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Article

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FINANCIAL ECONOMICS | RESEARCH ARTICLE

Nexus between corporate governance practices and cost of capital in PSX listed firms

Muhammad Arslan^{*1} and Sazali Abidin²

Abstract: The aim of this study is to examine the relationship between corporate governance (CG), in terms of its internal significance, and cost of capital (COC), based on a sample of listed firms of Pakistan Stock Exchange (PSX) over the period of 2009–2015. We used Pakistan as a case study mainly because we expect that key features of Pakistani setting in terms of CG and financial markets will have impact on the relationship between CG and COC. Drawing on a sample of 120 PSX listed firms, we find that CG compliance and disclosure (CG index [CGI]) has improved over time among PSX listed firms. The findings also reveal a positive relationship of institutional, government and director ownership with both CGI and COC, while this relationship becomes negative with block ownership. The findings of 2SLS reveal a significant negative association between CG compliance and COC; hence, firms with higher CG score enjoy a lower COC. Interestingly, gender diversity and board size have a negative association with CG compliance and COC, while audit firm size reveals a positive association with CG compliance and disclosure while a negative association with COC. The study contributes to existing literature dealing with CG and determinant of firm value (COC) in emerging markets, particularly in Pakistan, which has not been extensively explored in existing research.

Subjects: Corporate Finance; Business, Management and Accounting; Corporate Governance

Keywords: Corporate governance; compliance and disclosure; cost of capital; 2SLS; ownership structure; PSX



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PUBLIC INTEREST STATEMENT

Corporate governance (CG) is how a company or firm is managed and directed. The nexus between CG and cost of capital (COC) has been extensively examined in both developed and emerging markets. There are limited studies, to the best of our knowledge, that has examined the nexus between CG and COC with CG index. Consequently, this study fills this gap and offers interesting and different findings. The findings provide direction to policymakers to intensify or transform the extent and profundity of CG practices, helping the growth of an appropriate corporate culture in the country.

1. Introduction

The last decade witnessed the expeditiously growing trend in corporate governance (CG) code promulgation and espousal by a number of countries around the globe. However, two diverse mechanisms for code implementation have been espoused in the world, i.e. hard and soft regulations. Chhaochharia and Grinstein (2007) advocated that the governance structures and characteristics have been swayed by CG reforms diffused in the former decade. Aguilera and Cuervo-Cazurra (2008) also conclude that governance structure has been rehabilitated globally after CG reforms. Pakistan follows the Anglo-Saxon tradition of common law as the basis for its commercial laws (Ibrahim, 2006). The CG compliance level has significant dissimilarities reliant upon the nature of the country's internal and external governance mechanisms and rule of law.

It is well supported from existing literature that effective governance mechanisms retain investors' confidence and reduce cost of capital (COC). The good CG regulations and rules persuade prospect investors to make investment decision in both local and international equity markets. It is also acknowledged that CG practices have numerous benefits for both developed and emerging countries like Pakistan. Consequently, these practices also provide support to emerging economies in getting sustainable and higher growth rates. Furthermore, these practices are supportive in mobilizing savings and increasing the ability of the capital market to boost investors' confidence in the national economy of the country. Researchers also documented that this helps in raising investment rates and emboldens growth by protecting the rights of both small and large investors (Attiya, Javid, & Iqbal, 2008; Rwegasira, 2000). The Security and Exchange Commission of Pakistan (SECP) introduced code of corporate governance (CCG) in 2002 with many voluntary provisions, and SECP revised and issued a revised CCG in 2012, in which transparency and disclosure have gained the substantial attention by defining criteria for internal head of audit committee, evaluation of board and establishing the director's remuneration procedure.

In Pakistan, the main problem is the compliance of CG code. After contemporary reform in 2012, CCG has many mandatory provisions related to auditing, board structure and disclosure for listed companies; however, there are still some voluntary provisions. Due to high ownership concentration, these provisions challenge the discretionary power of state and families. Consequently, they are diffident to perceive the CG code in its true essence, and the compliance of CCG is only in a form not in substance. A recent study conducted by Khan (2014) documented that most of the provisions are ticked just in box, not in true sense. He also documented that senior officer of SECP confirmed that CCG is not implemented in true sense as most of the public listed firms are family owned in Pakistan. The family members are elected as executive and non-executive directors. Moreover, the firms also appoint family members as independent directors with few shares. Most of the firms are appointing their children as independent directors with few shares to fulfill the requirement of CCG. A number of studies have been conducted in Pakistan to investigate the nexus between CG mechanisms and firm behavior, but these studies are limited to financial performance (Attiya et al., 2008; Qaiser, 2011; Shaheen & Nishat, 2005; Tariq & Abbas, 2013) and dividend policy (Afzal & Sehrish, 2011; Ahmed & Javid, 2009). Only few studies investigated the relationship between CG and COC in Pakistan (Hasan & Butt, 2009; Khan, 2016; Shah & Butt, 2009) and around the globe (Byun, Kwak, & Hwang, 2008; Derwall & Verwijmeren; Pham, Suchard, & Zein, 2012; Reverte, 2009; Tran, 2014).

This study investigates the level of CG compliance and its determinants among PSX listed firms. Moreover, the study also investigates the nexus between CG compliance and COC. Drawing on a sample of 120 PSX listed firms over the period of 2009–2015, this study attempts to achieve three objectives. First, a CG compliance index is constructed with provisions of both CCG 2002 and 2012 of Pakistan to determine the level of CG compliance and disclosure. Second, the study investigates the determinants of CG compliance and disclosure. In the end, the study investigates the nexus between CG compliance and COC. The theoretical rationale of investigating the nexus between CG and COC is based on agency theory (Shleifer & Vishny, 1997).

The present study has several implications and fills the gap in existing literature. The present study employs a self-constructed CG index (CGI) comprising of 75 provisions from both CCG 2002 and recent reform in 2012 that is ignored in prior studies (Javid & Iqbal, 2008b); hence, it will be the first study which considers CCG 2012. Furthermore, prior studies deliberated small sample and shorter time period (Hasan & Butt, 2009; Tariq & Abbas, 2013), while this study is comprehensive and takes a sample of 120 PSX listed firms for a longer period (7 years) to find more robust results. Most of the prior studies investigated the relationship between CG and financial performance measured by return on assets (ROA), return on equity (ROE) and Tobin's Q (Attiya et al., 2008; Shaheen & Nishat, 2005; Tariq & Abbas, 2013) and found inclusive results, while this study investigates the CG mechanisms and COC by employing a self-constructed CGI that will help in understanding the relationship with underlying variables. In addition, prior studies have explored only traditional determinants of CG compliance among PSX listed firms, while this study adds and investigates new determinants other than the traditional determinant like gender diversity to understand the gender role in CG compliance and COC. In the end, the study also sheds lights on the appropriateness of the Anglo-American model of CG in Pakistan due to difference in socioeconomic factors. The next section provides a literature review of CG and level of CG compliance in developed and developing countries.

2. Literature review

CG can be defined in a narrow sense that emphasized on shareholder values; therefore, it is applied to warrant that the company is acting on behalf of its shareholders to increase their wealth. The whole process of accountability and decision-making has ended up and revolves around profit-maximizing and increasing values of shares. Shleifer and Vishny (1997) defined CG in a narrow sense. They documented that "Corporate governance is a set of mechanisms through which outside investors protect themselves from expropriation of insiders" (p. 1).

Recently, many countries have introduced CG codes to enhance CG practices, especially to improve transparency, accountability and disclosure (Aguilera & Cuervo-Cazurra, 2009; Bouwman, 2011) among firms. Therefore, researchers also paid close attention to examine factors influencing CG disclosure (Allegrini & Greco, 2013). Additionally, researchers also found that development in CG is still progressing due to some cultural and regional differences among countries which affect implementation and compliance of CG code (Bebchuk & Fried, 2003; Haniffa & Hudaib, 2006; Ntim & Danbolt, 2012); hence, the level of CG compliance differs (MacNeil & Li, 2006; Samaha, Dahawy, Hussainey, & Stapleton, 2012).

2.1. Level of CG compliance in developed countries

Existing literature provides the evidence that the level of CG compliance is high in developed countries. Werder, Talaulicar, and Kolat (2005) conducted a study among German firms to investigate the level of CG compliance. They used a sample of 408 German firms for the year 2003 and found a high level of CG compliance in listed firms of Frankfurt Stock Exchange. Correspondingly, Cromme (2005) also conducted a study among German listed firms to investigate the compliance of CG principles in 2003. He found that 75% of the listed firms were complying with good CG principles. In 2010, Hegazy and Hegazy (2010) conducted a study among UK firms to determine CG compliance. They found about 70% average level of CG compliance from annual reports of the year 2008.

Hussainey and Al-Najjar (2012) conducted a study by taking a sample of non-financial listed firms of the UK. They took 130 firms as a sample of study over the year 2003–2009 and found a high level of CG compliance with CG quotient. On the basis of the above studies, it can be argued that UK firms are improving disclosure and governance practices by following the UK combined code. Allegrini and Greco (2013) conducted a study among Italian listed companies. They developed an index with 60 provisions of CG from the 2007 Italian civil governance code. They documented that the level of governance practices and voluntary disclosure has increased among Italian listed companies. Correspondingly, Salterio, Conrod, and Schmidt (2013) conducted

a study among Canadian listed firms. They took a sample of 742 Canadian listed firms and used 16 CG recommendations. They found that 39% of the firms were complying with all the 16 recommendations of good CG, while 81% of the firms were complying with some recommendations of good CG practices. In sum, the level of CG compliance is high among developed countries due to having strong cultural, economic and legal systems (Aguilera & Cuervo-Cazurra, 2009; Salterio et al., 2013).

2.2. Level of CG compliance in developing countries

Researchers found extensive inequality with level of compliance with CG disclosure among developing countries (Solomon, 2010). Samaha et al. (2012) documented that the level of CG compliance varies according to the type of government at the country level. Krambia-Kapardis and Psaros (2006) conducted a study by taking a sample of 160 Cyprus listed firms for the year 2002. They found that only a marginal number of firms was complying with CG provisions. The CG code was introduced in 2002 in Cyprus, and it might be a possible reason for these findings. Additionally, researchers also documented that appropriate time is required for the implementation of CG reforms to improve CG practices (Renders, Gaeremynck, & Sercu, 2010). Tsamenyi, Enninful-Adu, and Onumah (2007) conducted a study to determine the level of CG compliance in listed firms of Ghana. They took a sample of 22 firms over the period of 2001 to 2002 and developed a CGI. They found 52% average score for disclosure and transparency. In contrast, some studies found a comparative improved level of CG compliance after the introduction of CG code in some developing countries. Researchers conducted a study to determine the level of corporate disclosure in Portuguese firms (Alves & Mendes, 2004). They documented a significant improvement in CG compliance after the introduction of Portuguese CG code in 1999. In contrast, Barako, Hancock, and Izan (2006) found a gradual rise in the level of CG compliance among 54 listed firms of Kenya for the year 1999 after the introduction of CG principles. Additionally, Chalevas (2011) conducted a study among Greek companies to determine the level of compliance with CG standards from the year 2000 to 2003. He found that the level of CG compliance improved among Greek companies for the investigated period. Similarly, Ntim and Danbolt (2012) conducted a study to determine the effect of King II report on CG practices and developed CGI with 50 provisions by taking a sample of 169 South African listed firms. They found improvement in CG standards after the release of King II report in 2002, specifically, the level of CG compliance increased up to 69% in 2006 which was 47% in 2002.

Moreover, there are some cross-countries studies that determined and compared the CG compliance among different countries. In 2002, researchers conducted a study among 19 emerging markets to investigate CG compliance level. They took 354 firms over the period 1998–2000. They documented that South African and Asian markets have considerably high level of disclosure and transparency as compared to Eastern Europe, Latin America and Middle East markets. Furthermore, Klapper and Love (2004) employed Credit Lyonnais Securities Asia (CLSA) index to find variation in firm-level governance disclosures. They draw a sample from 14 developing countries for the year 2000. They found prodigious variation in firm-level governance disclosures. As discussed above, it can be summarized that variances in compliance with CG standards are due to differences in the cultural, social and legal system of countries (Arslan & Roudaki, 2017; Haniffa & Hudaib, 2006; Ntim & Danbolt, 2012). It can also conclude that CG compliance has been improved with the introduction of CCG in some countries. In a similar vein, Bozec, Dia, and Bozec (2010) documented that developing countries adopt good CG practices to attract more investors as they are already suffering from the weak legal system in the country.

After issuance of CG code in March 2002, very few research studies have been conducted to determine CG compliance in Pakistan (Javid & Iqbal, 2008a; Khan, 2016; Tariq & Abbas, 2013); furthermore, these studies only undertook the CG code 2002 and determined the CG compliance by considering less number of CG provisions and took small sample size. Javed and Iqbal (2007) examined the CG compliance by taking 50 listed firms of Karachi Stock Exchange (KSE) over the period of 2003–2005. They only constructed the CGI by taking 22 provisions and found possible

improvement in the level of compliance and disclosure. These few provisions may not represent the level of CG compliance in true form. Additionally, Javid and Iqbal (2008a) conducted a study to examine CG standards among 50 KSE listed companies for the period of 2003–2007. They documented that CG quality improved due to the monitoring of SECP. Recently, Tariq and Abbas (2013) employed a weighted index consisting of 50 provisions for 119 PSX listed firms over the period of 2003–2010. They documented that although CG compliance and disclosure have improved since the issuance of CG code in 2002, CG code is still minimal. The above studies have some limitations in the shape of fewer provisions, methodology and fewer observations. All of these studies only considered the CG code 2002. This study addresses these limitations by employing a self-constructed CGI with more provisions to determine the level of CG compliance and determinants of CG compliance among PSX listed firms and investigates the nexus between CG compliance and COC. The next section presents the relationship between CGI and COC.

2.3. CG disclosure and cost of capital

In prior literature, researchers highlighted the difference in the level of CG disclosure among firms (Bouwman, 2011). Researchers found corporate ownership and board characteristics as leading determinants for quality and level of CG disclosure (Chalevas, 2011; Nadeem, Zongjun, & Shoaib, 2013; Samaha et al., 2012). Scholars argued that strong CG practices improve quality of disclosure and financial reporting and increase the investors' confidence which reduces their required rate of return.

Block holders have more funds to support the firm financially and can improve firm performance (Chen, Chen, & Wei, 2009). In contrast, researchers also documented that large shareholders can expropriate corporate resources and small shareholders through conspiracy with managers (Ntim, Lindop, Osei, & Thomas, 2015). In literature, the empirical studies documented negative or no association of block holder ownership with level of CG disclosure. It is deliberated that high profitability is associated with high risk. Therefore, high COC means a high rate of return in the form of compensation. Hail and Leuz (2006) documented that block ownership has a direct link with COC as compared to the firm value and financial performance. Prior studies found mixed results while examining the relationship between block ownership and COC. Pham et al. (2012) found a negative relationship between block holder ownership and weighted average cost of capital (WACC) in Australian firms, while Bozec, Laurin, and Meier (2014) found a positive relationship between block ownership and WACC. In a similar vein, Elston and Rondi (2007) also found a positive link between concentrated insider ownership and COC in Italian firms while found no relationship in German firms.

It is documented that government ownership is a key factor in emerging countries that can influence CG disclosure due to the prevalence of high ownership concentration (Cornett, Guo, Khaksari, & Tehranian, 2010). From a resource theory perspective, Eng and Mak (2003) argued that firms can easily get financing from the government in case of high government ownership. Consequently, firms can raise financing on minimum rate, and overall firm COC will decrease which will ultimately increase the firm value. They also documented that government ownership firms can create agency problem, and this can lead to poor CG practices (Konijn, Kräussl, & Lucas, 2011). Therefore, it might create information asymmetry among outsiders and controlling investors and can increase the COC. The government can employ the CEO and directors on their political connections rather than on merit (Cornett et al., 2010). Therefore, CEOs have to improve firm performance in order to protect their reputation and career growth (Conyon & He, 2011).

Researchers documented that institutional investors are more proficient to monitor and improve CG disclosure (Barako et al., 2006). Jensen and Meckling (1976) documented that monitoring is helpful in reducing conflicts between investors and directors (Solomon, 2010). Chung and Zhang (2011) argued that institutional investors have more stronger spur to protect investment mainly when exist is costly for the firm. Consequently, they also ensure a high level of accountability between top management and shareholders (Aggarwal, Erel, Ferreira, & Matos, 2011; Haniffa &

Hudaib, 2006). Only few studies have been conducted to investigate the relationship between institutional investors and COC. Bhojraj and Sengupta (2003) investigated the impact of institutional ownership over bond yield and rating by taking a sample of over 1,000 bond issue from 1991, and they found an inverse relationship between bond yield and institutional ownership while positive relationship between institutional investors and bond ratings. In a similar vein, Piot and Missonier-Piera (2009) conducted a study to examine the relationship between cost of debt (COD) and institutional ownership by taking a sample of 102 French listed firms over the period of 1999–2001. The findings of their study showed a negative relationship between institutional investors and COD.

The board of directors (BoDs) play a significant role in CG disclosure and firm policies (Chalevas, 2011; Eng & Mak, 2003; Jensen & Meckling, 1976). Consequently, CG disclosure can improve CG practices (Aguilera & Jackson, 2003) and monitoring of directors (Eng & Mak, 2003). On the other hand, director ownership affects the outside shareholders and directors (Jensen & Meckling, 1976). Moreover, if the interests of shareholders and directors are aligned, directors seek to improve transparency and disclosure. Directors can use firm's resources for their personal benefits as compared to outside shareholders and creditors due to having more information (Bebchuk & Weisbach, 2010); it means they may shift the risk rather than share the risk. Moreover, the high level of director ownership nurtures the chances of conflicts between management and directors. Due to high level of information asymmetry, the COC may increase. Hence, a high level of director ownership may have a high COC and, ultimately, a low profitability and firm value.

Keeping in view the agency perspective, researchers documented that shareholders select directors to represent their interests and expect a high level of disclosure from directors (Davidson, Nemec, & Worrell, 1996). Board size is a decisive factor in monitoring the management behavior as advised by agency theory (Allegrini & Greco, 2013). Moreover, Ntim and Soobaroyen (2013) found a positive influence of increased managerial monitoring on voluntary CG disclosure. In literature, researchers also documented that knowledgeable, experienced and independent directors are important for CG disclosure and more relevant to board size (Haniiffa & Cooke, 2002). The prior empirical studies indicated a positive association between board size and CG disclosure. Samaha et al. (2012) also found that those firms tend to disclose more CG information which have a larger board as compared to their smaller counterparts. Additionally, Allegrini and Greco (2013) also documented that larger boards tend to disclose more information about strategic objectives of firms in contrast to smaller boards. BoDs play a pivotal role in mitigating the agency costs and effective operation of firms (Jensen & Meckling, 1976). In contrast, the cost of managerial activities may arise due to the presence of more board members which can increase the COC and adversely affect firm value (Yawson, 2006). On the other hand, researchers also documented that large boards can increase firm value due to having access to critical resources and ability to appeal experienced and qualified directors (Ntim & Soobaroyen, 2013); nevertheless, resource dependence theory suggests a negative relationship between board size and firm COC. Pfeffer (1972) documented that large board can represent wide stakeholders and communicate to majority shareholders and investors easily that can reduce the COC. The literature is scarce on investigating the relationship between board size and COC, and most of the prior studies investigated the association between board size and cost of equity (COE) or COD and found a negative relationship between board size and COE (Shah & Butt, 2009). Similarly, Bozec and Bozec (2011) conducted a study in Canada to investigate the association between CGI and COC. By taking a sample of 155 listed firms over the year 2002–2005, they documented the inverse association of CGI with COE and COD. As CG compliance increases, COE and COD decrease.

Literature provides the evidence of mixed results in determining the nexus between board diversity and CG disclosure. Bear, Rahman, and Post (2010) argued that board diversity improves the CG compliance and disclosure by monitoring managers to protect shareholders' interests from agency theory perspective while ensuring the provisions of resources from resource dependence theory perspective (Pfeffer & Salancik, 2003). Some researchers found that female

directors have effect on firms' board (Carter, D'Souza, Simkins, & Simpson, 2010; Yu, Lord, Peni, & Vähämaa, 2010), while some argued that gender diversity can improve CG disclosure due to unique methods to information disclosure (Terjesen, Sealy, & Singh, 2009). A number of researchers investigated the impact of board gender diversity on financial performance (Rose, 2007) and managerial and corporate decisions (Ntim, 2015). Adams and Ferreira (2009) conducted a study in the US and reported that female board members have a significant impact on board inputs and outputs. They also documented that female attendance was high in board meetings as compared to male board members. Consequently, this participation in board meeting can increase the communication between stakeholders that can moderate COC and risk shifting. Nielsen and Huse (2010) conducted a study among 201 Norwegian firms and documented that firm value may be affected in the absence of female BoDs that can increase COC. Moreover, they also documented that the presence of women on corporate boards' increases board effectiveness through ensuring high quality of board development activities and reducing the level of conflict among stakeholders.

The empirical literature documented positive or no significant relationship between the quality of external auditing and CG disclosure. Ntim and Danbolt (2012) documented a positive relationship between the level of CG disclosure and audit firm size among South African firms. In a similar vein, Schiehl, Terra, and Victor (2013) documented that big four audit firms tend to increase executive stock option disclosure among Brazilian firms. Alsaeed (2006) conducted a study among Saudi firms and found no significance of audit firms on the level of CG disclosure.

Big audit firms provide good quality audits as compared to small audit firms due to having qualified auditors, resources, reputation and experience (DeAngelo, 1981). Due to good reputation and influence, big audit firms can compel firms to disclose information to reduce information asymmetry which helps in building investors' confidence and reduces COC. Furthermore, Diamond (1989) reported that the acquisition of reputation reduces the COD for firm and eventually COC. Pittman and Fortin (2004) conducted a study to investigate the impact of auditor choice on debt pricing in firms' early public years and found that big auditing firms can increase the reliability of annual reports and reduce monitoring cost that enables firms to reduce COD.

2.4. Nexus between CGI and COC

Prior literature highlights that most of the studies examined the association between individual CG mechanisms and COC (Ashbaugh, Collins, & LaFond, 2004; Shah & Butt, 2009). Chen et al. (2009) found that companies with poor CG transparency and disclosure face more COE. Researchers recommended to consider CG mechanism as an index to determine the nexus between CG and COC (Bozec & Bozec, 2011). Chen and Yuan (2004) conducted a study to investigate the relationship between CG disclosure and COE capital. They found a negative relationship between CG disclosure and COE in emerging economies. They also reported that country-level legal protection and CG disclosure play a complementary role in reducing the COE capital. It is also evident from existing literature that strong CG practices enhance the quality of financial reporting that leads towards reducing monitoring cost and investors' required rate of return (Zhu, 2014). However, existing literature is limited to developed countries (such as the US, Australia, Canada, etc.), and only few studies have been conducted in developing countries (Chen, Wei, & Chen, 2003). Similarly, question arises that how CG practices affect the COC under variations in market risk across firms and countries (Doidge, Karolyi, & Stulz, 2007; Teti, Dell'Acqua, Etro, & Resmini, 2016)? In addition, Ball, Robin, and Wu (2003) argued that quality of accounting income is lower in emerging markets and comprises of a major portion of portfolio; consequently, the information risk is higher in emerging markets as compared to developed markets. Thus, diversification and estimation of risk are difficult in emerging markets, and marginal benefits of CG disclosure might be greater in reducing the COC (Chen et al., 2003). It is also evident from existing literature that disclosure is acknowledged as fundamental part of CG research (Black, Jang, & Kim, 2006; Durnev & Kim, 2005; Mitton, 2002) and in surveys

(Analysis & Research, 1989; Asia, 2001; Patel & Dallas, 2002). Therefore, the relationship between CG disclosure and COC might change by controlling CG mechanisms. Hence, need arises to investigate the nexus between CG practices (CGI) and COC because the COC is a more direct measure of firm's financing cost than firm value. Thus, this study employs the CGI to determine the nexus between CG and COC among PSX listed firms.

The next section provides detailed methodology including population, sample size, data sources, construction of CGI, control variables, measurement for COC, operationalization of variables and analytical tools.

3. Methodology

3.1. Population and sample

The population of this study included all the listed firms of PSX. The sample comprised of 120 PSX listed firms over the period 2009–2015 (Table 1). This sample was selected on the basis of one criterion. Only those non-financial listed firms were selected whose annual reports were available from 2009 to 2015. The study excludes the financial firms as their capital and profitability structures are quite different. This seven years of data window makes 840 observations.

3.2. Data sources

The data was collected from annual reports for CG, financial and stock market variables. The data was collected manually from annual reports which were downloaded from PSX and companies' websites.

3.3. Self-constructed CG index

In literature, self-constructed and analyst ratings have been used to measure CG disclosure (Bhagat & Bolton, 2008). The self-constructed index is developed from country CG standards and provisions in order to examine different issues. Some researchers used self-constructed CGI (Javid & Iqbal, 2008a; Tariq & Abbas, 2013), while some used analyst rating indices (Clacher, Doriye, & Hillier, 2008; Henry, 2008) to investigate the relationship between CG and corporate policy decisions.

This study developed and employed a self-constructed binary CGI to determine CG compliance and disclosure among PSX listed firms due to several reasons. The analyst rating indices are developed by professional organizations keeping in view the CG principles of developed countries. Those developed countries' CG indices are not much applicable to a developing country due to differences in their socioeconomic factors (Arslan & Roudaki, 2017). Moreover, the analyst rating

Table 1. Industry-wise distribution of sample firms

| Industry | No. of sample firms |
|-----------------------------|---------------------|
| Textile | 24 |
| Automobile and engineering | 19 |
| Chemical | 14 |
| Cement | 12 |
| Oil and gas | 11 |
| Food and beverages | 10 |
| Electricity and electronics | 9 |
| Household | 8 |
| Pharmaceutical | 6 |
| Sugar | 5 |
| Misc. | 2 |
| Total | 120 |

indices are largely based on board characteristics and shareholding patterns (Chung & Zhang, 2011), while self-constructed CGI consists of all the CG aspects suggested by literature and country CG standards. The CGI of this study has five elements, i.e. BoDs (20 provisions), internal control (18 provisions), transparency and disclosure (16 provisions), auditing and committees (15 provisions) and shareholders rights (6 provisions), and that contains overall 75 CG provisions. Due to lack of standard criterion and theoretical support of index, CGI is developed in line with prior studies (Javid & Iqbal, 2008b; Khan, 2016; Samaha & Dahawy, 2010; Samaha et al., 2012; Tariq & Abbas, 2013).

3.4. Control variables

To control the endogeneity issue and statistical problems, this study used different measures and took firm size, leverage, growth and profitability as control variables.

The firm size is taken as control variable in this study and is measured by the natural log of total assets (LTA). Samaha et al. (2012) documented firm size and leverage as determinants of good CG practices. Moreover, Haniffa and Hudaib (2006) documented a positive relationship between ROE and firm size. In addition, leverage (LEV) is measured through the debt ratio and employed as a control variable in this study. Due to the influential positive effect of growth in CG disclosure (Ntim & Danbolt, 2012), it is taken as a control variable for this study and measured by current year's sales minus last year sales divided by the last year sales (GWTH). Beiner, Drobetz, Schmid, and Zimmermann (2006) argued that the adaptation of good CG practice is pivotal to minimize the COC by attracting more capital. Ntim and Soobaroyen (2013) found that profitable firms disclose more information as compared to their counterparts. Empirically, a negative relationship is reported between performance and COC in the literature (Zhu, 2014) by using ROE as a proxy of profitability.

3.5. Model specification

Following models are estimated to investigate the determinants of CGI and nexus between CGI and COC in this study:

$$CGI_{it} = \alpha_0 + \beta_1 DOWN_{it} + \beta_2 IOWN_{it} + \beta_3 BOWN_{it} + \beta_4 GOWN_{it} + \beta_5 BG4_{it} + \beta_6 BSZ_{it} + \beta_7 GEND_{it} + \beta_8 LTA_{it} + \beta_9 ROE_{it} + \beta_{10} GWTH_{it} + \beta_{11} LEV_{it} + \mu_{it} \quad (\text{Model 1})$$

$$COC_{it} = \alpha_0 + \beta_1 CGI_{it} + \beta_2 DOWN_{it} + \beta_3 IOWN_{it} + \beta_4 BOWN_{it} + \beta_5 GOWN_{it} + \beta_6 BG4_{it} + \beta_7 BSZ_{it} + \beta_8 GEND_{it} + \beta_9 LTA_{it} + \beta_{10} ROE_{it} + \beta_{11} GWTH_{it} + \beta_{12} LEV_{it} + \mu_{it} \quad (\text{Model 2})$$

where, CGI represents the corporate governance compliance index and comprises of 75 provisions from both CCG 2002 and CCG 2012, a binary coding is applied, 1 if company follows the CG provision in annual report, otherwise 0; COC represents the weighted average COC; DOWN, IOWN and GOWN represent the percentage of director ownership, percentage of institutional ownership and percentage of government ownership, respectively, with regard to total shares of the firm. BOWN represents block holder ownership and percentage of shares held by shareholders with at least 5% of the total shares. BG4 represents the big four audit firms and calculated by binary coding. BSZ represents the board size and calculated by number of directors on the board of firm at the time of annual general meeting (AGM), while GEND represents the presence of female board member and calculated using binary coding. LTA, ROE, GWTH and LEV represent the control variables used in the study.

To control endogeneity, this study employed multiple linear regression analysis by employing two-stage ordinary least square regression (2SLS) to examine the relationship. Regarding model 1, each of seven CG variables ($\beta_1 DOWN_{it} + \beta_2 IOWN_{it} + \beta_3 BOWN_{it} + \beta_4 GOWN_{it} + \beta_5 BG4_{it} + \beta_6 BSZ_{it} + \beta_7 GEND_{it}$) is regressed over control variable (e.g. $P - CG \text{ variables} = \alpha_0 + \sum_{i=1}^n \beta_i \text{Controls}_{it} + \varepsilon_{it}$) and their predicted values are saved

Table 2. Correlation matrix between CGI, I-CGI and R-CGI

| | | CGI | I-CGI | R-CGI |
|--------------|---------------------|----------|----------|----------|
| CGI | Pearson correlation | 1.000 | 0.091*** | 0.975*** |
| | Sig. (two-tailed) | | 0.000 | 0.000 |
| | N | 840 | 840 | 840 |
| I-CGI | Pearson correlation | 0.091*** | 1.000 | 0.000 |
| | Sig. (two-tailed) | | | 1.000 |
| | N | 840 | 840 | 840 |
| R-CGI | Pearson correlation | 0.975*** | | 1.000 |
| | Sig. (two-tailed) | 0.000 | 1.000 | |
| | N | 840 | 840 | 840 |

***Correlation is significant at the 0.01 level (two-tailed). CGI = corporate governance index, I-CGI = standardized predicted value and R-CGI denotes standardized residual.

in the first stage. In the second stage, model 1 is re-estimated by replacing the seven CG variables with their predicted values as following in model 1(a):

$$CGI_{it} = \alpha_0 + \beta_1 DOWN_{it} + \beta_2 IOWN_{it} + \beta_3 BOWN_{it} + \beta_4 GOWN_{it} + \beta_5 BG4_{it} + \beta_6 BSZ_{it} + \beta_7 GEND_{it} + \beta_8 LTA_{it} + \beta_9 ROE_{it} + \beta_{10} GWTH_{it} + \beta_{11} LEV_{it} + \mu_{it} \quad \text{Model 1(a)}$$

In model 2, CGI is assumed as an exogenous variable and may produce biased results; hence, an instrument variable (I-CGI) is created by performing regression analysis between CGI and alternate CG variables like gender diversity (*GEND*), board size (*BSZ*) and board meeting frequency (*BMF*) while keeping the same control variables for model 2. These variables are selected with the support of existing literature (Ntim & Danbolt, 2012; Tariq & Abbas, 2013) and the availability of data. Equation 1 represents this regression, where predicted values of CGI are saved as I-CGI and R-CGI.

$$CGI_{it} = \alpha_0 + \beta_1 BSZ_{it} + \beta_2 GEND_{it} + \beta_3 BMF_{it} + \beta_4 LTA_{it} + \beta_5 ROE_{it} + \beta_6 GWTH_{it} + \beta_7 LEV_{it} + \mu_{it} \quad (\text{equation 1})$$

I-CGI will be a valid instrument if it reveals a significant association with CGI and insignificant association with R-CGI. The decision is made on correlation matrix of CGI, I-CGI and R-CGI (see Table 2).

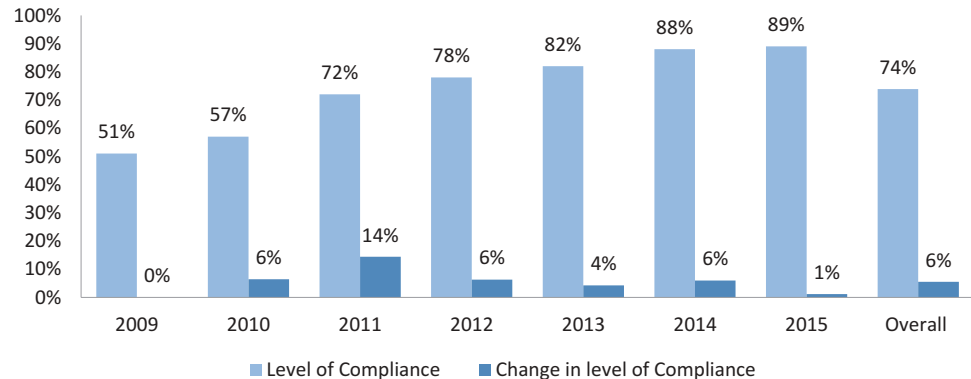
As shown in Table 2, I-CGI is a valid instrument as it has a significant relationship with CGI while insignificant with R-CGI. Hence, this instrument variable (I-CGI) is used in model 2 in place of CGI as shown below:¹

$$COC_{it} = \alpha_0 + \beta_1 I-CGI_{it} + \beta_2 DOWN_{it} + \beta_3 IOWN_{it} + \beta_4 BOWN_{it} + \beta_5 GOWN_{it} + \beta_6 BG4_{it} + \beta_7 BSZ_{it} + \beta_8 GEND_{it} + \beta_9 LTA_{it} + \beta_{10} ROE_{it} + \beta_{11} GWTH_{it} + \beta_{12} LEV_{it} + \mu_{it} \quad (\text{Model 2a})$$

4. Results and discussion

The results and discussion are presented in this section. First, the descriptive statistics of overall CG compliance and disclosure among PSX listed firms are presented. Second, this section expounds the descriptive statistics of all the variables. The correlation matrix is also presented in this section. In the end, findings of 2SLS representing the determinants of CG compliance and disclosure (model 1a) and nexus between CGI and COC (model 2a) are presented.

Figure 1. Level of compliance among PSX listed firms.



4.1. Descriptive statistics of CGI

The self-constructed binary CGI determines the level of CG compliance and disclosure among PSX listed firms and comprises of 75 provisions. Figure 1 reveals the level of CG compliance from the year 2009 to 2015 among PSX listed firms.

The finding of CG compliance reveals that the level of CG compliance and disclosure has improved over the period of 2009–2015. It can be seen that the mean value of CGI increased from 51% to 89% from 2009 to 2015. The finding reveals that overall increase in CG compliance is 38% over seven years which is in line with other emerging economies' studies (Akhtaruddin, Hossain, Hossain, & Yao, 2009; Ntim & Danbolt, 2012; Tsamenyi et al., 2007). Three possible reasons for this increase are (1) suitability of Anglo American model in Pakistan, (2) the CG compliance and disclosure has become mandatory for PSX listed firms after issuance of recent reform in 2012 according to legal requirements of PSX listing regulations and Companies Ordinance Act and (3) level of awareness has increased among stakeholder of PSX listed firms. The firms who failed to follow CG principles were delisted from PSX (Pakistan Stock Exchange, n.d.).

The descriptive statistics of overall CGI and its sub-indices are presented in Table 3. The mean score of CGI ranges from 50.7 to 89.3 over the period of 2009–2015 with an average of 74% for 75 CG provisions. The standard deviation (SD) of CGI is 22.48% which represents the dispersal in CG compliance level. A possible reason for increase in the level of CG compliance over a period of seven years is due to increase in the level of awareness and appreciation among stakeholders about CG principles.

Table 4 reveals the descriptive statistics of all the variables including CGI, COC, explanatory and control variables. The finding reveals that CGI has a mean value of 73.8% with a maximum value of 99.5% and a minimum value of 0%. The variation among 840 firm-year observation is high as SD is 24.1%. These findings are supported by previous CG studies (Henry, 2008; Ntim & Danbolt, 2012). The mean value of COC is 0.212, while the variation of COC is high among PSX listed firms as SD is 24.3%. The block ownership is having a mean score of 54.50% with maximum of 99.60% and minimum of 0%. This indicates the high ownership concentration among PSX listed firms and posits a low level of CG compliance and disclosure. These findings are supported by existing CG studies (Attiya et al., 2008; Tariq & Abbas, 2013). The director ownership is having a mean score of 19.64% with maximum of 98.97% and minimum of 0%. This level of director ownership is quite high as compared to both developed and developing countries. Henry (2008) found 6% of the director ownership among Australian firms, while Samaha et al. (2012) found 9% among Egyptian firms. The mean score of government ownership is 5.44% with maximum of 94.82% and minimum of 0%. This reveals a high level of government ownership and involvement among PSX listed firms which can have an impact on inclination about CG practices and compliance of the firm. The mean score of institutional ownership is 9.46% with maximum of 96.07% and minimum of 0%. These

Table 3. Descriptive statistics of CGI and sub-indices

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 |
|------------------------------------|-------|--------|--------|-------|-------|-------|-------|
| CGI | | | | | | | |
| Mean | 50.7 | 57.2 | 71.6 | 77.9 | 82.1 | 88.1 | 89.3 |
| Median | 51.9 | 59.5 | 77.9 | 85.5 | 89.9 | 94.7 | 95.6 |
| Maximum | 81.2 | 83.1 | 89.6 | 94.8 | 97.8 | 98.9 | 99.5 |
| Minimum | 4.6 | 4.8 | 5.0 | 5.8 | 5.9 | 8.1 | 9.7 |
| SD | 19.1 | 19.9 | 24.4 | 26.2 | 26.6 | 21.2 | 20.0 |
| CG provisions | 75.0 | 75.0 | 75.0 | 75.0 | 75.0 | 75.0 | 75.0 |
| Board of directors | | | | | | | |
| Mean | 53.13 | 58.55 | 69.45 | 74.83 | 78.24 | 82.65 | 83.93 |
| Median | 52.78 | 60.9 | 79.03 | 85.59 | 89.96 | 95.28 | 95.59 |
| Maximum | 77.74 | 82.35 | 89.64 | 92.8 | 96.35 | 97.63 | 98.43 |
| Minimum | 15.8 | 19.41 | 17.01 | 20.14 | 21.45 | 39.56 | 41.02 |
| SD | 17.87 | 18.52 | 22.07 | 22.89 | 23.89 | 21.91 | 19.92 |
| CG provisions | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Shareholders rights | | | | | | | |
| Mean | 53.13 | 61.46 | 82.19 | 90.11 | 96.67 | 98.13 | 98.25 |
| Median | 53 | 61.43 | 82.37 | 90.5 | 97.37 | 99.56 | 99.87 |
| Maximum | 53.6 | 61.1 | 81.1 | 89.23 | 94.85 | 97.37 | 97.35 |
| Minimum | 48.08 | 56.2 | 76.83 | 84.95 | 90.58 | 94.95 | 94.33 |
| SD | 1.62 | 1.46 | 1.26 | 1.31 | 1.54 | 0.72 | 1.1 |
| CG provisions | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| Transparency and disclosure | | | | | | | |
| Mean | 54.43 | 60.5 | 72.82 | 78.36 | 80.99 | 83.04 | 83.44 |
| Median | 56.69 | 64.81 | 83.25 | 90.44 | 92.94 | 95.12 | 95.12 |
| Maximum | 81.23 | 83.1 | 88.1 | 93.1 | 96.23 | 98.73 | 98.73 |
| Minimum | 14.4 | 17.53 | 21.28 | 22.53 | 24.4 | 25.65 | 26.9 |
| SD | 19.29 | 19.6 | 22.21 | 24.14 | 24.9 | 25.35 | 24.78 |
| CG provisions | 16 | 16 | 16 | 16 | 16 | 16 | 16 |
| Committees and audit | | | | | | | |
| Mean | 33.73 | 38.91 | 50.34 | 55.61 | 60.03 | 79.58 | 83.15 |
| Median | 38.6 | 43.91 | 60.16 | 68.29 | 72.35 | 84.85 | 87.98 |
| Maximum | 62.35 | 66.4 | 84.23 | 94.82 | 97.78 | 98.89 | 99.49 |
| Minimum | 4.56 | 4.75 | 5 | 5.81 | 5.88 | 8.1 | 9.65 |
| SD | 22.75 | 24.225 | 32.565 | 35.93 | 35.75 | 23.79 | 22.96 |
| CG provisions | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Internal control | | | | | | | |
| Mean | 59.2 | 66.42 | 83.12 | 90.41 | 94.79 | 97.25 | 97.84 |
| Median | 58.54 | 66.66 | 84.48 | 92.6 | 96.66 | 98.85 | 99.48 |
| Maximum | 68.71 | 73.08 | 87.46 | 93.71 | 96.83 | 98.71 | 98.71 |
| Minimum | 21.73 | 26.73 | 33.6 | 39.23 | 44.85 | 47.98 | 52.98 |
| SD | 10.45 | 10.59 | 12.43 | 12.76 | 12.28 | 12.08 | 10.93 |
| CG provisions | 18 | 18 | 18 | 18 | 18 | 18 | 18 |

Table 4. Descriptive statistics of variables

| Variables | Observations | Mean | Median | Std. | Maximum | Minimum |
|-----------|--------------|--------|--------|--------|---------|---------|
| CGI | 840 | 73.8 | 77.9 | 24.1 | 99.5 | 0 |
| COC | 840 | 0.212 | 0.158 | 0.243 | 0.968 | −0.41 |
| BOWN | 840 | 54.501 | 55.162 | 27.577 | 99.606 | 0 |
| DOWN | 840 | 19.649 | 8.943 | 23.581 | 98.971 | 0 |
| GOWN | 840 | 5.447 | 1.683 | 13.414 | 94.823 | 0 |
| IOWN | 840 | 9.469 | 5.485 | 13.444 | 96.071 | 0 |
| GEND | 840 | 11.451 | 0 | 23.376 | 1 | 0 |
| BG4 | 840 | 0.571 | 1 | 0.498 | 1 | 0 |
| BSZ | 840 | 8.22 | 8 | 1.683 | 17 | 6 |
| LTA | 840 | 15.967 | 15.591 | 2.052 | 21.274 | 12.606 |
| GRWTH | 840 | 0.152 | 0.115 | 0.378 | 1.644 | −0.739 |
| ROE | 840 | 0.134 | 0.091 | 0.211 | 0.19 | −0.224 |
| LEV | 840 | 29.315 | 24.393 | 29.031 | 146.417 | 0 |

CGI = CG index, COC = cost of capital, BOWN = Block ownership, DOWN = Director Ownership, GOWN = Government Ownership, IOWN = Institutional Ownership, GEND = Gender diversity, BG4 = Big four audit firms, BSZ = Board size, LTA = Firm size, GRWTH = Growth rate, ROE = Profitability, LEV = leverage.

findings of institutional ownership are supported by studies of Aggarwal et al. (2011) and Chung & Zhang (2011). The gender diversity is 11.45% which reveals the presence of female director on board. It can be noteworthy to say that female directors can play a pivotal role in improving the CG compliance among PSX listed firms. These findings are supported by Adams and Ferreira (2009). The result indicates that 57.1% of PSX listed firms use the services of big audit firms. However, this percentage is still less than that in other developing country studies. In a similar vein, Barako et al. (2006) conducted a study to investigate the use of big audit firms by Kenyan firms. They found that 75% of the sampled firms were using big audit firms. Literature provides the evidence that audit firm reputation can play a remarkable effect on CG compliance and reduce COC. The average board size is 8.22 which are within range of 6–17. These findings are well supported by Akhtaruddin et al. (2009) who found average board size of 7.97 among Malaysian firms. Moreover, this also fulfills the requirement of SECP CCG that board size should be at least seven (7). The average score of firm size is 15.96 with maximum value of 21.27 and minimum of 12.60. The average score of growth is 15.2% with maximum value of 1.644 and minimum of −0.739, while the average score of profitability (ROE) is 13.4% with maximum of 19% and minimum of −22%. In the end, the average score of leverage is 29.31% which is a bit higher than prior developing country studies (see Barako et al., 2006).

4.2. Correlation matrix

Table 5 reveals the correlation matrix between variables. It is evident from correlation matrix that most of the variables have a significant high correlation with each other. So, there may be multicollinearity between the variables. However, findings reveal that the correlation coefficient of 0.281 between DOWN and GEND and 0.528 between IOWN and BOWN reveals no serious problem of multicollinearity.

4.3. Results of model 1

Table 6 reveals the results of 2SLS for CGI and COC. Model 1(a) presents the results related to the determinants of CGI.

The value of adjusted R^2 is 50.2 which reveals that 50.2% variation in CGI is explained by these explanatory variables, while remaining 49.8% is explained by other factors. Moreover, the value of F -stats (55.254) reveals the fitness of the model as it is above 20. Findings reveal that director

Table 5. Correlation matrix between variables

| | COC | CGI | DOWN | IOWN | GOWN | BOWN | BG4 | BSZ | GEND | LTA | ROE | GRWTH | LEV |
|-------|---------|----------|---------|---------|---------|---------|---------|--------|--------|---------|--------|---------|-----|
| COC | 1 | | | | | | | | | | | | |
| CGI | -0.15* | 1 | | | | | | | | | | | |
| DOWN | 0.018 | 0.02 | 1 | | | | | | | | | | |
| IOWN | 0.016 | 0.029 | -0.158* | 1 | | | | | | | | | |
| GOWN | 0.018 | 0.014 | -0.189* | 0.269* | 1 | | | | | | | | |
| BOWN | -0.10* | -0.11* | -0.024 | 0.528* | 0.329* | 1 | | | | | | | |
| BG4 | -0.048 | 0.065** | -0.401* | 0.098** | 0.157* | 0.089 | 1 | | | | | | |
| BSZ | -0.007 | -0.024 | -0.249* | 0.229* | 0.179* | 0.09* | 0.281* | 1 | | | | | |
| GEND | -0.008 | -0.003** | 0.281* | -0.021 | -0.081 | 0.083** | -0.18* | -0.11* | 1 | | | | |
| LTA | -0.118* | 0.159* | -0.039 | 0.112** | 0.069* | 0.079 | 0.057** | 0.089* | -0.11* | 1 | | | |
| ROE | -0.05 | -0.051** | 0.192* | 0.008 | -0.079* | 0.013 | -0.2* | -0.09* | 0.07* | -0.134* | 1 | | |
| GRWTH | -0.041 | 0.029 | 0.049* | -0.02 | -0.02 | -0.021 | -0.03 | -0.003 | 0.02 | 0.104* | -0.005 | 1 | |
| LEV | -0.139* | 0.013 | 0.199* | -0.031 | -0.091* | -0.014 | -0.2* | -0.15* | 0.11* | -0.094* | 0.132* | -0.005* | 1 |

COC = cost of capital, CGI = CG index, DOWN = Director Ownership, IOWN = Institutional Ownership, GOWN = Government Ownership, BOWN = Block ownership, BG4 = Big four audit firms, BSZ = Board size, GEND = Gender diversity, LTA = Firm size, ROE = Profitability, GRWTH = Growth rate, LEV = leverage. *denotes 5% level of significance, ** denotes 10% level of significance.

Table 6. Results of determinants of CGI (model 1a) and nexus between CGI and COC (model 2a)

| | DV = CGI | | DV = COC | |
|-------------------------|-------------|--------------|-------------|--------------|
| | Model 1(a) | | Model 2(a) | |
| | Coefficient | t-statistics | Coefficient | t-statistics |
| Constant | 1.6214 | 0.201 | 0.596214 | 6.30255 |
| CGI | | | −0.004081* | −2.298154 |
| DOWN | 0.023 | 0.798 | 0.000905 | 2.808574 |
| IOWN | 0.13* | 2.381 | 0.000498 | 1.04044 |
| GOWN | 0.301 | 4.132 | 0.001103 | 1.805421 |
| BOWN | −0.022** | −1.964 | −0.000319* | −2.854172 |
| BG4 | 0.481 | 0.321 | −0.013902 | −0.908541 |
| BSZ | −0.699** | −1.812 | −0.001412 | −0.299789 |
| GEND | −0.704** | −0.498 | −0.00301 | −0.148147 |
| LTA | 1.501 | 3.798 | −0.017801 | −4.653324 |
| ROE | −3.617 | −1.389 | −0.001232 | −2.707919 |
| GRWTH | 0.91 | 0.557 | −0.009025 | −0.594175 |
| LEV | 0.01 | 0.429 | −0.000762 | −7.909152 |
| Adjusted R ² | | 0.502 | | 0.3254 |
| F-stat | | 55.254 | | 31.49512 |
| Observations | | 840 | | 840 |

COC = cost of capital, CGI = CG index, DOWN = Director Ownership, IOWN = Institutional Ownership, GOWN = Government Ownership, BOWN = Block ownership, BG4 = Big four audit firms, BSZ = Board size, GEND = Gender diversity, LTA = Firm size, ROE = Profitability, GRWTH = Growth rate, LEV = leverage; * and ** denote 5% and 10% level of significance, respectively.

ownership has a positive association with CG compliance and disclosure; moreover, BoDs may improve the level of CG compliance and disclosure. These results are well supported by Samaha et al. (2012). A significant positive relationship is found between institutional ownership and CG compliance and disclosure that supports the argument that a high level of institutional ownership in firms can improve the level of CG compliance in Pakistan. Aggarwal et al. (2011) found the similar results in their study and documented that accountability increases in the presence of institutional ownership. Moreover, they also documented that institutions have experience, knowledge and resources which can help them in improving CG compliance directly or indirectly. In addition, Barako et al. (2006) argued that institutions demand a high level of CG compliance to reduce their monitoring costs. This finding is also supported by prior studies (Chung & Zhang, 2011; Ntim & Danbolt, 2012). Similarly, a positive relationship is also found between government ownership and the level of CG compliance and disclosure. These findings are in line with the study conducted by Conyon and He (2011) who also found the same findings in their study on a Chinese dataset. In contrast, a negative relationship is found between block ownership and level of CG compliance and disclosure. In Pakistan, the ownership concentration is quite high, and consequently, it may influence management to disclose less information and expropriate minority shareholders due to the weak legal system and lack of protection of minority shareholders. These findings are supported by several studies on emerging markets (Alsaeed, 2006; Khan, 2014; Samaha & Dahawy, 2010). The findings reveal an insignificant positive association between audit firm size and level of CG compliance and disclosure. Literature provides the evidence that audit firm size may have a positive effect on CG compliance, and large audit firms have high auditing standards and demand for high level of CG compliance and disclosure (Alsaeed, 2006; Barako et al., 2006). Due to the high level of family and block ownership, auditing firms are less influential in Pakistan for improvement of CG compliance and disclosure. The board size and gender diversity have a negative association with level of CG compliance and disclosure. Hence, it is argued that the level of CG compliance and disclosure improve in

the presence of small board due to strong coordination. These findings are not consistent with findings of existing studies (see Akhtaruddin et al., 2009; Ntim & Danbolt, 2012). The findings reveal that there is an insignificant but positive relationship of control variables like firm size, growth and leverage with the level of CG compliance and disclosure, while the negative association is found with ROE. These findings are also supported by prior studies (Ntim & Danbolt, 2012; Samaha et al., 2012).

4.4. Results of model 2(a)

Model 2(a) presents the results regarding nexus between the level of CG compliance and disclosure with COC. The value of adjusted R^2 is 32.54 which reveals that 32.54% variation in COC is explained by these explanatory variables, while remaining 67.46% is explained by other factors. Moreover, the value of F -stats (31.49512) reveals the fitness of the model as it is above 20. The findings reveal that CGI has a significant negative relationship with COC which means the COC decreases with increase in the level of CG compliance and disclosure. Although the literature is limited in examining the nexus between CG and COC, this finding of significant negative association is supported by prior studies (Bozec & Bozec, 2011; Chen et al., 2009; Shah & Butt, 2009). The findings reveal an insignificant positive association of director, institutional and government ownership with COC among PSX listed firms. It means that director, institutional and government ownerships are not able to explain variation in COC. Agency theory supports these findings and documents more agency problems (Demsetz & Lehn, 1985) due to high level of director ownership and government ownership. In contrast, the block ownership has a significant negative association with COC. It means the COC decreases with increase in block ownership among PSX listed firms. Bozec et al. (2014) and Pham et al. (2012) also found similar results in their studies. There is a negative association between audit firm size and COC among PSX listed firms. It means that those firms bear less COC whose accounts are audited by big audit firms. Jensen and Meckling (1976) documented that external auditors can play a pivotal role in mitigating agency conflicts and improving CG compliance. In a similar vein, audit firms can help in the reduction of information asymmetry which ultimately reduces COC (Beatty, 1989; DeAngelo, 1981). Additionally, those firms have fewer problems of CG compliance and disclosure that are audited by big audit firms which increases the investors' confidence and reduces COC. The findings reveal a negative association of board size and gender diversity with COC. It means firms with large board size may bear less COC as compared to firms with smaller boards in Pakistan. These findings are supported by literature (Bozec & Bozec, 2011; Shah & Butt, 2009). Moreover, findings reveal that firms with a higher level of female board members have a lower COC than those with less or no female board members. These findings are also supported by existing literature (see Nielsen & Huse, 2010). The study finds a negative relationship of all four control variables, i.e. firm size, growth, ROE and leverage with COC. These findings are in line with previous studies (Bozec et al., 2010; Pham et al., 2012).

5. Conclusions

The objective of this study was to investigate the determinants of the level of CG compliance and disclosure and nexus between CG compliance and COC among PSX listed firms. The study employed 2SLS by drawing a sample of 120 PSX listed firms over seven years from 2009 to 2015. The binary CGI is developed, comprising of 75 provisions from CG standards of both CCG 2002 and recent reform in 2012.

The findings of this study reveal that the average score of CGI has improved from 51% to 89% over the period of 2009–2015. The finding reveals that overall increase in CG compliance is 38% in these seven years which is in line with other emerging economies' studies (Akhtaruddin et al., 2009; Ntim & Danbolt, 2012; Tsamenyi et al., 2007). Results reveal that block ownership has a significant negative association with CG compliance and COC. It concludes that PSX listed firms having a high level of block ownership are less intended to conform to CG principles as compared to those having a low level of block ownership, and firms having a high level of block ownership have a lower COC as compared to those having a low level of block ownership.

A positive association is found between government ownership and CG compliance. It is documented that PSX listed firms with more government ownership are likely to fulfill more CG principles as compared to those with a low level of government ownership. However, the insignificant positive association is found between government ownership and COC. It documents that government ownership has no explanatory power to explain variation in COC. Institutional ownership has a significant positive association with CG compliance while insignificant with COC. It documents that PSX listed firms having a high level of institutional ownership are intended to fulfill more CG principles as compared to those having a low level of institutional ownership, and institutional ownership has no explanatory power to explain variation in COC.

Findings reveal that director ownership has a positive association with CG compliance and COC. It is suggested that BoDs may improve CG compliance and disclosure among PSX listed firms and lower COC. The negative association is found between board size and CG compliance. These findings are not consistent with findings of existing studies (see Akhtaruddin et al., 2009; Ntim & Danbolt, 2012). The negative association is also found between board size and COC. It means that firms with large board size may bear less COC as compared to firms with smaller boards in Pakistan. Gender diversity has a negative association with CG compliance and COC. It means that PSX listed firms with a higher level of female board members have a lower COC than those with less or no female board members. While the negative association between gender diversity and CG compliance may be due to absence of voicing mechanism and females' participation at AGMs. Audit firm size has a positive association with CG compliance while negative association with COC. It means those firms bear less COC whose accounts are audited by big audit firms.

In the end, the negative association is found between CGI and COC. It means that as CG compliance and disclosure increases, COC decreases. The results of the control variables are mixed and supported by the literature.

5.1. Significance and implications of the study

This study contributes to existing CG literature. It is found that most of the existing studies focused on developed markets and literature is scarce in developing markets. Therefore, this study contributes to the existing literature, especially in emerging markets. A significant arising implication of the paper is that firms of emerging countries should pay higher attention to CG issues to enjoy a lower COC. The efficient management of this matter is of critical significance in the creation of firm value. Since the firm's COC is a more direct measure of firm's value, the findings of this study are important for emerging markets, particularly Pakistan. Thus, this study provides more evidence in support of strong CG practices in Pakistan and overall Asia's emerging markets due to similar socioeconomic context.

5.2. Limitations and directions for future research

Although this study is comprehensive, it still has some limitations. Due to the lack of organized data, this study used data of 120 PSX listed firms while total population size is 579². Consequently, this may limit the generalizability of the findings of this study. Future research can be done by taking data from all the PSX listed firms. This study excludes financial firms due to their different capital and profitability structures. Only seven years of data from 2009 to 2015 was collected while SECP introduced CCG in 2002; future researchers can collect data over a longer period of time.

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Notes

1. All seven CG variables were replaced with their predicted values.
2. Total population size is 579 because only these firms are listed on the Pakistan Stock Exchange and come under the scope of the study.

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