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## Article

# Does corporate governance reduce overinvestment? The mediating role of information asymmetry

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## **Does Corporate Governance Reduce Overinvestment? The Mediating Role of Information Asymmetry**

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### **Abstract**

This study investigates the direct and indirect relationship between corporate governance and agency cost using bootstrap analysis. For a sample of 155 firms during 2009-2015, this study finds statistically significant both direct effect of corporate governance on agency cost of overinvestment, and an indirect effect mediated by information asymmetry, with favoring the indirect effect as more important in reducing agency cost. The direct effect shows that despite increasing corporate governance mechanism, the agency cost of overinvestment is rising. However, the indirect effect suggests that the corporate governance mechanism promotes transparency by exerting pressure on management to produce information that investors and other stakeholders can use. This creates a monitoring channel that reduces information asymmetry, thus reducing the ability of management and majority shareholders to expropriate the firm's resources that mitigates overinvestment of free cash flow. The results provide implications for regulators that the effectiveness of corporate governance practices should be watched carefully to reduce managerial opportunism and controlling shareholders' expropriation in firms. Moreover, the regulatory authorities should collaborate with firms' management to frame disclosure policies that investors can use as a monitoring device to make firms unable to overinvest free cash flow.

**Keywords:** corporate governance index, information asymmetry, agency cost, Bootstrapping analysis.

## 1. Introduction

Pertaining to many financial scandals during the last three decades (e.g. Enron (USA), Parmalat (Italy) and Crescent Standard Investment Bank Limited (Pakistan)), companies are paying more attention to resolve management's opportunistic behaviors in the form of fund expropriation, empire building and suboptimal investments. Jensen and Meckling (1976) argued, in a case where both principle and agent in an agency relationship are value maximizers, the agents might not act in the best interests of the principle. Similarly, majority shareholders' interests may not match minority shareholders' interests, and the former are expected to gain benefits at the expense of the latter (La Porta, Lopez-de-Silanes, Shleifer, & Vishny, 2000; Morck, shleifer, 1997). Managerial desires for their own welfare rather than shareholder's wealth, termed as agency cost has become a widely debated topic in economic and financial literature since the publication of 'Theory of the Firm' by Jensen and Meckling, (1976).

Agency cost prevail in several forms in firms, which include excessive perquisites consumption, entrenched decisions, empire building and non-optimal investment decisions. These forms adversely affect the firms' performance and might take the firms towards a corporate fraud. Although managers do agree with the owners' wealth maximization but in reality, managers' concern towards their wealth and fringe benefits maximization prevents them to perform for owners' interests. Coupled with conflict of interest, information asymmetry also tends to rise with separation of ownership and control. The information differential between the knowledge possessed by board of directors and what is made available to the investors and public is termed as information asymmetry. Additionally, it is the extent to which share price sensitive information varies between informed (which have potential access to inside information) and uninformed stock traders.

There is a considerable stream of research supporting CG mechanisms to mitigate firm level agency conflicts and thus the resulting agency cost (Fleming et al., 2005; Mcknight and Weir, 2009; Garanina and Kaikova, 2016). This study introduces new insights in existing literature, by suggesting an effective approach through which corporate governance mechanisms effectively mitigate agency cost. The presence of corporate governance quality proposed to achieve a transparent management of the company, consequently affecting the agency cost by decreasing information asymmetry between insiders and the market. The less is the information regarding the firm, the more are managerial discretions and self-maximizing decisions ultimately leading to heightened external monitoring and agency cost. The study extends the literature by empirically investigating the fundamental role of information asymmetry as a mediator between corporate governance and agency cost.

Prior research has either investigated the relationship between corporate governance and agency cost or the relationship between corporate governance and information asymmetry. However, the indirect effect of a firm's corporate governance on agency cost, through information asymmetry remains unexplored. Corporate frauds and stock market crashes in developing and developed economies reveal that compliance with CG codes

does not always indicate that managerial interests are aligned with that of shareholders. Even with corporate governance controls, firms' management may involve in misreporting and concealment. This situation motivates to examine whether the presence of information asymmetry aids monitoring efforts of corporate governance mechanism in reducing managerial opportunism in firms. The current study contributes to existing literature by empirically examining the indirect effect of corporate governance index on agency cost through information asymmetry.

Moreover, earlier research was largely conducted in Anglo-Saxon countries (Garanina & Kaikova, 2016; Gisbert & Navallas, 2013; Shao & Wang, 2018; Wang et al., 2013), and minimal research has been done in South Asian countries where institutional differences, particularly legal enforcement, ownership structure, business-government relationships, and level of investor protection differ considerably which may affect the associations between corporate governance, levels of information asymmetry and agency cost. As per Millar et al., (2005) and Gisbert and Navallas (2013) developing economies in Asia depict business structures with ownership concentration, inadequate legal framework, ineffective flow of information, and relationship based institutions. Pakistan provides a good institutional setting to contribute to the debate on the direct and indirect relationship between corporate governance and agency cost, owing to the very fact, that the lack of policies and unwillingness of management to practice codes,, ownership structure, lack of board independence the implementation of corporate governance in Pakistan are ineffective (Ameer, 2013; Dar et al., 2011).

Firms are subject to a high degree of freedom when choosing how much information to disclose and the issue of transparency thereby is increasing at an alarming rate in developing countries, which itself constitutes a sufficient reason to examine this matter. Najm-Ul-Sehar et al. (2013) further affirm that corporations in Pakistan do not tend to disclose value relevant information due to ineffective implementation of laws regarding disclosures, lack of awareness and business ethics. Aforementioned, due to changing institutional framework the conclusions drawn in a developed economy may become invalid when applied in developing economy. It could be asked whether corporate governance mechanism has the same result in reducing agency cost in developing economies as it has in developed economies?. The study by Iatridis, (2012) empirically showed that the effectiveness of corporate governance in reducing agency cost is dependent on the institutional settings of the country. Moreover, Khan et al. (2017) answered this question by suggesting that the research in the field of corporate governance in Pakistan is at inception stage which consequently upholds the motivation and contribution of this study, which examined the direct and indirect effect of corporate governance on agency cost through information asymmetry.

Additionally, previous studies examined the effect of corporate governance on agency cost through a few single measures whereas, current study therefore contributes to the existing literature by using a composite corporate governance index therefore increasing the reliability of the results. The study also contributes methodologically by employing bootstrap analysis using PROCESS Macro to derive 95% level confidence intervals for all the effects. As compare to conventional mediation analysis, Process Macro report the values of direct and indirect effect of corporate governance on agency cost. Similarly, it also reports the bootstrap confidence intervals to determine the significance of the effects.

## 2. Literature Review

### 2.1. Corporate Governance and Agency Cost

In firms, the principle-agent conflicts (Jensen & Meckling, 1976), as well as large shareholders and small shareholders' conflicts (Morck & shleifer, 1997) aid inefficient investment in the form of empire building, funds expropriation and perquisite consumption. Jensen and Meckling (1976) advocates that restraint on these managerial and controlling shareholders expropriation derive monitoring and bonding costs, termed as agency cost. The magnitude of agency costs in firms depends on the control mechanism employed as well as the firms' ownership structure. Agency theory suggests that effective corporate governance firms have higher valuations and lower agency costs due to effective monitoring mechanisms.

There is a substantial stream of research in developed economies, -supporting corporate governance mechanisms to align principal-agent interests and reduce agency cost (Ang et al., 2000; Belghitar & Clark, 2015; Chrisostomos, 2008; Fleming et al., 2005; Henry, 2010; Maurović & Hasić, 2013; Mcknight & Weir, 2009). These studies have mostly based their research area in a single country sample such as USA, Australia and UK. However, Garanina and Kaikova (2016) argued that such studies are not sufficient to provide adequate knowledge about corporate governance mechanisms in emerging markets. The study under discussion used data comprised of samples of 240 firms from US, 180 from Norway and 200 from Russia. The sphere of south Asian emerging countries lacks research on corporate governance mechanism in curtailing agency cost. Shi, (2019) examined the effect of corporate governance on overinvestment in emerging market of China. The results showed that overinvestment is not effectively mitigated by corporate governance mechanism, but board and state shareholding increased agency cost. In the growing market of India, Katti, (2018) found board attributes including board size, meeting frequency and CEO duality as important factors of agency cost during the period of 2005 to 2014. Similarly, Namitha and Shijin, (2016) suggests that large board size and independence increase better monitoring and oversight which reduces the empire building behaviors of managers. Concerning Pakistan, Sajid et al., (2012) proposed that a smaller board size, separation of CEO and chairperson roles, higher institutional and director ownership, and high remuneration minimize agency cost. In recent past, Khan et al., (2018) found that insiders, institutions and block holders were the effective monitors in controlling agency issues in firms.

While most studies inspected the effect of corporate governance on agency cost through a few single measures, present study in contrast provides a composite governance index and expects a negative relationship between Corporate Governance Index and agency cost.

- **H<sub>1</sub>:** There is a negative relationship between Corporate Governance Index and agency cost.

## *2.2 Mediation of Information Asymmetry*

### *2.2.1. Corporate Governance Index and Information Asymmetry*

Corporate governance structure provides a framework to govern companies in the best interest of owners by monitoring, applied on managements' decisions. According to Agyemang et al., (2013), effective corporate governance in firms provide essential information to its owners, thus reduce information asymmetry. Empirical studies in this area have explored the effect of corporate governance on asymmetric information by using limited variables related to board structure, audit committee structure, compensation structure and ownership structure. For example, Ajina et al. (2013); Elbadry et al. (2015); and Kanagaretnam et al. (2007) proposed that corporate governance quality (measured as size, independence and meeting frequency of board) encourages managers' monitoring and causes a decrease in information asymmetry. Effective boards in firms provide a supervisory mechanism to monitor management activities and disseminate quality information, which reduces information asymmetry. Similarly, Attig et al. (2006); Byun et al. (2011) and Farooq & Zarouali, (2016) found that large shareholders trade on insider information and exacerbate information asymmetry.

In the Pakistani context, prevalence of dominant shareholders, weak legal system and low level of investor protection raise the information asymmetry between insiders and outsiders. Javaira & Hassan, (2015) argued that there is a poorly regulated market structure, and information asymmetry for traders is high. There is no study that has investigated the effect of corporate governance mechanism in mitigating information asymmetry in the specific case of Pakistan. This study uses an index of corporate governance to measure the quality of corporate governance in firms and hypothesizes that the corporate governance index has a determinant influence on the level of information asymmetry in firms.

- **H<sub>2</sub>:** There is a negative relationship between corporate governance index and information asymmetry in firms.

### *2.2.2. Information Asymmetry Mediates the Corporate Governance-Agency Cost Relationship*

Corporate governance quality affects the agency cost by decreasing information asymmetry between insiders and the market. According to Maurović and Hasić, (2013) even if monitoring and supervisory mechanisms are applied to control agency cost, agents still possess opportunities to restrain information from outsiders. Further, it is argued that the presence of dominant shareholders can influence directors' decisions, still the directors have first-hand information obtained from daily operations and they are able to restrict information from controlling shareholders and using it for their own interest, rather than firms' interest. Myers and Majiuf (1984) indicate that a higher level of information asymmetry in firms results in rejection of positive NPV investment opportunities because of inclusion of a risk premium into the cost of capital by the provider of capital. The lesser the information available about the firm, the higher will be the managerial discretions and self-maximizing decisions which will ultimately lead to heightened external monitoring and agency cost. Hope and Thomas (2008) argue that high information asymmetry results in managerial involvement in non-value maximizing

investments. Therefore, a positive relationship between the degree of information asymmetry between informed and uninformed traders and the agency cost is expected. Lin, (2017) showed that the voluntary claw back provisions reduces information asymmetry and thus the agency cost of overinvestment.

The conflict of interest always exists between directors (as agents) and shareholder (as principal), when agents usurp benefits for themselves instead for the company. Farooq & Zarouali, (2016) argued that the low information asymmetry reduces the ability of controlling shareholders to expropriate firms' resources. Similarly, agency cost is expected to grow if information asymmetry is high, as additional supervisory mechanism applied by the principal provokes additional costs. Pellicani and Kalatzis, (2019) argued that overinvestment problems occur due to managerial discretions in Brazilian context. Therefore, the implementation of appropriate system of corporate governance in order to mitigate information asymmetry, constrains agents to behave opportunistically, that reduces the agency cost. Based on these arguments this study is the first to empirically investigates if the relationship between corporate governance, information asymmetry and agency cost can be investigated as a mediated link i.e. the information asymmetry is determined by the effectiveness of corporate governance, and in turn affects the agency cost.

- **H<sub>3</sub>:** Information Asymmetry mediates the relationship between the corporate governance and the agency cost in firms.

### 3. Materials and Methods

#### 3.1. Sample and Data Sources

The study used a sample of 155 firms, forming 1085 observations, for the period of 2009-2015. The data time period end in 2015 due to the issuance of Securities Act, 2015 (section 159) which has declared, insider trading based on insider information, a criminal offense (SECP, 2015). The sample is selected from a set of 432 non-financial listed Pakistani firms as on March 01, 2017. The rationale for using non-financial firms is that the financial firms are considerably different in their business activities, reporting practices, operating policies and regulatory oversight from non-financial firms. From 432 non-financial firms, this study first excluded delisted and merged firms during the study period. Moreover, those firms which are unable to provide complete annual reports and complete market value data were also excluded. The study was left with a sample of 170 firms after removing 262 firms due to applied filters. After data collection, the study used standardized variables (z-score) technique to exclude extreme values and further excluded 16 firms. The data for final sample of 155 firms from 16 sectors have been collected from secondary sources, which includes companies' annual reports and the Pakistan Stock Exchange (PSX)' official website

#### 3.2. Research Framework and Method

The study incorporates the method of mediation. The mediated model requires three equations to understand the mechanism through which the predictor (X) affects the outcome (Y). First equation estimates Y as a linear function of X (Direct effect) and establishes a base that there is an effect that may be mediated. Second equation estimates

M as a linear function of X and treats mediator as an outcome variable. Third equation show that the M effects Y and estimates Y as a linear function of X and M (indirect effect). The M and Y may be correlated because X caused the both. So, X is controlled in third equation to examine the effect of the M on Y.

The data collected is analyzed by employing the bootstrapping analysis (Hayes, 2013). Bootstrapping is a widespread non-parametric method of measurement that randomly resamples the observations with replacements which are done 5000 times. The regression coefficients are estimated by PROCESS Macro v3.0, available for SPSS, developed by Hayes (2013). The upper and lower confidence intervals, a P value, are computed. In case the zero is not between the confidence interval, the results provide evidence that the mediating effect is different from zero and an indirect relationship is existing.

### 3.3. Empirical Model

#### *Model 1: Corporate Governance and Agency Cost:*

The study conducts a mediation analysis in two steps by examining the direct and indirect effect of corporate governance index on agency cost of overinvestment. For the direct effect analysis, the following regression models are formed based on the aforementioned literature and hypotheses. First, the effect of corporate governance index on agency cost is investigated via the following equation,

$$Ag\_Cost_{it} = \beta_0 + \beta_1 CGI_{it} + \beta_2 Size_{it} + \beta_3 ROE_{it} + \beta_4 Tob\_Q_{it} + \beta_5 Beta_{it} + \beta_6 Lev_{it} + \varepsilon_{it} \dots \dots (1)$$

Where,  $Ag\_Cost_{it}$  = Agency cost for firm i for year t,  $CGI_{it}$  = Corporate governance index for firm i for year t,  $Size_{it}$  = Size of the firm i for year t,  $ROE_{it}$  = Return on equity for firm i for year t,  $Tob\_Q_{it}$  = Tobin's Q for firm i for year t,  $Beta_{it}$  = Systematic risk for firm i for year t,  $LEV_{it}$  = Leverage for firm i for year t and  $\varepsilon_{it}$  = Residual.

To investigate whether decreased information asymmetry can strengthen the monitoring efforts of corporate governance to mitigate agency cost, the study examined the indirect effect of CGI on  $Ag\_Cost$  through information asymmetry. The mediated model required two equations through which the corporate governance affects the agency cost. First equation estimates information asymmetry as a linear function of corporate governance and treats mediator as an outcome variable. Second equation show that the information asymmetry effects agency cost and estimates agency cost as a linear function of corporate governance and information asymmetry (indirect effect).

#### *Model 2: Corporate Governance and Turnover*

$$IA_{it} = \beta_0 + \beta_1 CGI_{it} + \beta_2 Size_{it} + \beta_3 ROE_{it} + \beta_4 Tob\_Q_{it} + \beta_5 Beta_{it} + \beta_6 Lev_{it} + \varepsilon_{it} \dots \dots (2.1)$$

Where,  $IA_{it}$  = Information Asymmetry for firm i for year t,

#### *Model 3: Corporate Governance and Agency Cost*

$$Ag\_Cost_{it} = \beta_0 + \beta_1 CGI_{it} + \beta_2 IA_{it} + \beta_3 Size_{it} + \beta_4 ROE_{it} + \beta_5 Tob\_Q_{it} + \beta_6 Beta_{it} + \beta_7 Lev_{it} + \varepsilon_{it} \dots \dots (2.2)$$

### 3.4 Measurement of Variables

The agency cost is proxied by the extent of overinvestment of firms' free cash flow. Following Richardson, (2006) and Zhang & Cao, (2016) this study estimated the following regression equation and the obtained residuals from the model indicated agency cost associated with inefficient investment. The positive residual values correspond to the managerial discretions' cost of overinvestment of free cash flow in firms.

$$\text{Inv}_t = a_0 + a_1 \text{Tobins}Q_{t-1} + a_2 \text{Lev}_{t-1} + a_3 \text{Cash}_{t-1} + a_4 \text{Size}_{t-1} + a_5 \text{Ret}_{t-1} + a_6 \text{Inv}_{t-1} + a_7 \text{Industry} + \varepsilon_i$$

Where

*Inv<sub>t</sub>* = cash paid for fixed assets, intangible assets and other long-term assets deflated by total assets at the end of year *t*

*TobinsQ<sub>t-1</sub>* = market capitalization plus total debt divided by total assets at the end of year *t-1*

*Lev<sub>t-1</sub>* = Book value of short term and long-term debt deflated by the sum of book value of total debt and equity at the end of year *t-1*

*Cash<sub>t-1</sub>* = Cash and cash equivalents deflated by total assets at the end of year *t-1*

*Size<sub>t-1</sub>* = log of total assets at the end of year *t-1*

*Ret<sub>t-1</sub>* = change in market value of firm for year *t-1*

*Inv<sub>t-1</sub>* = cash paid for fixed assets, intangible assets and other long-term assets deflated by total assets at the end of year *t-1*

*Industry* = Industry dummy

Following, Abdioglu *et al.*, (2015) and A. W. hsin Hsu and Liu, (2016) the current study investigates information asymmetry as proxied by the share turnover ratio (i.e., the annual average) of the log of daily share turnover. High information asymmetry reduces the willingness of uninformed investors to trade in these stocks and thus the lower trading volumes. Similarly, a higher turnover ratio indicates higher trading volume and less information asymmetry.

A composite corporate governance index (CGI) is constructed, to access governance structure and practices, by following the Sajid and Afza (2018). The index consists of 29 indicators which are built on maximal information that is available for corporate governance structure in firms' annual reports during the study period. These indicators are further classified into seven board indicators, 14 ownership structure indicators, three executive compensation structure indicators, and five audit committee indicators. In order to rate the indicators based on information available in companies' annual reports a binary coding system is used. Each firm is given a score between 0 and 29, with a high score representing better governance quality.

The measurement of control variables are given in table 1.

#### 4. Results and Discussion

**Table 1: Control Variables Measurement**

Variable	Symbol	Description
Firm Size	Size	Ln (Total Assets) as of year end
Profitability	ROE	Return on equity= earnings after interest and taxes / shareholder's equity
Growth Opportunities	Tob_Q	Tobin's Q = market capitalization plus total debt / total assets at the year end
Systematic Risk	Beta	Empirically estimated via market model regression using daily return observations.
Leverage	LEV	Long term debt/total assets

Table 2 reports the descriptive statistics for agency Cost, Corporate Governance, turnover and other control variables. The average of agency cost is 0.058, with a standard deviation of 0.026. The minimum value in data is 0.008 and the maximum value is 0.471. The average turnover of -8.9 indicates a lower level of willingness of traders to buy and sell shares and high IA. The average level of governance index is 53% in Pakistan. According to Black *et al.*, (2018) the average CG index for Brazil is 60.8 for a survey during 2004 to 2009 and average CG index for India is 59.1 relying on a data from 2006 to 2012. The descriptive statistics of corporate governance index showed that on average Pakistani companies disclose 53% of the total items comprising the index. The CG index score for Pakistan is less as compare to the score of CG index with other emerging countries. The results evidenced that the average firm size is 15.5 and the values of firm size in Pakistan ranges from 11.08 to 20.13. The average profitability, measured as return on equity, is 7.5 % with a high standard deviation of 0.628. Tobin's Q exhibit a mean value of 1.109 with a standard deviation of 2.01. Systematic risk, showed an average value of 0.57, which is relatively low. However, the value ranges from a minimum value of -3.22 to a maximum value of 4.82. The average leverage ratio of 27 % demonstrates that on average 27 % of firm's assets are being financed by long term debts. The values of leverage ranges from 0 to 1.66 showing that there exist firms which do not use debt as a financing source as well as the firms which are financing 100 % of their assets from long term debts. The Pearson correlation analysis among all independent variables is performed to examine the level of multicollinearity. Table 3 reports the results of pair wise correlation coefficients, which indicate that all variables have a correlation coefficient less than 0.55, and thus there exist no multicollinearity issue.

**Table: 2: Descriptive Statistics for Study Variables**

Variable	N	Mean	Std. Error	Std. Dev	Max	Min
Ag_Cost	1085	0.0508	0.0008	0.026	0.471	0.008
CG_Index	1085	0.533	0.003	0.097	0.83	0.28
Turnover	1085	-8.905	0.069	2.288	5.27	-15.37
Size	1085	15.507	0.049	1.629	20.13	11.08
ROE	1085	0.075	0.019	0.628	5.80	-11.64
Tob_Q	1085	1.109	0.062	2.031	21.51	0.00

Beta	1085	0.577	0.019	0.642	4.82	-3.22
Lev	1085	0.268	0.007	0.231	1.66	0.00

**Table 3: Correlation Analysis**

Sr.No.	Variables	1	2	3	4	5	6
1	CG_Index	1.00					
2	Size	.32**	1.00				
3	ROE	0.03	0.03	1.00			
4	Tob_Q	-.10*	-.27**	.12**	1.00		
5	Beta	.26**	.33**	0.04	0.00	1.00	
6	Lev	-.14*	-.16**	-.12**	-.08*	-0.06	1.00
* represent the significance level at 5%, and ** represent the significance level at 1%.							

The empirical results for the relationship between corporate governance and agency cost are presented in Table 4. Corporate governance index has a statistically significant and positive relationship (the coefficient is 0.017 and is significantly different from 0) with agency cost, indicating that corporate governance structure in Pakistani firms is not effectively mitigating overinvestment of free cash flow (FCF) and hence, rejects H1. According to agency theory the lack of monitoring in firms creates potential for managers to overinvest of free cash flow (Jensen & Meckling, 1976). It can be drawn out that the monitoring functions of corporate governance in aligning incentives of management and shareholders is not implemented in true spirit. In consequence, exacerbating the extent of agency cost of inefficient investments in Pakistani firms. The possible reason is that the perquisites of management increase with investment even though investment is made in negative NPV projects. Therefore, despite increasing shareholder's wealth, management maximizes investment.

The other possible reason for contradicting results in Pakistan from developed markets could be institutional differences. In this context Ameer, (2013) and Dar, Naseem, Niazi, & Rehman, (2011) argued that the implementation of corporate governance codes are ineffective reasons being the lack of board independence, ownership structure, lack of policies and unwillingness of management to practice codes. The weak legal environment and high ownership concentration also impair the board independence. Therefore, there is an evidence of agency conflicts associated with overinvestment of FCF and consequently the higher agency cost. The results are however similar to the study of Shi, (2019) that the board and state shareholding exacerbate agency problems and overinvestment of free cash flow in the emerging economy of china.

Firm Size exhibited a positive and significant relationship with agency cost at 1% level (coeff. =0.007) indicating that the large firms are more diversified due to which managerial actions are less observable and difficult to monitor. The coefficient for Tob\_Q is significantly positive (.001) at 1% level suggesting that firms with greater growth opportunities tend to have higher agency cost. The results indicate positive coefficients for relationship between beta (.003), leverage (.015) and agency cost. The relationships are statistically significant at 1% level, implying that high leveraged firms with high systematic risk are associated with higher agency cost in firms.

**Table 4: Empirical Results of Impact of Corporate Governance Index on Agency Cost**

	Bootstrap Analysis			
Variable	Coeff.	P-value	BootLLCI	BootULCI
CGI	0.017	.041**	.0034	.0309
Size	.007	.000***	.0060	.0078
ROE	.001	.649	-.0014	.0026
Tob_Q	.001	.001***	.0006	.0019
Beta	.003	.008***	-.0054	-.0013
Lev	.015	.000***	-.0054	-.0013
Constant	-.069	.000	-.0833	-.0548
N	1085			
Ad R-sq	15.9			
F-stat (p-value)	.000			
Notes: * $p<.10$ ** $p<.05$ *** $p<.001$ .				

The empirical results for the relationship between corporate governance and information asymmetry are presented in Model 1 of Table 5. The information asymmetry is proxied by share turnover ratio. The higher the turnover ratio, the less is the information asymmetry (Hsu & Liu, 2016; Leuz & Verrecchia, 2000; Prommin, Jumreornvong, Jiraporn, & Tong, 2016). Corporate governance index has a strong statistically significant and positive relationship with turnover, indicating that effective corporate governance increases number of transactions in the stock market. The firms that effectively monitor management activities disclose frequent information to stakeholders. In context of Pakistan, Javaira & Hassan, (2015) also documented that investors withdraw their investments and are reluctant to invest due to information asymmetry. The results support H2 of negative relationship between corporate governance and information asymmetry and are consistent with the agency theory and earlier research (Ajina et al., 2013; Alves et al., 2015; Attig et al., 2006; Byun et al., 2011; Kanagaretnam et al., 2007).

Firm size, as expected, exhibits a positive and significant relationship with a turnover in Model 1 of table 5. Large companies distribute more information as compare to small companies, which leads to a decrease in IA and more trading transactions. The coefficient of Beta for systematic risk is significant and negative, indicating that investors are less willing to buy and sell shares of risky firms. The relationship between leverage and turnover presented a statistically significant coefficient in Model 1, indicating that an increase in leverage leads to a decrease in share turnover.

The results of model 2 (table 5) showed that the coefficient (-0.001) for information asymmetry is negative and statistically significant at 5 % level. The results indicate that the high share turnover (low IA) leads to a decreased agency cost in firms. The managers' overinvestment of FCF practices are more severe in firms with high information asymmetry. Similarly, low information asymmetry reduces the ability of management and majority shareholders to expropriate the firm's resources and as a result mitigate overinvestment. The results are consistent with the fundamental study of Myers and

Majluf, (1984) that a higher level of information asymmetry between firm insiders and the external capital market results in rejection of positive NPV projects.

The significant relationship between corporate governance and agency cost (Table 4), corporate governance and information asymmetry (Model 1, Table 5) and information asymmetry and agency cost (Model 2, Table 5) showed that the mediation relationship exists. Model 2 of table 5 exhibits the results of mediation of information asymmetry in corporate governance and agency cost relationship. Results support mediation as the coefficient (-0.001) for information asymmetry remains significant after controlling for corporate governance index. However, the coefficient (0.019) for corporate governance index is still significant, indicating that corporate governance index and information asymmetry both significantly predicts agency cost and thus provide evidence for partial mediation. Model 2 of table 5 also exhibit the results of direct and indirect effects of corporate governance on agency cost. The bootstrap confidence interval for the direct effect (.0185) of corporate governance index on agency cost is positive and significant, as it is different from zero. The direct effect remains unchanged in mediation analysis that despite increasing governance practices, the agency cost of overinvestment is rising in firms. The results for the indirect effect (-.0014) of corporate governance index on agency cost through information asymmetry showed that the zero is not within the confidence interval. Thus, indicating a negative and significant mediating effect that the increase in corporate governance lowers agency cost of overinvestment by controlling information asymmetry between insiders and outsiders of firms. (In order to address the corporate governance endogeneity problem, the study employed two stage least square (2sls). The results from the additional test support the significant negative mediating effect of information asymmetry in reducing agency cost of overinvestment. Our results are robust). The results support monitoring and convergence of interest hypothesis that the CG mechanism promotes transparency by exerting pressure on management to produce information to be used by investors and other stakeholders. This creates a monitoring channel that reduces information asymmetry and makes firms unable to overinvest FCF.

**Table 5: Empirical Results of Data Analysis: Impact of CG on IA (Model-1)  
Mediation of Information Asymmetry in CG and Agency Cost relationship (Model 2)**

Variables	Bootstrap Analysis								
	Model 1:					Model 2:			
	Coeff.	P-value	Boot LLCI	Boot ULCI		Coeff.	P-value	Boot LLCI	Boot ULCI
Intercept	-11.64	0.000***	-12.80	-10.48		-0.078	0.000***	-0.094	-0.062
CGI	1.813	0.008***	0.690	2.936		0.019	0.027**	0.005	0.032
IA						-0.001	0.041**	-0.001	-0.0002
Size	0.073	0.096*	0.001	0.145		0.007	0.000***	0.006	0.008
ROE	-0.150	0.131	-0.313	0.013		0.000	0.718	-0.002	0.002
Tob_Q	-0.045	0.160	-0.098	0.008		0.001	0.002***	0.001	0.002
Beta	-1.483	0.000***	1.312	1.654		-0.002	0.109	-0.005	0.000
LEV	-0.560	0.042**	-1.013	-0.108		0.015	0.000***	0.009	0.020
Direct effect of X on Y						.0185		.0047	.0323
Indirect effect of X on Y						-.0014		-.0031	-.0002
Rsqr	22.60					16.26			
F-stat (P-Value)	0.000					0.000			
Obs	1085					1085			
Notes: *p<.10 **p<.05 ***p<.001. Model 1: Dependent Variable = Information Asymmetry Model 2: Dependent Variable = Ag_Cost									

## 5. Conclusion

For a sample of 155 firms from 2009 to 2015, the study provides empirical evidence for the direct path from corporate governance to agency cost, and an indirect path mediated by information asymmetry under an institutional setting of weak legal framework, lack of transparency and under developed capital market. The degree of overinvestment of firm level FCF is used as the measure for agency cost and results show that in spite of increasing corporate governance mechanism the agency cost of overinvestment is increasing. In Pakistani firms, managers invest FCF in non-optimal projects. Under these circumstances using bootstrap analysis, the study examined the existence and relative importance of the indirect path.

The corporate governance mechanism promotes transparency by exerting pressure on management to produce information that investors and other stakeholders can use. This creates a monitoring channel that reduces information asymmetry and makes firms unable to overinvest FCF. Managers are less likely to take self-maximizing decisions as investors are capable to oversight, when the information is widely available. Similarly, firms with better information environment maintain lower information asymmetry and thus reduce the ability of majority shareholders to expropriate the firm's resources that

mitigates overinvestment of FCF. The results provide implications for regulators in developed as well as developing economies to formulate more effective corporate governance structure and collaborate with firms' management in the promotion of quality disclosure environment to makes firms unable to overinvest free cash flow.

The better information environment provides significant implications in emerging markets characterized by weak investor protection. Weak legal system and investor protection makes investors vulnerable to management's expropriation. The Securities and Exchange Commission of Pakistan (SECP) issued a comprehensive set of corporate governance rules (CCG, 2002 and CCG, 2012), with the aim of promoting effective work environment, ensuring accountability and transparency. The unwillingness of management to practice codes in the findings of direct path reveal that the effectiveness of governance practices should be watched carefully. The results however, provide implications for regulators to achieve improvements in corporate governance monitoring practices to reduce managerial opportunism and controlling shareholders' expropriation in firms. SECP should frame laws to give more power to the commissions to investigate the true implementation of CG codes, enhancing fines and allowing prosecution for defrauding investors. The findings of the indirect path also provide implications for policy makers and managers regarding extensive disclosure requirements to mitigate private control exploitation. The regulatory authorities should collaborate with firms' management to promote transparency as a monitoring device that can be used by investors to make firms unable to overinvest FCF. The results also provide implications for investors and portfolio managers to investigate firms' extent of information asymmetry before making investment decisions.

The main limitation of this study is the use of turnover ratio as a proxy for information asymmetry, as this study did not have access to more data to use better empirical proxies, than that used in this paper. Future research however should validate the results of this study with other measures of information asymmetry. Second, the corporate governance index is constructed from information provided in annual reports only; thus, future work exploring the direct and indirect effect of corporate governance should use several information sources in addition to annual reports to provide a more detailed insight into the corporate governance mechanisms that mitigates agency cost. Third, the conclusion of this research is difficult to generalize in other institutional frameworks as the sample size contains 155 firms pertaining to a single country. Future research should increase analysis sample and consider more countries.

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