

INSTITUTIONAL QUALITY AND INNOVATION AT FIRM LEVEL: AN EMPIRICAL EVIDENCE FROM ASIAN COUNTRIES

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Abstract

This study investigated that how institutional quality affects firm level innovation in Asian countries. Strong institutions, like the rule of law, property rights protection, and efficient government, play a key role in creating an environment that supports innovation. The research analyzed how different factors, such as political instability, corruption, crime, R&D spending, workforce training, export exposure, and firm characteristics, influence product innovation using a binary Probit model. Data included firm-level variables and indicators of institutional quality across Asian countries. It was gathered from the World Bank Enterprise Survey (WBES) for this study involving 12 countries. The findings showed that political instability has a positive and significant effect on the chances of firms introducing new products or services. R&D spending showed the strongest positive relationship with product innovation, emphasizing the importance of research and development. On the other hand, crime and corruption hurt product innovation, reducing the likelihood of developing new products or services. The education level of the workforce had a slightly negative effect on patent applications. Interestingly, skill development through workforce training positively impacts product innovation, confirming that human capital is important for driving innovation. The study highlighted the need to improve institutional quality, promote R&D investment, boost workforce skills, and encourage international exposure to stimulate firm innovation in Asian countries. These findings provide useful insights for policymakers looking to create a supportive environment for innovation.

INTRODUCTION

In the current global business landscape, innovation is vital for economic success and competitiveness (Ullah et al., 2022). Companies that can produce innovative new products, services, or solutions have a better chance of staying ahead in the market. However, whether they can innovate is largely influenced by the local institutional environment. Institutional quality refers to how strong and effective a country's formal and informal institutions are. This includes the rule of law, protection for property rights,

and government efficiency, as previous studies have shown (Niu et al., 2020). Institutional quality is a key factor in shaping a nation's capacity for innovation. Strong institutions foster higher rates of quality research and development (R&D), cooperation between organizations, and the commercialization of innovation. Conversely, weak or ineffective institutions can create obstacles for businesses, such as bureaucratic red tape, corruption, and inadequate protection for intellectual property rights. These

issues can discourage innovation and diminish a firm's motivation to innovate (Mateut, 2022).

Given the significant differences in institutional quality across Asia, this issue is particularly relevant for Asian countries. Since innovation plays a crucial role in economic development, it is important to understand how a firm's level of institutional quality affects its capacity for innovation, especially within the Asian context. The connection between institutional quality and firm innovation has been widely studied in developed economies. However, there are fewer studies on this relationship in regions with diverse economic development and varying institutional settings, such as Asian countries (Ullah et al., 2022; Zahid et al., 2024).

Many studies focus primarily on the Western world and overlook how institutional contexts influence innovation activities in Asian economies. This study aims to address these gaps by examining an additional setting in Asia, contributing to the growing evidence that institutional factors significantly impact firm innovation. Furthermore, the findings could improve broader theories about how institutions shape and alter innovation systems within a country. These insights may benefit a wider group of policymakers in developing regions or countries seeking guidance on fostering innovation-driven competitiveness (Shehzadi, 2023; Cai et al., 2024).

Literature Reviews

The literature on how institutional quality affects firm innovation highlights the importance of governance structures, regulatory frameworks, and institutional effectiveness in shaping a firm's innovative capacity. Institutional quality usually refers to factors such as political stability, the rule of law, regulatory quality, and corruption control, all of which significantly impact a firm's innovative activities.

Mosconi et al. (2021) studied the effects of institutional quality and innovation in Emilia-Romagna. They looked at the rule of law, government effectiveness, regulatory quality, and voice and accountability, using data from 2004 to 2011. The results revealed positive and significant effects of the rule of law, regulatory quality, corruption control, and government effectiveness. Kafka et al. (2021) found that institutions positively impact innovation outcomes and economic growth in a cross-country

relationship among three groups, using annual data for 152 countries from 2007 to 2017.

Hussen et al. (2021) examined the relationship between firm-specific actions, innovation and the quality of regional institutions, affecting firm productivity by utilizing an extensive firm-level data set spanning from 2000 to 2019. The study found that enterprises implementing products, process or technological innovations tend to be more productive in regard to labor productivity. Paus et al. (2022) discussed the firm-level characteristic in determined firm-level innovation in 35 African and Latin American countries, the investigation of firm-level and national country affected firm innovation activities and innovation output by using firm-level data from 2014 to 2020.

Mateut (2022) investigated the complex role that various regional institutions play. They compared the differing quality of governance, regulation, the rule of law, and corruption across African nations using panel data from 2014 to 2016. Their findings indicated that boosting economic growth and innovation in Africa requires improving the ability to adopt new technologies. This can be achieved by strengthening capabilities at both national and regional levels. A two-part strategy is necessary, focusing on enhancing domestic institutional frameworks and fostering collaboration between countries.

Njinyah et al. (2022) examined the relationship between manager's level of education (primary, secondary and university degree) and industrial experience in firm innovation, product and process innovation in 17 African countries by using firm level data from 2011 to 2019. The study finds a significant direct relationship between managers with primary and secondary education and firm innovation, showing a significant positive direct relationship between managers with a university degree and firm innovation.

The existing literature shows that the relationship between institutional quality and innovation is investigated for different samples, region, data type and time periods. The current study is investigating the mentioned relationship for the Asian countries.

Data and Methodology

The 12 Asian Countries consider for this study including Bangladesh, Hong Kong, India, Iraq, Malaysia, Myanmar, Mongolia, Nepal, Pakistan, Sri Lanka, Tajikistan, and Uzbekistan. Product innovation means new products or services introduced by the establishment in 3 years. This variable accounts for the innovativeness of the establishment and how inclined they are towards generating new products. R&D: The amount that the establishment spent during its last fiscal year on research and development (not including market research). It is an exogenous variable that represents the effort/commitment of the establishment to technological and scientific innovation in terms of products, processes or services. Crime: It quantifies the impediments to commerce caused by crime, theft

and disorder. This provides relief from the challenge of high crime and security. Corruption: Score Factor represents how much of an obstacle corruption is; It takes note of whether an establishment is subject to the inefficiency and market distortions that arise from corruption. Training (formal course, last fiscal year): Training includes any formal training programs administered in the previous calendar year for permanent full-time employees. This variable indicates the degree to which a company prioritizes employee learning and development. Share of Direct Exports (D expo as % Total Imported): This gives an idea regarding the penetration of units in international markets and dependence on export business.

Table 1 Description of Variables

Variable	Description
product innovation	New Products/Services Introduced Over Last 3 Years
Political instability	How Much of An Obstacle: Business Licensing and Permits
R&D	During the Last Fiscal Year, the Establishment Spent On R&D (Excl Market Research).
Crime	How Much of An Obstacle: Crime, Theft and Disorder?
Corruption	How Much of An Obstacle: Corruption
Training	Formal Training Programs for Permanent, Full-Time Employees in the Last FY
Direct exports	% of Sales: Direct Exports
Manger experience	How Many Years of Experience Working in This Sector Does the Top Manager Have?
Schooling	% of Full Time Workers Completed High School End of Last FY

The variable “product innovation” is a binary indicator variable with a mean value of 0.271, which means that on average 27.1% of the 19,581 observations represent the characteristic of this variable. Which means if firm introduced new product, then it 1 otherwise 0. Another variable “R & D” has a mean value of 0.268, which is equivalent to a 26.8% representation of the characteristic of this variable among observations. The variable shows whether firm spend on research and development or not. Ordinal variables appear to be “crime” and “corruption” variables, indicating different levels or categories of crime and corruption, with mean

variable values of 2.785 and 2.964, respectively. The political instability shows the different categories of obstacles faced by firms ranging from 1 to 5. The “Training” variable is also a binary indicator variable with a mean of 0.292, such as 29.2% of the 19,581 observations have the characteristic of this variable, which shows whether firm provided formal train to workers or not. The “Direct exports”, shows the percentage of sale to direct exports with a mean of 7.917 and a standard deviation of 23.616. The standard deviation of the variable suggests a spread of values for it between the 19,581 observations. The variable is “manger experience” with a mean of 16.284

and a standard deviation of 9.956, shows the experiences of top-level managers. The variable

indicates the spread of exporting experience around the average value of it. Descriptive statistics of the

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Product innovation	19581	.271	.445	0	1
Political instability	19581	2.894	1.26	1	5
Manger experience	19346	16.284	9.956	2	70
Direct Exports	19581	7.917	23.616	0	100
R&D	19581	.268	.443	0	1
Crime	19581	2.785	1.022	1	5
Courts	19581	2.757	1.026	1	5
Training	19581	.292	.455	0	1
Schooling	19581	57.75	34.002	0	100

datasets represent their main characteristics and can help to understand it better and use it further.

The binary probit model is a statistical method that considers the dependent variable to be in two

categories, having only one of these values: coded 0 and 1 (Greene, 2018). In the case of corporate innovation, this could be an indicator of whether a firm has innovated and (1) or not (0).

$$\text{product_inv} = \alpha + \beta_1\text{political_insta} + \beta_2\text{rd} + \beta_3\text{crime} + \beta_4\text{corruption} + \beta_5\text{schooling} + \beta_6\text{training} + \beta_7\text{D_expo} + \varepsilon$$

This study used the above probit model for empirical analysis. Here product inv shows New Products/Services Introduced over Last 3 Years. Political insta represents How Much of an Obstacle: Business Licensing and Permits. RD shows the During the Last Fiscal Year, the Establishment Spent on R&D (Excl Market Research). The variable crime describes How Much of an Obstacle: Crime, Theft and Disorder? The variable Corruption shows How Much of an Obstacle: Corruption. The training variable in model shows that Formal Training Programs for Permanent, Full-Time Employees in the Last FY. The variable D expo describe the % of Sales: Direct Exports. The variable manger experience, shows how many years of experience working in this sector does the top manager Have? And the variable schooling represents the % of Full Time Workers Completed High School End of Last FY

Results and Discussion

The results of Probit Regression model showed in Table 3, a positive and significant relationship between the political instability faced by the firm and product innovation in Asian economies. The significance and the sign of Political instability are

presented in variable Probit regression results, which show that political instability has a significant positive impact on the dependent. The coefficient for political instability is 0.031, statistically significant. This indicates increased political instability obstacles faced by firms associated with the 3 percent increase in new product innovation being succeeded.

The study findings reveal that research and development (R&D) spending emerged as having the most significant positive correlation with a dependent variable at a coefficient of 0.878, statistically significant in Asian economies. These results indicate that when firms spend on Research and Development (R&D) the probability of new product innovation increases by 87%. These results are significant at a 1% level of significance. Antwi et al. (2019) studied the association of R&D investment with product innovation performance among firms in sub-Saharan Africa. The study discovered that greater spending on R&D served as a major stimulus to the creation and release of newer products so far it let companies get customized, new, and distinctive items that could satisfy consumer needs.

The findings reveal that crime is significant and negatively related to product innovation. The coefficient for crime is -0.081.

Table 3: Estimation Results of Probit Regression

Product innovation	Coefficient	Std. Err	P	Z
Political instability	0.031	0.009	0.000	0.014
Spending	0.878	0.026	0.000	0.829
Crime	-0.081	0.011	0.000	-0.103
Corruption	-0.023	0.008	0.006	-0.039
Schooling	0.002	0.000	0.000	0.001
Training	0.401	0.024	0.000	0.354
Direct Export	0.001	0.000	0.052	-0.000
Year	-0.109	0.004	0.000	-0.117
Country	-0.006	0.003	0.049	-0.013
_cons	219.721	7.307	0.000	205.399
LR Chi-squared (10)	5446.64	Log Likelihood	-570.91	
Pseudo R ²	0.2411	No. of Obs	19,346	

These results show that with the increase in crime obstacles, the probability of new product innovation decreases by 8%. In other words, the increased level of crime, the lower the chance of attaining successful product innovation by firms. The negative impact of crime in terms of product innovation is its manifestation as a deterrent for business activities and investment. This article helps to clarify the plausible mechanisms suggested by research on crime effects in tandem with a number of its negative economic and entrepreneurial consequences.

The results suggest that corruption has a statistically significant negative association with innovation, the coefficient for corruption is -0.021. Higher degrees of corruption obstacles are related to a reduced probability of product innovation by 2% in Asian economies. This is also what has been claimed in the literature already on corruption and its adverse impact on economic and business activities. The results are inclined with the studies of Mauro, (1995); Anokhin and Schulze (2009). The coefficient for working Labor who completed secondary school education is 0.001. These results show that the magnitude coefficient is very small. This result is in line with Fernandez et. al, (2020) and Shehzadi and Wetzel (2024). The training variable has a coefficient of 0.401 and it is statistically significant. This implies if a firm trains its workforce, then the probability of successful product innovation increases by 40%. This finding is in line with Saunila et al, (2020).

The experience of management and the percentage of exports have a very small and positive impact on the

probability of product innovation. Respectively the coefficients are 0.001 and 0.002. Innovation is a multi-faceted process that responds, be it internally or externally to various factors. Management experience and export orientation were found as predictors of innovation, but they may lose importance compared to other more important determinants such as R&D investment, technological capabilities or market competition. Contextual factors operating within Asian economies. The particular economic, cultural and institutional contexts prevailing in different parts of Asia may modulate the effects of managerial experience and export focus on innovation. In other words, innovation in Asian economies may be more influenced by government policies or industry clusters rather than firm-specific factors. This is why characteristics such as the experience of management are less important (Lee and Malerba, 2017).

Conclusion

The study examined the impact of institutional quality on firm innovation in 12 Asian countries, highlighting the importance of strong institutions such as the rule of law, property rights protection, and government efficiency in fostering a conducive environment for innovation. The data section identified variables studied in the research including product innovation, institutional quality indicators including political instability, corruption, and crime, and the firm-level characteristics including factors like R&D spending, training, direct exports, as a control variable. The data for this study was collected from

World Bank Enterprise Survey (WBES). A binary probit model was used because of the nature of the dependent variable, which is a binary variable representing the firm's adoption of innovation in the form of new products or services. It also underlined the necessity of using the MLE in the estimation of the probit model and the interpretation of the coefficients as marginal ones. The variables are political instability, research and development (R&D) expenditure, crime, corruption, education standards of the workforce, training of the workforce, direct exports, and managerial experience. The findings reveal that political instability, R&D spending, and skill workers have a positive and significance effect on the likelihood that firms introduce new products or services in Asian Countries. Crimes and corruption exercise negative and significant effects on product innovation, meaning any increased levels of crime and corruption hurdles encountered by firms lower the chances of new product or service development.

Essentially, institutions are central to the formulation of an enabling environment for firm innovation. Here are some recommendations for improvement of institutional quality, which should be pursued by the policymakers: An attempt should be made to control corruption and crime since they were identified as having a bearing on the innovation activities of firms.

The study revealed that there is a very positive association between the level of investment in research and development or R&D and successful product innovation. Policies should be introduced to encourage the firms to undertake R&D activities. Educated employees are vital, particularly in developed countries for development technologies. The authorities should pay attention to the importance of increasing the quality of education. As such, innovation hubs, research parks or industry clusters should be set as platforms and networks of learning. Subsidizes can be offered with the aim having firms undertake development of research projects collectively.

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