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Gender Diversity and Economic Efficiency: Reducing Information Asymmetry through Women on Boards

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ABSTRACT

Corporate boards are increasingly becoming diverse, with women playing pivotal roles in shaping governance practices and economic outcomes. This study investigates the impact of women on corporate boards (WOB) on reducing information asymmetry—a persistent issue in financial markets that affects investment decisions and corporate valuation. Using a panel dataset comprising 240 non-financial firms listed on the Shanghai and Shenzhen Stock Exchanges over 2008–2023, the study integrates insights from stakeholder and agency theories to explore how board diversity influences information transparency. This research analyzes the impact of WOB on information asymmetry, with CSR and analyst coverage serving as moderating factors. The study indicates that the presence of female directors on organizational boards enhances governance structures, as these organizations demonstrate elevated levels of corporate social responsibility (CSR) and garner increased analyst attention, thereby mitigating information asymmetry and fostering trust among stakeholders. This research examines the beneficial effects of board diversity from an economic and governance standpoint within organizations, particularly in the Chinese market, where transitional institutional structures present both challenges and opportunities. Consequently, the study addresses the intersection of gender diversity, corporate social responsibility, and analyst coverage, providing valuable insights for policymakers, investors, and management seeking to improve market efficiency and economic equity. The findings endorse the significance of employing inclusive governance as a mechanism for cost reduction and enhancing the accountability of major corporations while fostering sustainable development.

Introduction

The board of directors is the principal element of corporate governance and is accountable for acting in the best interests of stakeholders through its operations and decision-making processes. The Board of Directors establishes policies and makes decisions on significant matters (Guerrero, 2018). In the contemporary landscape, information is crucial in the financial market and serves as the cornerstone of modern finance. Information asymmetry significantly influences corporate investment and finance decisions (Myers & Majluf, 1984). Conversely, previous studies indicate that female board members are more inclined to engage in openness and public disclosure, hence mitigating informational risk in the market; thus, we anticipate a negative correlation between the presence of women on boards and information asymmetry.

A woman on board improves the board's decisions and provides better oversight of firm conditions and reports. The growing number of women board members illustrates the importance of their role in Business development and performance enhancement. The effect of women board members, CEO's and CFO's on different decision-making issues has been studied by different authors. Which includes the impact of women on board and firm performance (Khan & Vieito, 2013; Yang & Terjesen, 2019), women board members on acquisition activities (Huang & Kisgen, 2013) differences in gender and risk aversion (Ahmed, 2019; Zingales, & Maestripieri, 2009) issues regarding the women on board and corporate social responsibility (Harjoto, 2019; Rajesh, 2020), women directors and sustainability reporting (Isabel, 2019).

Previous literature reports the substantial impact of women on firms in different dimensions. For instance, management as an accurate decision maker (Nielsen & Huse, 2010), increase financial performance (Martínez, 2019); Confidence (Huang & Kisgen, 2013), managing efficiently (Loden, 1985); firm value (Carter & Simpson, 2003); disclosure (Husted, 2019). China Securities regulatory commission (CSRC) reported 64 cases of irregularities in 2017 because of the information asymmetry between investors and firms. R. B. Adams and Ferreira (2009) found that women on board have better attendance and are more likely to join monitoring committees than male, women board members dislike financial fraud.

Women's presence in firms affects the performance and the theory which explains this relationship is agency theory (Jensen & Meckling, 1976). Agency theory explains the conflict of interest between managers and shareholders due to opportunistic behaviour (Ortas et al., 2015). Opportunistic behaviour leads towards financial losses, fraud and disaster for the firm (Hillman & Dalziel, 2003). So for that managers have to be monitored or compensated. Women board members on the 13 boards improve the monitoring (Adam & Ferreira, 2009). Women board members provide better insider and closer observation and also reduction of agency conflict. Stockholder and the board of directors of the corporation plays an important role in monitoring the actions of the management. Stakeholder theory which is given by (Fryxell & Lerner, 1989) recommend that minority groups and diversity in the board of directors are important for the Firm. The theory claims that a company must consider the stakeholder's (Employees, Customers, and Suppliers) interest and (Berman et al., 1999) emphasize on consideration of stakeholders for the creation of value for the firm. By following the Stakeholder theory considering the women and minorities in the board can be a responsible indicator of a firm corporate social responsibility (Ibrahim & Angelidis, 1994; Oakley, 2000).

Literature gives evidence that women on board reduce accounting fraud (Liao & Liu, 2019)and also more presence of women on the boards and women independent directors are more likely to reduce financial irregularities than male chairpersons. Women chairperson not only improves the

internal control quality but also improves the financial reporting quality by reducing the information asymmetry (Boskey & Ganor, 2018). (Abad et al., 2017) the paper provides evidence of the inverse relationship between gender diversity on board and information asymmetry and it's only limited to Spanish Listed Companies but it could be interesting to examine in depth to test the impact of women on boards on asymmetric information in China and for the depth study i channelize Analyst Coverage and corporate social responsibility as a mediating variable.

Over the last decade, U.S. firms increased the number of Women Board members and non-executive directors for the effectiveness of boards (Pham & Hoang, 2019). By encouraging the Spanish Gender Act companies enlarge the share of Women members up to 40% by 2015. Similarly, Other European Countries like Belgium, Italy, and France have reached minimum quotas for women representatives. These governmental advances to avoid inequality and support diversity in the management of firms. Previous literature finds that women on board add quality 15 public disclosure by firms, Similarly, the participation of Women board members encourages efficient communication with investors (Lu, 2019; Wasiuzzaman & Mohammad, 2020). Furthermore, empirical facts have shown an inverse relationship between information asymmetry and disclosure quality (Brown & Hillegeist, 2007).

Moreover, if Board Diversity indicates to enhancement in informational revelation and transparency, we would be expecting a relationship between women on board and information asymmetry in Corporations. In previous literature, the increasing number of women directors has a positive impact on boardroom behaviours (Dong & Li, 2017; Sharda, 2019). Having diverse board members will have extensive thought, high-value negotiations and more efficient interaction which improves the monitoring of management. The presence of women can impact the nature and elements of the executive's discussions (Gul et al., 2011), which can positively affect the Company Information. For instance, contrasted with male individuals, women heads will in general have better relational abilities with investors, and better understand the market conditions, which leads to innovative and creative ideas(Jelinek & Adler, 1988); (Eagly & Johnson, 1990); (Dalton et al., 2003). Likewise, women are bound to contribute with fresher points of view to tackling complicated issues that can reduce information asymmetry in strategy formulation (Francoeur et al., 2008).

Board members are the most significant insider controller for empowering and shielding the advantage of owners. A recent study found a link between women on board and information asymmetry in Spain (Abad et al., 2017). Women on boards can indicate unobservable information through which stakeholders' actions may affect the company's performance (Kirsch, 2018). Firms may infringe on investors rights due to information asymmetry so it is important to study the effective mechanism to reduce agency cost (Xiaochong, 2019). Hence in response to a future call of this paper corporate social responsibility and Analyst Coverage are taken as mediators because these variable reduces the Information Asymmetry and have not been tested in the past.

The previous study reports the positive aspects of women directors in transparency and disclosure of information to investors and reports, as well as effective communication. The Agency theory proposes that corporate administration instruments consider the decrease of asymmetric information between financial investors and, likewise between market members (Chung et al., 2010). A recent study found a link between women on board and information asymmetry in Spain (Abad et al., 2017). Women on boards can indicate unobservable

information through which stakeholders' actions may affect the company's performance (Kirsch, 2018).

Hence in response to a future call of this study, corporate social responsibility and Analyst Coverage are taken as mediators because these variable reduces the Information Asymmetry and have not been tested in the past. Corporations that construct common connections with stakeholders done improved moral and cultural norms (e.g., exhibiting powerful corporate social responsibility disclosure) are required to profit from an improved firm information environment (Freeman et al., 2004; Jensen, 2002).

Literature Review

Agency Theory

Agency theory was initiated by (Berle & Means, 1932) and is taken as one of the most fundamental theories of cooperate governance. Which states that "ownership is dispersed" due to the manager's objective instead of maximizing shareholder wealth. In 1976 a renowned article was published that further developed this viewpoint, namely "Theory of the Firm: Managerial Behavior, Agency Cost and Ownership Structure" which was given by "Jensen & Meckling". The author defines Agency Theory as a contract under which the principal (Owner) engages the agent (Manager) to perform some duties on their behalf. The owner cannot follow the daily operations which results from the manager taking advantage of the situation and working for their interest. The consequences will incur agency costs which are described by Jensen and Meckling in 1976 as Principals monitoring expenditure, Agent bonding expenditure and residual loss. The monitoring cost incurred by the principal is for establishing a monitoring system and incentives to agents for value principal maximization. The Agent bonding cost is by the agent to follow the established monitoring system. Residual losses are agency costs which are incurred after monitoring and bonding (Jensen & Meckling, 1976).

The main focus of Agency Theory is the "Monitoring Function" of the Board of Directors. According to theory Board members are monitoring devices in eliminating the agency relationship.

Stakeholder Theory

Stakeholder theory was given by (Freeman, 1984) which recommends that corporate governance should also protect the interest of stakeholders not only stockholders but also other indirect interests. Similarly, Shareholders, Employees, Customers and Suppliers. Stakeholders can be classified, as "consubstantial, contractual and contextual stakeholders". The first one, Consubstantial stakeholders are the survival of a firm like employee and strategic partner. Contractual stakeholders have different official contracts with the company and they are Suppliers, Buyers, Customers and financial institutions. Furthermore, Contextual stakeholders are widely as Social, Economic and political environments, people or organizations surrounding the firm's operations. Study indicates that Managers can play a vital role in managing the Stakeholder theory. They can make decisions that ensure the rights and participation of each group of stakeholders.

Women on Board and Information Asymmetry

The corporate board encourages the enhancement of disclosure and reporting in the firm which may come from better observing. Agency theory suggests that board directors facilitate the reduction of information asymmetry between Principal and Agent and market investors by bringing diversity in board members it brings different expertise, and abilities (Rahman et al., 2010; Hillman et al., 2003). Women board members are positively associated with reliable and clear information (Ferrero et al., 2019). As indicated by hypotheses from financial humanism and psychology, given the outstanding contrasts in behavioral attributes between males and women, the diversity of gender in boards could influence the environment and elements of board thoughts (Gul et al., 2011), which may affect the information environment. For example, in contrast with male individuals, women members will, in general, have better interpersonal aptitudes, and appear more prominent and dependable. Their correspondence style is more participative and process-arranged, which may improve basic leadership forms by creating an atmosphere of more noteworthy correspondence of information and by empowering the board to think about alternate points of view and to consolidate increasingly differed conclusions into an exchange. Also, women contribute different points of view for complicated issues which may decrease the informational biases (Francoeur et al., 2008).

Women Board members add Quality and Quantity of Public disclosure by firms, similarly, the participation of Women board members encourages efficient communication with investors (Joy, 2008). Nelson (2015) Documents circumstantial impacts, such as cultural effects, that seem to be an important effect on observed women on board. There are women in China who are expected to be reserved and the belief for the women is that they are additional careful and traditional than men when making a financial or business decision (Riley & Formby, 1992). Moreover, it is also proved that women are less overconfident (Lundeberg, Fox, & Punćcohaŕ, 1994) higher ethical standards in decision-making (Pan & Sparks, 2012), and are less risk averse to financing (Powell & Ansic, 1997). These characteristics lead firms towards better financial reporting and reduce informational risk.

H1: Women on board is associated with Information Asymmetry.

Women on Board and Analyst Coverage

Consideration of board members allows financial analysts to collect, develop and spread accurate information to investors. Information intermediaries interpret the firm financial disclosure and forecast the returns. (Yang et al., 2016) suggest that analysts are more attracted to firms with more Diverse or independent boards. (Wang et al, 2019) find out that managers do more financial misreporting when monitoring is weaker and the board cannot establish communication between external stakeholders. Literature shows that consideration of financial analysts will undoubtedly provide information disclosure to firms and investors (Walker et al, 2003). Literature reports that financial agents and institutional financiers increase a firm's authority and checking (Irani & Oesch, 2013) so my observed effect is predictable with the expected indirect effect of analysts improving the information of institutional investors (Lehmann, 2019).

When having women on board it is found that the Company get a high rating and becomes more institutionalized firstly analysts expect that women on board will bring a diverse ideology and mindset to the company and due to this companies believe in its benefits as a better performers and leads towards the high rating. Secondly, Women on board bring a positive signal of a responsible organization of society and those who follow diversity demonstrate an awareness of social norms and adapt it. In contrast, companies that do not follow diversity in boards are taken

as conservative and backward (Broome, 2008; Reutzel et al, 2011; Miller et al, 2009) signaling effect will bring the attention of analysts and they forecast accordingly.

H2: Analyst Coverage is associated with Women on board

Information Asymmetry and Analyst Coverage

Analyst coverage shows the number of analysts who pursue an organization and publish forecasts and proposals regularly (Hinze & Sump, 2019). The dominant part of the empirical discoveries shows a relationship between the analyst's coverage and informational transparency anyway which recommends the positive connection between an organization's transparency and analysts (Yu, 2010; Lang & Lundholm, 1996).

Current literature suggests that market analysts help to decrease information asymmetry crosswise over various dimensions (Ying, 2018). As analysts accurately transfer the information from the company to the stockholder and help them to recognize the true value of these investments, then managing the company does not fail to engage in value operation activities. Analysts help organizations by reducing information asymmetry through superior capabilities and help as outsider observers in organizations (Subrahmanyam, 1995; Hong et al., 2000; Yu, 2010). Analysts have a primary role in the capital market they interpret and disseminate information through earnings forecasts and recommendations. As the primary theoretical model of Biais and Gollier which explains the asymmetric information between Buyer (Firms) and Banks about the signals of positive NPV. Banks always try to prefer financing in Positive NPV and sometimes they don't so for that financial analysts give information to banks, potential shareholders and bondholders. So the existence empirical existence suggests that an increase in analyst coverage will cause a decrease in information asymmetry

H3: Analytical coverage is associated with information asymmetry.

Analyst Coverage Mediate the Relationship between Women on Board and Information Asymmetry

The role of analysts as an extra observing instrument and analyst imposes control on disobedient managers and helps them to support their shareholders, generally, our paper adds to an unrivalled understanding of the effect of women board member presence on information asymmetry Mazur et al., (2020). Women on board influence less information asymmetry between stockholders, probably due to the role of those analysts as information intermediaries. Analyst coverage shows the number of analysts who pursue an organization and consistently estimate and give suggestions (Hinze & Sump, 2019). To carry out the monitoring activities, Women on board rely on the information through the managers and they share only the information which are their interest. For this concern, the Board of Directors have to check other channels that aid their monitoring activities like analyst coverage which plays an important role as an information intermediary and determines the future financial prospects of the firm (Yu, 2010). However, most empirical findings show a positive connection between women on board and analyst coverage (Elbadry et al., 2015; Lang & Lundholm, 1996). As analyst's coverage discloses the information as required and also presence of women can also monitor the operations the effect of information asymmetry is minor in an organization which increases the firm performance and profitability (Hughes et al., 2019).

H4: Analyst Coverage has a mediating outcome on the link between Women on board and Information asymmetry.

Women on Board and Corporate Social Responsibility

Corporate Social Responsibility contains information regarding the financial disclosure and expenditure on environmental protection welfare and charity activities (Wang, 2019). Corporate Social Responsibility has different benefits for a firm it can enhance the firm value and performance brand image and reputation in the market (Zahid et al., 2020). Previous literature shows the influence of corporate governance on CSR reporting. The characteristics are bored size, diversity, independent directors and ownership structure (Darus et al., 2014; Haji, 2013; Wu et al., 2015). (Darus et al., 2014) provide evidence that board diversity like gender, age, skills and culture influences Corporate Social Responsibility. It anticipates the importance of women on board to be suitable. Firms with have more women on board positively increase the corporate social responsibility rating.

Women's Presence on Boards impacts the board's essential limit of watching the organization. Having more women on the board improves the board's capability by extending the extent of master understanding and broadening the number of women board members with cutting edge (Turrent et al., 2019).

Adherence to the reporting standards of CSR reporting Global Reporting Initiative (GRI) will be reliable for Corporate Social Responsibility (Frankel, 2004). Corporate Social Responsibility convinces the Business Press, Legislation and investors and non-government institutes. In particular the Women on board enhance the quality of monitoring in critical decision making and promote Corporate Social Responsibility. These included qualities by women board members enable the board to even more reasonably monitor the board member (Hillman & Dalziel, 2003).In line with previous opinions, I suggest the following hypothesis:

H5: Women on board enhance corporate social responsibility.

Corporate Social Responsibility and Information Asymmetry

Cui (2018) Estimates a negative relation between corporate social responsibility & information asymmetry. The main argument is that corporate social responsibility reports deliver non-financial information which increases the transparency of corporations (Cortesi & Vena, 2019). This reduces the information asymmetry between stakeholders. It emphasizes that associations receive corporate social responsibility practices as a gadget for better correspondence among members and partners.

(Darus et al., 2014) sustainability reports provide information regarding corporate strategy, performance and prospects in social and economic contexts especially in communicating how profit was made and different practices regarding the supplier-company relationship, customer and social contribution, safety and health in the workplace and so on (Broome, 2008; Jo & Harjoto, 2014) show that corporate social responsibility reduces the agency problems between managers and investors. Sustainability and corporate social responsibility reports provide the company’s strategic information, performance which is useful for the financial stakeholders because corporate social responsibility reports are the main source for communicating the environment and informing the stakeholders regarding the trends of profit obtained .Therefore, reduction of information asymmetry between stockholders and stakeholders due to the voluntary disclosure of Corporate Social Responsibility (Frías, 2014). (Ferrero et al., 2015). The study proposes that firms having more CSR activities involvement have the least informational barriers so it will be better for the Firm and market participants.

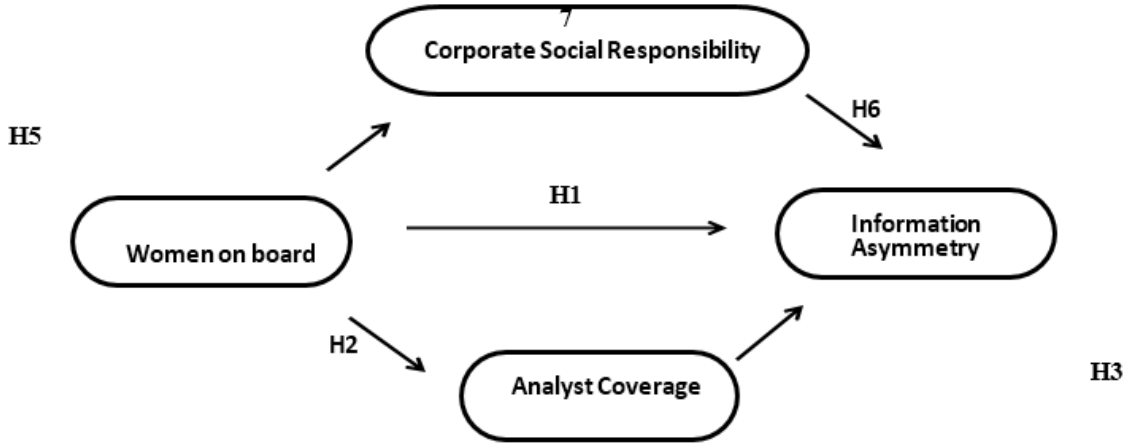
H6: Corporate Social Responsibility is associated with Information Asymmetry.

Corporate Social Responsibility Mediates the Relation between Women on Board and Information Asymmetry

The previous studies supported the negative relationship between Women on board and information asymmetry (Carter et al., 2003). If female directors influence positively Corporate Social Responsibility then it will decrease the effect of information asymmetry and CSR will have a negative relationship with information asymmetry. It is considered that firms who disclose more information regarding CSR activities are more aware of their stakeholder and are considered efficient Corporate Governance, who adapt the organizational changes. CSR can serve as a filter which facilitates the relationship between the Board and the Environment. Regardless, the findings of previous research are mixed results between women on board and firm performance (Bao & Lu, 2019). So by making the board diverse, it decrease the effect of information asymmetry. As shown by Stakeholder Theory, Corporations that develop basic associations with stakeholders and improve good and social standards (e.g., displaying ground-breaking corporate social responsibility exercises) are required to benefit from an enhanced firm information environment (Gulzar et al., 2019). The framework through which women on boards impact more efficiently is CSR as a strategy for responding to investors' needs and interests. Therefore the following hypothesis is proposed;

H7: The influence between Women on board and Information Asymmetry is mediated through Corporate Social Responsibility.

Theoretical Framework



Research Methodology

This section presented below details the steps taken to gather insights and answer our research questions, providing a clear approach.

Corporate social responsibility is a composite of ESG (Environment, Social and Governance) as well as the three pillars of CSR. For this purpose, data will be retrieved from Thomson Reuters ASSET4 for the years 2008-2018. To measure corporate social responsibility, I compute the average of ESG pillars or CSR scores by combining the different indicators given by Thomson Reuters EIKRON ESG Score. Thomson Reuters has already been validated in literature(Birkey et al., 2016; Breuer et al.,2019; Gangi et al., 2019; Gutsche et al., 2017).Asset4 collects the

information from company reports, websites and newspapers. An ESG pillar contains different categories and has different scores for the weightage of that indicator. ESG Environmental scores 61 indicators and consists of resource use, emissions and innovations. Resource use reflects the company's performance and sustainable supply chain management. Emission scores reflect the firm's commitment and environmental emission manufacturing processes. Innovation Environmental score reflects new market opportunities and advancement in technology and eco-friendly products.

The ESG Social Pillar scores 63 indicators and it includes mainly (workforce, human rights, community and product responsibility). Workforce measures a company published controversies regarding the opportunities for a diverse workforce, regarding health and safety of the workforce, company relation with employees and job satisfaction. The human rights social score measures the controversies published about child labour issues and fundamental human rights issues. Community score measures the controversies concerning anticompetitive behaviour, protecting the health of the public and valuing the business ethics. Product responsibility reflects the customer complaints or dissatisfaction or company marketing and R&D core practices. Governance Score 54 indicators which include (management, shareholders and CSR strategies). Management score reflects the controversies regarding the top executives and board compensation. Shareholder score measures issues regarding non-transparent accounting issues, insider dealings and shareholder rights violations. CSR strategy replicates company practices and communicates day to day decision-making process.

Sample and Data Size

To test the relationship of Women on board on Information Asymmetry in China I take non-financial firms listed firms of the Shenzhen and Shanghai Stock Exchange. I take annual data of each variable from Thomson Reuters DataStream from 2008-2018. We take the data set from 2008 because the China Security Commission follow new accounting standards in the particular year so there will be no dispersion or change after that. Our final panel data consists of 2288 firm-year observations which includes 208 non-financial listed firms from China.

Dependent Variable: Information Asymmetry

Following the prior research, existing studies consider bid-ask spread as a method to measure information asymmetry (Ali et al., 2017; Chung et al., 1995; Ahmad et al., 2018). (Luo & Banking, 2017) find out that the higher the bid ask spread larger the degree of information asymmetry. The stock market of China is an order-driven market and maximum investors are private investors. Therefore, bid-ask spread can be observed as an illiquidity measure in the asymmetric information dimension (Zhang, & Li, 2019). We employ the percentage bid-ask spread method defined as follows (Lee & Yahn, 1997; Moscariello et al., 2019):

Independent Variable; Women on Board

The existence of one woman as a board member in a company is the primary measure of Women on board (Green & Homroy, 2018; Shahzad et al., 2019). I used the percentage of women board of directors which is calculated as the number of women board members divided by the total number of directors (Abad et al., 2017; Nadeem et al., 2019).

Mediating Variables Analyst Coverage

Analyst coverage shows the number of analysts who ensure a company and regularly publish forecasting and recommendations. We obtained the Number of analysts who forecast the earnings per share of a firm for the next financial year and treated it as a raw measure of analyst coverage (COVERAGE) (Navone & Wu, 2018). Yang, and Chan (2019) Then by taking the natural logarithm of this raw(COVERAGE) We get the analyst coverage(Ln Coverage). For downloading the earning information data we used the detailed history file of the I/B/E/S database (Chemmanur & Toscano, 2019). DeBoskey et al., (2018) find that higher analyst coverage leads towards more transparency in a firm's disclosure.

Control Variables

Similar to prior research the control variables are turnover, firm age, volatility and leverage (Chen et al., 2007; Malik et al., 2020; Naseem et al., 2019). Firm age is the total number of firms operating years and Leverage is the Total debt divided by total assets. TURNOVER is the natural logarithm of trading quantity (estimated as the normal day-by-day volume) scaled by the market estimation of an association's value to encourage cross-sectional examination. VOLAT is an intermediary for stock return unpredictability determined as the standard deviation of everyday returns. Literature shows that less volatile companies are more liquid and don't have adverse selection problems (Ajayi & Akinsomi, 2019; Chung et al., 2017; Hamid & Hasan, 2017; Nagar et al., 2019). TURNOVER and VOLAT have been likewise included as control factors because small-scale structure writing shows that enormous, often exchanged and less unpredictable firms are increasingly fluid and endure lower adverse selection issues (Powell & Ansic, 1997) and also include the dummy variable by the name of YEAR and INDUSTRY.

Baron and Kenny Method (1986)

To establish the mediation, there is the following condition that must hold: The first condition is, that the independent variable must influence the mediating variable significantly, the Second condition is, that the independent variable must influence the dependent variable significantly, the Third condition is, the mediator must affect the dependent variable. Perfect mediation or Full mediation holds when the effect of the independent variable on the dependent variable is less or no longer significant in the third condition.

Econometric Model

We test the hypothesized relationship outlined above using regression analysis by integrating the (Baron & Kenny, 1986) method to assess the mediating effect of Women on Board on Information Asymmetry for Analyst coverage and CSR as a mediator. I formulate the following econometric models:

asymit= α0+ α1wobit+ α2voltit+ α3turnoverit+ α4ageit+ α5levit+ ∑α6Year+ ∑α7Industry +€it …..

ancovit= β0+ β1wobit+ β2voltit+ β3turnoverit+ β4ageit+ β5levit+ ∑β6Year+∑β7Industry+ €it…..

asymit= r0+ r1wobit+ r2ancovit+ r3voltit+ r4turnoverit+ r5ageit+ r6levit+ ∑r7Year+ ∑r8Industr +€it

csrpit= β0+ β1wobit+ β2voltit+ β3turnoverit+ β4ageit+ β5levit+ ∑β6Year+ ∑β7Industry+ €it

asymit= r0+ r1wobit+ r2csrpit+ r3voltit+ r4turnoverit+ r5ageit+ r6levit+ ∑r7Year+ ∑r8Industry+€it

Where α1 in the equation reflects the impact of Women on board on Information asymmetry, β1 in the equation shows the influence of women on board on Analyst coverage and r1 in the equation represents the intensity of Analyst coverage as a mediator on Women on board and information asymmetry. α1 in the equation explains the relationship between Women on board and Information asymmetry, β1 shows the influence of women on board on corporate social responsibility and r1 in equation (5) represents the intensity of Corporate Social Responsibility as mediators on Women on board and Information Asymmetry. The relationship between them is the Total effect =Direct Effect (eq 1) + Mediator Effect that is $\alpha=\gamma+\beta\gamma$. Sample and time effect of panel data are controlled by Year and Industry dummies.

Key Variable Measurements

Dependent Variable:	**Abbreviations**	**Measurement**	**Source**
Information Asymmetry	**asym**	Ask Price- Bid Price/ [(Ask-Bid Price)/2]	Thomson Reuter
Independent Variable : Women on Board	**wob**	Percentage of women on board	Thomson Reuter
Mediating Variable : Corporate Social Responsibility	**csrp**	Average of Social, Economic & Governance Score	Thomson Reuter
Analyst Coverage	**anacov**	Number of Analysts who forecast EPS	Thomson Reuter
Control variables: Volatility	**volt**	Standard deviation of daily returns	Thomson Reuter
Turnover	**turnover**	Natural log Trading Volume	Thomson Reuter
Age	**age**	Total number of firm's operating years.	Thomson Reuter
Leverage	**lev**	Leverage is the ratio of total debt divided by total asset	Thomson Reuter

Result and Analysis Descriptive Statistics

Presents descriptive statistics of key variables. The aim of sample firms ranges from 0 to 0.020, with a mean of 0.001, indicating that the aspect of information asymmetry in Chinese firms is minimal. The percentage of Women on board represents the wob variable with the smallest value of 0 to the maximum value of 50 with a mean of 3.577. The mean value and standard deviation (7.567) represent a small number of firms hiring female board members. Similarly, the csrp of the sample ranges from 0 to 90.303 with a mean of 14.053, which indicates that most of the sample firms are not involved in CSR activities, ancov represents the Analyst coverage of firm, ancov ranges from 0 to 3.610 and the mean value is 2.064 which indicates that most of the sample firms are considered by analyst or higher number of analyst are forecasting the EPS for firms. The control variable volt ranges from -2.089 to 1.549 with a mean of -1.340 which means that daily stock returns of sample data are negative, similarly, turnover ranges from 0 to 7.661 with a mean value of 6.663 which indicates that most of the sample firms have Maximum firm equity. Age ranges from 0 to 3.258 and the mean value is 2.223 which suggests that most of the firms are old age, lev indicates the leverage of the firm which ranges from 0.722 to 1.008 and the mean value is 0.949.

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Asym	2126	0.001	0.001	0	0.020
Wob	2287	3.577	7.567	0	50
Csrp	2288	14.053	20.786	0	90.303
Ancov	1932	2.064	0.785	0	3.610
Volt	2080	-1.340	1	-2.089	1.549
Turnover	2124	6.663	0.991	0	7.661
Age	2067	2.223	0.733	0	3.258
Lev	1998	0.949	0.0362	0.722	1.008

Pairwise Correlation

Variables	asym	wob	csrp	csrsr	ancov	turnover	volt	age	lev
Asym	1								
Won	0.017*	1							
Csrp	0.137***	0.339***	1						
Csrsr	0.037**	0.365	0.541*	1					
Ancov	0.045**	0.240***	0.386*	0.290	1				
Turnover	**-0.024**	**0.013***	**0.007***	**0.016**	**0.05****	**1**			

Observing the correlation indicates, that it is confirmed that our model does not contain any issue regarding multicollinearity for all the variables. As Table 4.2 indicates that wob increases the asym (0.017) and csrp and anacov also increase the asym (0.137 and 0.045), also I note the csrp and anacov positively increase due to wob (0.339 and 0.240).

Table 4.3 presents a step-wise regression result based on Analyst Coverage as a mediator in the path of women on board and information asymmetry. Column of Table 4.3 shows the coefficient of wob (0.003) which indicates the positive relationship between wob and asym. This means that women on board women increase the information asymmetry for the sample firms.

Column of Table 4.3 explains the impact of wob on analyst coverage, the coefficient is 1.140 and the sign is a positive coefficient which means the firms having more women on board have more analyst coverage.

Column of Table 4.3 shows the mediation effect of analyst coverage in the path of women on board and information asymmetry. While taking the analyst coverage as a mediating variable the impact of women on board and information asymmetry shows full mediation and the coefficient value is (0.003) and the value of ancov and asym is 0.0001 the influence is positive and if analyst coverage increases information asymmetry also increases respectively.

Table 4.3: The Mediating Role of Analyst Coverage

	Asym	**ancov**	**asym**
Wob	0.003***	1.140***	0.003***
ancov			0.0001***
Volt	-0.0001	-0.0184	-0.001
Turnover	-3.000	0.0480**	-9.00
Age	-0.0002***	0.0291	-0.0002***
Lev	0.0008	2.911***	0.0004
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
_cons	0.009	-1.096*	0.001
Sobel Test			0.0001***

***, **, and * indicate 1%, 5%, and 10% significant, respectively

The Mediating Role oF CSR

Table 4.4 presents the results of stepwise regressions to test the intermediary role of CSR. The coefficient of column of table 4.4 indicates the direct relation of Women on board and Information asymmetry co-efficient is 0.002 which is positive which means the presence of women increases the information asymmetry.

Column of table 4.4 indicates the relationship between wob and CSR and the coefficient of csrp (80.760) indicates the positive relation and significance which explains that women on board increase the CSR in firms and as a result indicates more the women on board increase the aspect of corporate social responsibility.

Column of table 4.4 explains the Mediation role of CSR in the path of wob and asym and the results indicate the positive relation between wob and asym (0.001) and the coefficient value indicates that there is a reduction in asym due to the role of csrp, Similarly, the csr effect of asym is (0.00001) and the coefficient is positive and significant which means csrp increases the asym least. Sobel Goodman's Mediation test is 0.001 and its Z value is 6.942.

Table 4.4: The Mediating Role of CSR

	A sym	Csrp	**A sym**

Wob	0.002***	80.760***	0.001***
csrp			0.0001***
Volt	-0.001	-2.4302***	0.0001
Turnover	-8	-0.3767	-2.370
Age	-.001***	-1.4629**	-0.0017***
Lev	0.009	139.3176***	-0.001
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
_cons	0.0007	-106.17***	0.002**
Sobel Test			0.001**
Sobel Test	0.001**		

***, **, and * indicate 1%, 5%, and 10% significant, respectively

Alternative Measure of CSR

Table 4.5 presents the mediation role of CSR sustainability reports. In the first column of the table

4.5 shows the result of the Dependent and independent variables (Information asymmetry and Women on board) and the relationship is positive and significant.

In Column 2 of Table 4.5, the effect of the independent variable on Corporate Social Responsibility is positive and significant (1.122).

Column 3 of Table 4.5, the mediation effect of csrsr is positive and significant (.0003) which means women on board increase Corporate Social Responsibility but the total effect also increases the information asymmetry.

Table 4.5: Alternative measure of CSR

	Asym	csrsr	**asym**
Wob	0.002***	1.122***	0.002***
Csrsr			0.0003***
Volt	-0.000	-0.021**	-0.0003
Turnover	-8.000	-0.005	-6.000
Age	-0.0001***	-0.045***	-0.0001***
Lev	0.0009	1.990***	0.0002
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
_cons	0.0007	-1.458	0.013***
Sobel Test			0.0004***

Lagged Explanatory Variable Regression

Table 4.6 represents the results of using one lagged period value of the independent variable to mitigate the endogeneity problem.

Column 1 of Table 4.6 shows the results of the direct relationship between women on board and information asymmetry is positive and significant (0.005). This means women on board increase the information asymmetry.

Column 2 of Table 4.6 indicates the relationship between women on board and analyst coverage is significant (2.276) and the sign of coefficient indicates the positive relation between the variables.

Column 3 of Table 4.6 shows the mediating role of analyst coverage in the path of Women on board and information asymmetry, the direct relationship between wob and asym is also significant and positive (0.004) and the mediating role of analyst coverage holds true after using the lagged value. The value of the analyst coverage coefficient is (0.0001) significant at the 1% level. This indicates that a woman on board increases the analyst coverage and the analyst coverage increases the information asymmetry in the firms.

Column 4 of Table 4.6 explains the direct relation between women on board and information asymmetry and the coefficient indicates the significant results (0.004) at 1% level and the coefficient is positive which means women on board increase the information asymmetry.

Column 5 of Table 4.6 explains the impact of women on board on corporate social responsibility and the results indicate a positive and significant coefficient value of (139.192) which means women on board increase the CSR activities in the firm.

Column 6 of Table 4.6 shows the result of csr mediation on women on board and information asymmetry and the value is (0.0001).

Table 4.6: Lagged Explanatory Variable Regression

	Asym	**lancov**	**Asym**	**Asym**	**lCsrp**	**Asym**
lWob	0.005***	2.267***	0.004***	0.004***	139.192***	0.003***
lancov			0.0001***			
lcsrp						0.0001***
Volt	-0.00005	-0.004	-0.0005	-0.0004	-0.51	-0.0004
Turnover	-0.00001	0.041**	-0.0002	0.0001	-0.429	-8E-05
Age	-0.0002***	0.0230**	-0.002	-0.0002	-1.444	-0.0017***
Lev	0.0002	2.641***	0.0007	0.006	115.847***	-0.008
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.002	-0.898	0.002	0.001	-87.434	0.002**
N	1538	1538	1538	1707	1707	1707
Adj R^2	0.103	0.141	0.121	0.101	0.249	0.121
F	10.29	13.12	10.47	11.14	30.89	12.77

Dynamic Panel Regression

Table 4.7 presents the results by using dynamic panel regression to mitigate the indigeneity caused by missing variables.

Column 1 of Table 4.7 shows the results independent variable and dependent variable relationship, and the result indicates the significant and positive relationship between them (0.003). Column 2 of table 4.7 shows the results of women on board on analyst coverage and the coefficient is (1.140) significant and positive relationship between them.

Column 3 of Table 4.7 indicates the mediation of analyst coverage on the path of women on board and information asymmetry. And the results show the significant and positive mediation between them.

Column 4 of Table 4.7 indicates the relationship between women on board and information asymmetry and the results are positive and significant (0.003). This means the women on board increase the information asymmetry.

Column 5 of Table 4.7 shows the results of women on board on CSR and the coefficient value is (80.760) which is a significant and positive relation between variables.

Column 6 of Table 4.7 shows the results of women on board on CSR is positive and then the total effect of CSR on information asymmetry is positive (0.0001) and the coefficient value is positive, This means women on board increases the CSR and CSR increases the information asymmetry in Firm.

Table 4.7 : Dynamic Panel Regression

	lAsym	ancov	lAsym	lAsym	Csrp	lAsym
Wob	0.003***	1.140***	0.003***	0.003***	80.760***	0.001**
ancov			0.0001**			
csrp						0.0001***
Volt	-0.0001	-0.018	0.0001**	-0.0001***	-0.68	-0.0001
Turnover	-0.00002	0.048**	-0.00003	-0.0003	-0.376	-0.00008
Age	-0.0002	0.029	-0.0002**	-0.0001**	-1.462***	-0.001***
Lev	-0.0002***	2.911***	0.0007	-0.002	139.317***	-0.002
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
_cons	0.002	-1.096	0.002	0.002	-106.17	0.004
N	1602	1602	1602	1708	1708	1708
Adj R^2	0.092	0.087	0.095	0.092	0.2581	0.1251
F	8.5	9.11	8.38	9.1	32.25	12.06

Discussion

Women on Board and Information Asymmetry

The present study found a significant relationship between women on board and information asymmetry and the coefficient sign shows the positive relationship between the variables. The rationales behind the positive influence of women on information asymmetry are as follows; increase in conflict due to differences of opinions (Dawson et al., 2010) Some studies show lower effective management or monitoring of women on board (Carter, 2003; Lau & Murnighan, 1998), Women financial knowledge is lower as compared to men and it also influence on financial decision and financial information (Chen & Volpe, 1998).(Ezzamel & Watson, 1993) concluded that homogeneous groups perform well as compared to heterogeneous groups. (Kesner, 1988) investigated the characteristics of diverse gender board members and his study found that women are less likely to be in business as compared to men.

Women on Board on Analyst Coverage

The current study observes the significant relation between women on board and analyst coverage and the coefficient is positive which means that most analysts cover or forecast the earnings per share for those firms that have diversity in board members. The finding is aligned with the previous literature (Connelly et al., 2011; Lamkin et al., 2008; Miller et al., 2009) reasons behind this finding is that analysts expect women to bring a diverse mindset to the company board, and it gives positive of a responsible firm of society.

Analyst Coverage Mediate Women on Board and Information Asymmetry

By using the mediation effect proposed by (Baron et al., 1986), women on board significantly influence the analyst coverage due to the efficient and responsible attributes of the female characteristics. The mediating role of analyst coverage in the path of women on board and information asymmetry is significant and shows partial mediation and the coefficient sign is positive which means that analyst coverage increases the information asymmetry of the sample firms. (Connelly et al., 2011) shows that analysts create excessive pressure on managers, when they see a short-term failure they make unfavourable recommendations, so managers accept the expectation of external as a target to achieve. (Boulouta, 2013) find that institutional investors have more access to private information as compared to retail investors relying on analyst reports which causes information asymmetry when retail investors "crowd out" the stocks it affects the institutional investors who have small share portfolio investments.

Women on Board on Corporate Social Responsibility

The results reveal that Corporate Social Responsibility increases due to Women on board and show a significant positive relationship between them. The results are in accordance with prior literature (Bernardi et al., 2006) which includes the encouragement of a better work environment, signal to the external stakeholders that the firm pays attention to gender equality, Do more charitable events (Lam, 2013), represents the voice of same gender stakeholder (Bear, 2010).

Corporate Social Responsibility Mediate Women on Board and Information Asymmetry

Present study find out the significant relation of corporate social responsibility as a mediator in path of women on board and information asymmetry and according to (Baron et al., 1986) result shows the partial mediation in model and women on board increases positively significant with information asymmetry due to less knowledge of financial and business practices women get easily manipulated by the managers and secondly coefficient of CSR shows positive relation between women on board and information asymmetry which means that women on board increases the CSR and CSR increases the information asymmetry which does not support the major literature on CSR but there are some rationale behind the positive relation of CSR and Information asymmetry, (Lu et al.,2017)incorporates that for firm to appear well to public and investors, organizations use different techniques to manipulate the financial performance and managerial practices which is also known as earning management(Astari et al., 2020,Arya et al., 2009)support that earning management reduce the transparency and information is spread through different people and nobody has all the information or complete information which increases the information asymmetry. (Friedman, 1970) organization's main purpose is to make a profit or creation of wealth behind the concept of Corporation CSR seems irrelevant expenditure.

Endogeneity Mitigation

In the current study, we used the method of one lagged value of the independent variable and mediating variable to deal with the endogeneity problem of reverse causality. And result shows the mediating role of Analyst coverage and Corporate Social Responsibility still holds after using the lagged value. The Coefficient of women on board, analyst coverage and CSR are all significant at a 1% level. It proves that the mediating role of Analyst coverage and CSR increase the information asymmetry.

In the present study, we also used the panel regression test to deal with the endogenous problem caused by missing variables. We added one period-lagged value in the dependent variable (Information Asymmetry) to conduct the dynamic panel regression.

After adding the lagged value into the dependent variable, Analyst coverage still plays the mediating role in the path of women on board and information asymmetry and Corporate Social Responsibility also mediate the relation between women on board and information asymmetry. So the mediating role of Analyst coverage and CSR still holds true after taking the lagged value of a dependent variable.

Conclusion

The current study analyzes the impact of women on board on information asymmetry and mediating variables are Corporate Social Responsibility and Analyst coverage in China. The result revealed a significant positive relationship between women on board and information asymmetry. This shows the role of women on board increases the information asymmetry of firms due to the lower financial and business knowledge as compared to men. Results revealed a significant positive relation between women on board and analyst coverage. This shows the diverse board is improving the financial disclosure and monitoring of the firm. The present study also found a significant contribution of analyst coverage as a mediating variable in the relationship between women on board and information asymmetry, results posit that analyst gives more credit to those firms who have diversity in board and analyst coverage increases the information asymmetry due to the informational differences between institutional investor and retail investors and also in the pressure of analyst negative recommendations they accept the external target to achieve of short term earnings. The study finds a significant relationship between corporate social responsibilities, which indicates that the firm is socially responsible and gives preference to females and minorities. Similarly, the current study also finds that corporate social responsibility mediates the relationship between women on board and information asymmetry. Based on mediation results we can suggest that women on board increase the information asymmetry and CSR increases information asymmetry due to earning management, Managers do financial and informational manipulation to stay good in front of the public and investors. The findings of the present study are valuable to management, policymakers, regulators and business decision-makers, especially government in emerging economies, which can generate policies aimed at gender diversity in business. This current study is also useful for lenders and investors who need more accurate and truthful financial information, and based on this information, they can explore the benefits of gender diversity in companies. These findings are useful for policymakers and policymakers to develop appropriate quotas for women so that female representation increases and corporate governance is further improved. The present study also has several limitations in the case of emerging economies. In the future, it will be interesting to see the difference between male and female characteristics as board members. Moreover, moderation effects are not taken into account in this current study, also earning management has to be taken as a mediating variable to get a clear picture of its influence on information asymmetry. So efforts in this direction are required in the future.

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