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The Shift in Open Trade Policy due to Economic Maturity

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The study contributes to finding the shift in open trade policy to institutional quality due to economic maturity by juxtaposing developed and developing economies. The research study employs a quantitative approach to examine the impact of open trade policy and institutional quality on industrial production. The panel data consist of seventeen developed and fifteen developing countries ranging from 1999 through 2019. The study applies various econometric techniques like Principal Component Analysis, Panel Unit Root, and Panel Cointegration tests to examine the long-run nexus of open trade policy, institutional quality, and industrial production. We conclude that developing countries with immature economies are inclined to adopt open trade policy over institutional quality to grasp the benefits of increasing industrial production trends. However, developing countries with mature economies prefer to raise institutional quality by standardising their operating norms and procedures in their industries. The study's findings indicate that open trade policy is more beneficial for developing countries than for developed countries. However, higher levels of institutional standards comparatively provide more benefits to developed economies. This study is a practical help in redesigning trade policies by offering comparisons between developing and developed economies worldwide.

Key words: *Institutional Quality, Open Trade Policy, Industrial Production, Developed, Economies, Developing Economies, Panel Co-integration*

INTRODUCTION

Many scholars (such as Balassa, 1971; Michaely, 1977; Edwards, 1993; Dutta & Ahmed, 2004; Hye, Wizarat & Lau, 2016) have rigorously researched the nexus between open trade policy and Industrial Production. Preliminary studies on the subject include Balassa (1971), who reviewed the protection structure in developing countries and proposed an approach to accelerate import substitution. Import substitution is costly that undermines the Industrial Production of developing countries. Notably, in the absence of fair competition, consumers in developing countries have to buy substandard products at high prices. This absence is because domestic manufacturers have almost no incentive to increase the quality of their products. Many research studies (Adamu & Doğan, 2017; Chandran, 2009; Greenaway, Morgan & Wright, 2002; Frankel & Romer, 1999) indicate a significant positive relation between open trade policy and industrial production. However, this positive association between developed and developing countries has not been examined simultaneously. The current study compares the impact of open trade policy and institutional quality between developing and developed economies. It opens a new debate, especially after the wake of the WTO-sponsored World Trade Agreement. This study practically contributes to redesigning the regional policies in both economies, one (developing economies), where there is a wide gap between rich and poor people compared to the other (developed economies).

Lower GDP, higher population growth rate, higher unemployment rate, and dependency on exports of primary goods are the common characteristics of developing economies (Ashraf, Lester & Weil, 2008). Developing economies suffer from a low GDP growth rate that ultimately generates low-income per capita and low-savings for ordinary people. Hence, in general, the low level of investments in the country. Consequently, the system designs a poverty cycle from which the typical person endeavours to escape. A higher proportion of the population has to live a miserable life under the poverty line. Outsized population with a higher growth rate, income inequality, lack of family planning, inadequate education, and poor health are the common characteristics of developing economies. The human development index (HDI) is low in the countries of developing economies. People at large live imperfect lives with a low average expected life span and fighting against miserable health, diseases, and malnutrition compared to their counterpart countries. Another important characteristic of developing economies is a significant gap in the elite class's lifestyle and ordinary people.

Developing economies rely heavily on domestic demand that supports export industry growth (Ye, Shen & Zuo, 2013), while developed economies depend on foreign markets. Needs related to private households are the primary driver of domestic demand. The industrial sector's development is essential for a country's economic prosperity (Fujii & Managi, 2016). Developed economies have a much higher per capita GDP and industrial capacity than developing countries (Maddison, 1983). Roderick and Farquhar (2004) discuss various economic prosperity aspects that include international trade, institutional quality, and

geographical disparities. They conclude that open trade policy and institutional rates are the critical aspects of industrial production and economic prosperity. Therefore, the research scholars tend to make attention to study both variables, i.e., open trade policy (OPT) and institutional quality (INSQ), simultaneously in industrial and economic growth models (Rassekh, 2007) that are ultimately a significant source of sustainable economic development.

Institutional quality is a broad notion that embraces control of corruption, regulatory quality, political stability, government effectiveness, accountability, and the rule of law. Institutional quality and industrial production are the essential features of a stable economy. The government's force creates a strong link with economic growth (Alam, Kiterage & Bizuayehu, 2017), leading to industrial production. Political stability creates investment opportunities with sustainable long-term planning and a healthy environment in a country that is vital for industrial production (Al-Mulali & Ozturk, 2015). The governess is a salient feature of economic and industrial production in developing countries (Gani, 2011). Good governance brings regularity quality and the rule of law that controls corruption. It generates a healthy and politically stable environment, which ultimately leads to useful industrial production.

Open trade policy has a strong relationship with the institutional quality. An adequate taxation system, lower income inequality, literacy rate, employment rate, higher income per capita, and income distribution patterns are institutional quality hallmarks (Alonso, Garcimartin & Kvedaras, 2020). Thus, the role of institutions is vitally crucial for economic growth and industrial development. Institutional quality is critically vital for globalisation and international trade in developing countries (Samadi, 2019) and developed countries. Open trade policy ultimately brings improvement in the quality of institutions in a country. The current study seeks to search the importance of both variables in the context of industrial production in developing and developed economies. Therefore, the present study analyses the relation between open trade policy, institutional quality, and industrial production.

LITERATURE REVIEW

Open Trade Policy and Industrial Production

There exists extensive literature on an open trade policy-industrial growth nexus. For instance, Adamu and Doğan (2017) empirically investigated both long and short-term effects of trade-openness on industrial production in the context of Nigeria. The study applied the ARDL approach and showed that open trade policy positively contributed to industrial production in the short and long run. Anthony, Chukwumaeze, and Anthony-Orji (2020) worked under the export-led growth model and endogenous framework to investigate the short-run and long-run association between open trade policy and the industrial production context of Nigeria. The results showed the positive and significant influence of free trade policy on industrial output in the long run. Simultaneously, the results did not establish any meaningful relationship between open trade policy and industrial production in the short-run. Stout, Brantus, and Moffat (2012)

perceived trade openness as a paradigm of industrial production. They argued that many export-oriented industrial sectors produced tradable goods, which led to industrial production. Findings showed the positive and significant impact of trade-openness on industrial production. Farooq, Chaudhary, and Nawaz (2019) worked in the context of the Cobb-Douglas production function and empirically investigated the role of open trade policy and institutional quality in the growth of the industrial sector in Pakistan. The study applied the co-integration technique for testing the long-run association among the variables. The study results showed a direct impact of open trade policy and institutional quality on Pakistan's industrial production. Results concluded that better institutional quality is essential for the growth of the industrial sector. Back and Chang (2016) tested the linkage between open trade policy and industrial production in the context of OECD nations. For this purpose, they utilised the data of the ten most prominent industries. They showed a significant relationship between these variables, which reported that open trade policy resulted in industrial production that led to trade expansion. Ali, Alam, and Islam (2016) studied the affiliation among free trade policy, economic prosperity, and industrial value-added in Bangladesh and concluded a positive role of industrial value-added and free trade policy in economic prosperity. Findings suggested that Bangladesh should increase its exports and reduce its imports to enhance its economic prosperity. The above arguments allow constructing the following hypothesis:

H_1: There is a positive relationship between open trade policy and industrial production.

Institutional Quality and Industrial Production

Several researchers have explored the relationship between institutional quality and industrial production. Zhou (2018) incorporated the role of institutional quality and human capital in Industrial Production. Using the data of 92 nations, he showed a positive part of institutional quality and human capital in industrial production. Amiri, Samadian, Yahoo, and Jamali (2019) studied the influence of natural resource profusion and institutional quality on the manufacturing industry's value-added. In this regard, the study gathered data from 28 resource-oriented economies from 2003 through 2019. The study results showed the positive impact of natural resource abundance and institutional quality on the value-added manufacturing industry. They suggested that solid political institutions alleviated the adverse effects of the resource curse hypothesis. Klomp and de Haan (2009) studied the relationship between political institutions and economic volatility by collecting 100 economies between 1960 and 2005. We applied a dynamic panel model and showed a negative influence of political institutions on financial volatility. Farooq et al. (2019) studied the empirical association between open trade policy, institutional quality, and Pakistan's industrial production. The study revealed a positive and significant influence of free trade policy and institutional quality on Pakistan's industrial production. The Cobb-Douglas production function supported the results of the investigation.

Similarly, Chetthamrongchai, Jermsittiparsert, and Saengchai (2020) also showed the significant influence of open trade policy and institutional quality on ASEAN economies' industrial production. Law and Bany-Ariffin (2008) worked under the framework of error components and examined the impact of political institutions on economic growth. The study revealed a significant relationship between political institutions and economic development. Based on the above discussion, the study proposes that:

H_2: There is a positive relationship between institutional quality and industrial production

Theoretical Framework

The study's theoretical framework is proposed using four theoretical perspectives; neo-classical trade theory, endogenous growth theory, trade-led hypothesis, and new growth theory. These theories provide strong theoretical justifications that "trade-openness and institutional quality significantly contribute to the industrial output growth/industrial production." Neoclassical growth theory justifies the significant relationship between trade-openness and industrial production through a direct transmission of consumption, saving, and production. The view concludes that trade openness increases the demand for output (Feng, 2006), contributing to industrial output growth (Belton & Little, 2008). The endogenous growth theory by Romer (1986) and Lucas (1988) also highlights the significant relationship between open trade policy and industrial production. The theory claims that trade promotes the saturation of upgraded or modern technologies that results in the advancement of production methods, thereby initiating scales' economies (Helpman, 1981). The theory further concludes that trade openness expands the producers' local or domestic market, which reduces production costs. As the production cost reduces, industries start producing more output, and thus, industrial production increases (Khobai & Moyo, 2020). The trade-led hypothesis also sheds light on the significant relationship between open trade policy and economic growth. The theory suggests that a free trade policy brings a notable increase in industrial production (Krueger, 1998). The hypothesis further suggests that a free trade policy tends to increase industrial output because nations start producing more work after engaging in international trade (Cavallo, De Gregorio & Loayza, 2008). Simultaneously, the new growth theory justifies the significant relationship between institutional quality and industrial production. The approach reports that political instability, falsification of law and order, property rights' uncertainty, and corruption in political institutions are the main hurdles to industrial production (Aixalá & Fabro, 2008). The present study, thereby, proposes that institutional quality has a prominent effect on industrial production/output growth. i.e., weak institutions will hinder industrial production while strong institutions will promote industrial production. Therefore, the present study suggests that theories, as mentioned above, could be useful lenses through which the underlying mechanism among variables has been tested.

METHODOLOGY

Data Sources

The purpose of the present study is to investigate the role of institutional quality (INSQ) and open trade policy (OTP) on industrial production (IPR). To this end, the study collects panel data of seventeen developed and fifteen developing countries ranging from 1999 to 2019 from different sources. In this study, INSQ and OTP (IPR) have been used as independent (dependent) variables. Two control variables (labour force and physical capital) have also been used in this study to obtain more accurate and valid results. However, the operationalisation of variables is given in Table 1.

Table 1: Variables Description

Variable	Measurement
Dependent Variable	
Industrial Production (IRP)	Industrial Production Index
Independent Variables	
Institutional Quality (INST)	The overall index is calculated using PCA on six variables: the rule of law, control of corruption, government effectiveness, regulatory quality, accountability, and political stability.
Open Trade Policy (OTP)	Open Trade Policy is measured by the proxy of (Import+ Export)/GDP.
Control Variables	
Labour Force (LB)	World Development Indicators
Physical Capital(CAP)	Calculated through the perpetual inventory method

Model Specification

The study used the following model for estimation of data as under:

LNIPR = f (INSQ, OTP, LNLF, LNCAP)

The model has the following equation:

$$LNIPR_{it} = \beta_0 + \beta_1 INSQ_{it} + \beta_2 TRO_{it} + \beta_3 LNLF_{it} + \beta_5 LNCAP_{it} + e_{it} \qquad (1)$$

Where: LNIPR is the log of industrial production; INSQ is institutional quality; OTP is open trade policy; LNLF is the log of the labor force; LNCAP is the log of capital, β_0 is the intercept, β_1 to β_5 are coefficients; t is time, i is selected economies, and $_{it}$ is stochastic error term which is assumed to be normally distributed.

Econometric Techniques

Principle Component Analysis (PCA)

The present study uses PCA to calculate the index for institutional standards. PCA is a mathematical system that converts many variables into a small number of unassociated variables, called probable components (Jolliffe, 2002). PCA minimises the multidimensional relationships between variables and converts them into smaller, likely parts with the "maximum variance." PCA has the characteristics to convert the non-linearly related variables to the linearly unrelated variables, and this technique solves the problem of missing values (Peres-Neto, Jackson, and Somers, 2003).

Panel Unit-root test

Non-stationary is one of the most common problems of time series analysis, which, if not detected, provides biased and misleading results. The data must be stationary for valid and unbiased results. Therefore, it is essential to test the non-stationarity of the studied variables to obtain authentic outcomes. The study uses two different unit-root tests, i.e., ADF-Fisher (developed by Maddala & Wu, 1999) and the LLC test (developed by Levin, Lin & Chu, 2002) order to detect the problem of non-stationarity. Both LLC and ADF-fisher tests are extensively used in panel unit root tests in the existing literature and having the null hypothesis of "non-stationary series." The study uses equation 2 to test the stationarity of modeled variables with the LLC test's help.

$$\Delta Y_{gt} = a_g y_{gt-1} + \sum_{M=1}^{ji} b_{gh} \Delta y_{ht} - L + c_{hg} d_{ht} + e_{gt} \quad (2)$$

$_{Ag}$ is auto-regressive coefficients; c_{hg} is the corresponding vector of coefficients; d_{ht} is a vector of regression coefficients, and e_{gt} is the white noise error term.

The study uses equations 3 and 4 to test the stationarity of proposed variables with the ADF-Fisher test's help. We use two test statistics (i.e., Fisher-I and Choi-Z) to detect the problem of stationarity:

$$\text{ADF-Fisher I} = -2\sum_{n-1}^{N} \log(pi) \rightarrow X^2{}_{2N} \quad (3)$$

$$\text{ADF-Choi Z} = \frac{1}{\sqrt{N_{n-1}}} \sum_{N-1}^{N} \emptyset^{-1}(pi) \rightarrow N(0,1) \quad (4)$$

Pi is the probability value; $\emptyset^{-1}$ is the inverse of the standard normal accumulative distribution function.

Panel Co-integration

Co-integration tests are used to test the long-term association among the variables of the study. The present study uses Padroni's (1999) and Johansen's (1988) methodology of co-integration to examine whether the study variables moved together in the long run.

Pedroni test of co-integration: Pedroni's (1999) examination of co-integration is a widely used co-integration test, allowing the model's sizeable heterogeneity. It tests the long-run relation by allowing the number of explanatory variables for the co-integration vectors. It also can deal with complex regressions by providing suitable critical values (Pedroni, 1999). However, the study uses equation 5 to test the co-integration among the study variables.

$$Y_{it} = \alpha_i + \sum_{m=1}^{N} \beta mi\, X_{mit} + \delta_t + \mu_{it} \quad (5)$$

Pedroni uses seven statistics to test the relationship. Four tests are based on "within dimension," while three tests are based on "between dimension." The test is having the null hypothesis of "no-co-integration." If the null hypothesis is rejected, it concludes that the co-integration exists among the study variables, and they all are moving together in the long run.

Johansen's co-integration test: Johansen (1988) developed a co-integration test based on the multivariate framework. He proposes two different methods, i.e., "likelihood ratio trace statistics" and "maximum Eigenvalues statistics," to test the possibility of co-integration relation among variables. The test also assumes the null hypothesis of "non-stationary series." The test is suitable in small cross-sectional units and significant time-span (Wagner & Hlouskova, 2009). If the null hypothesis is rejected, it concludes that all the variables are related to each other (Camba, 2020).

Hypotheses Testing

After getting confirmed that co-integration exists among the variables, the next step is to estimate their coefficients. In the presence of co-integration, as OLS provides biased results, the study, therefore, uses FMOLS and DOLS to estimate the LR coefficients of the variables. DOLS was first developed by Kao and Chaing (2000) for the co-integrated panels. This technique is very reliable for the small sample size. But unfortunately, this technique is not consistent with the heterogeneity. Therefore, Pedroni (2000) developed another method, FMOLS, for the co-integrated panels. This technique provides unbiased estimates even in the presence of heterogeneity and endogeneity.

EMPIRICAL RESULTS

Cross-Sectional Dependence

Table 2 shows the results of the Breusch-Pagan LM and Pesaran CD tests. The tests are applied to test the problem of cross-sectional dependency among the variables. The tests are having the null hypothesis of "cross-sectional independence." Insignificant test statistics (as reported in Table 2) validate the acceptance of the null hypothesis. The study, thereby, concludes that the selected data are free from the problem of cross-sectional dependency.

Table 2: Cross-sectional Dependence

Variables	Breusch-Pagan LM	Pesaran CD	Decision
OTP	1.8742	0.7445	Cross-Sectional Independence
IPR	0.8254	1.6534	Cross-Sectional Independence
INSQ	0.6552	0.6442	Cross-Sectional Independence
LF	1.5423	1.7643	Cross-Sectional Independence
CAP	0.6241	1.3446	Cross-Sectional Independence

Panel Unit Root

The study applies a panel (ADF Fisher and PP Fisher) unit root to test the modelled variables' stationery and integration. Both tests are used for the case of developed and developing nations.

Results of panel unit root tests are reported in Table 3, which is comprised of four panels. Panel A and C show the ADF Fisher unit root test results for the developing and developed nations. While Panel B and D show PP Fisher unit root test results for the developing and developed countries, respectively. Both (ADF Fisher and PP Fisher) are having the null hypothesis of "non-stationary series." Both tests show that all the series in both developing and developed nations are non-stationary at level, i.e., test statistics are insignificant. However, all the serial data become stationary at the first difference. So, it rejects the null hypothesis of "non-stationary series" at the level of 1% for the case of both developing and developed nations. The study, therefore, concludes that all the series are stationary at the first difference and integrated of order 1, i.e., I (1).

Table 3: Panel Unit Root Test for Developing and Developed Nations

Panel A: ADF Fisher for Developing Nations				**Panel C: ADF Fisher for Developed Nations**			
Variables	**Level**	**First-Difference**	**Order of Integration**	**Variables**	**Level**	**First-Difference**	**Order of Integration**
OTP	0.3435	4.4221*	I(1)	OTP	0.3422	6.2653*	I(1)
IPR	1.4622	5.4874*	I(1)	IPR	1.2352	7.6324*	I(1)
INSQ	0.6673	4.2344*	I(1)	INSQ	1.5344	4.6536*	I(1)
LF	1.5633	3.9834*	I(1)	LF	0.3535	6.5344*	I(1)
CAP	1.3464	3.2456*	I(1)	CAP	1.4536	5.3472*	I(1)
Panel B: PP Fisher for Developing Nations				**Panel D: PP Fisher for Developed Nations**			
Variables	**Level**	**First-Difference**	**Order of Integration**	**Variables**	**Level**	**First-Difference**	**Order of Integration**
OTP	1.2322	5.3425*	I(1)	OTP	1.2454	4.2366*	I(1)
IPR	1.3463	4.3444*	I(1)	IPR	0.2463	6.2784*	I(1)
INSQ	0.7584	9.6724*	I(1)	INSQ	0.4242	7.8244*	I(1)
LF	0.4642	6.8724*	I(1)	LF	1.6846	4.9234*	I(1)
CAP	1.4289	5.2673*	I(1)	CAP	1.6723	5.5543*	I(1)

(*): Significant

Panel Co-integration

Panel co-integration tests are applied to test the long-run association among the study variables. The present study used Padroni's (1999) and Johansen's (1988) examination of co-integration for testing the long-run association among variables in the cases of developing and developed nations. Both tests are having the null hypothesis of "no co-integration."

Table 4: Panel Co-Integration Test

Panel A: Padroni Co-integration for Developing Nations								
	Within Dimension (Panel)				**Between Dimension (Panel)**			**Decision**
	V	***rho***	***PP***	***ADF***	***Rho***	***PP***	***ADF***	
Statistic	0.8345	1.7365	-4.2783	-0.2542	2.8734	-4.8745	-2.0673	Co-integration exists
P-value	0.2352	0.0906*	0.0373*	0.2853	0.0655*	0.0024*	0.0733*	
Panel B: Pedroni Co-integration for Developed Nations								
	Within Dimension (Panel)				Between Dimension (Panel)			Co-integration exists
	V	*rho*	*PP*	*ADF*	*Rho*	*PP*	*ADF*	
Statistic	0.2653	1.3422	-1.2763	0.0234	5.7244	-3.8723	-3.5234	
p-value	0.6523	0.9236	0.0736*	0.5193	0.0776*	0.0063*	0.0124*	
Panel C: Johansen Fisher Co-integration for Developing Nations					**Panel D: Johansen Fisher Co-integration for Developed Nations**			
CE(s)	*Trace Statistics*		*Max Eigen Statistics*		*CE(s)*	*Trace Statistics*	*Max Eigen Statistics*	
None	433.7*		235.3*		None	465.6*	262.8*	Co-integration exists
At most 1	274.2*		183.6*		At most 1	217.8*	193.5*	
At most 2	194.4*		88.73*		At most 2	126.9*	86.82*	
At most 3	72.67*		61.98*		At most 3	72.9*	65.94*	
At most 4	47.62*		49.65*		At most 4	6.73*	44.24*	

(*): Significant

Results of panel co-integration tests are presented in Table 4, comprised of four panels. Panel A and B report the Padroni (1999) co-integration test results for developing and developed nations, respectively. The Johansen (1988) test of co-integration is written in panels C and D of Table 4. Panel A shows that 5 out of 7statistics are significant (and reject the null hypothesis of no co-integration) for developing nations. For instance, the test statistic of PP (within and between dimension) is significant, rho (within the extent and between size), and ADF (between measurement) is substantial. The study, therefore, confirms the existence of a long-run relationship among the proposed variables for developing nations. At the same time, panel B shows that 4 out of 7 statistics are significant (and rejects the null hypothesis of no co-integration) for developed countries. For instance, the test statistics of PP (within and between dimension), rho (between measurement), and ADF (between size) are significant. The result also signifies the long-run association among the variables in the case of a developed nation. Results of panel C and D show that all the test statistics (i.e., trace statistics and max Eigen statistics) are significant and rejects the null hypothesis of no co-integration. Therefore, the study confirms the presence of co-integration among the modelled variable.

Hypotheses Testing

Table 5 shows the results of FMOLS which is used to test the hypotheses of the study. Findings show that the coefficient of OTP is 0.7245 for developing nations, while the coefficient is 0.2989 for developed countries. The positive coefficients reveal that a 1% increase in OTP in developing nations tends to increase their IRP by 0.72%, while a 1% increase in OTP in developed countries tends to increase IRP by 0.30%, thus, supporting H1. The coefficients of INSQ are also significant for both developing and developed economies, stating that a 1% rise

in INSQ of developing countries (developed countries) tends to enhance IPR by 0.17% (0.32%). Here, H2 is also supported. The result also shows the significant relationship between control variables (LF and CAP) and IPR. The coefficient of LF is negative in both developing and developed countries, which signifies the negative role of LF in IPR. The coefficient of CAP is positive for both the countries indicating the positive relationship between CAP and IPR. Results suggest that 89.34% (73.43) variations in IPR in developing economies (developed economies) are collectively explained by INSQ, OTP, LF, and CAP. Table 6 shows the outputs of DOLS for both the selected nations. The Table reveals that the coefficient of OTP is significant and positive in both economies. The positive sign indicates that increasing 1% of OTP results in a 0.17% rise in IPR of developing countries while 0.36% inclination in IPR of developed economies; H1 is confirmed.

Table 5: FMOLS

Variables	Developing Nations (DV: IPR)			Developed Nations (DV: IPR)		
	Coefficient	**P-Value**	**Decision**	**Coefficient**	**P-Value**	**Decision**
OTP	0.7245	0.0000*	H_1: ☑	0.2989	0.0000*	H_1: ☑
INSQ	0.1763	0.0000*	H_2: ☑	0.3263	0.0000*	H_2: ☑
LF	-0.0253	0.0000*		-0.1423	0.0243*	
CAP	0.1734	0.0431*		0.2023	0.0548*	
R^2	0.9163			0.8346		
$Adj.R^2$	0.8934			0.7343		

(*): significant; ☑: Acceptance of Hypotheses

Similarly, the coefficient of INSQ is found to be significantly positive, showing that 1% improvement in INSQ causes 0.24% and 0.38% increase in IPR of developing and developed countries, respectively. The findings also confirm H2. Moreover, the results of control variables (LF and CAP) are pretty similar to FMOLS, i.e., LF (CAP) negatively (positively) contributes to the IPR of both economies. Moreover, results indicate that 78.45% (in developing countries) and 78.35% (in developed countries) variations are collectively explained by INSQ, OTP, LF, and CAP.

Table 6: DOLS

Variables	Developing Nations (DV: IPR)			Developed Nations (DV: IPR)		
	Coefficient	**P-Value**	**Decision**	**Coefficient**	**P-Value**	**Decision**
OTP	0.1733	0.0000*	H_1: ☑	0.3656	0.0000*	H_1: ☑
INSQ	0.2434	0.0624*	H_2: ☑	0.3835	0.0463*	H_2: ☑
LF	-0.1073	0.0035*		-0.1354	0.0064*	
CAP	0.0424	0.0537*		0.0754	0.0831*	
R^2	0.8654			0.8754		
$Adj.R^2$	0.7841			0.7835		

(*): significant; ☑: Acceptance of Hypotheses

DISCUSSIONS AND CONCLUSIONS

We conclude that an open trade policy is more beneficial for developing countries than for developed countries. However, higher levels of institutional standards comparatively provide more benefits to developed economies. This study is a practical help in redesigning trade policies by offering comparisons between developing and developed economies worldwide.

The research aims to explore the role of INSQ and OTP in industrial production. The data from a panel of seventeen developed, and fifteen under-developed nations are collected to fulfill this objective. FMOLS results show that OTP has a significant positive impact on IRP in both developing and developed countries. They indicate that a 1% increase in OTP enhances, on average, IRP by 0.72% in developing economies and 0.30% in developed countries. DOLS results also indicate similar outcomes, i.e., there is a positive effect of OTP on IRP in both the nations, stating that 1% inclination in OTP leads to rising IRP by 0.17% 0.36% in developing and developed countries, respectively. The findings support H1: There is a positive relationship between open trade policy and industrial production. This means that the developing countries have more scope to enhance industrial production and economic development through free trade policy than developed countries. It may be because developing economies could have more excellent opportunities for further growth and development, poverty reduction, and job opportunities than developed economies. Open trade policy discovers new markets for international trade for domestic companies. It opens a new channel of innovative products and firm productivity due to global competition. Thus, it contributes to a cycle of economic activities that gives geopolitical benefits and solid wages for workers, reducing poverty. Therefore, it is almost impossible to thrive without an open trade policy (Destek and Sinha, 2020).

The study results also support past researchers' findings (Adamu & Doğan, 2017; Anthony et al., 2020; Stout et al., 2012; Farooq et al., 2019) who also find a positive relation between OTP and IRP. Moreover, the findings support the Neoclassical growth theory, which claims that OTP increases production demand (Feng, 2006), which positively contributes to the IPR (Belton & Little, 2008) through a direct transmission of consumption, saving, and production. In line with the endogenous growth theory, the positive impact of OTP implies that trade promotes the saturation of upgraded or modern technologies, which results in the advancement of production methods, thereby initiating the economies of scales (Helpman, 1981). It further indicates that OTP expands the domestic market for the producers, which reduces production costs. With the reduced production cost, industries start producing more output, and thus, industrial production increases (Khobai & Moyo, 2020). The trade-led hypothesis also supports the positive impact of OTP on IPR, which claims that OTP leads to enhanced IPR as the economies start producing more output after engaging in international trade (Cavallo et al., 2008). Based on the above findings, the study suggests that increasing the open trade policy ultimately improves industrial production for both economies.

Results of FMOLS further indicate a positive impact of INSQ on IRP in both economies. These findings can be explained as a 1% improvement in INSQ causes 0.17% (0.32%) rise in IRP in developing (developed) countries. Moreover, in DOLS, INSQ also positively influences IPR. Increasing 1% of INSQ causes 0.24% and 0.38% rise in IPR of developing and developed countries, respectively; hence, supporting H2: There is a positive relationship between institutional quality and industrial production. These results are similar to past studies (Zhou, 2018; Amiri et al., 2019; Farooq et al., 2019; Chetthamrongchai et al., 2020). The new growth theory justifies the positive impact of INSQ. This theory claims that political instability, the rule of law and order, the uncertainty of property rights, and corruption in political institutions are the main hurdles to industrial production (Aixalá & Fabro, 2008). In line with this theory, the findings imply that weak institutions hinder industrial production while strong institutions promote industrial production. The study recommends strong institutional quality that results in higher industrial production.

The overall results of the study provide exciting findings for policymakers in both economies. Policymakers in developing countries need to pay more attention to open trade policy. However, developed countries should focus on further improving institutional standards to reap maximum benefits.

Limitations and Future Directions

Some limitations of this study may guide future research. Although the study used panel data from 15 developing and 17 developed countries during 1999-2019, it did not consider the rest of the world. We recommend that more countries be included in future studies with an extended period to generalise and validate the empirical results. Finally, we did not consider the risks involved in the open trade policy. We suggest adding these risks in the future study.

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