

OWNERSHIP STRUCTURE, AUDIT QUALITY & FIRM INNOVATION: EVIDENCE FORM PAKISTAN

Adnan Khan, Lecturer, Department of Commerce and Management Sciences, University of Malakand, Pakistan. Email: adnan.ilink@gmail.com

Naveed, Associate Professor, Qurtuba University of Science & Technology Peshawar, Pakistan. Email: naveedtoru97@gmail.com

Zahid Ali, Lecturer, Department of Commerce and Management Sciences, University of Malakand, Pakistan. Email: zahidzady@yahoo.com

Abstract. *Ownership structure plays key role in the firm strategic decisions. Separation of ownership and control*

Received 21 March 2021
Accepted 30 June 2021

causes principal-agent conflict in organizations. Ownership structure is considered as the most powerful remedy to agency problems in firms. Firm investment in R&D for innovation being the critical and risky decision, gained the attention of researchers. The objective of this study is to determine the impact of ownership structure on firm innovation. It aims to answer whether the relationship of ownership structure and firm innovation is affected by the firm audit quality. The study utilizes all non-financial firms listed in Pakistan Stock Exchange (PSX) for the period of 2005-2018. Fixed effects model is used based on Husman's test result for analysis. The study finds concentrated ownership to be positively associated with firm innovation while restricted ownership negatively affects firm innovation. However the relationship between institutional ownership and firm innovation could not be established. Furthermore, we couldn't find the moderating role of audit quality in the relationship between ownership concentration and firm innovation. The same is the outcome in case of institutional ownership. However the study finds evidence that audit quality strengthens the negative relationship of restricted ownership and firm innovation.

Keywords: Ownership Structure, Concentrated Ownership, Restricted Ownership, Institutional Ownership, R&D, Audit Quality.

1. Introduction

Firm innovation decisions; an integral component of the strategic move of the organization is getting its importance in the modern research. Firm innovation decisions are considered as a consequence of corporate governance structure in general and ownership structure in specific. The board has a significant

influence in the strategic decisions of the firm range from financial to firm innovation. The existence of agency problems intensifies the relationship between ownership structure and firm innovation (Chou & Johennesse, 2021)

Modern corporations are more exposed to agency costs due to separation of ownership and control. The corporate governance mechanism is reducing the conflicts, control rights and safeguards the autonomy of the management to work for shareholders wealth maximization (Al-Matari, Al-Matari, & Saif, 2017). Effective corporate governance mechanism is considered as the best possible solution to the agent-principal conflicts. Ownership structure is the core aspect of corporate governance, gained more attention of the researchers. Various studies aimed to determine the relationship of ownership structure with the firm performance, value, growth, and innovations (Farwis & Azeez, 2019; Paniagua, Rivelles, & Sapena, 2018; Rubio-Misas, 2020; Soewarno & Ramadhan, 2020; Wan, Zhou, Liu, Fang, & Chen, 2021). Sing and Sirmans (2008) identified separation of ownership and management as integral part of modern corporations. This separation leads to conflicts of interest and results in higher agency costs.

Similarly, authors endured to assess the impact of ownership structure and firm innovation decisions process. The findings are mixed in different environments and corporate settings. A positive association between concentrated ownership and firm innovation is reported (Migliori, De Massis, Maturo, & Paolone, 2020; Minetti, Murro, & Paiella, 2015; Munari, Oriani, & Sobrero, 2010; Rapp & Udoieva, 2017) . The results of other studies reveal that concentrated ownership had a positive relationship with firm innovation (Berrone, Surroca Aguilar, & Tribo Gine, 2005; Minetti et al., 2015; Munari et al., 2010). Similarly, another study reported “U” Shaped relationship between Ownership and innovation (Sun, 2020). Chou and Johennesse (2021) reported a positive relationship with board independence, size of firm and lower level of leverage. In contrast, negative relationship was reported between board size and innovation in large firms.

Audit quality is considered as key determinant of the reliability and authenticity of the financial statements of corporations (Alzeaideen & Al, 2018). The audit quality gained more attention of the researchers in the field of finance, accounting and corporate governance after the financial crisis. Shareholders and creditors showed more reliance on the audit quality prior to investment decision. Various authors examined the relationship of ownership structure, audit quality, firm performance and firm innovation. Results of the studies revealed no significant moderating relationship of audit quality (Al-Matari & Al-Hebry, 2019; Al-Matari et al., 2017). However, the relationship between concentrated ownership and audit quality was positive but

insignificant (Alzeaideen & Al, 2018). Furthermore, the higher agency costs intensified demand for higher quality audits.

Due to the mixed findings in different corporate settings and fewer studies in the Pakistan context, this study endures to fill the gap and determine the impact of ownership structure on the firm innovation. Concentrated ownership, restricted ownership and intuitional ownership structures are considered in the study. Moreover, the audit quality has gained importance in the corporate environment, the present study attempts to assess the moderating role of audit quality on the relationship between ownership structure and firm innovation.

Concentrated ownership proxied by considering top five largest shareholders, has positive insignificant relationship, while, considering top three showed a significant positive relationship in Pakistan. Conversely, institutional ownership has an insignificant impact on firm innovation. Parallel to the findings of the other studies, no significant moderating relationship could be established. Similar evidence is reported from the other studies of the developing economies.

The results of the study are expected to be beneficial to the key stakeholders of the corporations in Pakistan. The findings of the study might be used as a major input in devising and implementation of innovation strategies. Furthermore, the current and potential investors would get insight into the corporate approach towards innovation. The study aims to add to the existing body of knowledge on the subject, through evidence from the developing country and use of audit quality as moderator variable.

2. Literature Review

R&D investment being an integral component of the modern organization strategic decision gained more attention in the last decade. Investment in R&D bring competitive advantage due to enhanced knowledge based and intangible assets (James & McGuire, 2016). Various authors endured to study the R&D intensity from one or another perspective. R&D decisions being important and difficult taken with utmost care. Problems raised from R&D investment were twofold: financing and control. Required initial cash outflow with higher degree of uncertainty in return increased the financing issues. While in-built information asymmetry relevant to the associated degree of risks, return and success of the investment results in adverse selection and increased agency costs (Rapp & Udoieva, 2017).

The level of R&D expenditures are examined with diverse variables like size of the firm, board size, audit quality, firm value and firm performance in different parts of the world. In the following lines the relevant studies

concentrated on the relationship of ownership structure and R&D are discussed briefly. Initially the research on direct relationship are discussed, followed by the studies covering the moderating effect of audit quality are given.

2.1 Ownership structure and R&D investment

Ownership structure being an integral component of corporate governance is placed as an important influencer for firm innovation decision. The conflicts arise when the control rest among few shareholders. In such situation controlling shareholders may exploit the interest of minority shareholders (type II agency problem) through tunneling transactions. The literature reported two possible outcomes of controlled ownership structure i.e. tunneling and supervisory affects. The tunneling effect reported to adversely affect firm innovation while, the later favors the innovation. The supervisory effect gives the courage and confidence to the shareholder to monitor the activities of managers and hence agency problems are minimized.

Lopez (2017) while sampling 1090 firms' data from 19 countries examines the impact of ownership structure on firm innovation. Their study reported that the legal protection of the shareholders to be positively associated with R&D investment. The concentrated ownership was found to be a substitute for the legal protection of the shareholders (Lopez Iturriaga & López-Millán, 2017). Similarly, previous studies identified the impact of family ownership on the innovations. It was concluded that family ownership (proxied by concentrated ownership) is more inclined towards demand full innovation (Migliori et al., 2020).

Minetti et al. (2015) endured to examine the relationship between ownership concentration and firm innovation in Europe. It was found that negative relationship exists between concentrated ownership and R&D investment i.e. evidence of conflict between minority and controlling shareholders. Similarly examining effect of ownership identity on R&D investments, it was found that firms with diverse ownership encouraged higher investment in R&D than closely held firms (Munari et al., 2010). The primary factor behind such behavior was reported to be the risk-averse nature of the owners, as their total investment was put into single firm. Greater variations in the outcomes and chances of failure intensify the agency costs (Berrone et al., 2005). (Sun, 2020) examined the relationship between ownership structure and firm innovation and U Shaped relationship was reported between the two. The study found that firms dominated by institutional investors depict high R&D investment due to their long-term commitment of the owners.

Similarly, a negative association was reported with directors ownership and top block holders ownership in large firms (Chou & Johennesse, 2021). Besides the advanced countries, a few studies focused on the impact of

ownership structure on the firm innovation in the emerging economies. Rapp and Udoieva (2017) determined the association between the ownership structure and R&D. Furthermore; attempt was made to investigate the corporate governance code and its implementation role in the behavior of the R&D spending. It was reported that concentrated ownership structure had negative association with R&D intensity.

Based on the above notion that large shareholders are able to play effective monitoring role and are able to concentrate on long term strategic objectives, we hypothesize for our study:

H1: Concentrated Ownership has a positive association with firm innovation.

H2: Restricted ownership has negative association with firm innovation.

The relationship between innovation and institutional ownership was assessed in US. US Firms (institutional owners) were interested to play supervisory role and positive relationship between the ownership and innovation was reported (Aghion, Van Reenen, & Zingales, 2013). Another study examined the relationship by taking board characteristics, ownership structure as influencers of firm innovation in Taiwan. Results indicated positive degrees of association of board independence. In contrast, negative relationship was reported between board size and R&D investment in large firms.

Furthermore, R&D personnel, and overall industrial intensity were key contributors for R&D investments. Driver and Guedes (2012) reported an inverse relationship between the size of institutional investors and R&D investment. The logic behind his finding was large institutions prefers short run return, while, R&D investment takes longer. However, individual investors were more motivated towards R&D investment. Based on the notion that institutional investors are effective monitoring channel and can bear with long term investments, the study hypothesize:

H3: Institutional ownership has negative association with firm innovation.

2.2 Moderating Effect of Audit Quality

Audit quality is considered an important component to overcome agency problems. The shareholders have more confidence on the financial statements being audited by the big auditing firms. The controlling shareholder can get the confidence/trust of the minority shareholders through quality of audit. Hence, the relationship between ownership and firm innovation might be affected by the perceptions of the shareholders regarding the quality of the audit. Various authors attempted to determine the relationship of ownership structure and firm

innovation by taking various moderators. In the given lines the studies focused on the audit quality are given. Therefore firms with quality audit may not allow the large shareholders to exploit minority shareholders.

A study attempted to determine the relationship of ownership structure on firm performance by taking audit quality as moderating variable. A positive impact of concentrated ownership on the performance was found. The managerial ownership showed a positive but insignificant impact on the performance of the firm (Al-Matari et al., 2017). Another study examined the relationship between ownership structure and innovation by considering regional governance environment as moderator. All non-financial companies listed at Shanghai and Shenzhen stock exchanges were taken as sample. It was reported that concentrated ownership has a negative relationship with R&D intensity (Wan et al., 2021).

Similarly, the relationship of ownership structure on the performance of the firm by taking audit quality as moderator was examined. Ownership structure characteristics of government, foreign and institutional were considered. It was found that government and foreign ownership had a positive and significant relationship with the performance. Audit quality has insignificant moderating effect. It was justified, that due to less qualified Audit staff this relationship exists (Al-Matari & Al-Hebry, 2019).

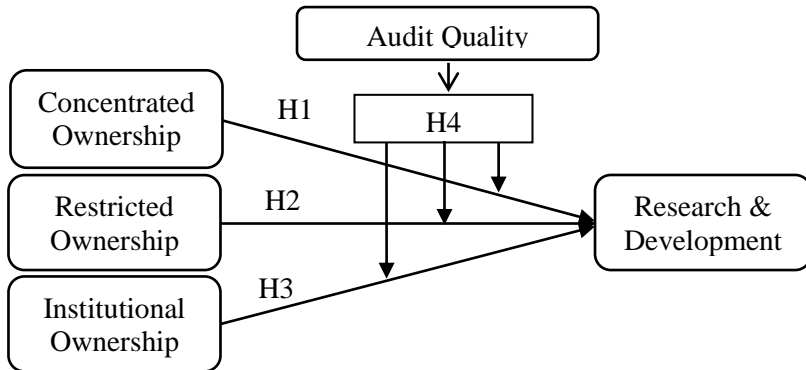
Another research endeavored to further examine the audit quality in Jordan environment. The variables of ownership structure and corporate debt were taken in relation to the audit quality. The study reported a positive relationship of institutional ownership, foreign ownership and corporate debt with audit quality. However, the relationship between concentrated ownership and audit quality was positive but insignificant (Alzeaiden & Al, 2018).

Similar findings were reported in a study in Kuwait. The results revealed that state and institutional ownership structures had a significant positive degree of association, while, a negative association with the family owned structure (Alshammari, 2014).

Based on the above literature relevant to audit quality and R&D intensity the following hypotheses can be drawn for analysis in this study:

- H4a: Audit quality weakens the positive association between ownership concentration and firm innovation.
- H4b: Audit quality strengthens the negative association between ownership restrictions and firm innovation.
- H4c: Audit quality strengthens the positive association between institutional ownership and firm innovation.

Conceptual Framework



3. Methodology

3.1 Data

The non-financial firms listed on Pakistan stock exchange (PSX) are taken as sample of the study. The sample period of the study is 2005 to 2018. The data relevant to the dependent variable (Firm Innovation), variables of interest i.e. ownership structure and Audit quality is collected from the annual reports of the concerned companies. The data of the control variables i.e. firm size, cash holdings and leverage are collected from balance sheet analysis (BSA) of the firms issued by state bank of Pakistan (SBP).

3.2 Definition of Variables

3.2.1 Dependent Variable

Firm innovation is taken as dependent variable for this study. Two approaches are used to measure the firm innovation based on the available literature. Firstly, the R&D expenditures normalized by the total asset in a given year and secondly represented by a binary dummy variable by assigning code of 1 if the firm incurs R&D expenses and 0 if otherwise.

3.2.2 Independent Variables

Ownership structure is the explanatory variable of the study. Ownership structure is further divided into the following three classes:

- i. *Ownership Concentration* is measured by proportionate shares owned by top five largest shareholders and then by proportionate shares owned by the top three largest shareholders denoted.
- ii. *Restricted Ownership* measured by taking the difference in number of shares hold by the largest and second largest shareholders in a firm

normalized by the total outstanding shares. Further, HHI Index was also calculated for the restricted ownership through $=\sum \{(Largest - Second)^2 + (Second - Third)^2\}$.

- iii. *Institutional Ownership* is operationalized by taking shares owned by institutions divided by total outstanding shares.

3.2.3 Moderating Variables

- i. *Audit Quality* is the moderating variable of the study. Audit quality was determined by a dummy binary variable with a score of 1 if firm audited by any of the Big four auditing firm and 0 otherwise.

3.2.4 Control variables

Firm size, leverage, profitability and cash holdings are taken as control variables in the study.

Table 1 *Variables Description*

Variable Name	Abbreviation	Measurement
Dependent (Research and Development)		
Research and Development	R&D_TA	Research and development cost normalized by the total assets of a firm in a financial year.
	R&D_Dummy	Dummy 1 for a firm which has incurred research and development cost in a year otherwise zero.
Independent Variables		
Ownership Concentration	Top5_Own	Shares owned by the five largest shareholders divided by the total no of outstanding shares
Ownership Concentration	Top3_Own	Shares owned by the Three largest shareholders divided by the total no of outstanding shares
Ownership Restrictions	Own_Dif	The difference in number of shares owned by the largest and second largest shareholder
Herfindahl index of Ownership contestability	Own_HHI	$=\sum \{(Largest - Second)^2 + (Second - Third)^2\}$
Intuitiional Ownership	Inst_Own	Shares owned by the institutions divided by the total no of outstanding shares
Moderators		
Audit Quality	Big_4	1 if firm audited by the top 4 auditing firms otherwise zero

Control Variables		
Firm size	Size	Number of shares outstanding times share price at the end of fiscal year.
Leverage	leverage	Total liabilities over book value of total assets reported.
Cash holding	Cash	Cash holdings of a firm in a year.

3.3 Econometric Techniques

To determine the association between firm innovation and ownership structure and to investigate the effect of audit quality on the relationship between ownership structure and firm innovation the study used fixed effects. Fixed effect techniques care for the heterogeneity among the firms.

4. Results and Discussion

4.1 Descriptive Statistics

In the table 2 the dependent variable Firm innovation (proxied by R&D expense to total assets) has mean value of 3.422 with minim 0 and maximum value of 862.4. The R&D is operationalized by taking the R&D to total assets, values denoted below in the table with mean score of 0.000245 and 0.0506 maximum. Concentrated ownership represented by 5 largest shareholders has got the mean score of 0.656 while restricted ownership shown 0.228 and 0.118 mean value. Institutional ownership reveals the average score of 0.107.

Table 2 *Descriptive Statistics*

Variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
R&D	2,915	3.42	31.94	0	862.4
R&D_TA	2,795	0.00	0.002	0	0.05
RD_dummy	2,915	0.10	0.296	0	1
ROA	2,249	0.04	0.111	-1.96	0.67
Size	2,233	21.33	2.318	11.81	30.61
Cash	1,761	12.58	1.963	5.19	19.04
Leverage	2,250	0.60	0.320	0.01	3.11
Top5_Own	2,255	0.66	0.208	0	1.00
Own_T3	919	0.00	0.000	0	0.00
Own_Dif	1,413	0.23	0.239	-0.44	0.99
Own_Dif2	1,383	0.12	0.180	0	0.98
Inst_Own	2,254	0.11	0.128	0	0.90
Big_4	2,258	0.45	0.498	0	1

4.2 Correlation

Correlation among the variables of the study is shown in the table 3 below. The table reveals that R&D expenditures has a positive correlation with all variables in the model. Firm Innovation reveals a positive correlation with leverage ratio, concentrated ownership, restricted ownership and audit quality. While negative correlation is found with Profitability, Size, cash-holdings and HHI. Further the table reveals that there is no multicollinearity among the independent independents of the study i.e. it is within the tolerable range.

Table 3 Correlation Statistics

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1												
2	0.6***	1											
3	0.4***	.4***	1										
4	0.1	-0.0	0.0	1									
5	0.1***	-0.0	0.0*	.5***	1								
6	0.1***	-0.0	0.0	.4***	0.8***	1							
7	0.1*	0.0	-0.0	-	-0.2***	-0.1	1						
				.4***									
8	0.0	0.1	0.0	.2***	0.2***	0.2***	0.0	1					
9	-0.0	0.1	0.1	-0.1*	-0.4***	-0.4***	-	0.2c	1				
							0.0						
10	0.0	0.0	0.0	.2***	0.3***	0.3***	-	0.6***	-	1			
							0.1		0.0				
11	0.0	-0.0	0.0	.2***	0.3***	0.2***	-	0.6***	-	0.9***	1		
							0.1		0.1				
12	0.3***	0.1	0.1	-0.1	0.0	0.1	0.1	-0.1**	-	-0.2***	-0.2***	1	
									0.0				
13	0.1	0.0	.2***	.2***	0.4***	0.3***	-0.1**	0.2***	-	0.2***	0.2***	0.1**	1
									0.1**				

Hints: 1=R&D; 2=R&D_TA; 3=RD_dummy; 4=ROA; 5=Size; 6=Cash; 7=Leverage; 8=Top5_Own; 9=Own_T3; 10=Own_Dif; 11=Own_Dif2; 12=Inst_Own; & 13=Big_4

Table 4 Regression Results

	(1)	(2)	(3)
VARIABLES	RandD_TA	RandD_TA	RandD_TA
Top5_Own		0.00 (1.499)	
Top3_Own			50,077*** (4.31)
Leverage		0.00 (0.224)	-0.00 (-0.09)
Size	-0.00** (-2.04)	-0.00** (-2.03)	0.00 (-0.22)
Cash	0.00** (2.25)	0.00** (2.25)	0.00** (2.53)
ROA	0.00** (2.43)	0.00** (2.43)	-0.00 (-0.40)
Constant	0.00 (0.83)	0.00 (0.57)	-0.00 (-1.23)
Observations	718	718	584

R-squared	0.022	0.026	0.055
Number of Firms	141	141	133
Industry Effect	No	No	No
F Stat	3.233	3.041	5.199

T-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 5 Ownership, Audit Quality & Firm Innovation

Variables	R&D_TA	R&D_TA	R&D_TA	R&D_TA	R&D_TA	R&D_TA	R&D_TA
Own_Diff	-0.00** (-2.013)				-0.00*** (-2.861)		
Own_HHI		-0.00 (-1.61)				-0.01*** (-2.654)	
Big_4 X Own_Dif					0.00** (-2.13)		
Big_4 X Own_HHI						0.00** (-2.22)	
Top3_Own				56,898*** (-4.53)			
Big_4 X Top3_Own				-7220 (-1.46)			
Inst_Own			0.00 (-0.15)				0.00 (-0.29)
Big_4 X Inst_Own							-0.00 (-0.29)
Big_4				0.00 (-0.50)	-0.00 (-1.02)	-0.00 (-0.77)	0.00 (-0.29)
Leverage	-0.00 (-0.33)	-0.00 (-0.31)	0.00 (-0.22)	-0.00 (-0.01)	-0.00 (-0.31)	-0.00 (-0.31)	0.00 (-0.20)
Size	-0.00 (-1.06)	-0.00 (-1.15)	-0.00** (-2.00)	-0.00 (-0.21)	-0.00 (-1.10)	-0.00 (-1.13)	-0.00** (-2.01)
Cash	0.00*** -2.63	0.00** -2.51	0.00** -2.242	0.00** -2.473	0.00*** -2.59	0.00** -2.40	0.00** -2.23
ROA	-0.00 (-0.49)	-0.00 (-0.48)	0.00** -2.43	-0.00 (-0.32)	-0.00 (-0.68)	-0.00 (-0.63)	0.00** -2.41
Constant	0.00 -0.13	0.00 -0.20	0.00 -0.80	-0.00 (-1.29)	0.00 -0.26	0.00 -0.30	0.00 -0.80
Obserns.	588	584	718	584	588	584	718
R-squared	0.03	0.02	0.02	0.06	0.03	0.03	0.02
No of Firms	133	133	141	133	133	133	141
Industry Effect	No	No	No	No	No	No	No
F Stat	2.26	1.96	2.59	4.02	2.28	2.12	1.86

Breusch Pagan test recommended of not preferring pooled OLS. Therefore, we estimated both fixed and random effects model thereafter, where Hausman test recommended ($\chi^2 = 20.18$ with P-value=0.0005) fixed models as appropriate estimation techniques. Table 4 reveals that ownership concentrated represented by the five largest shareholders have insignificant effect on innovation and concentration represented by the proportionate ownership of the three largest shareholders is having significant effect on innovation. It shows that the three largest shareholders have say in deciding research and development expenditures in Pakistan. The finding is in line with the findings of the studies of (Berrone et al., 2005; Minetti et al., 2015; Munari et al., 2010).

Table 5 depicts that the relation between institutional ownership and firm innovation couldn't be established. This results are also in accordance with the studies of (Berrone et al., 2005; Chou & Johenesse, 2021). The negative effect might be due to the fact that in our study we have considered institutional ownership measures via proportionate ownership of institutions. It is obvious that the institutions differ in their aims and nature, so in their tendency towards innovation. Furthermore, the table 4.4 reports confirm the findings of the study claimed that restricted ownership has a negative association with the R&D investment. It is parallel with the notion that firms having diffused ownership are facing lower level of type II agency conflict that's why such firms can afford to carry on with large cash flows at the discretion of managers/block holders rather than investing these in firm innovation. This results affirms H2 of the study and is in line with the findings of (Al-Matari & Al-Hebry, 2019). The study couldn't find the moderating role of audit quality in the relationship between ownership concentration and firm innovation. The same was the outcome in case of institutional ownership. These findings are parallel to (Al-Matari & Al-Hebry, 2019; Al-Matari et al., 2017; Alzeaiden & Al, 2018). It could be because of the policy dimensions, as the firms are not bound to be audited by the big firms. Furthermore, the institutional ownership and concentrated ownership are the tools of covering the agency issues similar to audit quality. However the study found evidence that audit quality strengthens the negative relationship of restricted ownership and firm innovation which affirms H4b of the study. That is, audit quality further prohibits expropriation of the minority shareholders by the major shareholders.

Conclusion

The aim of the study was to investigate the impact of ownership structure on the firm innovation with the moderating effect of audit quality. The non-financial firms listed in PSX were taken as the sample of the study for 2005-2018. Fixed effects model was applied for the study. Results of the study revealed that concentrated ownership has a positive association with firm innovation. While, restricted ownership has shown a negative association with

firm innovation. However the study couldn't find the negative association of institutional ownership with firm innovation.

Further the study couldn't found moderating role of the audit quality between the ownership concentration and firm innovation. The same was the findings in case of the association between institutional ownership with firm innovation. Yet the study found that audit quality strengthens the negative association of restricted ownership (measured via HHI and proportionate ownership difference between largest and second largest owner) with firm innovation.

The result of the study is expected to provide insight to the stock exchange authorities, government of Pakistan, SECP policy makers and the top management of the firms in Pakistan. Similarly, the current and potential investors may get an idea of the organization psychology and direction from the findings of this study, prior to take investment decisions. Beside the empirical importance, this study adds to existing literature by determining the relationship from a developing country. Future studies may further dig out the moderating role of audit quality in the association between ownership and firm innovation. Similarly investigating the role of the various categories of the institutional owners in the context of firm innovation may provide new window for future research. The study concluded that concentration innovation is positively associated with firm innovation while restricted ownership is negatively. And it also concluded that audit quality strengthens the negative association of restricted ownership with firm innovation.

References

- Aghion, P., Van Reenen, J., & Zingales, L. (2013). Innovation and institutional ownership. *American Economic Review*, *103*(1), 277-304.
- Al-Matari, E. M., & Al-Hebry, A. A. (2019). The impact of government, foreign and institutional ownership and firm performance on audit quality using regression analysis. *Industrial Engineering & Management Systems*, *18*(3), 395-406.
- Al-Matari, E. M., Al-Matari, Y. A., & Saif, S. A. (2017). Ownership structure, audit quality and firm performance moderating and direct-effect models: An empirical study. *Corporate Board: Role, Duties and Composition*, *13*(1), 28-35.
- Alshammari, S. (2014). Corporate governance and audit quality: The case of Kuwait. Bond University.

- Alzeaideen, K. A., & Al, S. Z. (2018). The effect of ownership structure and corporate debt on audit quality: Evidence from Jordan. *International Journal of Economics and Financial Issues*, 8(3), 51-73.
- Berrone, P. A., Surroca Aguilar, J., & Tribo Gine, J. A. (2005). The influence of blockholders on R and D investments intensity: Evidence from Spain.
- Chou, T., & Johennesse, L. (2021). Board characteristics, ownership structures and firm R&D intensity. *Accounting*, 7(3), 635-644.
- Driver, C., & Guedes, M. J. C. (2012). Research and development, cash flow, agency and governance: UK large companies. *Research Policy*, 41(9), 1565-1577.
- Farwis, M., & Azeez, A. (2019). Corporate ownership structure and firm risk: Empirical evidence from listed companies in Sri Lanka. *Journal of Finance and Bank Management*, 7(2), 72-81.
- James, B. E., & McGuire, J. B. (2016). Transactional-institutional fit: Corporate governance of R&D investment in different institutional contexts. *Journal of Business Research*, 69(9), 3478-3486.
- Lopez-Iturriaga, F. J., & López-Millán, E. J. (2017). Institutional framework, corporate ownership structure, and R&D investment: An international analysis. *R&D Management*, 47(1), 141-157.
- Migliori, S., De Massis, A., Maturò, F., & Paolone, F. (2020). How does family management affect innovation investment propensity? The key role of innovation impulses. *Journal of Business Research*, 113, 243-256.
- Minetti, R., Murro, P., & Paiella, M. (2015). Ownership structure, governance, and innovation. *European Economic Review*, 80, 165-193.
- Munari, F., Oriani, R., & Sobrero, M. (2010). The effects of owner identity and external governance systems on R&D investments: A study of Western European firms. *Research Policy*, 39(8), 1093-1104.
- Paniagua, J., Rivelles, R., & Sapena, J. (2018). Corporate governance and financial performance: The role of ownership and board structure. *Journal of Business Research*, 89, 229-234.
- Rapp, M. S., & Udoieva, I. A. (2017). Corporate governance and its impact on R&D investment in emerging markets. *Emerging Markets Finance and Trade*, 53(10), 2159-2178.
- Rubio-Misas, M. (2020). Ownership structure and financial stability: Evidence from Takaful and conventional insurance firms. *Pacific-Basin Finance Journal*, 62, 101355.
- Sing, T. F., & Sirmans, C. (2008). Does real estate ownership matter in corporate governance? *Journal of Property Research*, 25(1), 23-43.

- Soewarno, N., & Ramadhan, A. (2020). The effect of ownership structure and intellectual capital on firm value with firm performance as an intervening variable. *International Journal of Innovation, Creativity and Change*, 10(12), 215-236.
- Sun, C., Q. Long. (2020). An empirical study on the influence of ownership concentration on enterprise R&D investment. *Review of Industrial Economics*, 1, 120-132.
- Wan, W., Zhou, F., Liu, L., Fang, L., & Chen, X. (2021). Ownership structure and R&D: The role of regional governance environment. *International Review of Economics & Finance*, 72, 45-58.