

Will female board members increase the performance of the firm? The indirect relationship between board gender diversity and firm performance through CSR decoupling



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Master Thesis

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Abstract

This study states that board gender diversity will decrease the engagement of a firm in Corporate Social Responsibility (CSR) decoupling. Furthermore, this study states that this decreased engagement in CSR decoupling will increase the performance of the firm. In addition to these direct effects, this study investigates the indirect relationship of board gender diversity on firm performance through CSR decoupling. Three hypotheses were conducted using relevant literature, and stakeholder, legitimacy and signalling theory. This study investigated these relationships using a sample of European firms that were included in the ASSET4 database during the years 2015-2019. Using structural equation modelling, the results show a negative association between board gender diversity and CSR decoupling. The results also show a negative association between CSR decoupling and Tobin's Q, but no association between CSR decoupling and ROA. Finally, the results show a positive and significant indirect effect between board gender diversity and Tobin's Q through CSR decoupling. Additionally, the study investigated lag effects and a separate regression of brownwashing. This study contributes to the literature by showing that board gender diversity will decrease CSR decoupling in the firm, and this decreased CSR decoupling will increase the performance of the firm.

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1. Introduction

Firms must pay attention to the needs and expectations of many different people when they make decisions. According to stakeholder theory, the board of directors should manage the needs of different stakeholders when they operate the firm (Lyon & Montgomery, 2015). Shareholders want the firm to focus on maximizing shareholder wealth by increasing financial performance, but other stakeholders have different needs (Jackson, Bartosch, Avetisyan, Kinderman & Knudsen, 2020). One need of these stakeholders is the engagement of the firm in Corporate Social Responsibility (CSR). A firm that engages in CSR is not only concerned with the financial performance of the firm, but also with social and environmental issues (Vashchenko, 2017). A firm can implement internal CSR actions, like the implementation of CSR practices or workplace diversity (Habaragoda, 2018), and external CSR actions, like CSR reporting or cause related marketing (Sauerwald & Su, 2019). Stakeholders who consider CSR to be important will put pressure on the firm to engage in CSR (Sauerwald & Su, 2019). The legitimacy of the firm will increase when a firm responds to this pressure and implements CSR actions (Wolniak, 2016). Legitimacy theory states that firms need legitimacy to survive (Manning, Braam & Reimsbach, 2019). Legitimacy is achieved when the firm is perceived to operate within the norms and values of a socially constructed system (Manning et al., 2019). According to signaling theory, firms can use signals of their CSR actions to increase this legitimacy (Seele & Gatti, 2017). A firm can signal information about the internal CSR actions of the firm to stakeholders, thereby reducing information asymmetry between stakeholders and the firm. The decrease in information asymmetry is positively rewarded by stakeholders leading to an increase in legitimacy (Seele & Gatti, 2017). The information provided by the firm will give the most accurate and truthful representation of the actions of the firm when internal and external CSR actions are aligned. However, not all firms will align the internal and external CSR actions. When the actions are not aligned, the firm engages in CSR decoupling (Tashman, Marano & Kostova, 2019). Greenwashing is a form of CSR decoupling where a firm will exaggerate their internal CSR activities (Lyon & Montgomery, 2015). The firm implements external CSR actions to signal about their engagement in CSR without actually implementing internal CSR strategies (Malik, Chughtai & Khawaja, 2020). When the signal of the firm is interpreted by stakeholders as a sign of good CSR implementation, the legitimacy of the firm will increase without the associated costs of implementing internal CSR actions (Tashman et al., 2018). Brownwashing, in contrast, is a form of CSR decoupling where firms underestimate their CSR actions or not communicate them at all (Kim & Lyon, 2015). A firm might have stakeholders that perceive CSR investments as too costly and expensive (Kim & Lyon, 2015). Brownwashing increases legitimacy by signaling that a firm does not engage in costly CSR actions, even when the firm did implement these actions (Kim & Lyon, 2015).

The board of directors of a firm is the top decision-making body, so they can decide whether the firm engages in CSR decoupling or not (Whitler & Puto, 2020). The composition of the board has an influence on the implemented strategy of the firm (Whitler & Puto, 2020). One aspect of board composition is the number of female directors. Most women have different characteristics than men do, and these characteristics can benefit the firm. Women are, for example, more likely to be ethical sensitive (Hyun, Yang, Jung & Hong, 2016), they pay more attention to the needs of different stakeholders, and they are more aware of societal and environmental problems (Ramon-Llorens, Garcia-Meca & Pucheta-Martínez, 2021). The characteristics of women make them less likely to engage in unethical or fraudulent behavior and more likely to provide accurate and reliable information to stakeholders (Cumming, Leung & Rui, 2015). Therefore, women will be less likely to engage in CSR decoupling.

Board gender diversity will decrease the engagement of the firm in CSR decoupling. Even though firms might have incentives to increase their legitimacy by engagement in CSR decoupling, this decrease in CSR decoupling will be beneficial for the firm. Signaling and legitimacy theory stated that CSR decoupling would send a signal to stakeholders that would increase the legitimacy of the firm (Seele & Gatti, 2017). However, when the signal is distorted, stakeholders will detect CSR decoupling and the firm is punished by a decrease in legitimacy (Seele & Gatti, 2017; Tashman et al., 2019). Increased oversight, greater stakeholder pressure and objective data of CSR performance have increased the possibility of a distortion of the signal (Walker & Wan, 2012; Seele & Gatti, 2017). Furthermore, the firm does not receive all the benefits that follow CSR actions (Hawn & Ioannou, 2012) and the firm could get fines or penalties when the firm engages in CSR decoupling (Walker & Wan, 2012). A firm that does not engage in CSR decoupling will not have these risks. This suggests that a CSR decoupling and firm performance are negatively related.

As previously stated, women on the board of directors will decrease CSR decoupling in a firm. This decrease in CSR decoupling will improve firm performance. The combination of these two relationships suggests an indirect relationship between board gender diversity and firm performance through CSR decoupling. Several studies have already investigated the direct relationship between board gender diversity and firm performance, but the results are mixed. Several studies state that firm performance will improve if there are more women on boards of directors (Kiliç & Kuzey, 2016; Brahma, Nwafor & Boatend, 2020; Liu, Wei & Xie, 2014). However, other studies state that the relationship is neutral (Marinova, Plantega & Remery, 2016) or even negative (Salim, 2011). Board gender diversity might increase firm performance by diversifying perspectives (Al-Shaer & Zaman, 2016) and better monitoring (Gul, Hutchinson & Lai, 2013), but it also might decrease firm performance because there will be more conflicts (Salim, 2011). A possible explanation for these mixed results is the fact that boards cannot

influence firm performance directly, but only influence real actions of the firm (Galbreath, 2018). These actions have cost or revenue implications, and thereby influence firm performance (Galbreath, 2018). Therefore, the board of directors might not be able to directly influence firm performance, but only indirectly by influencing actions of the firm (Galbreath, 2018). This study suggests one potential action or mechanism through which board gender diversity is positively linked to financial performance. Board gender diversity influences CSR decoupling, and CSR decoupling influences firm performance. Therefore, CSR decoupling might be an action that is influenced by the board of directors, thereby influencing firm performance. This study expects a positive indirect effect between board gender diversity and firm performance, where board gender diversity will increase firm performance by decreasing CSR decoupling. This will lead to the following research question for this study:

To what extent does a relationship exist between board gender diversity and firm performance through CSR decoupling?

This study uses the ASSET4 Database from Eikon to answer the research question. The dataset consists of 1096 European firms for the years 2015-2019. The study will use structural equation modeling to test the three relationships. First, the effect of board gender diversity on CSR decoupling is analyzed. The results show negative and significant results, so there is support for a negative relationship between board gender diversity and CSR decoupling. Next, the effect of CSR decoupling on firm performance is analyzed. To measure firm performance, Return on Assets (ROA) and Tobin's Q are used. The relationship between CSR decoupling and Tobin's Q is negative and significant, but the relationship between CSR decoupling and ROA is insignificant. Finally, the indirect or mediation effect is analyzed. When ROA is used as the measure of firm performance, the results are insignificant and there is no support for mediation or an indirect effect. However, when Tobin's Q is used as the measure for firm performance, the results are significant, and the hypothesis is supported. There is support for an indirect and positive relationship between board gender diversity and firm performance through CSR decoupling. As expected, board gender diversity will decrease CSR decoupling, and this will increase firm performance. Two additional analyses include a lag effect of board gender diversity and a separate analysis of brownwashing. The analyses with the lag effect of board gender diversity shows a negative relationship between board gender diversity and CSR decoupling, a negative relationship between CSR decoupling and Tobin's Q, and a positive and indirect relationship between board gender diversity and Tobin's Q. There is no support for a relationship between board gender diversity, CSR decoupling and ROA. The second additional analyses show support for relationships between board gender diversity, brownwashing and Tobin's Q. There is still no support for a relationship between board gender diversity, brownwashing and ROA.

This study will contribute to the literature in several ways. First, the study will add to the literature by establishing a relationship between board gender diversity and CSR decoupling. The current literature has already found a lot of positive consequences of board gender diversity, and this research adds the decrease in CSR decoupling as another positive consequence. The study also contributes to the CSR decoupling literature by suggesting board gender diversity as a determinant of a decrease in CSR decoupling. Furthermore, the study establishes a relationship between CSR decoupling and firm performance using signaling and legitimacy theory. The study adds CSR decoupling as a potential determinant of firm performance. It could be beneficial for a firm to know the determinants of firm performance because the board of directors can use this information to improve firm performance. The study also adds a decrease in firm performance as a consequence of CSR decoupling. Firms can incorporate this information into their decision-making about CSR decoupling. Finally, the indirect effect between board gender diversity, CSR decoupling and firm performance is established. The current literature shows mixed results regarding the relationship between board gender diversity and firm performance. This study helps clarify these mixed results by showing an indirect relationship between board gender diversity and firm performance instead of a direct relationship. The study also offers managerial contributions. Managers can be more aware of consequences of board gender diversity and determinants of firm performance and use this awareness in the implementation of strategies and actions.

The research is scientifically relevant because it provides evidence for a relationship between board gender diversity, CSR decoupling, and firm performance. This increases the understanding of CSR decoupling, and the consequences and determinants of CSR decoupling. The research is also relevant because it provides an explanation for the contradictory results in the research about the relationship between board gender diversity and firm performance.

The next section will consist of the theoretical framework of the study and the hypotheses development. The third section will explain the methodology, the used variables, and the sample of the firm. The fourth section will cover the analysis of the data and the results of the study. The fifth section will end the research with a discussion and a conclusion. The paper will end with the limitations of the study and some ideas for future research.

2. Theoretical Framework and Hypotheses

2.1. Board gender diversity and CSR decoupling

The board of directors is the top decision-making body in a firm and has the responsibility to oversee and direct the firm (Whitler & Puto, 2020). The board makes a lot of choices in the firm, like hiring the CEO, governing the firm, and providing human and social capital (Whitler & Puto, 2020). Successes and failures depend on the board of directors (Setó-Pamies, 2015), because they make the important decisions in the firm about strategic choices (Whitler & Puto, 2020). The neo-classical view asserted that the board of directors has the responsibility to maximize shareholder wealth by increasing financial performance (Ruf, Muralidhar, Brown, Janney & Paul, 2001). However, the introduction of stakeholder theory states that firms have a wider responsibility if they want to do business (Ruf et al., 2001). The board of directors should manage the firm in the interests of all their constituents and shape the relationships with customers, suppliers, employees, and other stakeholders to create as much value as possible for these stakeholders (Laplume, Sonpar & Litz, 2008; Parmar, Freeman, Harrison, Wicks, de Cole & Purnell, 2010). A stakeholder is “any group or individual who can affect or is affected by the achievement of the firm’s objectives” (Freeman, 1984, p.49). Corporate Social Responsibility (CSR) is a way to create value for various stakeholders because CSR is concerned with the surrounding society of a firm and the fact that business operations should incorporate environmental and social approaches (Vashchenko, 2017). A firm should not only focus on their shareholders by paying attention to the financial performance of the firm, but also focus on the other stakeholders by looking at social and environmental issues that have an influence on the environment of the firm (Jackson et al., 2020).

A firm can have internal and external CSR practices or actions. Internal CSR actions are the real practices that firms implement to meet the needs of internal stakeholders, like employees and managers (Habaragoda, 2018). This includes, for example, actual CSR practices (García-Sánchez, Hussain, Khan & Martínez-Ferrero, 2020a), workplace diversity, employee training and the work environment (Habaragoda, 2018). External CSR actions, on the other hand, are the communications that a firm implements to make the actions of the firm seem legitimate for the public eye or external actors, like customers, suppliers, or the local community (García-Sánchez et al., 2020a; Habaragoda, 2018). This includes, for example, positive reporting, charitable donations and cause related marketing (Sauwerwald & Su, 2019; Habaragoda, 2018). Stakeholder theory suggests that firms must address the demands of stakeholders and take their expectations into account to remain legitimate and avoid negative consequences like lawsuits and protests (Wolniak, 2016; Lyon & Montgomery, 2015; Ruf et al., 2001). Legitimacy is “a generalized perception or assumption that the actions of an entity are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions”

(Suchman, 1995, p. 574). Legitimacy is achieved when the firm appears to be operating in conformance with the expectations of the community or society (Deegan, 2019). Legitimacy is important for a firm because it provides the right and access to needed resources (Deegan, 2019), and it leads to a stronger workforce, a better corporate reputation, higher consumer purchase intentions and stronger exchange relationships (Seele & Gatti, 2017). If there is less support from stakeholders, the legitimacy and financial performance of the firm will be reduced and the image might be destroyed (Sauerwald & Su, 2019; Schons & Steinmeier, 2015). Some stakeholders think that social and environmental performance of the firm are just as important as financial performance (Marquis, Toffel & Zhou, 2016). These stakeholders can be internal stakeholders who might be concerned about their workspace, or external stakeholders who might be more concerned about the environment and society (Habaragoda, 2018). To meet the needs of these stakeholders, firms might turn to internal CSR actions by improving CSR performance. In this way, stakeholders will support the firm and legitimacy will increase. Another important aspect of meeting demands of stakeholders is providing information to the stakeholders (Fernando & Lawrence, 2014). This information should also consist of non-financial information like CSR, because the stakeholders have the right to receive information about all aspects of the firm's operations (Fernando & Lawrence, 2014). CSR reports can be used to give information to stakeholders and show them the CSR awareness of the firm. This will reduce information asymmetry by showing stakeholders the CSR performance of the firm, thereby lowering the cost of capital, and maximizing the financial returns from the investment in CSR (Sauerwald & Su, 2019). Furthermore, firms can use these reports to address stakeholder expectations and manage the legitimacy of the firm (Sauerwald & Su, 2019). Therefore, it is important for firms to use external CSR actions and communicate CSR information to stakeholders.

In most countries, firms can voluntarily implement CSR activities and report on their CSR performance (Gatti, Vishwanath, Seele & Cottier, 2019; Nekhili, Nagati, Chtioui & Nekhili, 2017). Voluntary reporting has advantages because it will lead to a better implementation of CSR by management, and the voluntary nature will reduce social costs because management tailors the approach to the specific firm (Gatti, Seele & Rademacher, 2019). It can also lead to positive market effects for firms that voluntarily disclose their environmental performance, since these firms show that they are committed to environmental protection and sustainable development (Ramus & Montiel, 2005). Voluntary reporting also has disadvantages because it promotes free-riding behavior and it leads to questions about transparency and credibility of the reporting (Gatti et al., 2019). This voluntary and flexible nature of CSR reports can lead to reports that do not show the actual performance of a firm (Wolniak, 2016). It is hard to evaluate and compare the reports (Wolniak, 2016), since there is no third-party verification that the firm is implementing the policy that is published (Ramus & Montiel, 2005).

The voluntary nature of CSR activities can lead to CSR decoupling. CSR decoupling occurs when the internal and external CSR actions of a firm do not align (Tashman et al., 2019). There are two forms of CSR decoupling. On the one hand, firms can exaggerate the CSR activities in their disclosures or only disclose positive CSR actions to create a positive impression of the CSR performance of the firm (Tashman et al., 2019). Firms can adopt policies to falsely reflect legitimacy in practices and use processes to build good public relationships without implementing the CSR practices in their business activities (Malik et al., 2020). This can also be referred to as greenwashing (Hawn & Ioannou, 2015). Greenwashing is a concept that “encompasses a range of communications that mislead people into adopting overly positive beliefs about an organization’s environmental performance, practices, or products.” (Lyon & Montgomery, 2015; p. 225). On the other hand, a firm can engage in CSR activities without communicating and conveying them externally (Hawn & Ioannou, 2015). This can also be referred to as brownwashing (Kim & Lyon, 2015). Brownwashing occurs when firms issue communications that understate their CSR achievements (Kim & Lyon, 2015). Firms might for example understate their charitable contributions, governance changes or their expenditures on employee benefits (Kim & Lyon, 2015).

Firms can have several incentives to turn to greenwashing. First, greenwashing can be used to increase the legitimacy of the firm by signaling good CSR performance (Seele & Gatti, 2017). Legitimacy of a firm is necessary for the survival of the firm and can be achieved when a firm is perceived to operate within the norms and values of a socially constructed system (Manning et al., 2019). Firms with poor internal CSR actions can use external CSR actions to manage their legitimacy and reputation (Manning et al., 2019). Signaling theory is concerned with reducing information asymmetry between two parties (Seele & Gatti, 2017). A firm can provide information to stakeholders that is either true or misleading (Seele & Gatti, 2017). Firms can use misleading information as a signal of good CSR behavior, because of the information asymmetry between stakeholders and the firm, and the difficulty for stakeholders to distinguish between fair and false information (Seele & Gatti, 2017). By complying to accounting standards or voluntarily reporting on CSR performance, firms signal to have good CSR performance (Manning et al., 2019). The firm can manipulate communication and stakeholders might interpret this information as a signal of good CSR performance (Seele & Gatti, 2017). Firms might turn to greenwashing because CSR reporting is an external CSR activity that needs less effort and costs than changing internal CSR performance (Tashman et al., 2018). When firms change their CSR reporting without changing their CSR performance, they will have more flexibility but still appear to conform to the demands of stakeholders (Walker & Wan, 2012). The firm will appear to fulfill the requests of stakeholders without the costs associated with these requests (Schons & Steinmeier, 2015). Greenwashing can also be used when internal CSR performance of a firm falls short of the CSR performance they want

to achieve (Sauerwald & Su, 2019). Firms might disclose the positive information they have about their CSR performance to distract attention away from negative information (Hora & Subramanian, 2018).

Firms also have incentives to turn to brownwashing. Research found that stakeholders react negatively to CSR information if the current actions and the past reputation of the firm are not the same (Schuler & Cording, 2006). External actions will only increase firm performance if the firm has a positive reputation (Hawn & Ioannou, 2015). This can lead to brownwashing when a firm with a bad reputation faces pressure from internal stakeholders to engage in CSR actions. Firms will implement internal CSR actions without matching external CSR actions, because these external actions can lead to worse firm performance (Hawn & Ioannou, 2015). Another incentive for brownwashing is that engaging in CSR activities can be expensive and investors might punish green firms for these high costs (Kim & Lyon, 2015). When firms are under financial pressure or the economic times are difficult, shareholders might not appreciate it when a manager is pursuing CSR programs at the expense of programs that further shareholders' interests. The firm might turn to brownwashing to divert attention away from these high costs if they decide to implement CSR nevertheless (Kim & Lyon, 2015).

Research has found potential determinants of CSR decoupling. For example, Malik et al. (2020) have found that a better reputation will lead to higher CSR decoupling because these firms face higher pressure to address social issues. Kim & Lyon (2015) found that firm characteristics like size and profitability, and individual characteristics of the board like optimistic bias influence the CSR decoupling of a firm. This study will look at another potential determinant of CSR decoupling, namely board gender diversity. According to the literature, women on the board of directors have a lot of positive consequences for a firm. Burgess & Tharenou (2002) found that women will increase the diversity of opinions. Women look at things in a different way than men do, so they diversify perspectives and the approaches to problem solving (Al-Shaer & Zaman, 2016). Gul et al. (2013) state that women are better monitors, and board gender diversity is associated with a lower dispersion of analysts' earnings forecasts, less earnings management and lower information asymmetry. Finally, several researchers have found other advantages of board gender diversity, like an increased stock price informativeness (Gul, Srinidhi & Mg, 2011), a lower firm-risk (Lenard, Yum, York & Wu, 2014) and promoted dividend payouts (Ye, Deng, Liu, Szweczyk & Chen, 2019). Another positive consequence of board gender diversity might be a decrease in CSR decoupling. There are several reasons why board gender diversity will lead to less CSR decoupling.

First, research has shown that women are more ethical sensitive (Hyun et al., 2016; Cumming et al., 2015; Roxas & Stoneback, 2004; Gul et al., 2013; Ramon-Llorens et al., 2021). Women adhere more to an ethics code or a code of conduct than men do, so the chance of unethical behavior is reduced (Cumming et al., 2015; Ramirez, 2003). A study that gives participants different scenarios found that

women are less likely to engage in unethical behavior than men are (Loo, 2003). The scenarios include subjects like safety in retail and production, accepting bribes, and illegal smoke pollution (Loo, 2003). Behaving in CSR decoupling is not ethical, since the external CSR actions of the firm do not match the internal CSR actions of the firm (García-Sánchez, Hussain, Khan, & Martínez-Ferrero, 2020b). This will mislead the stakeholders by giving them false information. Another reason why women will be less likely to mislead stakeholders is because they are more aware of the interests and needs of stakeholders (Setó-Pamies, 2015; Cumming, Leung & Rui, 2015; Ramon-Llorens et al., 2021). Stakeholder theory states that firms must manage the relationships and interactions with different stakeholders to remain legitimate (Manning et al., 2019). Women will be more likely to manage these stakeholder relationships and stay away from CSR decoupling to provide accurate information to stakeholders. This stakeholder orientation also leads to better CSR reporting quality (Al-Shaer & Zaman, 2016). Research shows that certain stakeholders and female board members are more oriented towards social and environmental issues, instead of only looking at financial matters (Ramon-Llorens et al., 2021). Women are more aware of CSR reporting and performance, so board gender diversity will lead to better CSR in the firm (García-Sánchez, Suárez-Fernández & Martínez-Ferrero, 2019; Hur, Kim & Jang, 2016; Hyun et al., 2016). Women are more committed to CSR, so they will be less likely to engage in CSR decoupling (Parra-Domínguez, David & Azevedo, 2021). Women will be more likely to take action to improve CSR, instead of just claiming to take action or reporting misleading information. In addition, women in the board of directors make sure that CSR malpractice is limited, and CSR reporting is more relevant (Nekhili et al., 2017). In this way, the quality of CSR reporting is increased since women believe this is important (Nekhili et al., 2017).

Research has also found that women are more risk averse (Byrnes, Miller & Schafer, 1999; Gul, Hutchinson & Lai, 2013; Cumming et al., 2015; Setó-Pamies, 2015) and more averse to the violation of rules (Hyun et al., 2016; Roxas & Stoneback, 2004; Setó-Pamies, 2015). Women will be less likely to engage in tax aggressiveness, which shows that women are less likely to take the risk of breaking the rules (Richardson, Taylor & Lanis, 2016; Lanis, Richardson & Taylor, 2017). CSR decoupling is not automatically illegal, but it is often in conflict with the code of conduct of the firm. The board of directors does not give correct and fair information to the stakeholders, so they are not following the code of conduct. Additionally, Cumming et al. (2015) found in their research that female, risk-averse managers are also less willing to commit fraud because they are afraid that they will get caught. Some of the risks of being caught as a greenwashing or brownwashing firm are a loss of reputation, receiving negative publicity and being punished in their CSR rankings (Tashman et al., 2019). According to the literature, women are more concerned about the reputation of the firm and more averse to litigation than men (Al-Shaer & Saman, 2016), so they will be less likely to risk these damages.

Furthermore, the literature states that women are less overconfident than men (Dahlbom, Jakobsson, Jakobsson & Kotsadam, 2011; Beckmann & Menkhoff, 2008) and ask for more advice from experts (Liu, 2018). CEO overconfidence is an important determinant of CSR decoupling (Sauerwald & Su, 2019). Overconfident CEOs will engage in more socially irresponsible actions including CSR decoupling (Liu, 2018). They underestimate the negative consequences of CSR decoupling or try to be included in exclusive social circles by creating a more positive CSR image (Sauerwald & Su, 2019). This greater overconfidence in men also suggests that women are more likely to ask for help (Liu, 2018). Women have a greater propensity for advice seeking because they believe that their estimations are less precise, and they are more cautious (Liu, 2018). They ask advice from experts to help them make decisions. This also means that these experts will have a close look at the management and the performance of the firm. This leads to less CSR decoupling, since the firm will be less likely to take the risk of being caught by the expert (Liu, 2018).

Finally, women increase board monitoring quality, and they present more reliable and balanced information (Cumming et al., 2015; García-Sánchez et al., 2019). When there are more female board members, there is more diversity and there are more opinions in the board of directors which will lead to less trust. The decreased sense of trust will lead to conflict, which will increase board monitoring (Cumming et al., 2015). Female directors are also more independent thinkers which increases board monitoring and oversight (Richardson et al., 2016). This increased board monitoring will decrease the likelihood of committing securities or other corporate fraud (Cumming et al., 2015). In addition, García-Sánchez et al. (2019) found that women present more reliable and balanced information. CSR decoupling is unreliable information, so women are less likely to engage in CSR decoupling.

Past research has found a lot of results that give support for a negative relationship between women on the board of directors and CSR decoupling. Therefore, the first hypothesis is as follows:

Hypothesis 1: Board gender diversity is negatively related to CSR decoupling

2.2. CSR decoupling and firm performance

There are several incentives for firms to engage in CSR decoupling, but what are the consequences of this behavior? When a firm chooses to engage in CSR decoupling, this might influence firm performance. Firm performance is “the capability and ability of an organization to efficiently exploit the available resources to achieve accomplishments consistent with the set objectives of the firm, as well as considering their relevance to its users” (Taouab & Issor, 2019, p. 95). It includes wealth maximization for shareholders (Belghitar, Clark & Kassimatis, 2019), but also growth and effectiveness (Taouab & Issor, 2019). One of the main goals of firm performance is strategic management, which tries to create value over the long term, while still looking at the present to react to changes in the environment of the firm (Selvam, Gayathri, Vinavagamoorthi, Lingaraja & Marxiaoli, 2016). There is a lot of competition between firms, so if a firm wants to survive in the long run, the board of directors must keep innovating and paying attention to monitoring and improving the performance of the firm (Taouab & Issor, 2019). High performance has a lot of advantages for employees and the firm (Taouab & Issor, 2019). If a firm is performing well, the firm has high and long-term profits. This will lead to opportunities for employment and income for individuals. It will also lead to higher returns for the employees and higher quality products (Taouab & Issor, 2019).

Previous research has already found that improved internal CSR performance will increase firm performance (Oeyono, Samy & Bampton, 2011). Revenue will increase because of enhanced sales and costs will decrease because of efficiency gains due to government reduced duties to promote CSR activities or environment-friendly technologies (Mishra & Suar, 2010). Stakeholders believe that firms that balance the needs of multiple stakeholders are more inspirational, which leads to better firm financial performance (Orlitzky, Siegel & Waldman, 2011). The firm will gain legitimacy from stakeholders when the firm performs environmentally responsible (Walker & Wan, 2012). This increased legitimacy will lead to better access to resources, better job applicants, stronger exchange relationships, and ultimately improved financial performance (Walker & Wan, 2012).

But does this higher firm performance hold for firms that decouple their CSR? Firms can decouple CSR in two ways; greenwashing or brownwashing (Hawn & Ioannou, 2016). If the firm has more external than internal action, the firm engages in greenwashing. This might lead to lower firm valuation due to the risk of being exposed and being identified as a ‘greenwashing’ firm (Hawn & Ioannou, 2016). Legitimacy and signaling theory state that a firm can use signals of good CSR performance to increase legitimacy (Seele & Gatti, 2017). However, legitimacy theory mentions the impact of external factors, like the characteristics of the environment, on communication (Seele & Gatti, 2017). When there are increases in stakeholder pressure and monitoring of CSR performance, there will be a distortion of the

signal. This distortion might lead to increased discovering of CSR decoupling, a decrease in legitimacy and reputation damages for the firm (Seele & Gatti, 2017). The stakeholders will punish the firm when they discover greenwashing and firm performance will decrease (Walker & Wan, 2012). Greenwashing may reduce the ability for a firm to obtain resources, social support, or legitimacy when external stakeholders detect greenwashing (Kim & Lyon, 2015). There are multiple ways for stakeholders to detect CSR decoupling. It is becoming easier for stakeholders to get information about the CSR performance of a firm, because there is a lot of publicly available objective data about CSR performance. This makes it easier for stakeholders to confirm the received information (Walker & Wan, 2012). Greenwashing can also be detected when a firm highlights what they will or plan to do on their website, instead of stating what they have done (Walker & Wan, 2012). Firms have limited space on their website to give their stakeholders information about CSR. A firm that has engaged in CSR actions will use this space for information about these actions, instead of telling what they are planning to do in the future (Walker & Wan, 2012). When stakeholders identify CSR decoupling, the firms might be viewed as untrustworthy, manipulative, and opportunistic (Walker & Wan, 2012). The stakeholders question the motives of the firm, when the CSR reporting is present, but the corresponding actions are absent (Ginder, Kwon & Byun, 2021). This might lead to lower firm performance since the legitimacy of the firm will decrease (Wei, Song & Xie, 2019).

On the other hand, if the firm engages in brownwashing, they do not communicate their performance in an effective way. This will lead to a lower valuation of the firm because investors do not know the value that is created through CSR (Hawn & Ioannou, 2016). Brownwashing can also have negative consequences because it makes the firm look less CSR friendly than it really is and this may lead to criticism from the media or society (Kim & Lyon, 2015). According to signaling theory, the firm wants to show their stakeholders their good CSR performance by communicating CSR (Seele & Gatti, 2017). However, to hide the high costs of engaging in CSR activities, the firm might do the opposite and signal inferior CSR performance or no CSR performance at all (Kim & Lyon, 2015). According to the combination of legitimacy and signaling theory, a distortion in the signal will lead to a decrease in legitimacy and a decrease in firm performance (Seele & Gatti, 2017). When stakeholder discover brownwashing, they might punish the firm for the high costs of CSR actions and for the false information that they received.

Previous research found additional ways in which firm performance will decrease if the board of directors engages in CSR decoupling. Firms will fail to collect the benefits from greater environmental responsibility when they engage in CSR decoupling (Walker & Wan, 2012). Firms that engage in CSR actions will have lower waste reduction and more efficiency improvements. These firms will also be less

likely to get fines, penalties, liabilities, or clean-up costs (Walker & Wan, 2012). This means that firms that engage in CSR decoupling do not get these benefits, but still carry the disadvantages when they get caught. CSR decoupling can lead to penalties or increased regulatory oversight, and negative legitimacy implications (Tashman et al., 2019). CSR decoupling can destroy value of the firm and depreciate stakeholder confidence. If a firm does not align its external and internal CSR actions, the analysts' forecast errors and the cost of capital will be higher, and there will be more financial constraints (García-Sánchez et al., 2020a). If the public feels that the firm is engaging in self-promotion instead of improving CSR, the reputation and corporate legitimacy of the firm decrease (Gatti et al., 2019). Additionally, customers will have weaker purchase intentions for firms that engage in CSR decoupling (Ginder et al., 2021). When the customers feel that the firm is only claiming to act socially responsible, they will form different product judgement and have different purchase behavior (Lyon & Montgomery, 2015). When a firm engages in greenwashing, the consumers will have lower confidence in the firm (Lyon & Montgomery, 2013; Delmas & Burbano, 2011) and the firm will be punished by activists (Lyon & Maxwell, 2011).

Therefore, the second hypothesis is as follows:

Hypothesis 2: CSR decoupling is negatively related to firm performance.

2.3. The effect of CSR decoupling on the relationship between board gender diversity and firm performance

This study established a relationship between board gender diversity and CSR decoupling, and CSR decoupling and firm performance. Combining these two relationships can lead to a potential third relationship, namely between board gender diversity and firm performance. There might be a relationship between board gender diversity and firm performance, but the current literature is mixed about this relationship. Some studies find a positive relationship between board gender diversity and firm performance (Kiliç & Kuzey, 2016; Brahma et al., 2020; Liu et al., 2014). They find, for example, that board gender diversity increases the quality of decision making (Kiliç & Kuzey, 2016), leads to better monitoring (Liu et al., 2014) and brings unique and extensive human capital to the board (Brahma et al., 2020). However, there are also researches that find a neutral (Marinova et al., 2016) or even negative (Salim, 2011) relationship. Board gender diversity can lead to interpersonal conflict (Salim, 2011) and worse communication between the board of directors and managers because of lower cohesiveness (Bennoui, Chtioui, Nagati & Nekhili, 2018).

A possible explanation for the mixed results is the fact that board gender diversity does not influence firm performance directly, but only indirectly (Galbreath, 2018). The board of directors influence soft improvements and actions in the firm. These actions influence firm performance because they have cost and revenue implications (Galbreath, 2018). In this way, women do not influence firm performance directly, but only indirectly through their influence on actions in the firm (Galbreath, 2018). The first two hypotheses support this logic. Board gender diversity will decrease the CSR decoupling of the firm. This decrease in CSR decoupling will lead to better firm performance. Board gender diversity will thus increase firm performance by decreasing CSR decoupling. Board gender diversity influences the action to engage in CSR decoupling or not, and this influences firm performance. There will be a positive relationship between board gender diversity and firm performance. Women in the board of directors will decrease the engagement of the firm in CSR decoupling, and the firm performance will decrease. This means that board gender diversity will have a positive effect of firm performance by decreasing CSR decoupling.

Therefore, the third hypothesis is as follows:

Hypothesis 3: The relationship between board gender diversity and firm performance is positive and indirect through CSR decoupling.

3. Research Method

3.1. Sample and data collection

To test the hypotheses, a panel data set was compiled covering a 5-year period (2015-2019) for European firms that are included in the ASSET4 database. The ASSET4Europe database is part of Refinitiv Eikon. ASSET4 data is transparent, comparable, and accurate, and it includes environmental, social and governance (ESG) data (Refinitiv, 2021). It is a database with 450 different ESG metrics and contains data from 2002-2021. The database consists of scores for a lot of different ESG aspects. Included are scores for resource use, emissions, innovation, workforce, human rights, community, product responsibility, management, shareholders, and CSR strategy (Refinitiv, 2021). It covers approximately 1000 firms, mainly from the United States and Europe (Refinitiv, 2021). The firms that are included in the sample of this study are European firms for which ESG data in the ASSET4 database is available. Table 1 shows the European countries that are included in the dataset. It also shows the number of firms that are included in the dataset for every country. There are 29 countries in the sample and the most firms are located in Great Britain, followed by Germany and France. Table 2 shows the sectors included in the study and the frequency of firms in a certain sector. There are 10 different sectors defined. Most firms operate in the Financials sector, the Industrials sector, and Consumer Cyclical sector. The Utilities and Real Estate sectors include the least firms. The original database consists of observations of 1159 firms and 5 years and would lead to 5.795 observations. In total, 63 firms are removed from the dataset due to an error or missing ESG data. This leads to a final dataset of 5.480 observations for 1096 firms and 5 years.

<i>Country</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative</i>
<i>Austria</i>	16	1.46	1.46
<i>Belgium</i>	30	2.74	4.20
<i>Bermuda</i>	10	0.91	5.11
<i>British Virgin Island</i>	1	0.09	5.20
<i>Czechia</i>	4	0.36	5.57
<i>Denmark</i>	27	2.46	8.03
<i>Finland</i>	25	2.28	10.31
<i>France</i>	102	9.31	19.62
<i>Germany</i>	109	9.95	29.56
<i>Gibraltar</i>	1	0.09	29.65
<i>Great Britain</i>	335	30.57	60.22
<i>Greece</i>	18	1.64	61.86
<i>Guernsey</i>	9	0.82	62.68
<i>Hungary</i>	4	0.36	63.05
<i>Ireland</i>	13	1.19	64.23
<i>Isle of Man</i>	2	0.18	64.42
<i>Israel</i>	1	0.09	64.51
<i>Italy</i>	54	4.93	69.43
<i>Jersey</i>	14	1.28	70.71
<i>Luxembourg</i>	7	0.64	71.35
<i>Norway</i>	22	2.01	73.36
<i>Poland</i>	32	2.92	76.28
<i>Portugal</i>	9	0.82	77.10
<i>Spain</i>	49	4.47	81.57
<i>Sweden</i>	65	5.93	87.50
<i>Switzerland</i>	62	5.66	93.16
<i>Turkey</i>	30	2.74	95.89
<i>United States</i>	1	0.09	95.99
<i>The Netherlands</i>	44	4.01	100.00
<i>Total</i>	1,096	100.00	

Table 1: Tabulated overview per country

<i>Sector name</i>	<i>Frequency</i>	<i>Percentage</i>	<i>Cumulative</i>
<i>Basic Materials</i>	102	9.31	9.31
<i>Consumer Cyclicals</i>	175	15.97	25.27
<i>Consumer Non-Cyclicals</i>	74	6.75	32.03
<i>Energy</i>	69	6.30	38.32
<i>Financials</i>	212	19.34	57.66
<i>Healthcare</i>	67	6.11	63.78
<i>Industrials</i>	196	17.88	81.66
<i>Real Estate</i>	61	5.57	87.23
<i>Technology</i>	101	9.22	96.44
<i>Utilities</i>	39	3.56	100.00
<i>Total</i>	1,096	100.00	

Table 2: Tabulated overview per sector

3.2. Variables

3.2.1. Dependent variables

The dependent variable of this study is firm performance. To calculate firm performance, two different measures were used. First, a book value performance or accounting measure was used. Return on Assets (ROA) measures the ratio of operating income to total assets (Bennouri et al., 2018). This variable thus shows if the firm is using their assets to generate profit for the firm. This variable was retrieved from Eikon. Several other studies also use this measure to calculate firm performance (Delen, Kuzey & Uyar, 2013; Mohamed, Basuony & Badawi, 2013; Bennouri et al., 2018).

The other measure for firm performance that was used is Tobin's Q. Tobin's Q is the ratio between the market value and the replacement value or book value of a physical asset (Bennouri et al., 2018). Tobin's Q is a mix between a market-based or market value performance measure and an accounting measure, but it is mostly referred to as a market-based measure (Singh, Tabassum, Darwish & Batsakis, 2018). It proxies the expectations of the market about the future earnings of the firm and is less affected by manipulation of earnings or accounting conventions than ROA. The variable will change when the market value of the firm will change, so Tobin's Q cannot be retrieved directly from Eikon. Therefore, this variable was calculated using different variables that can be retrieved from Eikon. The following formula as used to calculate Tobin's Q:

$$Tobin's\ Q = \frac{Equity\ Market\ Value + Liabilities\ Book\ Value}{Equity\ Book\ Value + Liabilities\ Book\ Value}$$

This variable is also used in previous research to measure firm performance (Mohamed et al., 2013; Hawn & Ioannou, 2016; Bennouri et al., 2018).

3.2.2. Independent variables

The independent variable of this research is board gender diversity. The following variable was used to calculate if a board of directors is gender diverse: the number of women on a board of directors divided by the total directors in that board. This leads to the percentage of women on the board of directors and this variable was retrieved from Eikon. This variable is used by previous research that studies board gender diversity (Setó-Pamies, 2015; Williams, 2003; Gul et al., 2011).

Another variable of this study is CSR Decoupling. This variable creates an indirect effect between board gender diversity and firm performance. To calculate CSR decoupling, the method of Hawn & Ioannou (2016) was used. They use ASSET4 data to calculate CSR decoupling. This database includes quantitative measures of CSR behavior of the firm that can be classified as internal actions or external actions. Internal actions are actions that are aimed at achieving structural change, like the adoption of

accepted and appropriate strategies (Hawn & Ioannou, 2016). In this study, internal actions are for example the adoption of certain policies and the percentage of non-executive board members on the audit committee of the firm (see Appendix 8.4). External actions are aimed at gaining organizational approval by external constituents. In this study, external actions are for example reporting on certain subjects or providing daycare services or flexible working hours for its employees (see Appendix 8.4). In their research, Hawn & Ioannou (2016) have classified datapoints as either internal or external action. They implemented a working decision rule to classify as external the actions that are more oriented towards disclosure, and as internal the actions that are more oriented towards policies (Hawn & Ioannou, 2016). This working decision rule was used to identify the data points, and the definitions were tested for validity. The final composition included 21 internal datapoints and 24 external datapoints (Hawn & Ioannou, 2016). Most of these datapoints are also used in this study (see Appendix 8.4). The ASSET4 database has changed since the study of Hawn & Ioannou (2016), so not all the datapoints are available for this study due to missing data or removal of the datapoint (see Appendix 8.4). There are also datapoints that are not identified as internal or external action in Hawn & Ioannou (2016) but are used in this study because they reflect an internal or external action. These variables have replaced the removed datapoints to make sure there is enough data available (see Appendix 8.4). This leads to 22 datapoints for both internal and external actions. The first two datapoints are measured as a percentage and the other datapoints are binary variables. To transform the percentages into binary variables, the mean of the variable in a certain year is calculated. The variable gets a 1 if the value is higher than the mean, and a 0 if the value is lower than the mean. To calculate CSR decoupling, the difference between the score of the internal actions and the score of the external actions was calculated. The main research will focus on the absolute difference between internal actions and external actions, to capture both greenwashing and brownwashing. Additional analysis will differentiate between greenwashing and brownwashing. A higher value of CSR decoupling indicates less alignment between internal and external CSR actions.

3.2.3. Control variables

Several control variables were added to this research. The first control variable is firm age. Firm age was used to control for both firm performance and CSR decoupling. This variable has been found to influence firm performance and is used in several studies that look into firm performance (Mohamed et al., 2013; Belghitar et al., 2018). Older firms have higher productivity, higher equity ratios and lower debt ratios, but they also have lower growth levels (Coad et al., 2013). This variable is also used in the literature to control for CSR decoupling (Hauser & Schembera, 2019). This variable was calculated as the number of years since the firm was founded.

Firm size is another control variable that is often used in research (Mohamed et al., 2013; Bennouri et al., 2018; Schons & Steinmeier, 2015). Firm size has an influence on both firm performance and CSR decoupling. Bigger firms have more resources that can lead to efficiency gains and higher market power (Lee, 2009). This would imply that a bigger firm will have better firm performance. This variable is also used in the literature to control for CSR decoupling (Graafland & Smid, 2019). Smaller firms have less knowledge about the implementation of CSR programs, which will lead to more CSR decoupling. Smaller firms also have less resources to implement CSR behavior. They will be more likely to show patterns where they only communicate good CSR behavior, instead of also implementing this behavior. This will potentially lead to higher CSR decoupling for smaller firms (Wickert, Scherer & Spence, 2016; García-Sánchez et al., 2020a).

Furthermore, the leverage of the firm and the sales growth were added as control variables for firm performance (Belghitar et al., 2019; Bennouri et al., 2018; Schons & Steinmeier, 2015). Leverage captures the riskiness and growth potential of the firm (Bennouri et al., 2018). In this study, financial leverage was retrieved from Eikon and measured as the total debt in the firm divided by the total amount of common equity. Sales growth measures the actual increase in sales over the past year and captures the operational performance of the firm (Bennouri et al., 2018).

For CSR decoupling, two more control variables were added. The first one is the duality of the CEO (Sauerwald & Su, 2019). This variable shows whether the CEO is also the chairman of the board of directors. If this is the case, the CEO will have more influence and power in the organization, which will influence the quality of the CSR reporting (Sauerwald & Su, 2019). Duality has value 1 if the CEO is also the chairman of the board of directors and 0 otherwise. Board independence was also added as a control variable for CSR decoupling (Sauerwald & Su, 2019). When there are more outside directors, the CEO will be more rigorously controlled and monitored, and CSR decoupling will be reduced. Board independence was measured as the number of outside directors in the board of directors.

Finally, dummies were added to control for specific effects. Year dummies were included to control for omitted variables that are constant among the firms but vary over time. Sector dummies were included to control for sector-specific effects. Country dummies were included to control for the differences between countries.

<i>Variable</i>	<i>Definition</i>	<i>Data source</i>
<i>Return on Assets</i>	Return on Assets (ROA) is the accounting measure of firm performance. Return on Assets measures how much money a firm earns by using its assets. It is measured as the ratio of operating income to total income.	Eikon
<i>Tobin's Q</i>	Tobin's Q (TobinQ) is the market-based measure of firm performance. It is the ratio between the market value of a firm and the replacement value of a firm and represents the expectations of the market of a firm.	Eikon
<i>Board gender diversity</i>	Board gender diversity (GD) measures the percentage of women on the board of directors. A higher percentage of women leads to a more diverse board.	Eikon
<i>CSR Decoupling</i>	Corporate Social Responsibility Decoupling (DecAb) is the gap between internal and external CSR actions. The paper follows the method of Hawn & Ioannou (2016) by measuring the difference between datapoints that are defined as internal action and external action.	Eikon
<i>Brownwashing</i>	Brownwashing occurs when a firm has more internal CSR actions than external CSR actions. It is measured as the difference between internal actions and external actions.	Eikon
<i>Greenwashing</i>	Greenwashing occurs when a firm has more external CSR actions than internal CSR actions. It is measured as the difference between external actions and internal actions.	Eikon
<i>Size (assets)</i>	The size of the firm is measured by the year-end total assets of the firm.	Eikon
<i>Age</i>	Age is the difference between the year the firm is founded and the current year. Current year is 2015, 2016, 2017, 2018 or 2019, depending on the year corresponding the data.	Eikon
<i>Leverage</i>	Leverage is the debt of the firm divided by the common equity. It represents the amount of debt a firm has to manage business.	Eikon
<i>Sales Growth</i>	Sales Growth (SalGro) is the increase in Sales compared to the previous year.	Eikon
<i>Duality of the CEO</i>	Duality of the CEO (Dual) has value 1 if the CEO of the firm is also the chairman of the board, and value 0 if the CEO of the firm is not also the chairman of the board.	Eikon
<i>Independence of the board</i>	Independence (Indepen) shows the number of outside directors in the board of directors. The board of directors is more independent when there are more outside directors.	Eikon
<i>Sector</i>	Sector is a vector of dummy variables based on the Economic Sector in which the firm operates.	Eikon
<i>Country</i>	Country is a vector of dummy variables based on the country in which the firm operates	Eikon
<i>Year</i>	A vector of year dummies.	

Table 3: Variable Definitions

3.3. Econometric model and methodology

To test the hypotheses, the following structural equation model was used, where board gender diversity is the mechanism that explains variation in CSR decoupling and firm performance, while controlling for variations in CSR decoupling and firm performance related to the other factors specified in the model:

$$\begin{aligned}
 ROA_{it}, TobinQ_{it} &= \beta_0 + \beta_1 CSR\ Decoupling_{it} + \beta_2 GD_{it} + \beta_3 Age_{it} + \beta_4 Size_{it} + \beta_5 Leverage_{it} \\
 &+ \beta_6 Sales\ Growth_{it} + \beta_7 Sector_{control,it} + \beta_8 Country_{control,it} + \beta_9 Year_{control,it} \\
 &+ \varepsilon_{it}
 \end{aligned}$$

and where board gender diversity affects firm performance through CSR decoupling:

$$\begin{aligned}
 CSR\ Decoupling_{it} &= \beta_0 + \beta_1 GD_{it} + \beta_2 Age_{it} + \beta_3 Size_{it} + \beta_4 Duality_{it} + \beta_5 Independence_{it} \\
 &+ \beta_7 Sector_{control,it} + \beta_8 Country_{control,it} + \beta_9 Year_{control,it} + \varepsilon_{it}
 \end{aligned}$$

After the main analysis, two additional analyses are conducted. First, an analysis with the lag version of board gender diversity. Second, an analysis with a differentiation between brownwashing and greenwashing.

CSR decoupling can be seen as a mediator between board gender diversity and firm performance. A mediator is a third variable that represents the mechanism through which the independent variable influences the dependent variable (Baron & Kenny, 1986). The independent variable influences the mediator, and this mediator influences the dependent variable (MacKinnon, Fairchild & Fritz, 2007). In this research, the independent variable will be board gender diversity, the mediator is CSR decoupling, and the outcome variable is firm performance. This will lead to the following figure for this research:

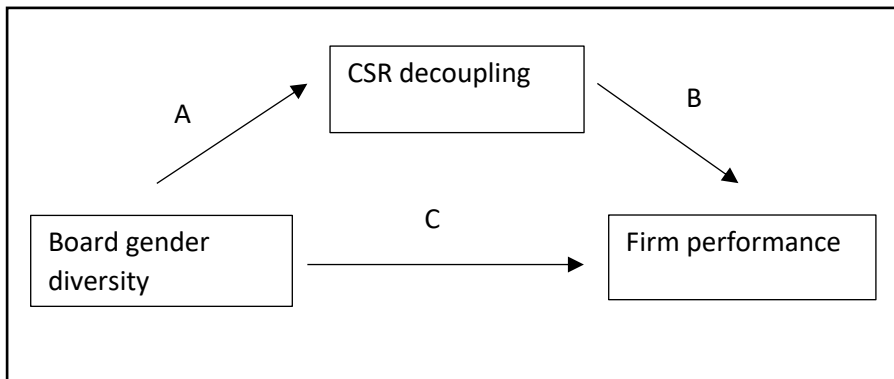


Figure 1: Mediation model

The figure shows three different path coefficients. A is the path coefficient of the effect of board gender diversity on CSR decoupling, B is the coefficient of the effect of CSR decoupling on firm performance, and C is the coefficient of the direct effect of board gender diversity on firm performance. To test for mediation, structural equation modelling (SEM) was used (Manning et al., 2019). A structural equation model tests and estimates causal relationships in a powerful way (Chen & Chang, 2013). The SEM software estimates the path coefficients A, B, and C with two regressions (Woody, 2011). First, the software uses the mediating variable (CSR decoupling) as a criterion variable, and next Y (Firm performance) is used as the criterion variable. The estimate for A is predicted by a regression of board gender diversity on CSR decoupling, and the estimates of B and C are simultaneously predicted in a second regression (Woody, 2011). The results of the SEM regression were used to answer all three hypotheses.

4. Results

4.1. Summary statistics

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>ROA</i>	5,379	5.56	14.46	-417.73	267.24
<i>TobinQ</i>	5,378	1.80	2.52	0.41	91.20
<i>GD</i>	5,117	26.16	13.11	0	71.43
<i>DecAb</i>	5,119	5.01	2.58	0	14
<i>Age</i>	5,480	68.93	59.37	-2	547
<i>Assets (size)</i>	5,441	4.16e+07	1.67e+08	1530	2.42e+09
<i>Leverage</i>	5,441	94.44	684.74	-25130.88	22500
<i>SalGro</i>	5,331	13.51	84.30	-100	2470.36
<i>Dual</i>	5,122	0.19	0.39	0	1
<i>Indepen</i>	5,117	57.73	24.49	0	100

Note. ROA: Return on Assets; TobinQ: Tobin's Q; GD; Board Gender Diversity; DecAb; CSR Decoupling; SalGro; Sales Growth; Dual: Duality; Indepen: Independence. See Table 3 for the definitions of the variables

Table 4: Summary statistics

Table 4 shows the summary statistics of the dataset. The original dataset consists of 5,480 observations, but the variables have missing values leading to a lower number of observations. This indicates an unbalanced data set where each firm has a different number of observations (Park, 2011). However, every firm has observations for at least one firm-year. Therefore, the firm-years with missing values are not included in the analysis. The firm-years for which there is available data are included in the analysis. Table 4 shows a mean of board gender diversity of 26, which means that on average only 26% of the members of the board is female.

The standard deviation of some of the variables is quite high, which suggests that the data is not clustered around the mean. This could be a problem, so the normal distribution of all the variables will be examined. For every variable, a quadratic term and a natural logarithm are generated (see Appendix 8.1). The normal distribution of duality, sector and country are not examined since these variables are dummies. The quadratic term, the natural logarithm, and the original term of all the other variables are

compared in terms of the normal distribution. The quadratic term does not improve the normal distribution of any of the variables, so these terms are dropped. The normal distribution of Assets, Age and Leverage are improved with the natural logarithm term. The standard deviation and the dispersion of the data will be decreased which will lead to a more reliable dataset. The normal distribution of ROA and Sales Growth will also improve. However, the natural logarithm of a negative value cannot be determined. Since these variables have a lot of negative values, taking the natural logarithm will delete a lot of valuable observations and the results will not be reliable anymore. Only firms with a positive value for these observations will be included in the dataset, which will not be reliable. Therefore, the variables Assets, Age and Leverage will be used in the natural logarithm form and the other variables will be used in their original form.

This will lead to the following summary statistics:

<i>Variable</i>	<i>Obs</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>Min</i>	<i>Max</i>
<i>ROA</i>	5,379	5.56	14.46	-417.73	267.24
<i>TobinQ</i>	5,378	1.80	2.52	0.41	91.20
<i>GD</i>	5,117	26.16	13.11	0	71.43
<i>DecAb</i>	5,119	5.01	2.58	0	14
<i>lnAge</i>	5,451	3.85	0.96	0	6.30
<i>lnAssets (size)</i>	5,441	15.48	1.83	7.33	21.61
<i>lnLeverage</i>	5,067	3.98	1.54	-4.61	10.02
<i>SalGro</i>	5,331	13.51	84.30	-100	2470.36
<i>Dual</i>	5,122	0.19	0.39	0	1
<i>Indepen</i>	5,117	57.73	24.49	0	100

Note. ROA: Return on Assets; TobinQ: Tobin's Q; GD; Board Gender Diversity; DecAb; CSR Decoupling; SalGro; Sales Growth; Dual: Duality; Indepen: Independence. See Table 3 for the definitions of the variables

Table 5: Summary statistics after checking normal distribution

The dataset is also tested for other assumptions (see Appendix 8.5-8.6). First, the data is tested for homoscedasticity (see Appendix 8.5). The test statistic is significant, which means we must reject the hypothesis of constant variance. This provides evidence for a heteroscedastic model. To control for this heteroscedasticity, robust standard errors will be included. Next, the correlation between variables is examined (see table 6). Most correlations are weak and not problematic. ROA and Tobin's Q both measure firm performance, so they have a high correlation of 0.5271. This is not problematic in this study since they are not used in the same regression. Finally, the dataset is tested for multicollinearity (see appendix 8.6). Appendix 8.6 reports the Variance Inflation Factor (VIF) of all the variables. Multicollinearity only becomes a problem when the VIF is higher than 3 (Thompson, Kim, Aloe & Becker, 2017). The highest VIF is 1.52, so multicollinearity is not a problem in this dataset. Because the dataset consists of panel data, it cannot be tested for autocorrelation.

	<i>ROA</i>	<i>TobinQ</i>	<i>GD</i>	<i>DecAb</i>	<i>InAge</i>	<i>InAssets</i>	<i>InLeverage</i>	<i>SalGro</i>	<i>Dual</i>	<i>Indepen</i>
<i>ROA</i>	1.000									
<i>TobinQ</i>	0.518	1.000								
<i>GD</i>	0.038	0.020	1.000							
<i>DecAb</i>	0.019	0.022	-0.130	1.000						
<i>InAge</i>	0.017	-0.031	0.124	-0.017	1.000					
<i>InAssets</i>	-0.120	-0.250	0.222	-0.303	0.189	1.000				
<i>InLeverage</i>	-0.123	-0.187	0.074	-0.032	0.044	0.380	1.000			
<i>SalGro</i>	-0.066	-0.003	-0.026	0.003	-0.049	-0.042	-0.091	1.000		
<i>Dual</i>	-0.008	0.010	0.073	-0.101	0.065	0.086	0.052	-0.031	1.000	
<i>Indepen</i>	0.039	0.017	0.177	0.125	0.001	0.108	0.004	0.019	-0.121	1.000

Note. ROA: Return on Assets; TobinQ: Tobin's Q; GD; Board Gender Diversity; DecAb; CSR Decoupling; SalGro; Sales Growth; Dual: Duality; Indepen: Independence. See Table 3 for the definitions of the variables

Table 6: Correlation Matrix

4.2. Hypotheses testing

Table 7 shows the results of the structural equation model used to test the three hypotheses. The first two hypotheses predicted a direct effect between board gender diversity and CSR decoupling, and between CSR decoupling and firm performance. Additionally, the third hypothesis predicted an indirect effect between board gender diversity, CSR decoupling and firm performance. Model 1 of table 7 shows the SEM with ROA as the measure of firm performance and Model 2 of table 7 shows the SEM with Tobin's Q as the measure of firm performance. Model 1 and model 2 both show a significant and negative relationship between board gender diversity and CSR decoupling. This indicates that a board of directors with more female board members is associated with a decrease in CSR decoupling, after having controlled for variations in firm performance related to CSR decoupling and the other factors specified in the model. These results provide evidence for the first hypothesis, which indicates that board gender diversity negatively affects CSR decoupling.

Model 1 shows a positive and significant relationship between board gender diversity and ROA. However, the relationship between CSR decoupling and ROA is insignificant. This means that model 1 does not provide support for both hypothesis 2 and 3. Model 2 shows a negative and significant relationship between CSR decoupling and Tobin's Q. Hypothesis 2 predicted that CSR decoupling would decrease firm performance. Therefore, there is support for hypothesis 2. Furthermore, hypothesis 3 predicted that CSR decoupling would mediate the relationship between board gender diversity and firm performance. Model 2 shows a positive and significant relationship between board gender diversity and Tobin's Q. This indicates that a board of directors with more female board members is associated with a higher Tobin's Q through CSR decoupling. Therefore, model 2 provides support for the third hypothesis. All three relationships are significant, which supports the indirect effect. As predicted, board gender diversity is associated with lower CSR decoupling, and this is associated with higher firm performance. The results are only significant with Tobin's Q as a measure of firm performance. Collectively, the results in table 7 provide support for all three hypotheses if Tobin's Q is taken as a measure of firm performance.

	Model 1		Model 2	
	DecAb	ROA	DecAb	Tobin's Q
<i>DecAb</i>		-0.096 (0.063)		-0.024 * (0.013)
<i>GD</i>	-0.011 *** (0.003)	0.075 *** (0.023)	-0.011 *** (0.003)	0.009 * (0.005)
<i>lnAge</i>	0.103 *** (0.037)	0.284 ** (0.138)	0.098 *** (0.037)	-0.028 * (0.017)
<i>lnAssets</i>	-0.312 *** (0.024)	-0.466 * (0.194)	-0.302 *** (0.024)	-0.196 *** (0.041)
<i>lnLeverage</i>		-0.592 * (0.351)		-0.196 *** (0.026)
<i>SalGro</i>		0.008 * (0.003)		-0.0003 ** (0.0002)
<i>Dual</i>	-0.177 * (0.091)		-0.187 * (0.101)	
<i>Indepen</i>	0.015 *** (0.002)		0.015 *** (0.002)	
<i>Constant</i>	6.760 *** (0.638)	12.359 *** (3.043)	6.758 *** (0.629)	4.833 *** (0.533)
<i>Observations</i>	4,623		4,657	

* p < 0.10 ** p < 0.05 *** p < 0.01

Note. ROA: Return on Assets; TobinQ: Tobin's Q; GD; Board Gender Diversity; DecAb; CSR Decoupling; SalGro; Sales Growth; Dual: Duality; Indepen: Independence. See Table 3 for the definitions of the variables

Note. Results on sector, country and year dummies effects are not reported for parsimony.

Table 7: Regression results for structural equation model

To further approach causality, the lag effect for board gender diversity is used. The effect of board gender diversity on CSR decoupling and firm performance could be stronger after a longer period, since decisions of the board of directors might take time to be implemented. Women on the board of directors might not be able to influence the decisions of the board immediately but only after a while. Models 1 and 2 of table 8 both shows a negative, significant relationship between the 1-year lag effect of board gender diversity on CSR decoupling. This provides additional support for hypothesis 1. It indicates that board gender diversity will have a negative effect on CSR decoupling in the long run. Models 1 and 2 also show a positive and significant relationship between the lag of board gender diversity and firm performance. However, model 1 shows an insignificant relationship between CSR decoupling and ROA. Model 2 shows a negative and significant relationship between CSR decoupling and Tobin's Q. Therefore, this additional analysis still provides no support for hypothesis 2 or hypothesis 3 with ROA as the measure of firm performance. The analysis does provide further support for hypothesis 2 and 3 with Tobin's Q as the measure of firm performance.

Another additional analysis differentiates between greenwashing and brownwashing. Appendix 7.4 shows the tabulated overview of greenwashing and brownwashing. Most of the observations include firms that engage in brownwashing. There are only 127 observations for greenwashing, which is too low for a separate analysis of greenwashing. Table 9 shows the SEM of brownwashing. Model 1 and 2 both show a negative and significant relationship between board gender diversity and brownwashing and provide additional support for hypothesis 1. Model 1 shows a positive and significant relationship between board gender diversity and ROA, but an insignificant relationship between brownwashing and ROA. This provides evidence for a positive relationship between board gender diversity and ROA, but no evidence for a relationship between brownwashing and ROA. Model 2 shows a positive and significant relationship between board gender diversity and Tobin's Q. Further, it shows a negative and significant relationship between brownwashing and Tobin's Q. These results provide support for a negative association between board gender diversity and brownwashing, and a negative association between brownwashing and Tobin's Q. Furthermore, it provides support for a positive and indirect relationship between board gender diversity and Tobin's Q through CSR decoupling.

Finally, and in accordance with previous literature, the results in table 7, 8 and 9 show support of other variables on CSR decoupling and firm performance. The age of the firm has a positive and significant effect on CSR decoupling and ROA. The size of the firm, measured in total assets, has a negative and significant effect on CSR decoupling and firm performance. Leverage has a negative and significant effect, while the effects of Sales Growth are positive for ROA and negative for Tobin's Q. The effects of duality are insignificant, and the effects on independence are significant and positive.

	Model 1		Model 2	
	DecAb	ROA	DecAb	Tobin's Q
<i>DecAb</i>		-0.102 (0.065)		-0.023 * (0.013)
<i>lagGD</i>	-0.012 *** (0.003)	0.050 ** (0.021)	-0.012 *** (0.003)	0.009 * (0.004)
<i>lnAge</i>	0.097 ** (0.038)	0.322 ** (0.142)	0.093 ** (0.038)	-0.023 (0.017)
<i>lnAssets</i>	-0.311 *** (0.025)	-0.365 * (0.196)	-0.301 *** (0.024)	-0.184 *** (0.041)
<i>lnLeverage</i>		-0.562 (0.365)		-0.091 *** (0.026)
<i>SalGro</i>		0.008 ** (0.003)		-0.0003 ** (0.0001)
<i>Dual</i>	-0.148 (0.104)		-0.159 (0.103)	
<i>Indepen</i>	0.016 *** (0.002)		0.015 *** (0.002)	
<i>Constant</i>	6.995 *** (0.644)	8.539 *** (3.006)	6.993 *** (0.636)	4.300 *** (0.440)
<i>Observations</i>	4,446		4,478	

* p < 0.10 ** p < 0.05 *** p < 0.01

Note. ROA: Return on Assets; TobinQ: Tobin's Q; GD; Board Gender Diversity; DecAb; CSR Decoupling; SalGro; Sales Growth; Dual: Duality; Indepen: Independence. See Table 3 for the definitions of the variables

Note. Results on sector, country and year dummies effects are not reported for parsimony.

Table 8: Regression model with 1-year lag effect of board gender diversity

	Model 1		Model 2	
	Brownwash	ROA	Brownwash	Tobin's Q
<i>Brownwash</i>		-0.0113 (0.069)		-0.028 * (0.014)
<i>GD</i>	-0.011 *** (0.003)	0.077 *** (0.024)	-0.011 *** (0.003)	0.009 * (0.005)
<i>lnAge</i>	0.107 *** (0.036)	0.281 ** (0.142)	0.102 *** (0.036)	-0.028 (0.018)
<i>lnAssets</i>	-0.289 *** (0.024)	-0.484 ** (0.202)	-0.280 *** (0.024)	-0.202 *** (0.043)
<i>lnLeverage</i>		-0.585 (0.359)		-0.099 *** (0.026)
<i>SalGro</i>		0.008 ** (0.003)		-0.0003 ** (0.0002)
<i>Dual</i>	-0.146 (0.100)		-0.157 (0.100)	
<i>Indepen</i>	0.012 *** (0.002)		0.012 *** (0.002)	
<i>Constant</i>	6.413 *** (0.623)	12.749 *** (3.202)	6.435 *** (0.620)	4.94 *** (0.563)
<i>Observations</i>	4,477		4,511	

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

Note. ROA: Return on Assets; TobinQ: Tobin's Q; GD; Board Gender Diversity; DecAb; CSR Decoupling; SalGro; Sales Growth; Dual: Duality; Indepen: Independence. See Table 3 for the definitions of the variables

Note. Results on sector, country and year dummies effects are not reported for parsimony.

Table 9: Regression results of brownwashing

5. Discussion and conclusion

This study investigated the relationship between board gender diversity, CSR decoupling and firm performance. First, the study investigated the direct relationship between board gender diversity and CSR decoupling. Second, the direct relationship between CSR decoupling and firm performance was examined. Finally, the indirect relationship of board gender diversity and firm performance through CSR decoupling was investigated. The results confirm the expected negative association of board gender diversity and CSR decoupling, in the short term. This indicates that the characteristics of women, like their awareness of stakeholders and their ethical sensitiveness, makes them less likely to engage in CSR decoupling. Stakeholder theory states that a firm should manage the expectations and needs of different stakeholders. Women are more aware of these stakeholder needs, so they will provide stakeholders with true information by decreasing CSR decoupling. The results also confirm the expected negative association between CSR decoupling and Tobin's Q. This is in line with the combination of legitimacy and signaling theory. The firm wants to increase legitimacy by signaling their commitment to CSR actions. Some firms turn to CSR decoupling by signaling CSR performance that is not in line with actual CSR performance. When this signal is distorted, the legitimacy will decrease, and this will have a negative effect on firm performance. There is no support for the expected negative association between CSR decoupling and ROA. The results also confirm the expected indirect effect of board gender diversity on firm performance through CSR decoupling with Tobin's Q as a measure of firm performance. The combined negative associations between board gender diversity and CSR decoupling and between CSR decoupling and firm performance provide support for a positive and significant indirect relationship between board gender diversity and firm performance. This indicates that board gender diversity will decrease CSR decoupling, thereby increasing firm performance. However, the results show that there is no significant indirect relationship between board gender diversity, CSR decoupling and ROA.

The results of the lag analyses indicate that board gender diversity is negatively related to CSR decoupling on the longer term. These results suggest that board gender diversity will decrease CSR decoupling in the following year. The lag effect of board gender diversity is bigger than the effect in the first model. Women in the board of directors might not immediately be able to influence the decisions of the board. Furthermore, it takes time to implement a new policy or disclose information, so the effect of board gender diversity might be bigger in the longer term. The results of the lag analysis do not provide support for a relationship between CSR decoupling and ROA. Therefore, there is also no support for an indirect effect between board gender diversity and ROA. The results of the lag analysis do provide additional support for a negative relationship between CSR decoupling and Tobin's Q, and a positive and indirect relationship between board gender diversity and firm performance.

Finally, the results of the analysis of brownwashing show a negative and significant association between board gender diversity and brownwashing. This suggests that women on the board of directors make sure that the internal CSR actions are externally presented to the stakeholders. The association between brownwashing and ROA is insignificant. Therefore, there is no support for an indirect relationship between board gender diversity and ROA through brownwashing. The results do provide support for a negative relationship between brownwashing and Tobin's Q, and a positive indirect relationship between board gender diversity and Tobin's Q. This suggests that board gender diversity decreases brownwashing, and indirectly increases Tobin's Q. The sample did not include enough observations for a separate analysis of greenwashing.

All the hypotheses are supported when Tobin's Q is used as the measure for firm performance, but the hypotheses are not supported when ROA is used as the measure for firm performance. The expectations of the market change the market value of the firm, and this changes Tobin's Q (Matolcsy & Wyatt, 2008). Legitimacy theory and signaling theory suggest that a firm might lose legitimacy when the signal of a firm is distorted, and the stakeholders discover CSR decoupling. A decrease in legitimacy can lead to a rapid decrease in the market value of the firm. Stakeholders can directly influence market value by lowering the future expectations of a firm. These expectations will decrease when the legitimacy and reputation of a firm are destroyed because of CSR decoupling. In contrast, ROA changes when the operating income of the firm changes. To decrease ROA, the firm has to generate less income with the available assets. The income will decrease, for example, when customers buy less products from the firm or services are no longer needed. This change in income might be less drastic and take a longer time than the change in the market value. Reputation and legitimacy damages might not be severe enough to make customers immediately change to an alternative firm, and customers first need to find an appropriate alternative. Therefore, it might take a longer period for ROA to change in response to CSR decoupling. This study looked at the 1-year lag value of board gender diversity, but these results were insignificant. Further research might study a longer time sample and include lag values of longer periods and different variables. If ROA only changes after a longer period, this might yield significant results.

This study is subject to some limitations. First, there is a selection bias in the firms included in the sample. CSR reporting and activities are mainly voluntary in Europe, so the firms in the sample have chosen to report their CSR performance. This means that firms that chose not to report CSR are not in this dataset, which might lead to omitted information. Furthermore, this research only includes firms that have available data in the ASSET4 database. The ASSET4 database is not the only available database with ESG data, so other databases might include information about other firms. Different databases lead to different results because of the coverage of a different set of firms (Lara, Osma & Noguer, 2006). Further

research should use and combine other databases to get a more complete sample. To deal with the selection bias, further research might collect the CSR information themselves. Instead of collecting the data from a database, researchers could collect the CSR information from the firm itself, for example by observations, interviews, or the annual report. This is outside the scope of this research, but it could add insights to this study.

Another limitation is the measurement of the variable CSR decoupling. The approach of Hawn & Ioannou (2016) is used but some of the datapoints had to be removed and some datapoints were added. Hawn & Ioannou (2016) first discussed the definitions provided in the literature to arrive at a working decision rule. The intercoder reliability was high, and they dropped all the items for which there was disagreement. After this, they dropped the datapoints that measured the same underlying construct and concluded that the reliability and internal consistency of the measures were good. Finally, they confirmed validity of the method by using codes based on subcategories of CSR and the indices were normalized to be able to compare them (Hawn & Ioannou, 2016). These steps were not conducted in this study, due to time limitations. Therefore, the reliability and validity of the variables that are added are not as high as the reliability and validity of the Hawn & Ioannou (2016) datapoints. Future research should look at the updated ASSET4 database and follow the procedure of Hawn & Ioannou (2016) to make an overview of a new CSR decoupling measure.

Furthermore, there were not enough observations of greenwashing to conduct a SEM regression. Therefore, only the effect of the absolute value of CSR decoupling and the effect of brownwashing could be studied. Previous research also had more brownwashing than greenwashing (Hawn & Ioannou, 2016; Parra-Domínguez et al., 2021), so these results are in line with previous research. However, the literature is more aware of greenwashing than brownwashing. Greenwashing will also have more advantages for a firm, so we would expect greenwashing to be higher than brownwashing. Future research could study whether brownwashing is more common than greenwashing. The difference in greenwashing and brownwashing could also exist because of measurement errors in the CSR decoupling measurement. If the measure is incorrect, this will influence the internal validity of the research. If the measure of CSR decoupling is not accurate, the results are not trustworthy and the results of this study cannot be used to say something about the relationships that are examined. To improve the internal validity of this research, future research should look at this measure and improve the measure if necessary.

The sample of this research is another limitation. The sample of this research only includes European firms. Country effects are considered, but the differences between continents and cultures are not measured. Future research could include the whole world to look at differences in culture.

Finally, this research only looks at one aspect of board diversity. Board diversity does not only include gender diversity, but also race diversity, age diversity and more. The other types of diversity could influence CSR decoupling and firm performance in their own way. Because it is outside the scope of this research to look at all the types of diversity, only board gender diversity was studied. However, it could be interesting to look at the other aspects of diversity.

The findings have several implications for firms and research related to board gender diversity, CSR decoupling and firm performance. First, this research provides insights into the current contradictory literature about the relationship between board gender diversity and firm performance. The current literature provides positive, negative, and neutral direct relationships. This research adds to the literature by showing the positive and indirect relationship between board gender diversity and firm performance through CSR decoupling. The results suggest that by decreasing CSR decoupling, board gender diversity indirectly increases firm performance. Second, the findings have implications for firms. The results suggest that board gender diversity will indirectly increase firm performance. When firms are aware of the positive consequences of board gender diversity, they can take this into account when they hire new board members. This study also suggests that CSR decoupling will decrease firm performance. When firms are more aware of this relationship, they can take the negative consequences of CSR decoupling into account when they make decisions about CSR decoupling. Third, the results show that the relationships between board gender diversity, CSR decoupling and Tobin's Q are significant, but the results between board gender diversity, CSR decoupling and ROA are insignificant. Further in-depth analysis is needed to study these differences in results.

Overall, this study showed a negative relationship between board gender diversity and CSR decoupling. Furthermore, it showed a negative relationship between CSR decoupling and Tobin's Q. The main finding of this study is the indirect relationship between board gender diversity, CSR decoupling and firm performance. Board gender diversity will decrease CSR decoupling, and this will increase firm performance. More research is needed on the drivers and consequences of CSR decoupling to advance the understanding of this concept and create value for the firm and the stakeholders.

6. References

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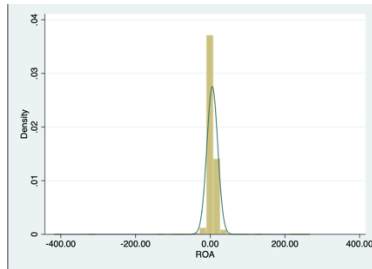
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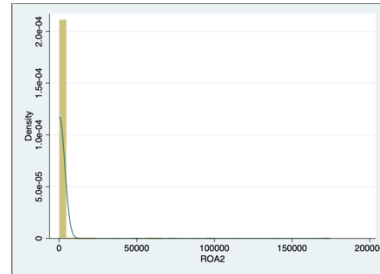
7. Appendices

7.1. Testing normal distribution

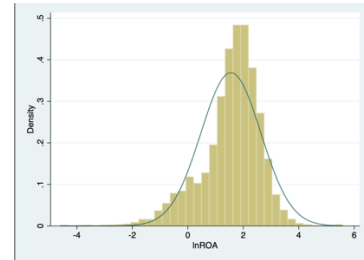
7.1.1. ROA



Normal

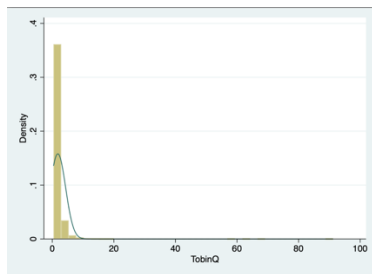


Quadratic term

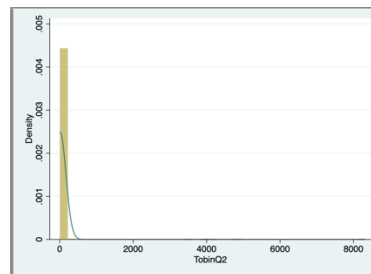


Natural Logarithm

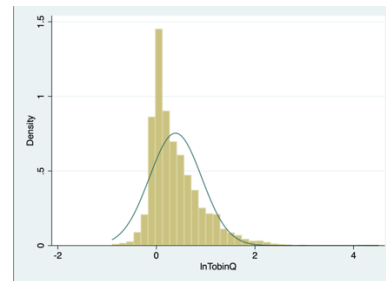
7.1.2. Tobin's Q



Normal

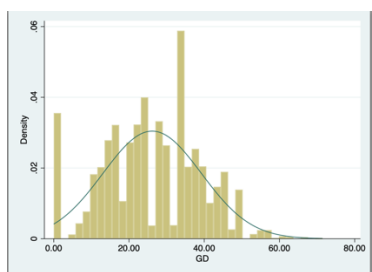


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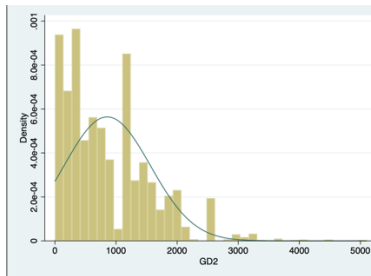


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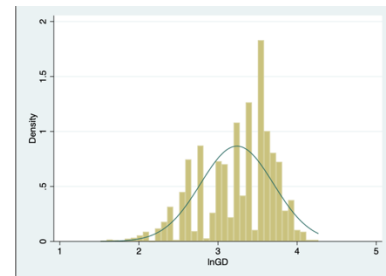
7.1.3. Gender Diverse Board



Normal

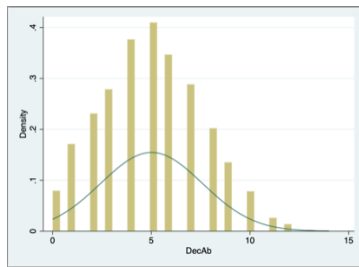


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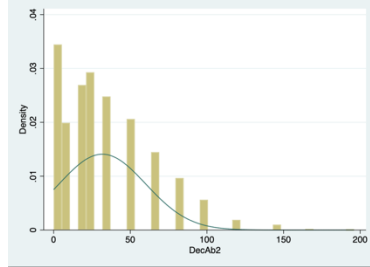


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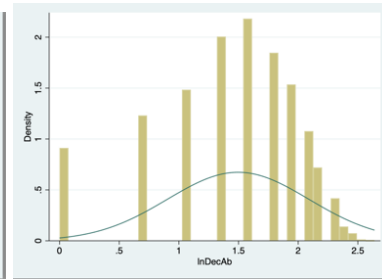
7.1.4. CSR Decoupling



Normal

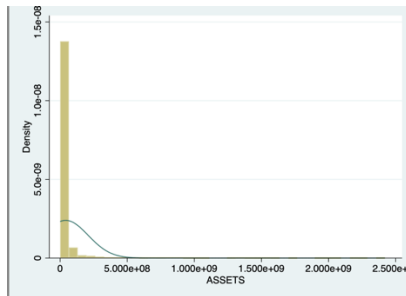


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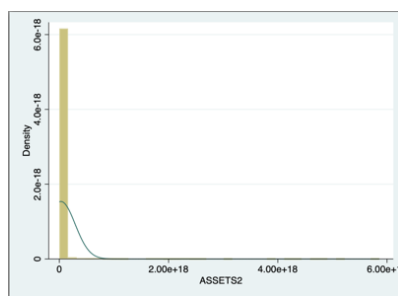


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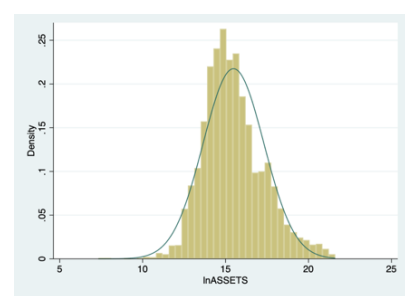
7.1.5. Assets



Normal

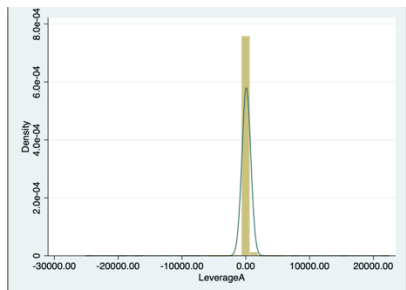


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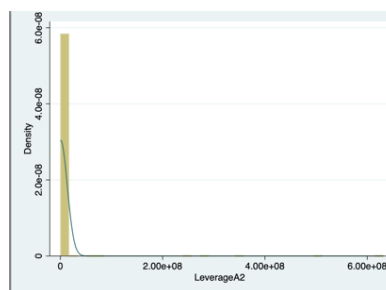


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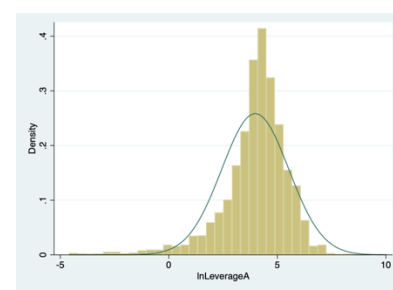
7.1.6. Leverage



Normal

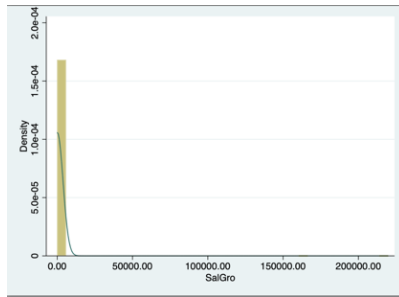


Quadratic term

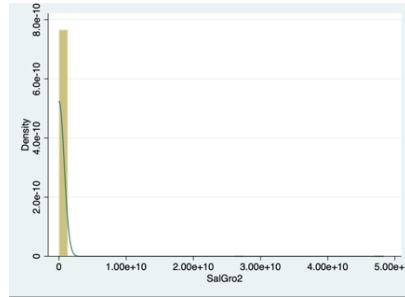


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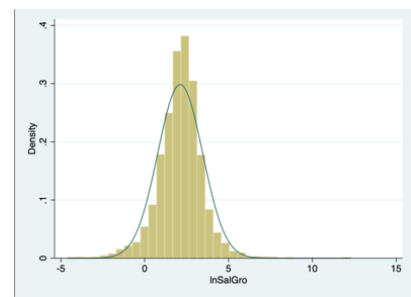
7.1.7. Sales Growth



Normal

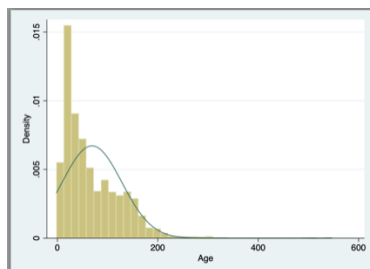


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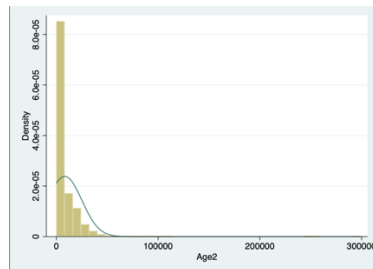


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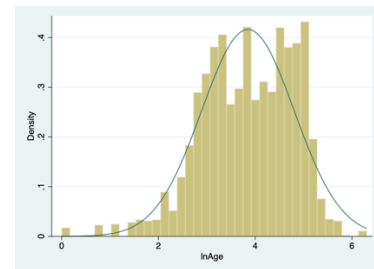
7.1.8. Age



Normal



Quadratic term



Natural Logarithm

7.2. Test for homoscedasticity

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of TobinQ

chi2(1) = **44365.65**

Prob > chi2 = **0.0000**

7.3. VIF table

<i>Variable</i>	VIF	1/VIF
<i>lnAssets</i>	1.48	0.675
<i>lnLeverage</i>	1.20	0.830
<i>DecAb</i>	1.17	0.857
<i>GD</i>	1.11	0.902
<i>Indepen</i>	1.10	0.910
<i>TobinQ</i>	1.09	0.917
<i>lnAge</i>	1.05	0.948
<i>Dual</i>	1.04	0.963
<i>SalGro</i>	1.01	0.988
Mean VIF	1.14	

7.4. Tabulated overview Greenwashing and Brownwashing

7.4.1. Tabulated overview Greenwash

	<i>Greenwash</i>	Frequency	Percentage	Cumulative
1		85	66.93	66.93
2		26	20.47	87.40
3		8	6.30	93.70
4		7	5.51	99.21
5		1	0.79	100.00
Total		127	100.00	

7.4.2. Tabulated overview Brownwash

	<i>Brownwash</i>	Frequency	Percentage	Cumulative
1		332	6.69	6.69
2		448	9.02	15.71
3		540	10.88	26.59
4		730	14.70	41.29
5		794	15.99	57.28
6		672	13.53	70.82
7		559	11.26	82.07
8		392	7.90	89.97
9		262	5.28	95.25
10		152	3.06	98.31
11		51	1.03	99.34
12		27	0.54	99.88
13		5	0.10	99.98
14		1	0.02	100.00
Total		4,965	100.00	

7.5. CSR decoupling internal and external actions

7.5.1. Internal actions

Datapoints of Hawn & Ioannou (2016)	Available in Eikon?	Replacement or reason for deleting datapoint.
Percentage of women on the board of directors.	Yes → Board Gender Diversity, Percent	Not used because this is also the independent variable of this research
Percentage of non-executive board members on the audit committee as stipulated by the company.	Yes → Audit Committee NonExecutive Members	Deleted due to much missing variables
Percentage of non-executive board members on the nomination committee.	Yes → Nomination Committee NonExecutive Members	Deleted due to much missing variables
Percentage of independent board members as reported by the company.	Yes → Independent Board Members	
Does the company have a policy to support the skills training of its employees?	Yes → Policy Skills Training A	
Does the company have a policy to support the career development of its employees?	Yes → Policy Career Development	
Does the company have a policy to improve employee health & safety within the company?	Yes → Policy Employee Health & Safety	
Does the company have a policy to improve employee health & safety within its supply chain?	Yes → Policy Supply Chain Health & Safety	
Does the company use environmental criteria (ISO 14000, energy consumption, etc.) in the selection process of its suppliers or sourcing partners?	Yes → Environmental Supply Chain Management	
Does the company make use of renewable energy?	Yes → Renewable Energy Use	

Does the company have a policy to improve its energy efficiency?	Yes → Policy Energy Efficiency	
Does the company have a policy to improve its water efficiency?	Yes → Policy Water Efficiency	
Does the company develop products or technologies that are used for water treatment, purification, or that improve water-use efficiency?	Yes → Water Technologies	
Does the company have a policy to reduce emissions?	Yes → Policy Emissions	Deleted due to many missing values.
Does the company have a policy for ensuring equal treatment of minority shareholders, facilitating shareholder engagement, or limiting the use of anti-takeover devices?	Yes → Shareholder Rights Policy	
Does the company's statutes or by-laws require that stock options can be only granted with a vote at a shareholder meeting?	No	Replaced by: Does the company require that shareholder approval is obtained prior to the adoption of any stock-based compensation plans?
Does the company have a policy for performance-oriented compensation that attracts and retains the senior executives and board members?	Yes → Executive Compensation Policy	
Does the company have a policy for maintaining a well-balanced membership of the board?	Yes → Board Structure Policy	
Does the company have an audit committee with at least three members and at least one 'financial expert' within the meaning of Sarbanes-Oxley?	Yes → Audit Committee Expertise	
Does the company have a CSR committee or team?	Yes → CSR Sustainability Committee	

Does the company have a policy to guarantee the freedom of association universally applied independent of local laws?	Yes → Policy Freedom of Association	
Does the company have a policy for the exclusion of child, forced, or compulsory labor?	Yes → Human Rights Policy	
Does the company have a competitive employee benefits policy or ensure good employee relations within its supply chain? AND Does the company have a policy for maintaining long-term employment growth and stability?	No	Replaced by: Does the company have an environmental management team?
Does the company have a work-life balance policy?	No	Replaced by: Does the company have a corporate governance board committee?
Does the company have a diversity and equal opportunity policy?	Yes → Policy Diversity and Opportunity	

Resulting questions/datapoints:

1. Percentage of non-executive board members on the audit committee as stipulated by the company.
2. Percentage of independent board members as reported by the company.
3. Does the company have a policy to support the skills training of its employees?
4. Does the company have a policy to support the career development of its employees?
5. Does the company have a policy to improve employee health & safety within the company?
6. Does the company have a policy to improve employee health & safety in its supply chain?
7. Does the company use environmental criteria (ISO 14000, energy consumption, etc.) in the selection process of its supplies or sourcing partners?
8. Does the company make use of renewable energy?
9. Does the company have a policy to improve its energy efficiency?
10. Does the company have a policy to improve its water efficiency?
11. Does the company develop products or technologies that are used for water treatment, purification, or that improve water-use efficiency?
12. Does the company have a policy for ensuring equal treatment of minority shareholders, facilitating shareholder engagement, or limiting the use of anti-takeover devices?
13. Does the company require that shareholder approval is obtained prior to the adoption of any stock-based compensation plans?
14. Does the company have a policy for performance-oriented compensation that attracts and retains the senior executives and board members?
15. Does the company have a policy for maintaining a well-balanced membership of the board?
16. Does the company have an audit committee with at least three members and at least one 'financial expert' within the meaning of Sarbanes-Oxley?
17. Does the company have a CSR committee or team?
18. Does the company have a policy to guarantee the freedom of association universally applied independent of local laws?
19. Does the company have a policy for the exclusion of child, forced, or compulsory labor?
20. Does the company have a policy to drive diversity and equal opportunity?
21. Does the company have an environmental management team?
22. Does the company have a corporate governance board committee?

7.5.2. External actions

Datapoints of Hawn & Ioannou (2016)	Available in Eikon?	Replacement or reason for deleting variable.
Does the company reportedly develop or market products and services that foster specific health and safety benefits for the consumers (healthy, organic or nutritional food, safe cars, etc.)?	Yes → Organic Products Initiatives	Not used because this is also the independent variable of this research
Does the company claim to favor promotion from within?	Yes → Internal Promotion	Deleted due to much missing variables
Does the company report on policies or programs on HIV/AIDS for the workplace or beyond?	Yes → HIV-AIDS Program	Deleted due to much missing variables
Does the company report on crisis management systems or reputation disaster recovery plans to reduce or minimize the effects of reputation disasters?	Yes → Crisis Management Systems	
Does the company report about environmentally friendly or green sites or offices?	Yes → Green Buildings	
Does the company report on initiatives to reduce, reuse, substitute, or phase out toxic chemicals or substances?	Yes → Toxic Chemicals Reduction	
Does the company report on initiatives to reduce the environmental impact of transportation of its staff?	Yes → Staff Transportation Impact Reduction	
Does the company show an initiative to reduce, reuse, recycle, substitute, phase out or compensate CO2 equivalents in the production process?	No	Replaced by: Does the company report on initiatives to recycle, reduce, reuse, substitute, treat or phase out e-waste?

Does the company report on initiatives to recycle, reduce, reuse, substitute, treat, or phase out total waste?	Yes → Waste Reduction Initiatives	
Does the company report on initiatives to reduce, substitute, or phase out volatile organic compounds (VOC)?	Yes → VOC Emissions Reduction	
Does the company report on initiatives to reduce, reuse, recycle, substitute, or phase out SOx (sulphur oxides) or NOx (nitrogen oxides) emissions?	Yes → NOx and SOx Emissions Reduction	
Does the company report on initiatives to recycle, reduce, reuse, or substitute ozone-depleting (CFC-11 equivalents, chlorofluorocarbon) substances?	No	Replaced by: Does the company report on partnerships or initiatives with specialized NGOs, industry organizations, governmental or supra-governmental organizations, which are focused on improving environmental issues?
Is the company's CSR report published in accordance with the GRI guidelines?	Yes → GRI Report Guidelines	Deleted due to many missing values
Is the company openly reporting about the challenges or opportunities of integrating financial and extra-financial issues, and the dilemmas and trade-offs it faces?	No	Replaced by: Has the company set targets or objectives to be achieved on emission reduction?
Does the company's extra-financial report take into account the global activities of the company?	Yes → CSR Sustainability Report Global Activities	Deleted due to many missing values
Does the company report or show to be ready to end a partnership with a sourcing partner if human rights criteria are not met?	Yes → Human Rights Breaches Contractor	

Does the company report or show to use human rights criteria in the selection or monitoring process of its suppliers or sourcing partners?	Yes → Human Rights Contractor	
Does the company claim to provide its employees with a pension fund, health care, or other insurance?	No	
Does the company claim to provide a bonus plan to most employees?	No	
Does the company claim to provide daycare services for its employees?	Yes → Day Care Services	
Does the company have a policy to strive to be a good corporate citizen?	Yes → Policy Community Involvement	
Does the company have a policy to respect business ethics?	Yes → Policy Business Ethics	
Has the company signed the UN Global Compact?	Yes → Global Compact Signatory	
Does the company follow the OECD guidelines?	Yes → OECD Guidelines for Multinational Enterprises	
Does the company have an external auditor of its CSR/H&S/Sustainability report?	Yes → CSR Sustainability External Audit	Deleted due to many missing values
Does the company claim to provide flexible working hours or working hours that promote a work-life balance?	Yes → Flexible Working Hours	
Does the company claim to provide regular staff and business management training for its managers?	Yes → Management Training	

Resulting questions/datapoints:

1. Does the company reportedly develop or market products and services that foster specific health and safety benefits for the consumers (healthy, organic or nutritional food, safe cars, etc.)?
2. Does the company claim to favor promotion from within?
3. Does the company report on policies or programs on HIV/AIDS for the workplace or beyond?
4. Does the company report on crisis management systems or reputation disaster recovery plans to reduce or minimize the effects of reputation disasters?
5. Does the company report about environmentally friendly or green sites or offices?
6. Does the company report on initiatives to reduce, reuse, substitute, or phase out toxic chemicals or substances?
7. Does the company report on initiatives to reduce the environmental impact of transportation of its staff?
8. Does the company report on initiatives to recycle, reduce, reuse, substitute, treat or phase out e-waste?
9. Does the company report on initiatives to recycle, reduce, reuse, substitute, treat, or phase out total waste?
10. Does the company report on initiatives to reduce, substitute, or phase out volatile organic compounds (VOC)?
11. Does the company report on initiatives to reduce, reuse, recycle, substitute, or phase out SO_x (sulphur oxides) or NO_x (nitrogen oxides) emissions?
12. Does the company report or show to be ready to end a partnership with a sourcing partner if human rights criteria are not met?
13. Does the company report or show to use human rights criteria in the selection or monitoring process of its suppliers or sourcing partners?
14. Does the company claim to provide daycare services for its employees?
15. Does the company have a policy to strive to be a good corporate citizen?
16. Does the company have a policy to respect business ethics?
17. Has the company signed the UN Global Compact?
18. Does the company follow the OECD guidelines?
19. Does the company claim to provide flexible working hours?
20. Does the company claim to provide regular staff and business management training for its managers?

21. Does the company report on partnerships or initiatives with specialized NGOs, industry organizations, governmental or supra-governmental organizations, which are focused on improving environmental issues?
22. Has the company set targets or objectives to be achieved on emission reduction?

7.6. Do-File

*PREPARATIONS FOR READING IN DATA FROM EXCEL FILE

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cd "Users/evavervoort/Desktop/Master Thesis"
```

```
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*DESCRIPTION OF THE DATA FILE

```
descr
```

*TURN SECTOR AND COUNTRY INTO DUMMY

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tabulate Sector, generate(dumSector)
```

```
tabulate Country, generate(dumCountry)
```

*INDUSTRY STATISTICS

```
tabulate Sector
```

```
tabulate Country
```

*RENAME DUMMY VARIABLES

```
rename dumSector1 BasicMaterials
```

```
rename dumSector2 ConsumerCyclicals
```

```
rename dumSector3 ConsumerNonCyclicals
```

```
rename dumSector4 Energy
```

```
rename dumSector5 Financials
```

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rename dumSector6 Healthcare
```

```
rename dumSector7 Industrials
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rename dumSector8 RealEstate
```

```
rename dumSector9 Technology
```

```
rename dumSector10 Utilities
```

rename dumCountry1 Austria
rename dumCountry2 Belgium
rename dumCountry3 Bermuda
rename dumCountry4 BritishVirginIslands
rename dumCountry5 Czechia
rename dumCountry6 Denmark
rename dumCountry7 Finland
rename dumCountry8 France
rename dumCountry9 Germany
rename dumCountry10 Gibraltar
rename dumCountry11 GreatBritain
rename dumCountry12 Greece
rename dumCountry13 Guernsey
rename dumCountry14 Hungary
rename dumCountry15 Ireland
rename dumCountry16 IsleofMan
rename dumCountry17 Israel
rename dumCountry18 Italy
rename dumCountry19 Jersey
rename dumCountry20 Luxembourg
rename dumCountry21 Norway
rename dumCountry22 Poland
rename dumCountry23 Portugal
rename dumCountry24 Spain
rename dumCountry25 Sweden
rename dumCountry26 Switzerland
rename dumCountry27 Turkey
rename dumCountry28 UnitedStates
rename dumCountry29 theNetherlands

*TRANSFORM WIDE DATA INTO LONG DATA

```
reshape long Age ROA GD TobinQ Assets Leverage SalGro Int Ext Decoup DecAb Dual Indepen, i(ISIN)  
j(year)
```

*ADD NUMERIC ID VARIABLE

```
egen ID = group(ISIN)
```

*TELL STATA WE ARE WORKING WITH PANEL DATA

```
xtset ID year
```

*SCIENTIFIC TABLES & SEM

```
ssc install estout
```

```
ssc install medsem
```

*CREATE BROWNWASH & GREENWASH

```
gen Brownwash = DecAb
```

```
replace Brownwash = . if Brownwash < 1
```

```
gen Greenwash = Decoup
```

```
replace Greenwash = . if Greenwash < 1
```

```
tabulate Brownwash
```

```
tabulate Greenwash
```

*SUMMARY STATISTICS

```
sum ROA TobinQ GD DecAb Brownwash Greenwash Age Assets Leverage SalGro Dual Indepen
```

*NORMAL DISTRIBUTION

```

gen Age2=Age^2
gen ROA2=ROA^2
gen GD2=GD^2
gen TobinQ2=TobinQ^2
gen Assets2=Assets^2
gen Leverage2=Leverage^2
gen SalGro2=SalGro^2
gen DecAb2=DecAb^2
gen Brownwash2=Brownwash^2
gen Greenwash2=Greenwash^2
gen Indepen2=Indepen^2

gen lnAge=ln(Age)
gen lnROA=ln(ROA)
gen lnGD=ln(GD)
gen lnTobinQ=ln(TobinQ)
gen lnAssets=ln(Assets)
gen lnLeverage=ln(Leverage)
gen lnSalGro=ln(SalGro)
gen lnDecAb=ln(DecAb)
gen lnBrownwash=ln(Brownwash)
gen lnGreenwash=ln(Greenwash)
gen lnIndepen=ln(Indepen)

hist Age, normal
hist Age2, normal
hist lnAge, normal

hist ROA, normal

```

hist ROA2, normal

hist lnROA, normal

hist GD, normal

hist GD2, normal

hist lnGD, normal

hist TobinQ, normal

hist TobinQ2, normal

hist lnTobinQ, normal

hist Assets, normal

hist Assets2, normal

hist lnAssets, normal

hist Leverage, normal

hist Leverage2, normal

hist lnLeverage, normal

hist SalGro, normal

hist SalGro2, normal

hist lnSalGro, normal

hist DecAb, normal

hist DecAb2, normal

hist lnDecAb, normal

hist Brownwash, normal

hist Brownwash2, normal

hist InBrownwash, normal

hist Greenwash, normal

hist Greenwash2, normal

hist InGreenwash, normal

hist Indepen, normal

hist Indepen2, normal

hist InIndepen, normal

drop Age2

drop ROA2 InROA

drop GD2 InGD

drop TobinQ2 InTobinQ

drop Assets2

drop Leverage2

drop SalGro2 InSalGro

drop DecAb2 InDecAb

drop Brownwash2 InBrownwash

drop Greenwash2 InGreenwash

drop Indepen2 InIndepen

sum ROA TobinQ GD DecAb Brownwash Greenwash InAge InAssets InLeverage SalGro Dual Indepen

*CREATE LAGGED INDEPENDENT VARIABLES

gen lagGD = GD[_n-1]

gen lag2GD = GD[_n-2]

gen lagDecAb = DecAb[_n-1]

gen laglnAge = lnAge[_n-1]

```
gen lagLnAssets = lnAssets[_n-1]
```

```
gen lagLnLeverage = lnLeverage[_n-1]
```

```
gen lagSalGro = SalGro[_n-1]
```

```
gen lagDual = Dual[_n-1]
```

```
gen lagIndepen = Indepen[_n-1]
```

```
*SAVE LONG DATASET
```

```
save "Master Thesis Long.dta", replace
```

```
use "Master Thesis Long.dta", clear
```

```
*TESTING FOR HETEROSCEDASTICITY
```

```
reg TobinQ ROA GD DecAb Brownwash Greenwash lnAge lnAssets lnLeverage SalGro Dual Indepen  
estat hettest
```

```
*CORRELATION MATRIX
```

```
correlate ROA TobinQ GD DecAb Brownwash Greenwash lnAge lnAssets lnLeverage SalGro Dual Indepen
```

```
*CREATE VIF TABLE
```

```
reg ROA TobinQ DecAb Brownwash Greenwash GD lnAssets lnAge lnLeverage SalGro Dual Indepen  
vif
```

```
*SEM (MEDIATION)
```

```
sem (TobinQ<-DecAb GD lnAge lnLeverage SalGro lnAssets BasicMaterials ConsumerCyclicals  
ConsumerNonCyclicals Energy Financials Healthcare Industrials RealEstate Technology Austria Belgium  
Bermuda BritishVirginIslands Czechia Denmark Finland France Germany Gibraltar GreatBritain Greece  
Guernsey Hungary Ireland IsleofMan Israel Italy Jersey Luxembourg Norway Poland Portugal Spain  
Sweden Switzerland Turkey UnitedStates year) (DecAb<-GD lnAge lnAssets Dual Indepen BasicMaterials  
ConsumerCyclicals ConsumerNonCyclicals Energy Financials Healthcare Industrials RealEstate  
Technology Austria Belgium Bermuda BritishVirginIslands Czechia Denmark Finland France Germany  
Gibraltar GreatBritain Greece Guernsey Hungary Ireland IsleofMan Israel Italy Jersey Luxembourg  
Norway Poland Portugal Spain Sweden Switzerland Turkey UnitedStates year), nocapslatent vce(robust)
```

sem (ROA<-DecAb GD InAge InLeverage SalGro InAssets BasicMaterials ConsumerCyclicals
ConsumerNonCyclicals Energy Financials Healthcare Industrials RealEstate Technology Austria Belgium
Bermuda BritishVirginIslands Czechia Denmark Finland France Germany Gibraltar GreatBritain Greece
Guernsey Hungary Ireland IsleofMan Israel Italy Jersey Luxembourg Norway Poland Portugal Spain
Sweden Switzerland Turkey UnitedStates year) (DecAb<-GD InAge InAssets Dual Indepen BasicMaterials
ConsumerCyclicals ConsumerNonCyclicals Energy Financials Healthcare Industrials RealEstate
Technology Austria Belgium Bermuda BritishVirginIslands Czechia Denmark Finland France Germany
Gibraltar GreatBritain Greece Guernsey Hungary Ireland IsleofMan Israel Italy Jersey Luxembourg
Norway Poland Portugal Spain Sweden Switzerland Turkey UnitedStates year), nocapslatent vce(robust)

*MEDIATION WITH LAGGED VALUES

sem (TobinQ<-DecAb lagGD InAge InLeverage SalGro InAssets BasicMaterials ConsumerCyclicals
ConsumerNonCyclicals Energy Financials Healthcare Industrials RealEstate Technology Austria Belgium
Bermuda BritishVirginIslands Czechia Denmark Finland France Germany Gibraltar GreatBritain Greece
Guernsey Hungary Ireland IsleofMan Israel Italy Jersey Luxembourg Norway Poland Portugal Spain
Sweden Switzerland Turkey UnitedStates year) (DecAb<-lagGD InAge InAssets Dual Indepen
BasicMaterials ConsumerCyclicals ConsumerNonCyclicals Energy Financials Healthcare Industrials
RealEstate Technology Austria Belgium Bermuda BritishVirginIslands Czechia Denmark Finland France
Germany Gibraltar GreatBritain Greece Guernsey Hungary Ireland IsleofMan Israel Italy Jersey
Luxembourg Norway Poland Portugal Spain Sweden Switzerland Turkey UnitedStates year), nocapslatent
vce(robust)

sem (ROA<-DecAb lagGD InAge InLeverage SalGro InAssets BasicMaterials ConsumerCyclicals
ConsumerNonCyclicals Energy Financials Healthcare Industrials RealEstate Technology Austria Belgium
Bermuda BritishVirginIslands Czechia Denmark Finland France Germany Gibraltar GreatBritain Greece
Guernsey Hungary Ireland IsleofMan Israel Italy Jersey Luxembourg Norway Poland Portugal Spain
Sweden Switzerland Turkey UnitedStates year) (DecAb<-lagGD InAge InAssets Dual Indepen
BasicMaterials ConsumerCyclicals ConsumerNonCyclicals Energy Financials Healthcare Industrials
RealEstate Technology Austria Belgium Bermuda BritishVirginIslands Czechia Denmark Finland France
Germany Gibraltar GreatBritain Greece Guernsey Hungary Ireland IsleofMan Israel Italy Jersey
Luxembourg Norway Poland Portugal Spain Sweden Switzerland Turkey UnitedStates year), nocapslatent
vce(robust)

*MEDIATION WITH BROWNWASHING

sem (TobinQ<-Brownwash GD InAge InLeverage SalGro InAssets BasicMaterials ConsumerCyclicals
ConsumerNonCyclicals Energy Financials Healthcare Industrials RealEstate Technology Austria Belgium
Bermuda BritishVirginIslands Czechia Denmark Finland France Germany Gibraltar GreatBritain Greece
Guernsey Hungary Ireland IsleofMan Israel Italy Jersey Luxembourg Norway Poland Portugal Spain
Sweden Switzerland Turkey UnitedStates year) (Brownwash<-GD InAge InAssets Dual Indepen
BasicMaterials ConsumerCyclicals ConsumerNonCyclicals Energy Financials Healthcare Industrials
RealEstate Technology Austria Belgium Bermuda BritishVirginIslands Czechia Denmark Finland France

Germany Gibraltar GreatBritain Greece Guernsey Hungary Ireland IsleofMan Israel Italy Jersey
Luxembourg Norway Poland Portugal Spain Sweden Switzerland Turkey UnitedStates year), nocapslatent
vce(robust)

sem (ROA<-Brownwash GD InAge InLeverage SalGro InAssets BasicMaterials ConsumerCyclicals
ConsumerNonCyclicals Energy Financials Healthcare Industrials RealEstate Technology Austria Belgium
Bermuda BritishVirginIslands Czechia Denmark Finland France Germany Gibraltar GreatBritain Greece
Guernsey Hungary Ireland IsleofMan Israel Italy Jersey Luxembourg Norway Poland Portugal Spain
Sweden Switzerland Turkey UnitedStates year) (Brownwash<-GD InAge InAssets Dual Indepen
BasicMaterials ConsumerCyclicals ConsumerNonCyclicals Energy Financials Healthcare Industrials
RealEstate Technology Austria Belgium Bermuda BritishVirginIslands Czechia Denmark Finland France
Germany Gibraltar GreatBritain Greece Guernsey Hungary Ireland IsleofMan Israel Italy Jersey
Luxembourg Norway Poland Portugal Spain Sweden Switzerland Turkey UnitedStates year), nocapslatent
vce(robust)