best world, entry and licensing requirements are viewed as symptoms of poor economic institutional quality. These requirements increase entry costs, reduce competition within the regulated markets, and generate rent for incumbent firms. However, Rodrik (2008) argues that entry requirements are a *necessary* evil. An institutional environment with entry requirements tends to stimulate entrepreneurship in non-traditional economic activities. Economic rents gained from entry restrictions can encourage entrepreneurs to venture into potentially profitable economic activities without the fear of profit-eroding imitative entry by other firms. Such entry can discourage entrepreneurship and innovation as imitative entry under a free entry system may not allow the pioneer firm to re-coup research and development costs, let alone earn substantial profits.

In fact, Klinger and Lederman (2006) provide evidence that entry barriers can promote new export activities. They find that the threat of imitation hinders discovery of new export activities and hence, entry barriers increase the frequency of new export discoveries. Such discovery of new export activities can potentially provide additional avenues for ELG. This provides an explanation for the possible threshold effect observed earlier; second-best economic institutions (such as markets imposed with entry requirements or barriers) can provide growth-enhancing results as opposed to first-best economic institutions (such as free markets) in terms of increased entrepreneurial and export activities in non-traditional sectors.

Another possibility as to why economic institutional quality displays a threshold point is as explained by the Commission on Growth and Development (2010) report that political institutions and forces can be contributing factors to dysfunctional economic institutions (e.g dictatorships are often associated with poor property rights protection). Hence, reforms to economic institutions without addressing the underlying political powers and forces that keep these bad institutions in place are unlikely to be effective. Forcing dictators to introduce more secure property rights does not necessarily ensure good property rights protection in reality as there are other instruments through which these dictators can extract private resources from society. This reinforces Rodrik's (2000) argument on how political regime (i.e. democracy) acts as a meta-institution that influences the quality of other institutions such as rule of law and property rights protection. Hence, this plausibly results in a threshold for economic and legal institutional quality; reforms and improvements to this set of institutions can potentially improve growth outcomes, conditioned on the political powers and institutions in play. A recent study by Sathyamoorthy and Tang (2018) acknowledges that institutional quality mediates the ELG relationship in general, and middle income group in specific. The legal institutional quality has significant positive impact, whereas political and economic institutional quality have significant negative impact on growth for all sampled countries via exports. A recent study by Tang and

[2] Rodrik (2008) cites Vietnam as a primary example – despite its weak formal system of contract enforcement, Vietnam's legal institutional landscape (with informal substitutes such as relational contracting) has still been conducive to support the economy's high growth of 8% per annum.

Abosedra (2019) has examined whether the validity of ELG hypothesis is contingent on logistics performance or not, by using a panel data of 23 Asian countries for the period 2010-2016. They found an empirical support of ELG for the examined countries, while the logistics sector performance is an important variable to be considered. Their results also showed that institutional quality had a positive impact on per capita real GDP that the ELG equations employed.

GLOBAL EVIDENCE ON ELG

The initial results consider real GDP per capita (Y, in US dollar, 100=2005), exports (X, % of GDP), and imports (M, % of GDP)[3] for a total of 125 countries for at least 30 annual observations. Most of them cover longer time span of between 1960 and 2014. Of them, 42 are categorized as high income, 63 as middle income countries and 20 as low income countries as classified by the World Bank. The ELG studies have favourably utilized non-causality approach in order to validate the ELG hypothesis whereby ELG is said to hold if exports variable does Granger-cause economic growth. The testing method is briefly described in **Appendix A**. The Phillips and Perron (1988) unit root test is used to test the null of a unit root for these three candidate variables for all 125 sampled countries.[4] Based on the results of the PP unit root tests, d_{max} is 1 for all sample countries, except for Belize and Mongolia for which d_{max} is 2.

Their empirical results of TY non-causality tests are reported in **Appendix B**. With an absolutely small *p*-value (less than 0.10), 27 countries (or 21.6% of the 125 countries) show causality from exports to GDP - it supports ELG hypothesis.[5] There is evidence of bi-directional causality between exports and GDP for only 8 countries (6.4%), namely, Albania, Argentina, El Salvador, Mauritius, Nicaragua, Saudi Arabia, Sierra Leone, and Trinidad and Tobago. Generally, only 35 countries (or 28%) support ELG hypothesis, acknowledging their success story of instrumenting exports in trade and economic policies to stimulate growth. Interestingly, of the 35 ELG countries, 16 countries (45.7%) are from middle income, 15 countries (42.9%) are high income, and 4 countries (11.4%) are low income. This explains that levels of income matter for ELG hypothesis. A uni-directional causality from GDP to exports, in which GLE hypothesis is supported, exists for 21 countries (16.8%).[6] Surprisingly, more than half of the 125 countries (69 countries or 55.2%) reveal no evidence of either ELG or GLE.[7]

INSTITUTIONAL QUALITY AND ELG FINDINGS

This section examines descriptively the influence of institutional quality i.e. from the perspectives of political, legal, and economic on ELG. A total of 119 countries have been considered as the institutional quality scores (Kuncic, 2014) for 6 countries (Antigua and Barbuda, Dominica, Kiribati, Macao, St. Kitts and Nevis, and Tonga) are not available. Table 1 presents a contingency table that cross-tabulates the TY non-causality findings of ELG, GLE and none with the three dimensions of institutional quality (political, legal, and economic) as well as income groups (high, middle, and low income). The reported values are the number of countries with their share in percentage in parenthesis. To interpret, for instance, the third column (ELG)

[3] The data are obtained from the World Development Indicator (World Bank). Since exports are a component of GDP, Giles and Williams (2000a, b) highlight that ELG studies could suffer from spurious correlation or also known as the "accounting identity" problem. One of the remedies to this "accounting identity" problem is to use alternative growth and export measures. Hence, this study uses alternative measures, namely GDP per capita and export share of GDP to remedy this problem.

[4] The results are tabled and available at https://www.dropbox.com/s/thrwwwbwhva5glt/ELG%20PP%20unit%20root%20results.pdf?dl=0.

[5] They are Austria, Belgium, Bhutan, Bolivia, Cameroon, Central African Republic, Chile, Cyprus, Denmark, Egypt, Finland, Gambia, Ghana, Grenada, India, Kenya, Luxembourg, Rwanda, Spain, St. Kitts and Nevis, St. Lucia, Swaziland, Sweden, Thailand, United States, Venezuela, and Zambia.

[6] These countries are Bangladesh, Barbados, Canada, Chad, Congo Democratic Republic, Equatorial Guinea, Iceland, Israel, Italy, Macao, Malawi, Malta, Mauritania, Niger, Pakistan, Portugal, South Africa, Uganda, United Kingdom, Uruguay, and Zimbabwe.

[7] These countries consist of 16 high income countries (Antigua and Barbuda, Australia, Bahrain, France, Germany, Greece, Hong Kong, Ireland, Japan, Netherlands, New Zealand, Norway, Seychelles, Singapore, South Korea, and Switzerland), 43 Countries from middle income group (Algeria, Belize, Botswana, Brazil, Bulgaria, Cabo Verde, China, Colombia, Congo Republic, Costa Rica, Cote d' Ivoire, Cuba, Dominica, Dominican Republic, Ecuador, Fiji, Gabon, Guatemala, Guyana, Honduras, Indonesia, Iran, Iraq, Jordan, Kiribati, Laos, Lesotho, Malaysia, Mexico, Mongolia, Morocco, Namibia, Nigeria, Panama, the Philippines, Senegal, Sri Lanka, St. Vincent and the Grenadines, Sudan, Tonga, Tunisia, Turkey, and Vanuatu), and 10 low income countries (Benin, Burkina Faso, Burundi, Comoros, Guinea-Bissau, Madagascar, Mali, Mozambique, Nepal, and Togo).

shows the number of countries in each institutional quality score range for which ELG holds. In general, across all three components of institutional quality, the lowest share of countries for which ELG holds (in percentage) is associated with the lowest institutional quality score range ($s \leq 20$). The highest share of countries for which ELG holds (in percentage) is associated with the higher score ranges (either $60 < s \leq 80$ or $80 < s \leq 100$), suggesting a positive association between institutional quality, and ELG.

Political institutional quality (POL)

From the political perspective, ELG holds for only one country, namely Rwanda, in the $s \leq 20$ score range. The highest share of countries for which ELG holds (41.2%) is associated with the highest score range of $80 < s \leq 100$, followed by the $60 < s \leq 80$ score range (28.6%). An interesting observation is that higher political institutional quality score ranges are those with higher share of ELG countries, revealing a positive association of political institutional quality on ELG. Interestingly, for the score range $s \leq 20$, the ELG country, Rwanda is a low income economy. At score ranges of $20 < s \leq 40$ and $40 < s \leq 60$, countries supporting ELG hypothesis are predominantly middle income (i.e. 13 of the 18 countries). At higher score ranges of $60 < s \leq 80$ and $80 < s \leq 100$, ELG countries are primarily high income (i.e. 12 of the 15 countries). This is in line with the argument of Mauro (1995) that higher income or richer countries tend to have better institutional quality compared to lower income or poorer countries. Looking at the percentages of ELG countries (third column) across the various ranges of political institutional quality show a 'N' shape.

Legal institutional quality (LEG)

From the legal perspective (see, the second panel of Table 1), none of the countries support ELG at the lowest legal institutional quality range, $s \leq 20$. Meanwhile, the highest share of countries that support the ELG hypothesis are associated with higher legal institutional quality score ranges, namely $60 < s \leq 80$ (33.3%), followed by $80 < s \leq 100$ (31.8%). These observations indicate a positive correlation between legal institutional quality and ELG across sampled countries. Looking at the percentages of ELG countries (third column of second panel) across the various ranges of legal institutional quality, a reversed 'V' shape is observed. Clearly, this indicates a certain threshold, i.e. percentage of ELG countries appear to increase with legal institutional quality up to score range of $60 < s \leq 80$, beyond which percentage of ELG countries begins to drop. It is explained by the second-best legal institutions could often be the most effective alternative to achieve growth as opposed to costly investments in first-best legal institutions as represented by the $80 < s \leq 100$ score range.

Economic institutional quality (ECO)

Turning to the economic perspective (see, the third panel of Table 1), once again none of the countries with the lowest economic quality ($s \leq 20$) are found to support the ELG hypothesis. The highest percentage of countries that support ELG (40.0%) is associated with the second highest score range, $60 < s \leq 80$. Given an increase in economic institutional quality (to the highest range, $80 < s \leq 100$), the percentage of ELG countries drops from 40 to 30%. These findings indicate a positive association between economic institutional quality and ELG. However, similar to the case of legal institutional quality, a reversed 'V' shape is identified, indicating there could be a threshold in play here; economic institutional quality positively influences the likelihood of ELG, but only up to a certain threshold, i.e. $60 < s \leq 80$.

Table 1 Contingency table for ELG and institutional quality

		Findings			ELG and Level of Development		
POL Score	No. of countries	ELG	GLE	None	Low Income	Middle Income	High Income
s≤ 20	6	1 (16.7%)	3 (50.0%)	2 (33.3%)	1 (100.0%)	0 (0.0%)	0 (0.0%)
20 <s ≤ 40	25	7 (28.0%)	6 (24.0%)	14 (56.0%)	2 (28.6%)	4 (57.1%)	1 (14.3%)
40 <s ≤ 60	43	11 (25.6%)	6 (14.0%)	29 (67.4%)	1 (9.1%)	9 (81.8%)	1 (9.1%)
60 <s ≤ 80	28	8 (28.6%)	10 (35.7%)	13 (46.4%)	0 (0.0%)	3 (37.5%)	5 (62.5%)
80 <s ≤ 100	17	7 (41.2%)	3 (17.6%)	7 (41.2%)	0 (0.0%)	0 (0.0%)	7 (100.0%)
LEG							
s≤ 20	3	0 (0.0%)	1 (33.3%)	2 (66.7%)			
20 <s ≤ 40	20	5 (25.0%)	7 (35.0%)	8 (40.0%)	2 (40.0%)	3 (60.0%)	0 (0.0%)
40 <s ≤ 60	50	14 (28.0%)	8 (16.0%)	34 (68.0%)	2 (14.3%)	9 (64.3%)	3 (21.4%)
60 <s ≤ 80	24	8 (33.3%)	8 (33.3%)	10 (41.7%)	0 (0.0%)	4 (50.0%)	4 (50.0%)
80 <s ≤ 100	22	7 (31.8%)	4 (18.2%)	11 (50.0%)	0 (0.0%)	0 (0.0%)	7 (100.0%)
ECO							
s ≤ 20	2	0 (0.0%)	0 (0.0%)	2 (100.0%)			
20 <s ≤ 40	34	7 (20.6%)	8 (23.5%)	20 (58.8%)	3 (42.9%)	4 (57.1%)	0 (0.0%)
40 <s ≤ 60	48	14 (29.2%)	11(22.9%)	27 (56.3%)	1 (7.1%)	9 (64.3%)	4 (28.6%)
60 <s ≤ 80	25	10 (40.0%)	7 (28.0%)	11 (44.0%)	0 (0.0%)	3 (30.0%)	7 (70.0%)
80 <s ≤ 100	10	3 (30.0%)	2 (20.0%)	5 (50.0%)	0 (0.0%)	0 (0.0%)	3 (100.0%)

Binary regression analysis

Of the ELG findings obtained (Appendix B), this study also considers a binary regression model (logit) as equation (1).[8]

$$ELG_i = \Lambda(\varphi_0 + \varphi_1 POL_i + \varphi_2 ECO_i + \varphi_3 LEG_i) + \mu_i \quad (1)$$

where ELG_i is a binary dependent variable that takes on the value of 1 if ELG holds for country *i*, and 0 otherwise; POL_i is average political institutional quality score for country *i*; ECO_i is average economic institutional quality score for country *i*; and LEG_i is average legal institutional quality score for country *i*.[9] Of equation (1), it is expected that better political, economic, or legal institutional quality scores increase the likelihood (probability) that ELG occurs in a country if φ_1, φ_2 and φ_3, respectively, are positive and statistically significant.

This alternative approach, more systematically examines the impact of institutional quality (political, legal, and economic) on the likelihood that ELG holds for the 119 countries under study. Table 2 reports the estimated logit equations. In all countries (with large *p*-values), institutional quality appears statistically insignificant in influencing the probability of ELG, regardless of their income groups. One exception is the economic institutional quality variable in model 3 (the first panel, all countries) which is found to be significant at the 10% level.

[8] Modelling a binary dependent variable using ordinary least squares (OLS) method in what is known as a linear probability model (LPM) often results in several problems including: non-normality and heteroskedasticity of error term; possibility of predicted probabilities lying outside the probability axiom (the 0 to 1 range); generally lower R^2 values; and also, LPM assumes that the marginal effect of independent variable (X) on dependent variable (Y) is constant, which is unrealistic. Therefore, this study considers maximum likelihood method instead to overcome these problems.

[9] The institutional quality scores are taken from Kuncic (2014) for between 1990 and 2010.

Table 2 Results of logit models using averaged institutional quality

Variables	Model 1	Model 2	Model 3	Model 4
All countries				
POL	1.02 (0.32)			-2.77 (0.51)
LEG		1.19 (0.25)		1.55 (0.73)
ECO			1.95 (0.10)*	3.13 (0.19)
Constant	-1.47 (0.02)**	-1.61(0.01)**	-1.95 (0.00)***	-1.96 (0.01)***
Cross sections:	119			
McFadden R^2	0.01	0.01	0.02	0.02
S.E. of regression	0.45	0.45	0.45	0.45
High income countries				
POL	-0.01(1.00)			0.60 (0.95)
LEG		0.00 (1.00)		-1.23 (0.90)
ECO			0.32 (0.90)	0.99 (0.82)
Constant	-0.57(0.71)	-0.58 (0.71)	-0.80 (0.64)	-0.75 (0.67)
Cross sections:	39			
McFadden R^2	0.00	0.00	0.00	0.00
S.E. of regression	0.49	0.49	0.49	0.51
Middle income countries				
POL	1.15 (0.59)			-5.79 (0.38)
LEG		1.61 (0.46)		4.59 (0.46)
ECO			3.05 (0.23)	4.50 (0.22)
Constant	-1.56 (0.15)	-1.83(0.12)	-2.47(0.05)*	-2.73 (0.06)*
Cross sections:	60			
McFadden R^2	0.00	0.01	0.02	0.03
S.E. of regression	0.45	0.45	0.44	0.45
Low income countries				
POL	-5.10 (0.33)			-2.21 (0.86)
LEG		-4.02 (0.48)		-8.19 (0.67)
ECO			1.21 (0.87)	10.67 (0.47)
Constant	0.38 (0.83)	0.21 (0.93)	-1.81 (0.51)	-1.13 (0.68)
Cross sections:	20			
McFadden R^2	0.05	0.03	0.00	0.08
S.E. of regression	0.41	0.42	0.42	0.43

Note: ***, ** and * indicate significance at 1, 5 and 10%, respectively.

For robustness check, the above logit models are re-estimated by using ordinal institutional quality measures see, Kuncic (2014) namely political (O_POL), legal (O_LEG), and economic (O_ECO) which take on values between 1 and 5 depending on the score range a given sample country falls under. Table 3 presents the empirical estimates. This robustness check reveals similar findings that political, legal, and economic institutional quality variables are statistically insignificant in explaining the likelihood of ELG for all cases.

Table 3 Results of logit models using ordinal institutional quality

Variables	Model 1	Model 2	Model 3	Model 4
All countries				
O_POL	0.21 (0.27)			0.13 (0.79)
O_LEG		0.19 (0.33)		-0.25 (0.64)
O_ECO			0.32 (0.14)	0.43 (0.26)
Constant	-1.59 (0.02)**	-1.56 (0.03)**	-1.91 (0.01)***	-1.82 (0.01)**
Cross sections:	119			
McFadden R^2	0.01	0.01	0.02	0.02
S.E. of regression	0.45	0.45	0.45	0.46
High income countries				
O_POL	0.11 (0.77)			1.33 (0.25)
O_LEG		-0.09 (0.80)		-1.42 (0.24)
O_ECO			0.01 (0.98)	0.14 (0.81)
Constant	-1.05 (0.53)	-0.18 (0.91)	-0.63 (0.70)	-0.67 (0.71)
Cross sections:	39			
McFadden R^2	0.00	0.00	0.00	0.04
S.E. of regression	0.49	0.49	0.49	0.49
Middle income countries				
O_POL	0.18 (0.66)			-0.24 (0.75)
O_LEG		0.22 (0.56)		0.09 (0.90)
O_ECO			0.51 (0.25)	0.61 (0.29)
Constant	-1.53 (0.20)	-1.67 (0.16)	-2.45 (0.06)*	-2.30 (0.11)
Cross sections:	60			
McFadden R^2	0.00	0.00	0.02	0.02
S.E. of regression	0.45	0.45	0.44	0.45
Low income countries				
O_POL	-0.63 (0.43)			-0.66 (0.52)
O_LEG		-0.51 (0.65)		-0.15 (0.93)
O_ECO			-0.00 (1.00)	0.43 (0.78)
Constant	-0.02 (0.99)	-0.08 (0.98)	-1.39 (0.64)	-0.57 (0.87)
Cross sections:	20			
McFadden R^2	0.03	0.01	0.00	0.04
S.E. of regression	0.41	0.42	0.42	0.44

Notes: O_POL, O_LEG, and O_ECO indicate ordinal political, legal, and economic institutional quality variables, respectively. The variables are ordered based on institutional quality scores (s) as follows: 1 for $s \leq 0.2$, 2 for $0.2 < s \leq 40$, 3 for $0.4 < s \leq 0.6$, 4 for $0.6 < s \leq 0.8$, and 5 for $0.8 < s \leq 1.0$. ***, ** and * indicate significance at 1, 5 and 10%, respectively.

CONCLUDING REMARK

This study, firstly, offers country-specific evidence of ELG hypothesis for 125 countries with data spanning between 1960 and 2014, with the Toda and Yamamoto (1995) non-causality tests supporting ELG in 35 countries (or 28%). Secondly, this study answers an important research question, namely, "*Does institutional quality explain the success of export-led growth (ELG)?*" A positive correlation is observed between institutional quality (political, legal, and economic) and the percentage of countries for which ELG holds – i.e. the highest share of ELG countries is from the high institutional quality score ranges, and *vice versa*. This descriptive observation, however is insufficient. More formally, the logit models empirically offer that only economic institutional quality has *slight* explanatory power on the success of ELG. However, this model provides no such evidence for the other two indicators (political and legal) of institutional quality. This finding is different from the study by Sathyamoorthy and Tang (2018) because they look at the impact of institutional quality on economic growth, rather than on the success of ELG.

This finding, however, does not rule out the importance of political and legal institutional quality on the success of ELG. Indeed, it reveals a need for policies and changes to re-position them into a desirable *threshold* that facilitates ELG. This study offers an insight for policymakers. Good governance and institutions have been essentially important for effective development policy as discussed in recent years, in particular, for the countries that are either starting, or already on the growth strategy of ELG. As such, it is vital for authorities to improve the six key dimensions of governance (institutional quality), namely voice and

accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law, and control of corruption.

The likelihood of ELG success can be increased by means of how a country's institutional quality is determined. One suggests that institutional quality can be improved by authorities with universal and free education, meritocratic recruitment to the civil service, increased gender equality, professional auditing of public finances and services, impartial and competent administration for tax collection, and increasing training in critical/ethical thinking in all forms or higher education.[10] Other is to upgrade the country's development level, enhancing income distribution, and a sound tax system.[11] Also, strengthening the parliamentary form of government, aggregate governance indicator, civil liberties, openness, monetary and fiscal policies, investment, labour freedom contribute to better economic and political institutions in IMF programme countries, while authorities should reduce or eliminate the presence of military in power, excessive strength of government and opposition in parliament, and foreign aid, in order to improve the institutional quality.[12]

This study serves as an additional reference for further ELG research. Further study is suggested to look at specific countries of interest with deeper understanding about the impact of institutional quality on not just economic growth, but the implementation of ELG policy for economic development. Also, firm-level data (i.e. perception survey on exporting firms, and micro data collection by the respective statistical agencies) are highly recommended, in which further research can inform the impact of institutional quality on exports performance as well as the exporting firms' value.

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[11] See, The Determinants of Institutional Quality. More on the Debate by *Alonso, J.A.* and *Garcimartin, C.*, https://eprints.ucm.es/9665/1/WP_03-09.pdf

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APPENDIX

Appendix A Toda and Yamamoto (1995) non-causality method

Toda and Yamamoto (1995) (hereafter TY) highlight that the standard Granger non-causality test may be vulnerable to pre-test biases as a result of mixture integration, *I*(d) (which is often the case with macroeconomic variables) or possibly cointegrated case. TY test is applicable regardless of the integration and cointegration properties of the data (Kempa & Khan, 2016). To undertake the TY approach to Granger non-causality, a VAR of order $(k + d_{max})$ is estimated where k is the optimal lag length and d_{max} is the maximum order of integration. According to Enders (2015), Akaike Information Criterion (AIC) works better for small samples, and it is used the optimal lag length (*k*) selection. The unique feature of the TY approach is that only k lags are included in the Wald test. The additional lags in the *augmented* VAR model (depending on d_{max}) are ignored. This helps ensure that the test statistic from this "modified" Wald test has its usual asymptotic chi-square distribution. Hence, a VAR $(k + d_{max})$ model is estimated as follows:

$$Y_t = \alpha_0 + \sum_{i=1}^{k} \alpha_{1i} Y_{t-i} + \sum_{j=1}^{d_{max}} \alpha_{2k+j} Y_{t-k-j} + \sum_{i=1}^{k} \beta_{1i} X_{t-i} + \sum_{j=1}^{d_{max}} \beta_{2k+j} X_{t-k-j} + \sum_{i=1}^{k} \gamma_{1i} M_{t-i} + \sum_{j=1}^{d_{max}} \gamma_{2k+j} M_{t-k-j} + \mu_{1t}$$

$$X_t = \delta_0 + \sum_{i=1}^{k} \delta_{1i} X_{t-i} + \sum_{j=1}^{d_{max}} \delta_{2k+j} X_{t-k-j} + \sum_{i=1}^{k} \eta_{1i} Y_{t-i} + \sum_{j=1}^{d_{max}} \eta_{2k+j} Y_{t-k-j} + \sum_{i=1}^{k} \theta_{1i} M_{t-i} + \sum_{j=1}^{d_{max}} \theta_{2k+j} M_{t-k-j} + \mu_{2t}$$

$$M_t = \lambda_0 + \sum_{i=1}^{k} \lambda_{1i} M_{t-i} + \sum_{j=1}^{d_{max}} \lambda_{2k+j} M_{t-k-j} + \sum_{i=1}^{k} \nu_{1i} Y_{t-i} + \sum_{j=1}^{d_{max}} \nu_{2k+j} Y_{t-k-j} + \sum_{i=1}^{k} \phi_{1i} X_{t-i} + \sum_{j=1}^{d_{max}} \phi_{2k+j} X_{t-k-j} + \mu_{3t}$$

where Y_t is GDP is per capita, X_t is exports as a percentage of GDP, and M_t is imports as a percentage of GDP. For example, from equation (1), X_t Granger-causes Y_t (i.e. ELG holds) if at least one of the $\beta_{1i} \neq 0$ for $i = 1, \dots, k$. From equation (A.2), Y_t Granger-causes X_t (i.e. GLE holds) if at least one of the $\eta_{1i} \neq 0$ for $i = 1, \dots, k$.

Appendix B Results of Toda-Yamamoto non-causality test

Country	Max. Lag	Optimal Lag (*k*)	d_{max}	Order of VAR ($k + d_{max}$)	H_o: Y-/->X (no GLE)	H_o: X-/->Y (no ELG)	Finding
High income:							
Antigua and Barbuda	3	2	1	3	0.13(0.94)	0.69(0.71)	None
Argentina	4	1	1	2	2.82(0.09)*	4.78(0.03)**	Both
Australia	4	1	1	2	0.11(0.74)	2.55(0.11)	None
Austria	4	1	1	2	0.45(0.50)	6.81(0.01)***	ELG
Bahrain	3	1	1	2	2.34(0.13)	1.11(0.29)	None
Barbados	3	2	1	3	5.07(0.08)*	0.81(0.67)	GLE
Belgium	4	1	1	2	0.23(0.63)	2.73(0.10)*	ELG
Canada	4	2	1	3	8.45(0.01)**	0.12(0.94)	GLE
Chile	4	3	1	4	1.20(0.75)	13.39(0.00)***	ELG
Cyprus	3	3	1	4	1.34(0.72)	15.27(0.00)***	ELG
Denmark	4	1	1	2	1.14(0.29)	4.89(0.03)**	ELG
Equatorial Guinea	3	1	1	2	5.47(0.02)**	0.00(1.00)	GLE
Finland	4	1	1	2	2.29(0.13)	3.68(0.06)*	ELG
France	4	1	1	2	1.69(0.19)	0.05(0.82)	None
Germany	4	1	1	2	0.95(0.33)	2.17(0.14)	None
Greece	4	2	1	3	0.08(0.96)	2.54(0.28)	None
Hong Kong	4	2	1	3	3.47(0.18)	4.33(0.11)	None
Iceland	4	2	1	3	11.11(0.00)***	2.41(0.30)	GLE
Ireland	4	2	1	3	0.94(0.63)	1.71(0.43)	None
Israel	4	4	1	5	16.07(0.00)***	7.60(0.11)	GLE
Italy	4	2	1	3	10.99(0.00)***	2.31(0.32)	GLE
Japan	4	1	1	2	0.20(0.66)	0.01(0.92)	None
Luxembourg	4	1	1	2	0.98(0.32)	3.13(0.08)*	ELG
Macao	3	2	1	3	6.29(0.04)**	1.97(0.37)	GLE
Malta	3	2	1	3	6.31(0.04)**	3.31(0.19)	GLE
Netherlands	4	4	1	5	4.83(0.31)	4.66(0.32)	None
New Zealand	3	1	1	2	1.77(0.18)	1.55(0.21)	None

Appendix B Cont.

Country	Max. Lag	Optimal Lag (k)	d_{max}	Order of VAR ($k + d_{max}$)	H_o: Y-/->X (no GLE)	H_o: X-/->Y (no ELG)	Finding
High income:							
Norway	4	2	1	3	1.15(0.56)	0.24(0.89)	None
Portugal	4	4	1	5	8.91(0.06)*	6.00(0.20)	GLE
Saudi Arabia	4	1	1	2	2.96(0.09)*	8.66(0.00)***	Both
Seychelles	3	1	1	2	0.42(0.52)	0.14 (0.71)	None
Singapore	4	3	1	4	2.86(0.41)	3.48(0.32)	None
South Korea	4	1	1	2	0.74(0.39)	1.48(0.22)	None
Spain	4	3	1	4	1.83(0.61)	9.87(0.02)**	ELG
St. Kitts and Nevis	3	2	1	3	0.23(0.89)	5.62(0.06)*	ELG
Sweden	4	1	1	2	0.05(0.83)	7.50(0.01)***	ELG
Switzerland	3	3	1	4	0.48(0.92)	5.25(0.15)	None
Trinidad and Tobago	4	2	1	3	5.16(0.08)*	5.42(0.07)*	Both
United Kingdom	4	3	1	4	7.44(0.06)*	3.00(0.39)	GLE
United States	4	2	1	3	1.03(0.60)	5.62(0.06)*	ELG
Uruguay	4	2	1	3	6.27(0.04)**	0.39(0.82)	GLE
Venezuela	4	1	1	2	0.03(0.87)	6.57(0.01)**	ELG
Middle income:							
Albania	3	3	1	4	9.90(0.02)**	9.32(0.03)**	Both
Algeria	4	1	1	2	2.67(0.10)	1.50(0.22)	None
Bangladesh	4	2	1	3	16.22(0.00)***	3.37(0.19)	GLE
Belize	3	2	2	4	0.95(0.62)	0.79(0.68)	None
Bhutan	3	2	1	3	1.08(0.58)	6.01(0.05)**	ELG
Bolivia	4	3	1	4	4.87(0.18)	6.55(0.09)*	ELG
Botswana	4	2	1	3	0.89(0.64)	0.23(0.89)	None
Brazil	4	1	1	2	0.89(0.34)	1.11(0.29)	None
Bulgaria	3	2	1	3	2.99(0.22)	1.91(0.39)	None
Cabo Verde	3	1	1	2	0.01(0.93)	0.00(0.99)	None
Cameroon	4	4	1	5	1.08(0.90)	30.35(0.00)***	ELG
China	4	3	1	4	2.58(0.46)	0.45(0.93)	None
Colombia	4	2	1	3	1.49(0.47)	3.36(0.19)	None
Congo Republic	4	2	1	3	0.25(0.88)	2.34(0.31)	None
Costa Rica	4	2	1	3	0.21(0.90)	2.10(0.35)	None
Cote d'Ivoire	4	1	1	2	0.00(0.97)	2.06(0.15)	None
Cuba	4	2	1	3	1.06(0.59)	1.32(0.52)	None
Dominica	3	3	1	4	3.53(0.32)	4.86(0.18)	None
Dominican Republic	4	1	1	2	0.02(0.88)	2.02(0.16)	None
Ecuador	4	2	1	3	0.68(0.71)	1.33(0.51)	None
Egypt	4	4	1	5	4.82(0.31)	8.15(0.09)*	ELG
El Salvador	4	3	1	4	7.84(0.05)**	11.89(0.01)***	Both
Fiji	4	1	1	2	1.42(0.23)	0.09(0.76)	None
Gabon	4	2	1	3	0.58(0.75)	4.47(0.11)	None
Ghana	4	3	1	4	1.08(0.78)	16.05(0.00)***	ELG
Grenada	3	1	1	2	0.39(0.53)	5.43(0.02)**	ELG
Guatemala	4	2	1	3	1.71(0.43)	0.91(0.64)	None
Guyana	4	1	1	2	0.57(0.45)	0.13 (0.72)	None
Honduras	4	3	1	4	0.55(0.91)	4.91(0.18)	None
India	4	3	1	4	3.57(0.31)	9.95(0.02)**	ELG
Indonesia	4	4	1	5	3.91(0.42)	2.05(0.73)	None
Iran	4	3	1	4	4.92(0.18)	0.87(0.83)	None
Iraq	4	1	1	2	0.03(0.87)	0.02(0.90)	None
Jordan	3	1	1	2	0.42(0.52)	2.06(0.15)	None
Kenya	4	1	1	2	0.60(0.44)	4.71(0.03)**	ELG
Kiribati	4	1	1	2	0.05(0.82)	1.06(0.30)	None
Laos	3	3	1	4	1.78(0.62)	2.24(0.52)	None
Lesotho	4	1	1	2	0.03(0.86)	0.03(0.86)	None
Malaysia	4	3	1	4	1.54(0.67)	0.61(0.89)	None
Mauritania	4	2	1	3	5.51(0.06)*	3.36(0.19)	GLE
Mauritius	3	3	1	4	24.31(0.00)***	8.87(0.03)**	Both
Mexico	4	1	1	2	0.01(0.93)	0.03(0.86)	None
Mongolia	3	2	2	4	0.78(0.68)	1.15(0.56)	None
Morocco	4	2	1	3	0.46(0.80)	4.26(0.12)	None
Namibia	3	1	1	2	1.36(0.24)	1.00(0.32)	None
Nicaragua	4	4	1	5	16.54(0.00)***	9.86(0.04)**	Both
Nigeria	4	3	1	4	2.17(0.54)	1.87(0.60)	None
Pakistan	4	1	1	2	5.40(0.02)**	1.70(0.19)	GLE
Panama	3	2	1	3	0.99(0.61)	0.45(0.80)	None
Philippines	4	2	1	3	3.69(0.16)	3.48(0.18)	None
Senegal	4	1	1	2	0.63(0.43)	0.39(0.53)	None

Appendix B Cont.

Country	Max. Lag	Optimal Lag (k)	d_{max}	Order of VAR ($k + d_{max}$)	H_o: Y-/->X (no GLE)	H_o: X-/->Y (no ELG)	Finding
South Africa	4	3	1	4	11.51(0.01)***	2.33(0.51)	GLE
Sri Lanka	4	1	1	2	0.00(1.00)	0.50(0.48)	None
St. Lucia	3	1	1	2	0.01(0.91)	5.54(0.02)**	ELG
St. Vincent and the Grenadines	3	2	1	3	3.84(0.15)	0.89(0.64)	None
Sudan	4	1	1	2	0.26(0.61)	0.09(0.77)	None
Swaziland	3	1	1	2	0.43(0.51)	5.62(0.02)**	ELG
Thailand	4	2	1	3	1.03(0.60)	5.57(0.06)*	ELG
Tonga	3	1	1	2	0.01(0.91)	0.51(0.48)	None
Tunisia	4	3	1	4	3.85(0.28)	0.48(0.92)	None
Turkey	4	2	1	3	1.59(0.45)	1.64(0.44)	None
Vanuatu	3	1	1	2	0.10(0.75)	0.60(0.44)	None
Zambia	4	2	1	3	3.17(0.21)	5.74(0.06)*	ELG
Low income:							
Benin	4	1	1	2	0.00(0.95)	1.31(0.25)	None
Burkina Faso	4	1	1	2	0.00(0.96)	0.05(0.83)	None
Burundi	4	2	1	3	4.18(0.12)	0.23(0.89)	None
Central African Republic	4	4	1	5	5.47(0.24)	10.17(0.04)**	ELG
Chad	4	1	1	2	3.38(0.07)*	0.44(0.51)	GLE
Comoros	3	3	1	4	2.01(0.57)	4.77(0.19)	None
Congo Democratic Republic	4	2	1	3	7.50(0.02)**	0.85(0.65)	GLE
Gambia	4	1	1	2	0.11(0.74)	5.77(0.02)**	ELG
Guinea-Bissau	4	4	1	5	6.69(0.15)	0.84(0.93)	None
Madagascar	4	1	1	2	0.53(0.47)	2.18(0.14)	None
Malawi	4	1	1	2	2.89(0.09)*	1.34(0.25)	GLE
Mali	4	1	1	2	0.04(0.84)	1.02(0.31)	None
Mozambique	3	1	1	2	1.25(0.26)	0.66(0.42)	None
Nepal	4	3	1	4	4.43(0.22)	1.52(0.68)	None
Niger	4	1	1	2	3.22(0.07)*	0.01(0.92)	GLE
Rwanda	4	2	1	3	1.41(0.49)	7.90(0.02)**	ELG
Sierra Leone	4	1	1	2	5.92(0.02)**	6.70(0.01)***	Both
Togo	4	1	1	2	0.83(0.36)	0.19(0.66)	None
Uganda	3	1	1	2	2.80(0.09)*	1.24(0.27)	GLE
Zimbabwe	3	2	1	3	6.28(0.04)**	0.27(0.87)	GLE

Notes: Y -/-> X indicates the null of no causality from GDP to exports, and X -/-> Y indicates the null of no causality from exports to GDP. Figures in parenthesis show *p*-value. ***, ** and * indicate significance at 1, 5 and 10%, respectively. The order of *augmented* VAR ($k + d_{max}$; reported in fifth column) is based on the results of unit root tests where d_{max} (fourth column) is the maximum degree of integration, *I(*d) among the variables X, M and Y. The maximum lag length (second column) is calculated by the formula proposed by Enders (2015), as quoted by Hacker *et al.* (2013, p. 130) that "*one should apply a lag length that is maximally $T^{1/3}$ where T is the number of observations, …*" Hacker *et al.* (2013) highlight that an information criteria should be applied in order to determine the appropriate or optimal lag length (*k*) for VAR models. According to Liew (2004), AIC is superior to other criteria in determining the lag length for small samples consisting of 60 or less observations, such as this study with sample sizes ranging from 31 to 55 annual observations. Appropriate *k* based on AIC is reported in third column.