

THE NEXUS BETWEEN INTELLECTUAL PROPERTY RIGHTS AND FOREIGN DIRECT INVESTMENT IN CENTRAL ASIAN COUNTRIES: A SPECIAL REFERENCE TO UZBEKISTAN

¹Sobirov Yuldoshboy, ²Mamurbek Karimov, ³Jurabek Kuralbaev

¹PhD Student, Department of International Trade, Jeonbuk National University, Jeonju, South Korea, syuldoshboy@jbnu.ac.kr

²PhD Student, Department of International Trade, Jeonbuk National University, Jeonju, South Korea.

³Assistant teacher, Faculty of Economics, Urgench State University, Urgench, Uzbekistan.

Abstract

Using a panel data model and yearly data from 2000 to 2020, this study explores the relationship between intellectual property rights (IPR) protection and foreign direct investment (FDI) in selected Central Asian countries, including Uzbekistan, Kazakhstan, and Kyrgyzstan. This paper contributes to the literature by establishing the following significant conclusions, including market size and trade openness as a main driver of FDI inflows into Central Asian countries especially, Uzbekistan. For every one percent increase in patent applications, FDI increases by 0.004%. Furthermore, there is a significant positive relationship between trade openness and foreign direct investments, with a 0.079 percent increase in FDI for every one percent increase in trade openness. Surprisingly, GDP has a minor negative impact on foreign direct investment, but not significant.

Keywords: FDI, Intellectual Property Rights, Panel Data Model, Economic growth, Central Asia.

INTRODUCTION

The enhancement of intellectual property rights will help the reduction of obstacles to participation in trade organizations such as WTO. Nonetheless, knowledge and execution of patent registration in general are relatively restricted in Central Asian countries. Over the last decade, this lack of understanding has resulted in several conflicts and copyright breaches. However, globalization has a significant influence on improved arbitration of global pricing of commodities and marketable services, as well as better access to new and diverse items and technology on worldwide markets by consumers and companies in each democratization country. As a result, such economies see increased competition, decreased domestic market power of previously concentrated industrial concerns, realignment

of economic resources into areas of competitive advantages, reduced manufacturing costs in industries with rising returns to scale, as well as the contraction or removal of uncompetitive enterprises (R. Kumar, Yadav, & Verma, 2018).

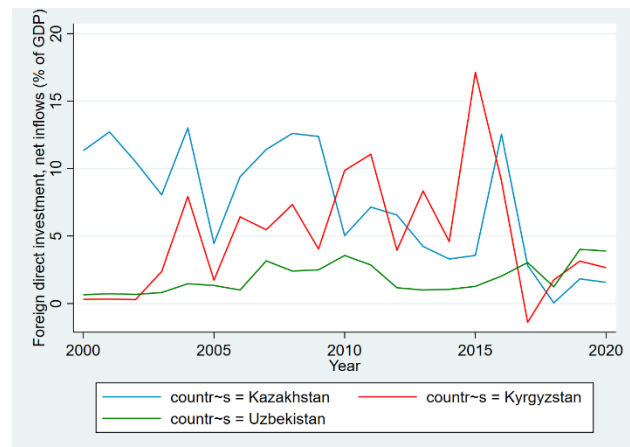
To begin with, strong intellectual property rights attract FDI inflows to host nations. As a result, businesses seeking patent protection for their innovation will prefer to invest in a nation with stronger protection. This, in turn, may enhance incoming FDI while also increasing national productivity. Despite this favorable FDI attribution, governments with higher protection would stimulate more technology transfer to domestic enterprises. FDI includes not only the transfer of finance but also the transfer of technology. Improved technology might result in high-quality products with IPR

protection. Countries with higher IPR rights provide a more secure vault for investors since their innovations or products are not easily imitated (Yi & Naghavi, 2017). As a result, their rights are legally protected. These promote larger FDI inflows to nations with more IPR.

Figure 1 shows us the amount of FDI as the percentage of GDP between 2000 and 2020 in selected Central Asian countries including Uzbekistan, Kazakhstan and Kyrgyzstan. We can see relatively significant difference between the values of FDI invested in Uzbekistan and Kazakhstan. It can be seen that Uzbekistan had the minimum value of FDI flowed compared to the other 2 countries: Kazakhstan and Kyrgyzstan, but there was a significant decline in Kazakhstan and Kyrgyzstan in 2019 because of global pandemic. From this figure, we can say that it is very important to enhance the inflow of FDI.

For emerging countries in Central Asia, the link between IPR protection and FDI is also very important. For one thing, the area is transitioning from an IP importer to a key IP producer in its own right (Arnesen et al., 2021). Furthermore, Central Asia has received substantial amounts of FDI inflows as a result of its strong growth, and this trend is projected to continue. Inflows of foreign direct investment into Central Asia benefit economies with limited technological capabilities and robust intellectual property protection regimes (Singh, Arya, & Jyoti, 2019). Imports of technology through FDI are critical to Asia's technological advancement. Petri (2012) discovers that FDI in Asia frequently leads to technology diffusion and advancement.

Figure 1 *Foreign Direct Investment flows into Central Asian countries (% of GDP, 2000-2020)*



Source: World Bank Open Data

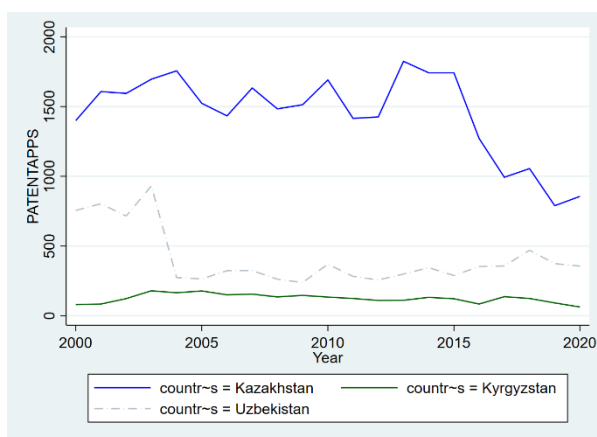
In the early stages of their economic growth, developing nations in Central Asia had very poor IPR protection regimes, but as those countries converted themselves into manufacturers of inventions and new technologies, those systems got stronger (Sabir, Rafique, & Abbas, 2019). IPR protection becomes a critical component of knowledge transfer and industrial operations only after countries develop significant indigenous technical capabilities and a robust science and technology infrastructure capable of creative imitation (Nguyen, Haug, Owen, & Genç, 2020).

Several researches by scholars all around the world have shown a link between IPDs and FDI attractiveness. Numerous analyses, in particular, indicate that on intellectual property rights have a major role in boosting FDI inflows (Maskus, Milani, & Neumann, 2019), but others show that, on average, patent rights have a minimal influence on site choices, and the effect of IPRs lowers the potential of investing in that nation (N. Kumar). The research findings are mixed, and the circumstances differ by area.

There is yet to be a specific research in Central Asian countries to analyze the impact of investment rights on foreign direct investment. As a result, the present research focuses on IPR as a conditional factor for FDI and economic growth in certain nations and years.

Figure 2 describes the overall application of patents in Central Asian countries, it can be seen from the graph that the number of patent applications in Kazakhstan is relatively high compared to Uzbekistan and Kyrgyzstan. But there has been a small decline after 2015. However, the patent applications in Kyrgyzstan are significantly low compared to Kazakhstan and Uzbekistan. In turn, the number of patent applications in Uzbekistan was relatively high until 2004, but there was a very significant decrease after that.

Figure 2 Overall patent applications in Central Asian countries (2000-2020)



Source: World Bank Open Data

This research will be exclusively focused on how intellectual property rights (IPR) play a conditional role in attracting greater FDI, which has an impact on economic growth in Uzbekistan. This would be a significant contribution to the research on IPR as a conditional component in the link between FDI and economic development in Central Asian countries including Uzbekistan, Kyrgyzstan and Tajikistan from 2000 to 2020. We adopt policy strategies for Uzbekistan's FDI Strategy by analyzing the current situation of FDI and IPR's in Central Asia from 2000 to 2020 using OLS panel data model.

After that, we generate hypothesis for our study as follows:

Hypothesis 1 (H1): FDI and IPRs have a favorable association.

Hypothesis 2 (H2): Trade openness promotes more FDI.

Literature Review

Foreign direct investment (FDI) is the transfer of money from an investor's nation to a host country (capital might be in the form of cash, assets, or technology) in order for businesses to profit (Seid, 2018).

Intellectual property rights (IPR) are described as cognitive creations or inventions. Intellectual property is enacted to protect any idea or invention. Trademarks, copyright, patents, and industrial designs are the most frequent forms of intellectual property rights awarded to innovators (Lee, Alba, & Park, 2018).

Foreign firms will confront cultural differences or challenges relating to copyrights and patent rights in the host nation as a result of the shift in the business environment. Intellectual property or patent rights aid in the advancement of a country's scientific and technical achievements; also, patents are vital in attracting foreign direct investment (FDI) into developing nations (Seyoum, 2006).

If FDI is the transmission route of productivity from North to South, strengthening protection of intellectual property rights in the South will improve incentives and opportunities in the North, according to the theory. Strengthening IPR protection is seen as a way for the South to incentivize Northern FDI (Fatma & Zouhaier, 2021).

If a developing economy satisfies the following institutional specifications, such as a low level of corruption, a good business environment, and generally peaceful politics, foreign direct investment (FDI) can help the nation grow through capital accumulation, increased employment, and knowledge transfer (Chan & Tang, 2017). Studies have also focused on intellectual property rights (IPR) as a possible factor since the early 2010s. Better intellectual property indicates that a country has stronger institutions, which indicates that shareholders should feel more secure that the risk of debt default is ameliorated, that any knowledge transferred is done so legally, and that legal processes are in place to address cases in which intellectual property is obtained illegally (Borovitsky, 2020).

In general, there are several factors of IPRs to consider. Intellectual property rights, however, appear to be the most studied and watched

component before even making a choice to invest (Ofili, 2014)). The cause for this is the rising trend of copying ideas and items, which results in losses for the innovator or original manufacturer. According to Alexiou et al. (2016), Frandsen (2015), and Kashcheeva (2013), stronger IPR protection might lead to an increase in FDI while also boosting economic development.

A variety of interesting research on technology transfer have explored the impact of enhancing IPR protection using North–South dynamic general equilibrium models with FDI as the technology transfer route of choice. Furthermore, these researches are classified based on their findings. Two of the most notable research in this subject, for instance, Lai (2012) and Glass & Saggi (2002), obtained contrasting results. Lai (2012), using a concept of variety-expanding-type innovation, indicated that boosting IPR protection encourages both innovation and FDI, but Glass & Saggi (2002) argued the reverse using a model of quality-improvement-type innovation. In another paper, Glass and Wu (2007) (hereafter G–W) presented costless imitation, as did Lai (2012), into a quality-improvement-type R&D model similar to that of Glass & Saggi (2002), and investigated how rising the probability of imitation affects innovation and FDI. Their analysis indicated that increasing IPR protection stifles both innovation and FDI. This results are contrary to Lai (2012) but is similar to that in Glass & Saggi (2002). G–W (2007)

hypothesized that by analyzing the settings and outcomes in these works, we may relate the different outcomes in Lai (2012) and Glass & Saggi (2002) to whether innovation is variety increasing or quality upgrading.

Data and Methodology

The empirical data in our paper is based on the studies described above, and it examines the causal link between intellectual property rights and foreign direct investments. We also use several variables, including trade openness and economic growth which have shown to be quite useful in determining the causal relationship. We utilize the dataset provided by World Bank, Statistical Committee of Uzbekistan, World Development Indicators and World Intellectual Property Organization Statistics Data Center from 2000 to 2020, an annual panel data of 3 Central Asian economies, namely, Uzbekistan, Kyrgyzstan and Tajikistan, were developed for the empirical examination.

By looking through previous papers, we choose the variables for our paper as below-mentioned.

1. Intellectual Property Rights (PATENTAPPS);
2. Foreign Direct Investments (FDI);
3. Economic Growths (GDP per capita);
4. Trade openness (TO).

Table 1 *Definition of Variables*

Variables		Abbreviation	Expected Sign	Sources
Foreign Direct Investments	Foreign direct investment, net inflows (% of GDP)	FDI		World Development Indicators
Intellectual Property Rights	Total patent applications (direct and PCT national phase entries)	PATENTAPPS	+	World Intellectual Property Organization Statistics Data Center
Economic Growths	GDP per capita	GDP	+	World Development Indicators
Trade openness	Trade (% of GDP)	TO	+	World Development Indicators

Source: Author's own contribution.

Foreign Direct Investments (FDI) - When a company, sector, individual, or organization in another nation acquires controlling ownership, it is referred to as foreign direct investment (FDI). As a consequence of FDI, foreign firms are actively engaged in day-to-day work from the other country, resulting in a movement of money, experience, capabilities, and technologies (Raza, Shah, & Arif, 2019). In our paper, we utilize net inflows (as a percentage of GDP) as a proxy for FDI. The data is derived from World Bank database.

Intellectual Property Rights (PATENTAPPS) - FDI inflows to host nations are aided by strong intellectual property rights. As a result, businesses seeking protection for their innovation will choose to invest in a nation that offers more protection (Dai, 2020). As a result, inbound FDI might grow, and the country's productivity could rise as well. So, we choose international property rights as an independent variable in our paper. And, we utilize Total patent applications (direct and PCT national phase entries) as proxy for this variable. The data is derived from the WIPO IP Statistics Data Center.

Market Size (GDP) - Gross domestic product, or the market value of all production of goods and services inside a country's borders in a given year, is The most essential criteria in assessing a country's market size and investment potential (Petrović-Randelović, Mitić, Zdravković, Cvetanović, & Cvetanović, 2020). For this variable, we utilize GDP per capita as a metric for market size and, World Bank data is used to assemble GDP results.

Trade Openness (TO) - Integration with global commerce with sources of innovation is facilitated through trade, which improves the return on FDI. Trade liberalization enables economies to grow output, resulting in higher returns to scale and specialization economics (Gerring, Bond, Barndt, & Moreno, 2005). The Trade Openness Index, which is utilized as a metric for trade openness, is determined by dividing the amount of imports and exports by the country's total GDP. The data is provided by World Bank database.

The following is the formulation for the variable of trade openness:

$$\text{TRADE} = \frac{X + M}{\text{GDP}}$$

Eq. (1)

In this paper, we utilize several panel data models to analyze the relationship between IPRs and FDI in three Central Asian countries: Uzbekistan, Kazakhstan, and Kyrgyzstan from 2000 to 2019; with the purpose of indicating some policies for Uzbekistan's FDI strategy. The countries that have been chosen have a lot in common, including economy and political system. As a consequence of the findings, Uzbekistan will get some policy recommendations. We used the Ramsey RESET test first, then Pearson Correlation and VIF to check for multicollinearity of variables, and finally heteroscedasticity tests. Then, to obtain more exact and accurate findings, we employ Pooled OLS with robust standard errors.

That's why; we below investigate previous literatures to highlight main point of models which is used in our model.

Pooled OLS Model

A pooled model is one of the models where the dataset on various individuals are simply pooled together with no provision for individual differences that might lead to different coefficients (Hill, Griffiths, & Lim, 2018). For an equation with three explanatory variables x_2 , x_3 and x_4 , a pooled model can be described as follows:

$$\text{FDI}_{it} = \beta_0 + \beta_1 \text{PATENTAPPS}_{IT} + \beta_2 \text{GDP}_{it} + \beta_3 \text{TO}_{it} + e_{it}$$

Eq. (2)

$t=1 \dots t$

$i=1 \dots i$

Y-dependent variable

X-independent variable

□- the coefficient which demonstrates relationship between dependent and independent variable

e-error term

Ordinary least square (OLS) is a form of linear least squares approach used in statistics to estimate the unknown coefficients in a linear

regression model. OLS selects the specifications of a linear function of a set of independent variable by reducing the sum of the squares of the differences between the observed dependent variable (values of the variable being observed) in the given dataset and those predicted by the linear function of the independent variable. As per above-mentioned literatures, we adopt empirical model for our study as:

$$FDI = \beta_0 + \beta_{1i} PATENTAPPS_{it} + \beta_{2i} GDP_{it} + \beta_{3i} TO_{it} + \varepsilon_{it}$$

Eq. (3)

Where, PATENTAPPS means Total patent applications (direct and PCT national phase entries), GDP measures the gross domestic product per capita for each country i , FDI denotes the foreign direct investment, TO measures the trade liberalization β indicates the constant. ε_{it} measures the residual term. α_{ji} measures the estimated coefficients of all variables that explain (where, $j = 1, \dots, 8$). The subscript $i = 1 \dots 40$ measures the region. The subscript $t = 1 \dots 20$ is the time period. In Table 2, we define all variables utilized in our paper. As per table 1, we can see maximum of GDP is 13890, and minimum is 279.61. The maximum patent applications in our sample are 1824 and the minimum is 63.

Table 2 Descriptive Summary

Variable	Obs	Mean	Std. Dev.	Min	Max
FDI	63	4.775009	4.2487	-1.391844	17.13123
PATENTAPPS	63	662.0159	609.739	63	1824
GDP	63	3239.405	3806.525	279.6196	13890.63
to	63	82.53864	28.60352	29.74841	146.1061

Source: Computed by Stata 16.0

Then, a test for the variance inflation factor also was performed, and the result is given in Table 3, to further check that the assumption of negligible multicollinearity was satisfied. The results reveal that none of the independent variables have a VIF greater than 10, the assumption is satisfied since the criterion for spotting multicollinearity is met. As per previous literatures (Daoud, 2017), a $VIF > 10$ or a $1/VIF < 0.10$ indicates trouble.

Table 3 Variance inflation factor

Variable	VIF	1/VIF
GDP	2.04	0.489180
PATENTAPPS	1.96	0.510272
to	1.09	0.919412
Mean VIF	1.70	

Source: Computed by Stata 16.0

Table 4 represents Pearson's Correlation for our variable of interest in our study. As per the table, we can see moderate positive correlation of FDI with PATENTAPPS, TO and GDP, respectively 0.3974, 0.04571 and 0.1357.

Table 4 Pearson's Correlation

	FDI	PATENT~S	GDP	to
FDI	1.0000			
PATENTAPPS	0.3974	1.0000		
GDP	0.1357	0.6998	1.0000	
To	0.4571	-0.2023	-0.2838	1.0000

Source: Computed by Stata 16.0

Empirical Results and Discussion

In this section, the main aim is to run regression to see the relationship between

PATENTAPPS, GDP, TO and FDI in Central Asian countries from 2000 to 2019 by utilizing OLS panel data model and to analyze the results which come from the regression.

We begin our empirical investigation by presenting the results of the Equation (3) estimate and coefficients. The nexus between PATENTAPPS, GDP, TO and FDI is investigated in this equation. Table 5 summarizes the results of Equation (3)'s estimation.

From the table 5, we can see that there is a strong relationship between PATENTAPPS and GDP which indicates if there is 1% increase in PATENTAPPS, FDI see a 0.004% rise. Furthermore, trade openness and foreign direct investments have also a significant positive relationship that 1% increase in trade openness result in 0.079% increase in FDI. Interestingly, GDP has an insignificant negative impact on FDI.

Table 5 Estimation results for OLS.

	(1)
VARIABLES	FDI
PATENTAPPS	0.00416*** (0.000927)
GDP	-0.000143 (0.000152)
to	0.0804*** (0.0147)
Constant	-4.152*** (1.447)
Observations	63
R-squared	0.467

Note: The calculated coefficients of PATENTAPPS (Total patent applications

(direct and PCT national phase entries)) as a dependent variable are summarized in this table. We utilize an annual data panel of three Central Asian nations (Uzbekistan, Kazakhstan, Kyrgyzstan) from 2000 to 2020 to test this model statistically

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As per table 6, the results are nearly the same compared to table 5. In detail, patent applications and FDI have a strong relationship in 1% significance. It can clearly be seen in table 6 that if there is 1% increase in the number of patent applications, FDI can see 0.00516% rise. However, trade openness also has a strong significant positive relationship with FDI, respectively 1% rise in trade openness result in 0.0983% increase in FDI Inflows. But, there is no any significant relationship between country specific dummies and FDI, at all.

Table 6 Estimation for OLS with country specific dummies

	(2)
VARIABLES	FDI
PATENTAPPS	0.00516*** (0.000958)
GDP	-0.000226 (0.000179)
to	0.0983*** (0.0271)
UzbekistanDummy	3.322 (8.001)
UzbekistanDummy#c.PATENTAPPS	-0.00566 (0.00457)

UzbekistanDummy#c.to	-0.0395
	(0.0757)
UzbekistanDummy#c.GDP	0.00142
	(0.00170)
Constant	-6.247*
	(3.173)
Observations	63
R-squared	0.547

Note: The calculated coefficients of PATENTAPPS (Total patent applications (direct and PCT national phase entries)) as a dependent variable are summarized in this table. We utilize an annual data panel of three Central Asian nations (Uzbekistan, Kazakhstan, Kyrgyzstan) from 2000 to 2020 to test this model statistically

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Then, as per Jeffrey M. Wooldridge (2015), we can analyze the country specific effects of the number of patent applications of Uzbekistan to FDI Inflows among other countries, using by this equation:

$$\frac{\partial y_1}{\partial x_1} = \beta_1 + \beta_2 x_2 \quad \text{Eq. (4)}$$

From this equation:

Y-dependent variable

X₁-is independent variable which is to be compared

X₂-summary mean of independent variable

□₁-Uzbekistan's country specific dummy variable coefficient

□₂- interaction of the coefficients of Uzbekistan's country specific dummy and independent variable which is to be compared (PATENTAPPS).

We may perform comparisons for IPRs in Uzbekistan, which is our field of interest in our

investigation, after receiving the findings shown in Table 6. To generate exact findings for Uzbekistan, we use OLS regression using country dummies, including interaction country dummies with PATENTAPPS, GDP and TO.

We just look at PATENTAPPS as independent variables (x₁) in Equation 4 to compare which are our key topics of interest. We can determine if the number of patent applications in Uzbekistan are statistically significant or not by examining coefficients using the above-mentioned equation.

1. The number of patent applications

$$Y = 3.2 + (-0.00566 * 662)$$

$$Y = 3.2 - 3.74$$

$$Y = -0.54$$

As per this result, we can conclude that the number of patent applications has a negative effect on FDI Inflows to the Economy of Uzbekistan rather than other, but there is no any significant relationship between FDI and the number of patent applications in Uzbekistan. So, we conclude that the number of patent applications has not got a critic role to enhance FDI attractiveness in Uzbekistan through selected countries in our model. So as per the results in table 5, we can give recommendations for international property rights and FDI strategies.

Conclusion

This study has added to the literature by establishing the following critical results in the course of evaluating the relationship between IPRs and FDI inflows in the short term in Uzbekistan from 2000 to 2020 including market size, trade openness are also taken into account as a primary driver of FDI inflows into Uzbekistan. In detail, FDI rises by 0.004% for every 1% growth in PATENTAPPS. Furthermore, trade openness and foreign direct investments have a considerable positive link, with a 0.079 percent rise in FDI for every 1% increase in trade openness. Surprisingly, GDP has a negligible negative effect on FDI. From these results, we can make enough evidence for our hypothesis.

I also should draw more attention to some of the paper's shortcomings. To begin, I am limited to data sets from 2000 to 2020 for selected Central Asian nations since they gained independence in the 1990s and there were insufficient statistics until the 2000s, which is why I conducted my empirical study using datasets from 2000 to 2020. Second, due to the same reason, the paper's econometric approaches are limited (i.e. data set limitations). With limited data sets, other time-series analysis, such as causality, cointegration, and error correction, may be ineffective. Aside from that, as previously said, the variables for the analytical study were picked based on earlier studies in which these variables were the most commonly researched elements with significant results. However, several important variables are left out of this research. These types of flaws will be addressed in future study.

Policy Implications

The following are the policy implications of this paper: Government officials in Uzbekistan can promote strong economic growth through promoting FDI, opening up the economy and trade, and accumulating more domestic capital. As a result of these attributes, host nations will become the finest platform for foreign direct investment. Intellectual property rights appear to be another issue on which policymakers in all nations in our study should focus. Authorities in Uzbekistan should also be stronger in their enforcement of intellectual property rights since it boosts the favorable impact of FDI on economic growth. As a result of the FDI inflow, such enforcement will be able to generate new ideas as well as high-end items through research and development. Investors are more willing to direct FDI to nations that offer the finest platform for the protection of IPR that they would profit from in exchange for FDI inflow. Strong IPR protection might help a nation in terms of technology transfer via increased FDI from high-tech businesses, resulting in a rise in value-added activities, which boosts productivity and economic growth.

Reference

- [1] Alexiou, C., Nellis, J., & Papageorgiadis, N. (2016). The effect of patent enforcement strength and FDI on economic growth. *Multinational Business Review*.
- [2] Arnesen, S., Broberg, M., Hansen, N., Nordström, D., Odratt, M., & Tu, V. (2021). Strategies for Intellectual Property in Transformative Industries.
- [3] Borovitsky, D. (2020). Intellectual Property Rights and Foreign Direct Investment in Low Income Countries.
- [4] Chan, S. M., & Tang, T. C. (2017). Foreign direct investment inflows and intellectual property rights: Empirical evidence from different income groups. *Global Economic Review*, 46(4), 372-401.
- [5] Dai, J. (2020). Intellectual property rights protection, foreign technology introduction and FDI-based on the provincial-level panel data of China. *Journal of Accounting, Business and Finance Research*, 8(1), 30-38.
- [6] Daoud, J. I. (2017). Multicollinearity and regression analysis. Paper presented at the *Journal of Physics: Conference Series*.
- [7] Fatma, M., & Zouhaier, H. (2021). Investigating the Foreign Direct Investment, Intellectual Property Rights and Economic Growth: A Panel Study from Arabic Countries. *Modern Perspectives in Economics, Business and Management Vol. 7*, 96-106.
- [8] Frandsen, L. (2015). Foreign Direct Investment and Property Protection in Brazil. *Copenhagen Business School*, 1-93.
- [9] Gerring, J., Bond, P., Barndt, W. T., & Moreno, C. (2005). Democracy and economic growth: A historical perspective. *World politics*, 57(3), 323-364.
- [10] Glass, A. J., & Saggi, K. (2002). Intellectual property rights and foreign direct investment. *Journal of International economics*, 56(2), 387-410.
- [11] Glass, A. J., & Wu, X. (2007). Intellectual property rights and quality improvement. *Journal of Development economics*, 82(2), 393-415.
- [12] Hill, R. C., Griffiths, W. E., & Lim, G. C. (2018). *Principles of econometrics*: John Wiley & Sons.

- [13] Kashcheeva, M. (2013). The role of foreign direct investment in the relation between intellectual property rights and growth. *Oxford economic papers*, 65(3), 699-720.
- [14] Kumar, N. Role of IPR in International transfer of technology in case of developing countries and countries with economies in transition.
- [15] Kumar, R., Yadav, S. K., & Verma, S. (2018). Intellectual property rights protection and foreign direct investment: a study of BRICS countries. *World Review of Entrepreneurship, Management and Sustainable Development*, 14(6), 694-704.
- [16] Lee, M., Alba, J. D., & Park, D. (2018). Intellectual property rights, informal economy, and FDI into developing countries. *Journal of Policy Modeling*, 40(5), 1067-1081.
- [17] Maskus, K. E., Milani, S., & Neumann, R. (2019). The impact of patent protection and financial development on industrial R&D. *Research Policy*, 48(1), 355-370.
- [18] Nguyen, A. T., Haug, A. A., Owen, P. D., & Genç, M. (2020). What drives bilateral foreign direct investment among Asian economies? *Economic Modelling*, 93, 125-141.
- [19] Ofili, O. U. (2014). Intellectual property rights protection and economic development: the case of Nigeria. *European Scientific Journal*, 1-145.
- [20] Petri, P. A. (2012). The determinants of bilateral FDI: Is Asia different? *Journal of Asian Economics*, 23(3), 201-209.
- [21] Petrović-Randelović, M., Mitić, P., Zdravković, A., Cvetanović, D., & Cvetanović, S. (2020). Economic growth and carbon emissions: evidence from CIVETS countries. *Applied Economics*, 52(16), 1806-1815.
- [22] Raza, S. A., Shah, N., & Arif, I. (2019). Relationship between FDI and economic growth in the presence of good governance system: Evidence from OECD Countries. *Global Business Review*, 0972150919833484.
- [23] Sabir, S., Rafique, A., & Abbas, K. (2019). Institutions and FDI: evidence from developed and developing countries. *Financial Innovation*, 5(1), 1-20.
- [24] Seid, S. (2018). *Global regulation of foreign direct investment*: Routledge.
- [25] Seyoum, B. (2006). Patent protection and foreign direct investment. *Thunderbird International Business Review*, 48(3), 389-404.
- [26] Singh, A. K., Arya, A. K., & Jyoti, B. (2019). A conceptual review on economic, business, intellectual property rights and science & technology related activities in Asian economies. *JNNCE Journal of Engineering & Management (JJEM)*, 3(2), 1.
- [27] Wang, H., Lai, M., & Spivakovsky, M. (2012). Does IPR promote innovation? New evidence from developed and developing countries. *Journal of Chinese Entrepreneurship*.
- [28] Wooldridge, J. M. (2015). *Introductory econometrics: A modern approach: Cengage learning*.
- [29] Yi, X., & Naghavi, A. (2017). Intellectual property rights, FDI, and technological development. *The Journal of International Trade & Economic Development*, 26(4), 410-424.