Intellectual Property Rights Protection and Economic Growth – An Empirical Based Analysis on the Innovation and Global Competitiveness of Pakistan

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Abstract

Developing countries' policymakers and strategy makers worry about the national competitiveness and closely watch the indices ranking and international competitiveness performance of their country. Global competitiveness may ultimately be achieved by influencing intellectual property rights protection and incentives to innovate, which may affect a country's economic growth in a meaningful way. This study empirically investigates the association among innovation, intellectual property rights protection, economic growth, and global competitiveness of Pakistan. Empirical analysis based on data for 2007 to 2017 shows that no co-integration (long-run relationship) exists between them in Pakistan. However, vector autoregressive model findings show a short-run positive relationship among innovation and intellectual property rights, and global competitiveness of Pakistan and the protection of intellectual property rights. Moreover, we found unidirectional short-run Granger Causality running from innovation to intellectual property rights protection and innovation to economic growth, from economic growth to global competitiveness, and from global competitiveness to the protection of intellectual property rights in Pakistan.

Keywords: Intellectual Property Rights Protection, Innovation, Economic Growth, Global Competitiveness of Pakistan, VAR, Granger Causality

Introduction

Intellectual property rights protection (IPRP) can be advantageous to the value of any organization or business. The capacity to protect a business or ideas of any individual, creation and the original invention is deemed fundamental to many organizations, especially for those who lean on novelty ideas and new products. Intellectual property rights are the legal rights that ensure to the inventor that any other party will not reproduce his conception without his permission or consent. Intellectual property rights (IPR) cover an extensive range of consequences and products. The most ordinary rights are patents, trademarks, copyright, and designs. All these intellectual property rights focus on shielding a unique area of development and invention. The work of art and music is protected with copyright; the design is used to protect the physical or intangible appearance of a product; the approach and the technical stuff which are used to produce a new invention is protected by the patents; the new way of mercantile which separates the trader from his contenders is protected by the trademarks (May & Sell, 2006).

Chin and Grossman (1990) discover that intellectual property does not inevitably enlarge the welfare of every country and sometimes implication of intellectual property rights becomes

the cause of monopolistic culture. In this era of technology, investors and inventors are investing in research and development projects to acquire higher yields and returns in the manifestation of IPR in every country. Strong IPR entice foreign direct investment in the country. Investors take consideration to invest in developed countries because of their high standard of IPR protection. Thompson and Rushing (1996) provided the evidence that in developing countries, the minimum standard of patents rights is not likely to contribute to the nation's economic growth. Results suggested that strong IPR protection can enhance economic growth (EG) when a country achieves a certain level of economic growth.

Seyoum (1996) find that the IPR is a strong staunch for inward investment and IPR stalwartly impact on FDI which become the cause to increase the economic growth. Demyanchuk (2006) estimate the empirical relation between the IPRs and EG for middle-income developing countries and transition economies. Dataset for 91 countries that cover the period of 2000 to 2004 was originated for the study. Results indicated the significant and positive relation between IPR and EG in low-income countries with a low level of IPR and the results were the same for transition countries as well. Strong and low levels of intellectual property rights have both pros and cons for different types of countries.

Furukawa (2007) found that enrichment in IPR protection can negatively impact growth because of an increase in the shares of the monopolized sector. The intention is that whenever the price surges, production always falls. Furthermore, elaborate that stronger IPR can negatively impact the growth of small-medium firms compared to big firms. Sattar and Mahmood (2011) reveals the significant relation between the IPRs and economic growth. This relation was more resilient and significant in established countries as compared to middle and low-income countries. Secondly, relation was strong between IPRs and middle-income countries as compared to low-income countries. The influence of IPRs changes with the country and its economic development. Conclusion is not equivalent in all kind of economies it varies with the condition.

Olwan (2012) confirms with the panel data of 64 developing countries that both IPR and innovation positively impact economic development. The study showed a U-shaped relation among IPR and EG initially impact decline and then intensify and explained that modernization and innovation enhance the existence of robust of IPR protection. Country trade is similarly exaggerated by different levels of IPR protection. Expansion in trade directly relates to the economic growth of the country. Prasetyo et al. (2013) demonstrated the antagonistic relation between IPR protection and the trade volume in factor-driven economies. Studies showed that this negative effect between both variables is not permanent, but it changes with its economic development standards. As the country shifts from a factor-driven economy to an efficiency-driven economy and then transforms into an innovation-driven economy, this negative effect turns zero. The impact of IPR on trade-in factor-driven countries may hamper its capacity to develop its economy, but there is no more significant impact of IPR on trade for efficiency-driven and innovation-driven economies.

IPR strongly contributes its role to import the technology-related and innovative products in the country. Intellectual property rights positively impact imports as well as also on exports. W. Chen (2017) used the data of 119 countries, and the time was from 1976-2010. The study shows the remarkably positive impact of IPR on manufacturing imports, specifically on the products with inordinate technology incarnation. Overall, studies show that IPR have an

impact in all countries, giving indulgence and rights to the inventors and creators to generate different kinds of products without any fear and giving them monopolistic rights.

Garg (2019 illustrate that 1% amplification in patents increases 2% foreign direct investment inward, which enhances technology reassign. The study described that many gaps regarding intellectual property rights are to be filled in Asian countries. The conversion ratio of domestic application of patents into PCT is meager in the Asian economy. The PCT filling ratio is 49.1% of Asian countries. This might be better by humanizing the conversion ratio. All the integrals like growth, trade, innovation, and invention are directly or indirectly related to the IPR and show different kinds of relations in different economies with different levels of protection. Generally, IPR insulated producer rights and gave them confidence and privacy to make ingenious notions and convert these into advanced technologies.

Objective of the study

The objective of this study is to empirically investigates the association among innovation, intellectual property rights protection, economic growth, and global competitiveness of Pakistan. The current study discourses the impact of IPR on the EG in Pakistan. Now the contention of policymakers is whether solid IPR helps to elevate EG and whether the connection between IPR and EG always remains constant or not. There is a possibility that strong and dissimilar IPRs can affect the EG in the altered levels of economic development inversely. Another question is whether the same type of IPRs systems, establishments, and approaches will be applicable for countries at a different level of economic growth. Figure 1 shows the trends of innovation, IPRP, and the global competitiveness index of Pakistan from 2007 to 2017. We can see a boom in innovation and IPRP of Pakistan from 2014 onwards, and that boom ultimately causes the increase of the global competitiveness of Pakistan.

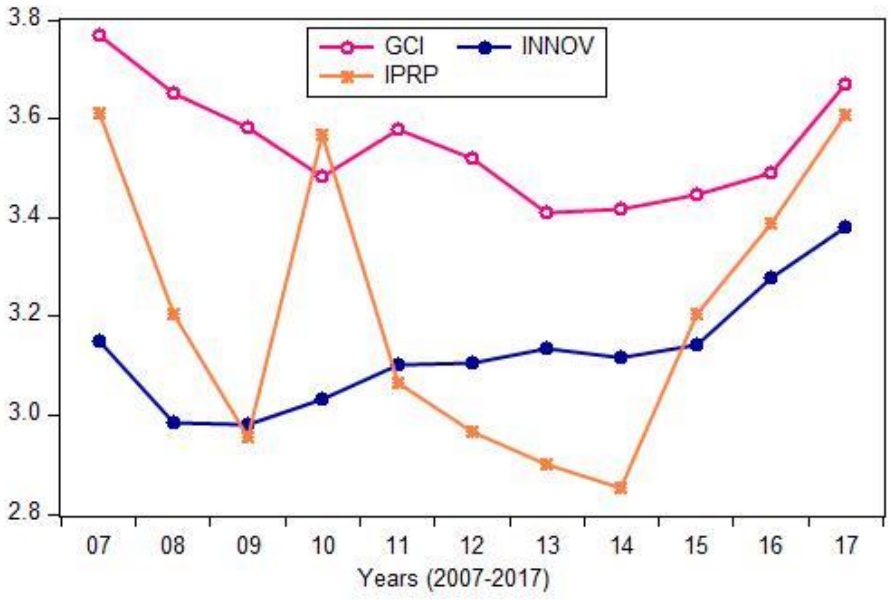


Figure 1. Trends of innovation, intellectual property rights protection and global competitiveness index of Pakistan (2007-2017)

Literature Review

Recent developments in both research and development and innovation have enthused the interest of researchers and policymakers in the links between the economic growth of any

country and IPRP. In the worldwide economy, individual nations obtain further developed advancements through various channels, both direct and by implication, using overflows. These channels incorporate development, authorizing, exchange, unfamiliar direct speculation, impersonation, and theft. Since more grounded IPR security has unique and restricting impacts on the stream of innovation through these channels, the widespread impacts of more grounded IPRs on innovation securing and total development are overall ambiguous. The effect of more grounded IPR security will probably fluctuate across nations relying upon their degrees of advancement, as reflected in their abilities to enhance and emulate (Falvey, Foster, & Greenaway, 2006).

Maskus (2000) provides a methodical review of how an effectual system of IPRs hindered or stimulated economic growth in different 26 economies. Evidence showed that the innovation is delicate towards IPRs while the technology and foreign direct investment move upward when invigorating the IPRs in developing countries. The study illustrates that the overall relation among IPRs and economic development is positive, but it depends upon economic condition of different countries. Monopolistic behavior from the makers or inventors may reason the factor of negative effect between IPRs and economic growth.

Y. Chen and Puttitanun (2005) conduct the pragmatic and speculative analysis between the innovation and the IPRs. The data set consists of 64 countries over the period from 1975-2000. The study found that the innovation dilates in the presence of strong IPRs and IPRs affected by country level of development non-monotonically, decreasing and then increasing. Study showed positive relation between the IPRs and innovation in the developing countries and occurrence of U-shaped relation among economic development and IPRs. They suggested the benefit of stronger IPRs to developing countries is greater than promoting local innovation in a more limited sense in a country.

Falvey et al. (2006) found positive association among IPRs and EG in high-income countries and low-income countries, while the association was not favorable for middle-income countries because of imitation activities. They use threshold regression analysis on the panel data of 80 countries to inspect the relation between IPRs and growth. The study defines that the technology could be enhanced by using different channels like foreign direct investment, piracy policies, trade, domestic innovation, and imitation. These channels affect differently on growth in the presence of a robust IPRs system. Economies with high capita incomes nurture more hastily with a robust IPRs system and FDI and imports expectant by IPR without distressing the country's domestic industry.

Janjua and Samad (2007) tells that the IPRs are now recognized as an essential source for the economic growth of a country. Studies enlighten that developing nations are the signatories of the World Trade Organization, and these nations are leaped by the Trade-Related Aspects of Intellectual Property Rights (TRIPs) agreement of trade-related IPRP. According to this contract, any country violates rule of trade that a particular country will detach from the world. This kind of covenant is not positively affected the middle-income countries. Strengthening the IPRs in developing economies may cause price rises, the balance of payment, redundancy, and they didn't get the foreign investor buoyancy. The developing countries included Pakistan, is not all set to agree this kind of experiment at current stage of economic infrastructure and escalation. While some other variables, like trade openness, political and civil liberty rights, impact positively on the economic growth of the developing countries.

Kim, Lee, Park, and Choo (2012) enlighten the importance of utility models and patents in economic growth and innovation. The study used the panel data of 70 countries. They explore that the patentable inventions to the growth in developed countries but not in developing countries. In small markets, the minor form of IPR like utility models contributes to growth and innovation. When firms reach a high level of innovation capabilities, firms depend more on patents than utility models. It authenticates that patent protection enriches the EG in countries, where the competence to bearing consequential study is existing. The study's goal was not to specify the importance of the IPRs but to select the right type of IPRs for economic growth.

Mohtadi and Ruediger (2014) suggested that the R&D activity could be distinguished in developed as well as non-developed nations because the developed nations take innovation as principal factor of R&D activity while the developing economies are affianced in imitation. They confirm that at a certain critical level of human capital threshold, IPRS can affect economic growth differently in both economies. Over a certain level, IPRs affect economic growth, and the effect could be contrary below a certain level. This approach of a human capital certain level breaks apart the two different countries into two different development disciplines.

Bielig (2015) analyze the association among different types of IPRs and EG in Germany. Data of GDP as economic development is taken from 1999 to 2009. They define that not all IPR significantly influences the gross domestic product in the Germany. Stocks of patents, trademarks, and industrial designs relate positively and reveal significant relation with the GDP, while the application for utility models influence negatively with the economic development. The relation between utility models and GDP was significant but negative. With the help of estimation coefficient study ratifies that the most substantial relation was spotted between the trademarks and GDP and after that design stock and patents. The study describes the German economy's specific innovation and technology structure and finds that three national intellectual property rights have a lot of importance in Germany: design development, complex technologies, and product differentiation.

Odilova (2016) originate the nonlinear relation between the IPRs and international trade. According to them, international trade is higher in those countries where the IPRs protection is restrained. Developing countries can make their trade better to heighten the IPRs protection in their countries. In developed countries where the IPRs protection is high, trade increases with the increase of IPRs. Data is used for 114 countries from 2010 to 2015. This study is limited to cross-sectional evidence because of the lack of IPR index data on an annual basis which is a gap to fill, and other was the use of complicated methods because of nonlinear relation between the trade and IPRs. In the end, the study described that developing economies can advance their IPRs by investing in resourceful institutions and human capital.

Shahhosseini, Vasfi Asfestani, and Naserzadeh (2017) talked about the importance of IPRs, TRIPS agreement, and new growth theories. The economic model is used through the panel data of 104 countries. A quantitative index of IPRs is applied to examine the effect of IPRs on EG. Foreign direct investment, GDP per capita, IPR indexes, and GDP growth are studied. The study confirms a positive relationship between IPRs protection and EG in all countries. They also found a well set of IPRs can positively impact by increasing the growth, welfare, and transfer of technology.

AYAPPAN and CHIN (2018) scrutinize the role of IPR on the foreign direct investment (FDI) inflow on EG. Three proxies of IPR are used, which are patents, design applications, and the trademark. Specific proxy of IPR is used to check the effect of IPR on FDI of particular countries sample. Data set of 103 countries are taken from 1998 to 2013, which is 16 years' period. All the substitutions of IPR and interaction terms of FDI are applied in a distinct model named two-step GMM. The outcomes showed that the FDI patents didn't show any significant relation towards the growth. FDI trademark and design exerted a positive influence on EG. Nations with strengthened IPRs can make escalation their growth through FDI. The implication of strict rules of IPR can quickly fascinate the foreign financier who can help make an enormous FDI in the country. Recently, Fatma and Zouhaier (2021) conducted a panel study on Arabic countries for investigating the relationship between foreign direct investment, intellectual property rights and economic growth and found that FDI responded positively to the level of intellectual property rights protection and also increases economic growth of Arabic countries.

Methodology

Sample population of this study is Pakistan, and we used secondary data for analysis. The sources of data are the Global Competitiveness Index and The World Bank databases. The sample time of the study ranges from 2007 to 2017, based on the availability of data. Variables used in this study include Innovation (INNOV), Global Competitiveness Index (GCI), Economic Growth (EG) and Intellectual Property Rights (IPRP). Where INNOV is measured as the total number of applications of patents, trademarks and industrial designs. EG is measured as the gross domestic product (GDP) of Pakistan. GCI is measured as Global Competitiveness Index of Pakistan. IPRP is measured as the intellectual property rights protection of Pakistan. The current study applied multiple data analysis and econometric techniques, such as Descriptive Statistics, Correlation Matrix, Unit Root test, Lag Selection Criteria, Co-integration test, Vector Auto Regressive model, Granger Causality test, and Impulse Response Function, in order to find the role of intellectual property rights protection in the economic growth of Pakistan.

Descriptive statistics are used to look at the overall dataset summary and tell us about the normality of the variables used in the analysis. The correlation matrix tells about the multicollinearity among independent variables. The dataset used in this study is time-series in nature; therefore, we applied time series econometric techniques. In order to find the stationarity of the variables, we applied the unit root test (Pantula, Gonzalez-Farias, & Fuller, 1994). Testing information for stationarity is vital in the research where the essential factors are based on the schedule. Also, time-series information investigation has numerous applications in numerous spaces, including concentrating on the connection among wages and house costs, benefits and profits, and utilization and GDP. A significant econometric errand is deciding the most fitting structure of the pattern in the information. Numerous economic and monetary time series show moving conduct or non-stationarity in the mean. Driving models are resource costs, trade rates, and the degrees of macroeconomic totals like real GDP. There are diverse conventional strategies used to check the information for stationarity proposed by various specialists. However, in this article, our accentuation will suffer on the test proposed by (Dickey & Fuller, 1981) they foster a conventional test for stationarity. The critical thing in their test was that trying for non-stationarity is identical to testing for unit root. Besides evaluation there is additionally on Dickey and Fuller test that the force of the test is deficient;

around 30% it settles on the right choices. It isn't a practical test, and the tests utilized for unit root have low power.

A Co-integration test is applied to the dataset for finding the long-run relationship. Co-integration tests recognize situations where at least two non-fixed time series are incorporated together such that they can't veer off from harmony in the long haul. The tests are utilized to distinguish the affectability of two factors to a similar average cost throughout a predefined timeframe. A co-integration test is utilized to build up in case there is a relationship between few time series in the long haul. The idea was first presented by Nobel laureates Robert Engle and Clive Granger in 1987 after British market analyst Paul Newbold and Granger distributed the misleading relapse idea (Engle & Granger, 1987).

Vector autoregression (VAR) is a factual model used to catch the connection between various amounts and change over the long run. VAR models sum up the single-variable (univariate) autoregressive model by taking into consideration multivariate time series. VAR models are frequently utilized in financial matters and the inherent sciences. A vector autoregression (VAR) is an essential econometric device in econometric investigation with broad uses. Among them, a period fluctuating boundary with stochastic instability, proposed by (Primiceri, 2005), is comprehensively utilized, particularly in dissecting macroeconomic issues (Nakajima, 2011).

Results and Findings

Table 1 describes the summary statistics of IPRP, INNOV, GCI, and EG of Pakistan sample from 2007 to 2017. The mean value of IPRP is 3.2116, with a standard deviation of 0.2907. The mean value of INNOV is 3.1282, with a standard deviation of 0.1180. The mean value of GCI is 3.5472 with a standard deviation of 0.1148. The mean value of EG is 26.0993, with a standard deviation of 0.2316. The probability values of variables are insignificant, meaning that the variables are normally distributed. Table 2 shows the results of the correlation matrix, which confirms that there is no problem of multicollinearity among variables of the study.

Table 1. Summary statistics of variables

	IPRP	INNOV	GCI	EG
Mean	3.2116	3.1282	3.5472	26.0993
Maximum	3.6113	3.3805	3.7703	26.4434
Minimum	2.8532	2.9814	3.4102	25.7497
Std. Dev.	0.2907	0.1180	0.1148	0.2316
Skewness	0.2785	0.8025	0.5488	-0.0793
Kurtosis	1.5555	3.1428	2.2733	1.7106
Jarque-Bera	1.0985	1.1899	0.7942	0.7735
Probability	0.5774	0.5516	0.6723	0.6793

Table 2. Correlation matrix of variables

	IPRP	INNOV	GCI	EG
IPRP	1	-	-	-
INNOV	0.4382	1	-	-
GCI	0.5591	0.0844	1	-
EG	-0.0556	0.7102	-0.4575	1

Tables 3 and 4 show the unit root test results under two different parameters, i.e., Augmented Dickey-Fuller and Philips-Perron. The results show that all variables are not stationary at levels under both parameters but become stationary at the first level (T-Static value > 5% critical value).

Table 3. Augmented Dickey-Fuller unit root test results

	Augmented Dickey Fuller (Level)		Augmented Dickey Fuller (1st Difference)		Augmented Dickey Fuller (2nd Difference)	
Variables	Test Static	5% Critical Value	Test Static	5% Critical Value	Test Static	5% Critical Value
IPRP	-1.444	-2.941	-2.448	-2.941	-3.940	-2.951
INNOV	-0.596	-2.933	-3.239	-2.933	-7.200	-2.935
EG	-0.001	-2.933	-3.470	-2.933	-8.035	-2.935
GCI	-1.669	-2.933	-1.840	-2.933	-8.222	-2.935

Table 4. Philips-Perron unit root test results

	Philips-Perron (Level)		Philips-Perron (1st Difference)		Philips-Perron (2nd Difference)	
Variables	Test Static	5% Critical Value	Test Static	5% Critical Value	Test Static	5% Critical Value
IPRP	-2.135	-2.931	-3.746	-2.933	-8.468	-2.935
INNOV	-0.296	-2.931	-3.328	-2.933	-7.263	2.935
EG	-0.687	-2.931	-3.552	-2.933	-8.039	-2.935
GCI	-1.943	-2.931	-1.719	-2.933	-8.233	-2.935

Assessing the lag length of the autoregressive cycle for a period series is a pivotal econometric exercise in most monetary investigations. The most intriguing finding of this review is that Akaike's data model (AIC) and last expectation mistake (FPE) are unrivaled than different rules understudy on account of little example (60 perceptions and beneath), in the habits that they limit the shot at under assessment while augmenting the shot at recuperating the actual slack length (Liew, 2004). Table 5 presents the results of lag selection criteria processed on EViews software. According to LR, FPE, AIC, SC, and HQ, we can see that the optimal order is two. Therefore, in the co-integration analysis, we use the lag length of 2.

Table 5. Lag selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	130.639	NA	0.000	-6.332	-6.163	-6.271
1	378.012	432.903	0.000	-17.901	-17.056	-17.595
2	436.131	90.08387*	2.483914*	-20.00653*	-18.48654*	-19.45695*
3	447.814	15.773	0.000	-19.791	-17.595	-18.997
4	461.361	15.579	0.000	-19.668	-16.797	-18.630

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

Table 6 shows the results of the Johansen co-integration test, in which the co-integration is observed under two different parameters, i.e., Trace Statistic and Max-Eigen Statistic. We can see that by considering both criteria, we found the evidence of the non-existence of co-integration among intellectual property rights protection, innovation, economic growth, and global competitiveness in the context of Pakistan. The co-integration graph is shown in figure2. We can say that there is no long-run relationship exists between intellectual property rights protection, innovation, economic growth, and global competitiveness in Pakistan for the period of 2007-2017.

Table 6. Johansen Co-integration test results

No. of CE(s)	Eigenvalue	Trace Statistic	Critical Value at 5%	Prob.
None *	0.64015	67.79065	47.85613	0.0002**

				*
At most 1	0.394563	25.88591	29.79707	0.1321
At most 2	0.120408	5.311916	15.49471	0.7748
At most 3	0.001261	0.051724	3.841466	0.8201

No. of CE(s)	Eigenvalue	Max-Eigen Statistic	Critical Value at 5%	Prob.
None *	0.64015	41.90474	27.58434	0.0004***
At most 1	0.394563	20.57399	21.13162	0.0597
At most 2	0.120408	5.260192	14.2646	0.7087
At most 3	0.001261	0.051724	3.841466	0.8201

*Note: Significant @ 99% CI

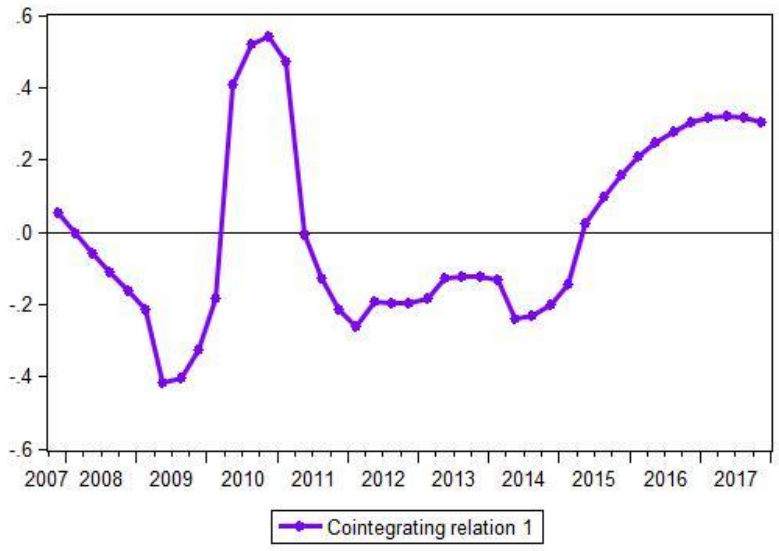


Figure 2. Co-integration graph

Table 7 shows the results of the VAR model of this study. The VAR model is applied to find the short-run relationship among variables of the study. Table 7 provides the results in four primary columns explaining the results of each dependent variable with all independent variables. We can see that in the short-run, only the previous period IPRP has a significant impact on Pakistan's current IPRP with lag 1 and 2, and INNOV, EG and GCI have no relationship with the IPRP of Pakistan in the short run. IPRP has a significant positive impact (95% confidence interval), on the INNOV in Pakistan, whereas EG and GCI have no impact on INNOV in the short-run in Pakistan. IPRP, INNOV, and GCI have a relationship with EG in Pakistan in the short-run, whereas IPRP has a positive significant (95% confidence interval) relationship with GCI of Pakistan in the short-run.

Table 7. VAR model results

	Dependent Variable IPRP		Dependent Variable INNOV		Dependent Variable EG		Dependent Variable GCI	
Independent Variables	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
IPRP LAG 1	1.493	0.000***	0.039	0.0141**	0.026	0.268	0.060	0.038**
IPRP LAG 2	-0.810	0.000***	-0.013	0.460	-0.008	0.782	-0.007	0.830
INNOV LAG 1	1.436	0.228	1.431	0.000***	0.002	0.991	-0.128	0.545
INNOV LAG 2	-0.939	0.375	-0.569	0.000***	0.110	0.699	0.158	0.406
EG LAG 1	-0.268	0.828	-0.082	0.494	1.248	0.000***	-0.374	0.099
EG LAG 2	-0.035	0.977	0.150	0.199	-0.334	0.0683*	0.366	0.093
GCI LAG 1	1.705	0.110	0.132	0.198	0.099	0.529	1.695	0.000***
GCI LAG 2	-1.372	0.216	-0.124	0.247	-0.212	0.204	-0.799	0.0003***

Note: *Significant @ 90% Confidence Interval
**Significant @ 95% Confidence Interval
***Significant @ 99% Confidence Interval

Granger causality results shown in table 8. Results show that unidirectional short-run Granger Causality runs from innovation to intellectual property rights protection and innovation to economic growth, from economic growth to global competitiveness, and from global competitiveness to the protection of intellectual property rights in Pakistan.

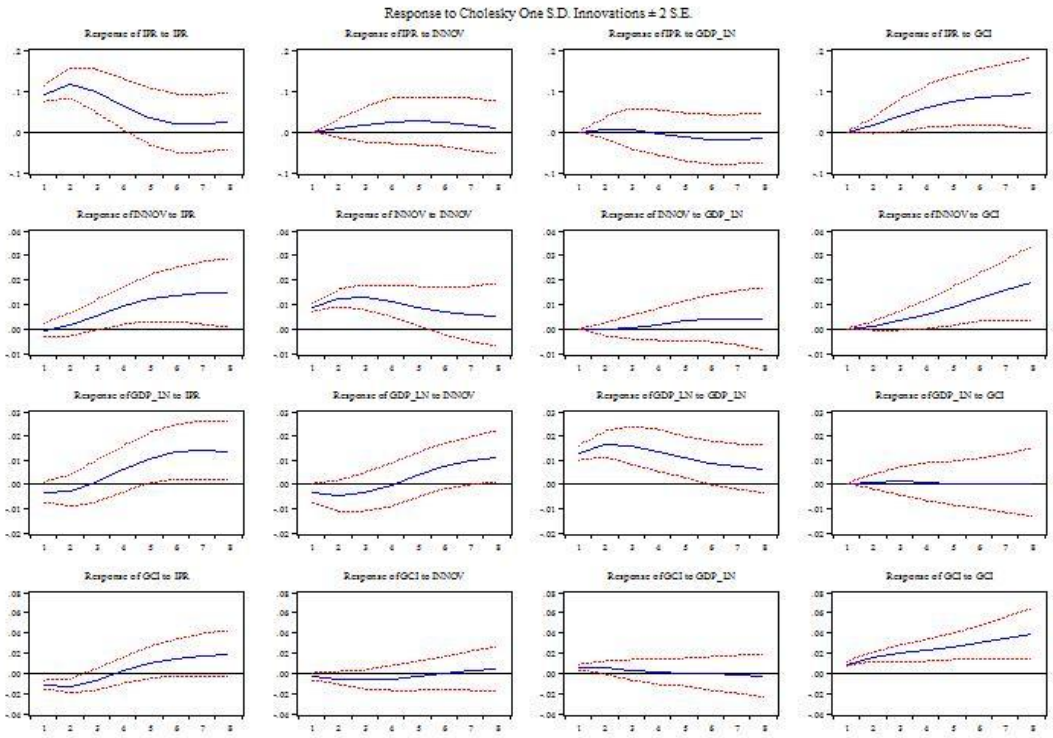
Table 8. Granger causality results

Independent Variables	IPRP	INNOV	EG	GCI
IPRP	_	0.001***	0.249	0.001***
INNOV	0.349	_	0.104	0.605
EG	0.480	0.006***	_	0.222
GCI	0.097	0.388	0.014**	_

Note: *Significant @ 90% Confidence Interval
**Significant @ 95% Confidence Interval
***Significant @ 99% Confidence Interval

The results of IRF are shown in figure 3, which describes if we provide one standard deviation positive shock to INNOV, IPRP, EG, and GCI, then how they react in the future. We can see that if one positive shock occurs in IPRP, it will lead to positive shocks in INNOV and GCI and negative shock in EG. A positive shock in INNOV will lead to positive shocks in IPRP, EG, and GCI. Similarly, a positive shock in EG may lead to INNOV and IPRP and less impact on GCI. Finally, positive shock in GCI may lead to a decline in IPRP, INNOV, and EG.

Figure 3. Impulse Response Function (IRF)



Conclusion

This study attempts to find the role of intellectual property rights protection in the innovation and economic growth of Pakistan for the period of 2007-2017. The current study is unique in that to the best of our knowledge, and no similar study exists in the context of Pakistan. By using multiple econometric time series techniques, we found exciting findings in the context of Pakistan. The findings suggest that there is no co-integration (long-run relationship) exists between them in Pakistan. However, vector autoregressive model results show a short-run positive relationship exists between the global competitiveness of Pakistan and the protection of intellectual property rights and innovation and protection of intellectual property rights. Moreover, we found unidirectional short-run Granger Causality running from innovation to intellectual property rights protection and innovation to economic growth, from economic growth to global competitiveness, and from global competitiveness to the protection of intellectual property rights in Pakistan.

Theoretical Implications

The study of intellectual property rights is essential for the better understanding, identification, documentation, planning and commercialization related activities of

innovation. Every organization is required to develop its own intellectual property rights policies in order to operate legally. This study provides many valuable insights to the young researchers, intellectual property managers, policymakers, and government bodies, in different ways. For researchers, this will guide and motivate the interest of study in the intellectual property rights area. For intellectual property managers and government bodies, this will provide a guide while promoting and making policies related to intellectual property rights protection in Pakistan and as well as for other countries.

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