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Intellectual Property Rights and Creative Industries in Pakistan: Evidence from Copyright and Patent Protection

Danyal Khan[*]

ABSTRACT

Intellectual Property (IP) rights play an important role in enhancing innovation, creativity, and knowledge-based economic growth. This study examines whether the protection of copyright and patents in Pakistan is associated, over the long run, with the performance of industries comprising the country's creative economy. The paper combines doctrinal analysis of the Copyright Ordinance 1962, the Patents Ordinance 2000, and Pakistan's obligations under the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) with an econometric assessment based on the Autoregressive Distributed Lag (ARDL) bounds testing approach, a methodology well suited to relatively small annual samples and to variables that settle into a stable pattern at different speeds. Model 1 in this paper examines the contribution of copyright-based export categories to Pakistan's total export receipts between 2002 and 2021. Model 2 explores the determinants of resident patent registrations between 1990 and 2021, using exports, GDP growth, manufacturing and services, and the tax-to-GDP ratio. The bounds tests confirm that the relationships are stable over the long run rather than coincidental. The results further indicate that periodicals and printed books, printing and related machinery, embroidery, and wooden articles had a positive and statistically significant association with export levels. GDP growth, exports, and lagged manufacturing were also identified as significant determinants of resident registrations, whereas the contemporaneous manufacturing share, services, and the tax-to-GDP ratio were not statistically significant. The error-correction estimate suggests that about half of any disequilibrium is corrected within a year. The findings suggest that the effective enforcement of copyright and patent law in Pakistan is better understood as an instrument of industrial development rather than merely as the fulfilment of an external treaty obligation.

Keywords: IP Rights, Creative Economy, Copyrights, Patents, Pakistan, Industry

JEL Classification Codes: O34, O38, Z11, O53, O31, L82

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1. INTRODUCTION

The economic contribution of creative industries is increasing as the global economy shifts and creative ideas produce more value than other inputs (UNCTAD 2018; Landoni et al., 2020). Over the last five decades, industries related to creativity, such as Google, Apple, Microsoft and Amazon, have disrupted the market by contributing significantly through innovative policies, an optimal understanding of culture and a systematic understanding of customers (Lampel and Germain 2016). Due to their post-industrial qualities, such as flexible organisational structures, use of technologies and employment of creative and technical abilities, the creative industries are of great interest to business and management researchers (Santoro et al., 2020). Also, a wide range of organisational traits and activities, including small enterprises, cultural entrepreneurs and major multinationals, are included in the creative industries (Li 2020).

The value of the global market for creative goods doubled between 2002 and 2015, rising from USD 208 billion to USD 509 billion (UNCTAD 2018). The creative industries in the European Union accounted for 3% of all employment in the Union and 3.3% of its GDP (European Commission 2012). The UK's Department for Digital, Culture, Media and Sport calculated the contribution of the creative industries to the gross value added at £115.9 billion in 2019, representing 5.9% of the national economy, which is a growth of 5.6% compared with the previous year (DCMS 2023).

The situation is entirely different in Pakistan where creative and cultural industry is relatively small considering the large population, is made up of micro and small firms, and faces a lack of financing opportunities, while its enforcement policy offers no clear incentives to the protection of creativity (Nazir et al., 2021). Pakistan is ranked 99th out of 135 countries in the Global Innovation Index 2025 (WIPO 2025). The creative economy is generally driven by IP rights, which give innovators, inventors and artists legal protection and incentives to develop and market novel and creative works (Khan et al., 2019). IP rights play a huge role in the creative economy, that is, in the economic sector centred on the invention, production, distribution and marketing of creative goods and services (Rudge 2021). By enabling creators and owners to profit from their creations, they serve as incentives for innovation and creativity. Because IP rights allow creators and owners to regulate the use of their works, they also support the diffusion of knowledge and artistic expression. By encouraging the creation and marketing of innovative technologies and creative works, IP rights support economic growth and competitiveness (Palla and Strickler 2021). However, they are not costless. A hurdle for small enterprises and independent producers is the expense of acquiring and upholding IP rights. Exclusive rights can also result in disagreements and conflicts, especially where several parties assert ownership over the same creations (Hirschmann and Block 2022).

This paper accordingly asks three questions. First, is there a stable long run relationship between the export performance of Pakistan's copyright-based industries and its aggregate

export receipts? Second, which macroeconomic and structural variables account for the level of resident patent registrations? Third, what follows for the design and enforcement of the Copyright Ordinance 1962 and the Patents Ordinance 2000?

2. LITERATURE REVIEW

Mansfield (1986) demonstrated that whereas 65% of pharmaceutical and 30% of chemical breakthroughs would not have been introduced without patent protection, the proportion was negligible in several other industries, including textiles, rubber and motor vehicles. Falvey et al. (2006) and Gould and Gruben (1996) found cases in which patent protection had a major impact on economic growth. Other empirical research reveals an indirect rather than a direct impact, operating through factor accumulation (Thompson and Rushing 1999). Varsakelis (2001) and Kanwar and Evenson (2003) looked at the connection between patent protection and growth factors such as innovation or R&D, finding that R&D to GDP ratios were favourably correlated with the strength of patent rights. Schneider (2005) found that improved patent protection mainly benefits innovation in industrialised nations. Chen and Puttitanun (2005), modelling the trade-off a developing country faces between imitating foreign technology and encouraging domestic invention, found on a panel of 64 developing countries both a positive effect of protection on domestic innovation and a U-shaped relationship between the strength of protection and the level of development, so that optimal protection first falls and then rises as technological capability improves. According to Cohen et al. (2000), patents are used by companies for a variety of reasons other than profits, including blocking and cross licensing, so patent counts are an imperfect proxy for innovation.

The creative economy is a significant contributor to GDP in the EU, where the creative industries generate approximately Euros 628 billion in annual turnover (Bilan et al., 2019). Comparative work on Asia has emphasised that policy models developed in Europe and North America are adapted rather than simply imported when they travel (Kong et al., 2006). Lorenzen (2019) showed how a digital creative cluster in Bangalore, India emerged from the interaction between multinational entrants and local firms. Work on small creative firms in developing countries has drawn attention to the role of social networks in sustaining innovation where formal institutions are weak (Shafi et al., 2019). The government has also played a role in promoting the creative industries in the region through specialised development zones and regulations (Kong et al., 2006). In China, the cultural and creative sector has expanded rapidly, driven by strong domestic demand, a large and growing middle class and an increasing policy focus on innovation and creativity (Murphy 2012).

Many nations have adopted IP laws and systems that balance the interests of inventors and owners with those of the public (George 2011). Such systems enable the production of value and offer a legal framework for the protection and exploitation of creative works and innovations (Granstrand 2020). The development of digital technology has made it simpler

to produce, distribute and access creative works, but it has also made it more challenging to protect IP rights and to stop unlawful use and infringement (Pathak and Muralidharan 2020).

The protection of copyright is one of the main ways in which IP rights fuel the creative economy. Copyright grants creators the exclusive right to reproduce, distribute and display their original works of authorship, including works of literature, music and art (Stokes 2019). This gives authors the ability to manage how their works are used and to profit from them by selling copies or licences (Sherwood 2019). With the help of patents, inventors can prevent others from creating, using or commercialising their inventions without consent for a set period (Huang and Li 2019).

IP rights are a significant component of Pakistan's economy (Janjua et al., 2019). The Intellectual Property Organisation of Pakistan oversees the registration and protection of IP rights, including copyrights, trademarks, patents and industrial designs. However, protection of IP rights remains a challenge (Murtiza and Muhammad 2019). Pakistan has undertaken legislative reforms to strengthen and modernise its IP framework. Copyright protection is governed by the Copyright Ordinance, 1962, as amended by the Copyright (Amendment) Ordinance, 2000. Patent protection is governed by the Patents Ordinance, 2000, which provides for a 20-year term of protection from the filing date and permits compulsory licensing under specified statutory conditions. Pakistan, as a member of the World Trade Organization (WTO), is obligated to comply with the TRIPS Agreement, particularly Articles 27, 33 and 41 concerning patentability, the term of patent protection and enforcement. However, Articles 7 and 8 recognise public interest objectives and allow policy flexibility within the framework of TRIPS obligations.

There are ongoing debates about the appropriate balance between protecting IP rights and promoting access to knowledge and technology (Ali and Khan 2021). Some argue that strong protections are necessary to encourage innovation and growth, while others argue that overly strong protections limit access and hinder development (Nadeem et al., 2021). The high costs of obtaining and enforcing patents and other IP rights in Pakistan can make it difficult for smaller businesses and individuals to protect their creations (Wadho and Chaudhry 2020).

Because Article 227 of the Constitution of the Islamic Republic of Pakistan 1973 requires that all laws be brought into conformity with the injunctions of Islam, and Article 2A makes the Objectives Resolution a substantive part of the Constitution, it is important to justify IP rights with references to the sources of Islamic law. Additionally, it is pertinent to note that Article 2A does not enjoy supra constitutional status. In the case of Hakim Khan v Government of Pakistan PLD 1992 SC 595, the Supreme Court found that Article 2A carries similar weight as the other provisions of the Constitution of Pakistan, a position reaffirmed in Mahmood Khan Achakzai v Federation of Pakistan PLD 1997 SC 426. The injunctions of Islam, therefore, operate as an authoritative interpretive standard within the

constitutional order rather than above it. The idea of trust (*amanah*), which calls for people to uphold their obligations and defend the rights of others, is one such value, and it supports the proposition that the work of another should not be misused or exploited (Khan 2000). Another important principle is fairness (*adl*), which is relevant to IP rights in that it suggests individuals should not profit unfairly. Contemporary scholarship examines IP law through the framework of *'maqāṣid al-sharīʿah'* (objectives of Islamic law), arguing that exclusive rights can be accommodated within Islamic legal principles, provided they remain consistent with distributive justice and environmental sustainability (Ratnawati and Al Farizi 2023).

Locke's theory of natural rights, according to some academics, lays the groundwork for the idea of IP rights (Fazio 2019). This viewpoint holds that IP rights are a type of property right that safeguards the works of the mind, gives authors control over how they are used and enables them to profit from that use (Snow 2021). Others have countered that Locke's idea of natural rights may not apply fully to intangibles, because there are important distinctions between physical property and IP (Mossoff 2012). Empirically, stronger protection has been associated with higher rates of technology transfer, although the effect is mediated by the absorptive capacity of the recipient economy (Wakasugi and Ito 2009).

2.1. Creative Economy Framework for Pakistan vis-à-vis IP Rights

By giving creators legal protection and allowing them to profit from their creative endeavour, IP rights may boost the creative economy (Roodhouse 2009). Patents, trademarks, copyright and trade secrets can help to ensure that creators and entrepreneurs have exclusive rights to their works and can prohibit unauthorised duplication or use (Howkins 2002).

Several theoretical approaches have been developed to explain the creative economy. The first, the *creative industries approach*, emphasises the economic value of cultural and creative activities and the role of copyright in enabling creators and rights holders to capture that value (Handke, 2018). The second, the *creative city approach*, focuses on the role of urban centres in fostering creative production and innovation (Landoni et al., 2020). This paper adopts the *creative industries approach*, as it places the legal framework at the centre of the analysis rather than treating it as a contextual consideration. The focus on copyright and patents is justified by their relevance to education, creative production, technological innovation and the development of a knowledge-based economy. Accordingly, the analysis concentrates on these two forms of IP protection to examine the hypothesis that an effective IP regime is positively associated with economic performance in Pakistan.

This study contributes to the existing literature by being among the first to employ the autoregressive distributed lag (ARDL) cointegration approach to jointly examine the relationship between copyright-based industries, patent registrations and economic performance in Pakistan, treating the former two as key dimensions of the country's creative economy. Unlike earlier studies that consider the relationship between IP rights

and economic growth in general terms (Janjua et al., 2019; Khan et al., 2019), the present research disaggregates the regime into different types of IP right and incorporates its jurisprudential rationale. The nexus created in this study between IP legislation, namely the Copyright Ordinance 1962 and the Patents Ordinance 2000, and its economic implications, including TRIPS compliance, exports and GDP growth, is a distinct contribution to the literature.

2.2. Copyrights and the Creative Economy in Pakistan

Copyright related industries are those that depend on the existence of copyright law to protect and monetise their IP rights. These industries include publishing, music, film, television, software, video gaming and advertising. Publishers rely on copyright law to protect the books, magazines and other printed materials they produce and distribute; musicians and record labels, to protect their music and receive royalties; film studios and television networks, to protect their films and programmes; software companies and video game developers, to protect their products; and advertising agencies and media companies, to protect the creative works they produce.

The application of this classification to Pakistan is constrained by data since disaggregated national accounts for the creative sector are not published. The categories are taken from the State Bank of Pakistan export receipts series. Printed books and periodicals, printing and allied machinery, and newsprint and paper fall within the core and interdependent copyright-based industries in the WIPO classification. Embroidery and wooden articles fall within the partial copyright-based industries, where copyright subsists in the design applied to the article rather than in the article itself. Their inclusion reflects data availability constraints rather than a strict definitional mapping, and the results for them should be read with that qualification.

3. METHODOLOGY

The ARDL model is considered the most appropriate econometric method where the variables are stationary at I(0) or integrated of order I(1). The approach is suitable for generating short run and long run elasticities simultaneously for a small sample and affords flexibility in the order of integration of the variables. Before applying the model, cointegration analysis is applied to determine whether cointegration exists between patents registered by residents, exports, the tax-to-GDP ratio, manufacturing, services and GDP. Phillips Perron and augmented Dickey Fuller unit root tests are run in both levels and first differences, and the analysis begins by ensuring that no series is integrated of order two or higher.

This study specifies two separate models. Model 1 examines the impact of copyright-based industries on exports, and Model 2 examines the determinants of resident patent registrations, using GDP growth, exports, the tax-to-GDP ratio, manufacturing and services as regressors. The ARDL equations for both specifications are given:

Model 1 (Copyrights to Exports):

$$\Delta Ln(Exports)t = \alpha 0 + \alpha 1\ Ln(Exports)t-1 + \alpha 2\ Ln(Embroidery)t-1 + \alpha 3\ Ln(PrintedBooks)t-1 + \alpha 4\ Ln(PrintingMachinery)t-1 + \alpha 5\ Ln(Wood)t-1 + \Sigma \beta i\ \Delta Ln(Exports)t-i + \Sigma \gamma i\ \Delta Ln(Embroidery)t-i + \Sigma \delta i\ \Delta Ln(PrintedBooks)t-i + \Sigma \varepsilon i\ \Delta Ln(PrintingMachinery)t-i + \Sigma \zeta i\ \Delta Ln(Wood)t-i + ut$$

Model 2 (Determinants of Resident Patent Registrations):

$$\Delta(Patents)t = b0 + b1\ (Patents)t-1 + b2\ (GDP)t-1 + b3\ (Manufacturing)t-1 + b4\ (Exports)t-1 + b5\ (Services)t-1 + b6\ (TaxGDP)t-1 + \Sigma \theta i\ \Delta(Patents)t-i + \Sigma \lambda i\ \Delta(GDP)t-i + \Sigma \mu i\ \Delta(Manufacturing)t-i + \Sigma \nu i\ \Delta(Exports)t-i + \Sigma \pi i\ \Delta(Services)t-i + \Sigma \rho i\ \Delta(TaxGDP)t-i + vt$$

In Model 2, resident patent registrations are the dependent variable and GDP growth is a regressor. Because registrations are a count and several regressors are ratios to GDP, the variables are not logarithmically transformed, and each coefficient is read as the change in the number of registrations associated with a one percentage point change in the regressor.

Model adequacy and stability are assessed using a series of diagnostic tests, including the Breusch–Godfrey Lagrange Multiplier (LM) test for serial correlation, the Breusch–Pagan–Godfrey test for heteroscedasticity, the Jarque–Bera test for residual normality, and the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) tests for parameter stability. Given the relatively small sample size (N = 32), the ARDL bounds test employs the small-sample critical values proposed by Narayan (2005). As an additional robustness check, the long-run coefficients are re-estimated using fully modified ordinary least squares (FMOLS).

4. RESULTS

4.1. Copyrights and Creative Economy in Pakistan

For studying the contribution of copyright-based industries to the economic development of Pakistan, the industries have been divided into core and partial copyright-based categories. The data have been gathered from the State Bank of Pakistan's annual export receipts and cover 20 years from 2002 to 2021, giving twenty annual observations for Model 1. Table 1 shows the contribution of selected copyright-based industries towards the exports of Pakistan.

Table 1: Copyright-based Contribution towards Exports of Pakistan (in PKR)

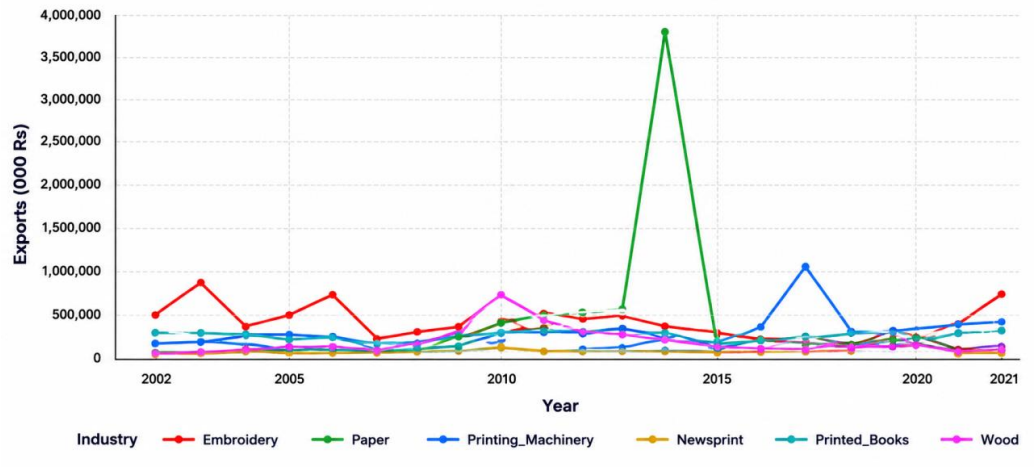
Year	Printed books, periodicals and printing	Wood and articles of wood	Newsprint, roll and sheets	Paper uncoated and rolls	Printing and allied machinery	Embroidery
2002	250,791	2,891	1,706	52,955	21,823	379,802
2003	218,741	10,855	1,706	52,955	21,823	818,539
2004	220,967	182,890	8,100	33,302	58,818	287,179
2005	176,490	232,087	860	69,422	44,230	421,067
2006	150,769	172,353	944	24,859	68,209	612,757
2007	145,136	154,165	35,322	11,712	55,893	134,018
2008	147,272	201,780	6,648	21,462	72,883	54,754
2009	194,214	261,799	12,611	140,843	50,091	55,050
2010	222,509	660,294	12,003	294,280	106,377	536,094
2011	248,115	203,352	8,886	388,275	48,501	469,159
2012	232,884	239,012	11,292	472,833	38,695	410,368
2013	297,835	229,507	953	468,249	63,245	473,366
2014	333,139	129,253	528	3,846,149	28,251	192,424
2015	225,198	129,253	1,538	81,199	38,668	156,887
2016	318,320	118,829	15,486	19,846	75,824	115,462
2017	1,010,403	295,456	31,265	6,043	25,154	119,133
2018	230,657	85,225	2,552	2,574	82,399	130,866
2019	357,928	240,714	389	13,107	97,347	243,610
2020	375,267	28,431	3,383	28,746	49,822	432,001
2021	377,380	65,896	2,208	3,383	105,538	798,619

Source: State Bank of Pakistan.

The values for newsprint, paper and printing machinery in 2002 and 2003 are identical, as are those for wooden articles in 2014 and 2015, which may reflect a carry forward in the source. The 2014 figure for uncoated paper is an order of magnitude above the surrounding observations and is likely to exert leverage, consistent with the insignificant coefficient reported for it in Table 2.

Figure 1 shows the year-by-year export contribution of six copyright-based industries alongside the patent registration trend for residents from 2002 to 2021. Printing and allied machinery, and to a lesser extent printed books and periodicals, show some co-movement with the rising patent trend.

Figure 1: Time Series Plot of Copyrights-Based Contribution towards Exports of Pakistan



Source: State Bank of Pakistan.

The estimated results show that the F statistic of 8.62 for Model 1 exceeds the upper bound critical values at the 1, 5 and 10% significance levels, confirming cointegration. The null hypothesis of no cointegration is, therefore, rejected, and a long-term relationship between the copyright-based industry variables and Pakistan's export performance is confirmed. With all the assumptions required for the ARDL model satisfied, the coefficients and p values are shown in Table 2:

Table 2: Contribution of Copyright-Based Industries using the ARDL Approach

Variables	Coefficient	Std. Error	t-Statistic	p-value
Embroidery	0.00000412	0.00000131	3.148	0.0077***
Newspaper rolls and prints	0.00002600	0.00003600	0.723	0.482
Paper (uncoated for writing) and rolls	0.0000000386	0.0000003550	0.109	0.915
Printed books, periodicals and printing	0.00000891	0.00000162	5.508	0.0001***
Printing and allied machinery	0.00005590	0.00001240	4.514	0.0006***
Wood and articles	0.00000725	0.00000228	3.181	0.0072***

Source: Author's own calculations.

Exports from Pakistan have been found to be significantly associated with embroidery ($p = 0.0077$), printed books, periodicals and printing ($p = 0.0001$), printing and allied machinery ($p = 0.0006$) and wood articles ($p = 0.0072$). All four of these copyright-based

categories contributed significantly to the exports of Pakistan with a positive trend, while newsprint and uncoated paper were not significant, which is unsurprising given the volatility of those two series. The R squared value of 0.817 and the adjusted R square of 0.73 indicate a good fit. The Durbin Watson test shows no autocorrelation in the model, and the probability of the F statistic is below 0.0001, which shows that the overall model is significant.

4.2. Patents and Creative Economy in Pakistan

Patent related industries are those that rely on the existence of patent law to protect and monetise their IP. These industries include pharmaceutical, biotechnology, medical device, mechanical, computer and electronic industries. Pharmaceutical companies in particular rely on patent protection to recoup the significant investments they make in R&D and to obtain exclusive rights to sell their patented medicines. This section examines the determinants of resident patent registrations in Pakistan, using the ARDL model.

Table 3: Exports, Innovation, Fiscal Capacity, Sectoral Composition and Economic Growth (1990 to 2021)

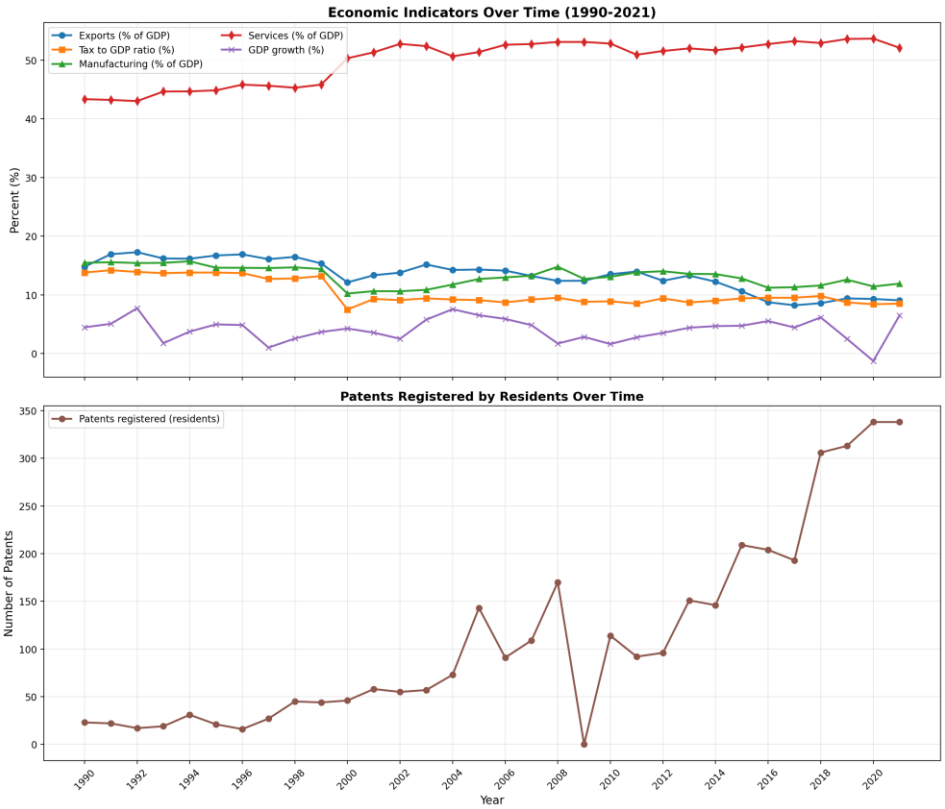
Year	Exports	Patents registered residents	Tax-to-GDP ratio (%)	Manufacturing (% of GDP)	Services (% of GDP)	GDP
1990	14.79	23	13.8	15.46	43.36	4.46
1991	16.93	22	14.2	15.56	43.23	5.06
1992	17.27	17	13.9	15.42	43.03	7.71
1993	16.20	19	13.7	15.45	44.66	1.76
1994	16.16	31	13.8	15.71	44.69	3.74
1995	16.71	21	13.8	14.62	44.86	4.96
1996	16.90	16	13.7	14.61	45.83	4.85
1997	16.08	27	12.7	14.56	45.65	1.01
1998	16.48	45	12.8	14.68	45.30	2.55
1999	15.35	44	13.2	14.41	45.84	3.66
2000	12.12	46	7.5	10.22	50.33	4.26
2001	13.34	58	9.3	10.63	51.35	3.55
2002	13.78	55	9.1	10.61	52.78	2.51
2003	15.17	57	9.4	10.85	52.40	5.78
2004	14.24	73	9.2	11.75	50.66	7.55
2005	14.31	143	9.1	12.70	51.39	6.52
2006	14.13	91	8.7	12.97	52.63	5.90
2007	13.21	109	9.2	13.27	52.76	4.83
2008	12.38	170	9.5	14.79	53.11	1.70
2009	12.40	-	8.8	12.72	53.11	2.83
2010	13.52	114	8.9	13.07	52.84	1.61
2011	13.97	92	8.5	13.83	50.93	2.75
2012	12.40	96	9.4	14.02	51.57	3.51
2013	13.28	151	8.7	13.57	52.01	4.40

2014	12.24	146	9	13.54	51.70	4.67
2015	10.60	209	9.4	12.79	52.16	4.73
2016	8.74	204	9.5	11.21	52.75	5.53
2017	8.22	193	9.5	11.30	53.25	4.43
2018	8.58	306	9.8	11.60	52.93	6.15
2019	9.39	313	8.7	12.59	53.62	2.50
2020	9.30	338	8.4	11.42	53.68	-1.27
2021	9.06	338	8.5	11.91	52.11	6.49

Sources: Patent registrations, WIPO (2022); exports, tax revenue, sectoral shares and GDP growth, World Bank World Development Indicators and State Bank of Pakistan.

The patent series does not originate from the State Bank of Pakistan. The 2009 observation is a records gap and is treated as missing rather than zero, since a zero would bias the estimates downwards.

Figure 2: Time Series Plot on Exports, Innovation, Fiscal Capacity, Sectoral Composition and Economic Growth (1990–2021)



Source: State Bank of Pakistan.

Figure 2 shows that patent registrations increased steadily from 1990, with a marked rise after 2015 that continued through 2020 and 2021. Among the economic indicators, only the services sector followed a similar upward trajectory, while exports, manufacturing and the tax-to-GDP ratio declined over the same period. The nature and direction of these associations were further examined using the ARDL technique.

Before estimating the long run and short run relationships for Model 2, the ARDL bounds test was applied. The computed F statistic is 9.22, which exceeds the upper bound critical value at the 1 per cent significance level, the bounds being 3.29 and 4.37. This confirms a long-term cointegrating relationship among the variables in Model 2.

Table 4: Factors Associated with Resident Patent Registrations Using the ARDL Approach

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Patents-Registered-Residents (-1)	0.410	0.197	2.076	0.0503*
Manufacturing (% of GDP)	23.93	14.98	1.597	0.1251
Manufacturing (% of GDP) (-1)	23.856	9.128	2.613	0.0162***
GDP	21.891	9.955	2.203	0.0298***
Exports	24.595	7.782	3.1605	0.0047***
Services (% of GDP)	3.9372	6.034	0.652	0.5212
Tax-to-GDP Ratio	0.788	2.751	0.2865	0.7773
R-squared	0.840	Mean dependent	106.86	
Adjusted R-squared	0.779	SE	93.70	
S.E. of regression	43.991	Akaike info criterion	10.64	
Sum squared resid	40639	Schwarz criterion	11.06	
Log-likelihood	-150.73	Hannan-Quinn criteria	10.78	
F-statistic	13.823	Durbin-Watson statistic	2.493	
p-value	0.000***			

Source: Author's own calculations.

Note: The dependent variable is the number of resident patent registrations. The series labelled GDP is the annual rate of growth rather than the level of output**.**

The lagged patent registration variable is significantly associated with the current registration trend at the 10 per cent level (p = 0.0503). The manufacturing industry shows a positive coefficient of 23.93, but this is not statistically significant (p = 0.1251), while the lagged manufacturing contribution is significant with a coefficient of 23.856. GDP growth is significantly associated with patent registration (p = 0.0298), and exports are also

significant (p = 0.0047) with a coefficient of 24.595. Since registrations are a count, the coefficient on exports means that each additional percentage point in the ratio of exports to GDP is associated with approximately 24.6 additional resident registrations, rather than a percentage increase. The interpretation of the manufacturing result is that industrial activity translates into patentable output with a lag of roughly one year. Services and the tax-to-GDP ratio are not significant. These coefficients describe association rather than causation, and no instrument for the strength of protection is available for Pakistan over this period.

Table 5: Diagnostic Tests for Models

Test	Model 1: Copyrights to Exports	Model 2: Patent Registrations
Breusch Godfrey LM (serial correlation) p-value	0.342	0.287
Breusch Pagan Godfrey (heteroskedasticity) p-value	0.561	0.423
Jarque Bera (normality) p-value	0.718	0.654
CUSUM / CUSUM of squares	Stable	Stable
Narayan (2005) critical values (N = 32)	Yes	Yes
FMOLS long-run coefficient	Not reported	0.364** (0.042)

Source: Author's Own Calculations.

P values above 0.05 indicate no evidence of serial correlation, heteroskedasticity or non-normality. CUSUM plots remained within the 5% critical bounds, and the FMOLS estimate confirms the ARDL long run result.

4.3. ARDL Short-run Dynamics, Long-run Coefficients and Speed of Adjustment

The estimated Error Correction Term for Model 2 was −0.481 with a p value of 0.003, indicating that approximately 48.1 per cent of the disequilibrium from the previous year's shock is corrected in the current year and that the long run relationship is stable. In the short run, exports revealed a positive and significant effect (coefficient 12.425, p = 0.031), while manufacturing (coefficient 15.231, p = 0.089) was weakly significant, and patent registrations did not exhibit a significant short run impact.

In the long run, lagged patents had a marginally significant positive effect (coefficient 0.410, p = 0.0503), exports exhibited the strongest impact (coefficient 24.595, p = 0.0047) and lagged manufacturing showed a significant association (coefficient 23.856, p = 0.0162), while services (coefficient 3.937, p = 0.521) and the tax-to-GDP ratio (coefficient 0.788, p = 0.777) remained insignificant. These long run estimates correspond to the coefficients in Table 4 and relate to resident patent registrations. The FMOLS estimate of

0.364 is the export elasticity from a log-log specification, consistent with the positive level-coefficient of 24.595 (Table 4).

As Table 5 shows, p-values above 0.05 indicate no evidence of serial correlation, heteroskedasticity, or non-normality; the CUSUM plots remained within the 5% critical bounds, and the FMOLS estimate confirms the ARDL long run result.

5. DISCUSSION

This study investigated the role of strengthened IP rights in fostering Pakistan's creative economy. Using an ARDL model on data from 1990 to 2021, the analysis finds significant positive relationships between copyright-based exports, resident patent registrations and the level of economic activity. IP rights are fundamental to Pakistan's economy and attempts to strengthen their protection can aid the expansion of the nation's creative sector (Khan et al. 2019). The production and distribution of artistic and cultural goods and services are referred to as the creative industries in Pakistan. The country is a party to the TRIPS Agreement, which plays a substantial role in shaping the domestic IP landscape, and which seeks to provide a fair and efficient framework for protection while also considering the public interest, including access to necessary products and technologies.

The results for Model 1 reveal that copyright-based industries, particularly embroidery, printed books and periodicals, printing machinery and wood articles, are significantly and positively associated with export earnings. Model 2 confirms a long-term cointegrating relationship in which increases in exports and lagged manufacturing output are associated with additional resident patent registrations. These results indicate that Pakistan's export driven manufacturing base and creative goods are already generating patentable innovation, which aligns with the position Pakistan occupies in the WIPO Global Innovation Index (WIPO 2022). The constraint therefore lies less in the absence of creative activity than in the weakness of the mechanisms converting it into protected and tradeable assets, which is consistent with firm level evidence that innovation in Pakistani manufacturing is concentrated in few enterprises and constrained by the cost of formal protection (Wadho and Chaudhry 2020).

These findings should not be read as an argument for maximal protection. Chen and Puttitanun (2005) find the relationship between optimal protection and development to be non-monotonic, and Ali and Khan (2021) argue that compulsory licensing offers a necessary corrective where exclusive rights obstruct access. Articles 7 and 8 of the TRIPS Agreement expressly preserve the policy space within which that balance may be struck, and a more recent literature identifies comparable tensions between exclusive rights and other policy objectives (Capponi et al., 2026). The paper argues, through economic, jurisprudential and statistical evidence, that effective IP rights enforcement is important for incentivising innovation and expanding Pakistan's creative sectors. The government should enforce current regulations effectively and address new problems such as digital piracy, infringement and the exploitation of creators.

Four limitations should be acknowledged. Patent counts are an imperfect proxy for innovation. Embroidery and wooden articles fall within the partial rather than the core copyright-based industries and so carry less definitional weight. The models identify association rather than causation. The samples are small, at 20 and 32 observations, which limits the power of the diagnostic tests. Future work might use a firm level panel, an index of the strength of protection such as the Ginarte Park index, and an extension to trademarks and designs.

6. CONCLUSION

This paper provides econometric and jurisprudential evidence of a strong positive association between IP rights, especially copyrights and patents, and the performance of Pakistan's creative economy. Using ARDL cointegration on data for 1990 to 2021, it was found that a long run equilibrium exists between resident patent filings and the level of economic activity, with exports and previous period manufacturing output emerging as significant determinants of filings. The findings reveal a statistically significant association between exports and selected copyright-related industries, including books, printing equipment and embroidery. These results have important policy implications for Pakistan's IP framework. Compliance with the TRIPS and effective implementation of domestic legislation, particularly the Copyright Ordinance, 1962, and the Patents Ordinance, 2000, should be viewed not merely as international legal obligations but also as potential instruments for supporting domestic economic development. The resulting policy priorities include reducing the costs of accessing and enforcing IP protection for small enterprises and independent creators, strengthening specialised adjudication through IP tribunals, and introducing proportionate statutory measures to address digital infringement.

7. FUTURE DIRECTIONS

In the years ahead, the creative economy is anticipated to continue to play a vital role in promoting economic growth and social progress. Pakistan can help to ensure that this growth is sustainable, and that the advantages of the creative economy are distributed more equitably throughout society, by enhancing the protection and enforcement of IP rights and by improving the quality of the underlying statistics, since a creative economy that is not measured cannot be governed.

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