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Determinants and Economic Consequences of Non-Financial Disclosure Quality: An Empirical Evidence from Germany

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DEDICATION

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TABLE OF CONTENTS

ABSTRACT... 1

INTRODUCTION... 2

References... 13

PAPER 1: IMPACT OF CORPORATE SOCIAL RESPONSIBILITY (CSR) DISCLOSURE QUALITY ON FIRM VALUE....................................... 21

1. Introduction 21

2. Literature Review and Hypothesis Development....................................... 29
    - 2.1 Literature Review... 29
    - 2.2 Hypothesis Development: CSR Disclosure Quality and Firm Value....... 32

3. Research Design... 35
    - 3.1 Sample Selection... 35
    - 3.2 Measuring CSR Disclosure Quality.. 37
    - 3.3 Reliability and Validity... 42
    - 3.4 Regression Model... 42
    - 3.5 Endogeneity. 45

4. Empirical Results... 47
    - 4.1 Descriptive Statistics and Correlation Matrix.............................. 47
    - 4.2 Regression Results... 49

5. Additional Analysis... 53

6. Discussion and Conclusion... 54

References... 58

PAPER 2: THE ROLE OF CORPORATE GOVERNANCE IN IMPROVING CORPORATE SOCIAL RESPONSIBILITY (CSR) DISCLOSURE QUALITY 65

1. Introduction... 65

2. Literature Review and Hypothesis Development....................................... 72
    - 2.1 Literature Review... 72
    - 2.2 Hypothesis Development... 75
        - 2.2.1 United Nations Global Compact (UNGC) Signatory.............. 75
        - 2.2.2 Institutional Investors... 78
        - 2.2.3 CSR Assurance and Types of CSR Assurance 80

3. Research Design... 83
    - 3.1 Sample Selection... 83
    - 3.2 Regression Model... 86

3.3 Dependent Variable: CSR Disclosure Quality………………………….... 87
3.4 Independent Variables: Corporate Governance Dimension……………..... 93
3.5 Control Variables……………………………………………………… 93

4. Empirical Results………………………………………………………….. 94
4.1 Descriptive Statistics and Correlation Matrix…………………………… 94
4.2 Regression Results…………………………………………………….. 98

5. Additional Analysis………………………………………………………... 104

6. Discussion and Conclusion………………………………………………… 106

References…………………………………………………………………. 111

PAPER 3: VALUE RELEVANCE OF NON-FINANCIAL DISCLOSURE AFTER THE IMLEMENTATION OF DIRECTIVE 2014/95/EU: EMPIRICAL EVIDENCE FROM FIRMS LISTED IN GERMAN CAPITAL MARKET……………………………... 120

1. Introduction………………………………………………………………… 120

2. Implementation of Directive 2014/95/EU in Germany……………………………. 125

3. Literature Review and Hypothesis Development………………………….…. 125
3.1 Literature Review……………………………………………………… 125
3.2 Hypothesis Development: Value Relevance of Non-Financial Disclosure. 129

4. Research Design…………………………………………………………… 132
4.1 Sample Selection……………………………………………………. 132
4.2 Regression Model……………………………………………………… 135
4.3 Non-Financial Disclosure……………………………………………… 138

5. Empirical Results………………………………………………………….... 144
5.1 Descriptive Statistics and Correlation Matrix…………………………… 144
5.2 Difference in NF Disclosure…………………………………………… 146
5.3 Regression Results…………………………………………………….… 147

6. Additional Analysis………………………………………………………... 150

7. Discussion and Conclusion………………………………………………… 151

References…………………………………………………………………. 155

CONCLUSION…………………………………………………………………. 160

References…………………………………………………………………. 167

ABSTRACT

Corporate voluntary disclosure i.e. Corporate Social Responsibility (CSR) reports, because of its discretionary nature allow managers with a significant flexibility in choosing reporting content and its style. In the presence of agency conflicts, this condition permit managers to communicate firms' CSR activities in an opportunistic manner; by systematically using self-serving bias language and narrative. Resultantly, there is considerable skepticism about the credibility and trustworthiness of information disclosed in CSR reports. However, firms' discretion is limited by the active monitoring role played by corporate governance mechanism, stakeholder involvement and possible litigation costs. Thus, considering the German context, this thesis investigates: (i) the impact of external governance mechanism and implementation of Directive 2014/95/EU upon CSR disclosure quality (ii) market reaction to such disclosure. The CSR disclosure quality is measured through a composite score that is based on specific narrative features; length, verbal tone, numerical content and forward-looking content. Overall, the findings show a mixed impact of external governance mechanism whereas the implementation of directive tends to improve CSR disclosure quality. Similarly, market participants significantly respond to CSR disclosure with better quality. Combinedly, this study tries to rationalize the debate over the usefulness of narrative disclosure practice by aiming to understand its most important determinants i.e. external CG mechanism and regulatory requirement, as well as its capital market consequences.

Keywords: Corporate Social Responsibility (CSR) Disclosure, Textual Analysis, Firm Value, Corporate Governance, Non-Financial (NF) Disclosure, Non-Financial Directives, Value Relevance

INTROUCTION

Over the last two-decade, action from various constituencies suggests an increased pressure imposed upon publicly traded companies to voluntarily include a broad set of Corporate Social Responsibility (CSR) activities (e.g. human rights, community engagement, employment equity, and environmental impact) in their corporate agenda (Michelon et al., 2015; Malik, 2015; Nazari et al., 2017). By responding to such demand, companies not only generate favorable stakeholder attitude (e.g. customers' patronage, retention of talented employee, investors' attractions) but also, over the long run, improve corporate image and enhance stakeholder advocacy behavior (Du et al., 2010; Malik, 2015). This in turn boost firms' competitiveness and their sustainability (Fisher and Fisher, 2017; Clarkson et al., 2013). However, such positive impact is largely contingent upon the quality of information provided in Non-Financial disclosure i.e. CSR disclosure[1]. CSR communication is as crucial as CSR engagements itself because stakeholder's low awareness and skepticism towards companies CSR activities limits the firms' effort to maximize return from their CSR activities (Du et al., 2010; Fisher and Fisher, 2017; Huang and Watson, 2015).

Although, publishing CSR report by companies reflect their concern and demonstrate their responsible behavior towards environment, social and governance (ESG) issues, its voluntary nature has led to inconsistencies in reporting format, treatment and inclusion of various contextual elements and a lack of robust measures pertaining to the quality and accuracy of information disclosed (Sethi et al., 2015, 2017). Such condition provides manager with a significant flexibility in the choice and styling of reporting content: which topic to discuss, what details to provide under each topic and how to frame those details (Muslu et al., 2017; Melloni et al., 2017; Michelon et al., 2015). In the presence of agency

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[1] The corporate social responsibility disclosure are identified by different names and may cover only a part or the entire CSR activities; CSR reports (Chen et al., 2016), accountability report (Ramanna, 2013), sustainability report (Simnett et al., 2009), environmental disclosure (Cho et al., 2010) and responsibility report (CorporateRegister, 2008). These terms are considered equivalent and used interchangeably in the literature.

conflicts, such discretionary reporting permit managers to communicate in a way that can most suitably fulfill their personal agenda; by either informing or misleading stakeholders (Merkl-Davies and Brennan, 2007). Resultantly, there is a considerable skepticism about the credibility and trustworthiness of information disclosed in CSR reports (Du et al., 2010; Fisher and Fisher, 2017; Nazari et al., 2017; Chen et al., 2016).

Because of the potentially high information asymmetry about firms' CSR activities, literature on sustainability accounting has long been interested in examining disclosure quality and information content of CSR reports (Malik, 2015; Dhaliwal et al., 2011; Clarkson et al., 2008). However, reliance on the use of report quantity i.e. absence/ presence of standalone CSR report that represents the amount ("how much") (e.g. Dhaliwal et al., 2011; Dhaliwal et al., 2012; Dhaliwal et al., 2014) or the use of CSR reporting guideline i.e. Global Reporting Initiative "GRI" that represent the themes ("what") (e.g. Clarkson et al., 2008; Clarkson et al., 2013) as a proxy for CSR disclosure quality, are considered a potential weakness in previous sustainability accounting research (Muslu et al., 2017; Gao et al., 2016). Most of the studies that relies on such crude measure, fails to properly account for any variance in the quality of CSR reports, including both cross-sectional component and inter-temporal one (Gao et al., 2016). Recent literature in sustainability accounting (i.e. Caglio et al., 2019; Muslu et al., 2017; Melloni et al., 2017; Michelon et al., 2015; Cho et al., 2010), has responded to such criticism by emphasizing on the analysis of narrative feature of CSR disclosure.

Since, firms have considerable freedom over the aspects they want to highlight and the language to describe CSR performance (Cho et al., 2010), literature on discretionary narrative disclosure encourages on the analysis of linguistic characteristics to understand the quality of voluntary disclosure (Merkl-Davies and Brennan, 2007; Li, 2010; Kearney and Liu, 2014). The discretionary reporting provides an opportunity for firms to either signal

incremental relevant information about their CSR practice or conceal adverse CSR performance by focusing on the linguistic feature of CSR disclosure i.e. the amount of information, the language and verbal tone, numerical and forward-looking content (Muslu et al., 2017; Melloni et al., 2017). As such, analyzing the linguistic feature of CSR disclosure can be a meaningful way to measure any variance in their quality, including both across the firms and over the time period.

Drawing on sustainability accounting literature that applies textual analysis (i.e. Caglio et al., 2019; Muslu et al., 2017; Melloni et al., 2017; Nazari et al., 2017; Cho et al., 2010), this study focuses on four linguistic characteristics underpinning CSR disclosure quality namely report length[2], tone, numerical content and horizon content[3]. According to Michelon et al. (2015) the content (what and how much: "themes") along with the type of information used to describe and discuss CSR issues (how it is disclosed: "qualitative, quantitative and monetary terms") and the managerial orientation (the corporate approach to CSR: "forward or backward looking") all are different yet complementary dimensions that constitute CSR disclosure quality. Since, such information not only allows firms to convey their CSR effort but also assist relevant stakeholder in understanding the organizational attitude and performance related to sustainability issues (e.g. Chui and Wang, 2015; Clarkson et al., 2013; Muslu et al., 2017), this study asserts that decomposing informational content into these precise measures allows to better understand the varied effect that different aspects of disclosure has.

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[2] Although, firms that wants to obfuscate its report could make the report lengthier (Loughran and McDonald, 2014), this study follows the line of argument i.e. Dhaliwal et al. (2011) Dhaliwal et al. (2012), that suggests longer report covers significantly more CSR issues which can help investors to better understand firms' CSR practice. Furthermore, Leung et al. (2015) analyzed the use of minimum narrative disclosure (MND) in annual report and finds that firms with poor performance and higher risk of financial distress are more likely to engage in MND behavior. The narrative in financial reports (i.e. Management Discussion and Analysis (MD&A) section of annual reports) are similar to CSR disclosure in this context as there are few standards for the narrative in these reports (Muslu et al., 2017). Additionally, longer CSR reports are found to represent better CSR performance (Nazari et al., 2017). Consequently, this suggests that CSR disclosure with enough details (length) signifies better disclosure quality.

[3] Horizon-content and forward-looking content is used interchangeably in the literature.

The unprecedented CSR efforts are not only driven just by ideological concept: projecting firms as a powerful and positive force for social changes, but more by the multi facet business return that corporation can generate from such initiation (Du et al., 2010). One of the major reasons that firms improve such communicate regarding their CSR activities is to establish and maintain good relationships with their financial stakeholders and to ensure their continued financial support (Bernnan and Merkl-Davies, 2018). Additionally, Dhaliwal et al. (2014) highlights the importance of CSR disclosure from financing perspectives by suggesting that financial and CSR disclosures act as substitutes for each other in reducing the cost of equity capital. Likewise, capital market participant pays specific attention to CSR disclosure as it allows them to understand firms position on CSR issue, assess related risk and make informed decision accordingly (De Klerk et al., 2015). Hence, this study analyzes the consequences of CSR disclosure quality from investors perspective.

According to Cahan et al. (2016), investors have an expectation about the extent of voluntary CSR disclosure that a firm is likely to provide, reducing the possibility for discriminating among firms on the basic of such routine (expected) information. They, therefore, modeled expected CSR disclosure and used the difference between actual and expected CSR disclosure (i.e. unexpected CSR disclosure) as a proxy for the informative portion of CSR disclosure. They posit and found support for their claim (positive relation with Tobin’s Q) that unexpected part contains incremental information which are valued by investors. Similarly, Muslu et al. (2017) developed a disclosure score based on their narrative feature and examined the relationship between CSR disclosure scores (Low/ Medium/High) and analyst forecast accuracy. They found that CSR disclosure with high scores are associated with more accurate forecast accuracy whereas low score CSR reports are not associated with better forecasts than firms who do not issue CSR reports. This finding supports Cahan et al. (2016) assertion and suggest that it is actually “information beyond

certain threshold" that has a capital market effect. Capitalizing on the findings, this study categorizes CSR disclosure quality into three levels (Low/ Medium/ High) based on a composite disclosure rank score of selected narrative dimensions: length, tone, numerical content and forward-looking content, and considers low quality disclosure as an expected level of CSR information (Textual analysis process explained in Appendix 1). Therefore, "low quality disclosure" act as a reference group and report that are "above low-quality disclosure" are expected to be more informative and hence have a positive effect on firm value.

By engaging in CSR activities and reporting their outcomes, firms generate numbers of benefit such as customers' preference, seeking employment, enhancing stakeholder's advocacy behaviors and boosting firms' competitiveness (Du et al., 2010). Moreover, CSR reporting can mitigate potential adverse regulatory pressures, and leave the firm better placed to take advantage of future business opportunities (Chiu and Wang, 2015). However, such positive outcome is largely dependent upon how these activities are reported (Du et al., 2010). Investors skepticism, due to lack of regulation and lack of uniform reporting standard, places a heavy burden on the firms' part to ensure that CSR disclosure is of high quality i.e. objective and credible (Sethi et al., 2015). In response, firms have begun to incorporate variety of CG mechanism through which they assure that the information contained in CSR disclosure is trustworthy and can be relied upon (Rupley et al., 2012; Chan et al., 2014). Moreover, with the growth and importance of CSR practices in last decade, firms tend to include specific governance mechanism i.e. CSR committee, CSR assurance, United Nations Global Compact (UNGC) participation, because of their subject specific knowledge that allows them to play an active role in improving firms' CSR performance as well as CSR disclosure quality (Peters and Romi, 2014; Rodrigue et al., 2013).

Furthermore, emphasis on transparency is evident with the implementation of Directive 2014/95/EU[4] (henceforth "NF Directive"), according to which, all publicly listed firm in European countries should comply with the directive from 2017 onwards and report their non-financial activities including environmental impact, social and employee matters, respect for human rights, and anti-corruption and bribery matters (Saenger, 2017). By imposing such requirements, NF Directive intent to achieve higher level of transparency with respect to policies, risks and outcomes of firms' NF activities (Gulenko, 2018; Saenger, 2017). Importantly investors are identified as a key constituent in the formulation of NF Directive (European Union, 2014; Grewal et al., 2018).

Considering the argument about the informational value that narrative feature carries and the possible role that CG mechanism and disclosure regulation plays in improving CSR disclosure quality, I develop three related studies on determinants and consequences of CSR disclosure quality in German context. This dissertation follows the argument in line with prior research (e.g. Clarkson et al., 2013; Muslu et al., 2017; Plumlee et al., 2015; Cormier et al., 2009; Healy and Palepu, 2001; Merkl-Davies and Brennan, 2007), which postulates that firms' voluntary disclosure is aimed at eliminating uncertainties and reducing information asymmetry between firm and stakeholders. The novelty of this dissertation is three-fold: (i) to measure disclosure quality by categorizing CSR disclosure into three levels (Low/ Medium/ High) based on a composite disclosure rank score of selected narrative dimensions: length, tone, numerical content and forward-looking content, and to analyze the effect that such disclosure quality has on capital market participants (ii) to examine the role of external corporate governance (CG) mechanism; United Nations Global Compact (UNGC) participation, institutional investors and CSR assurance, in improving CSR disclosure quality

[4] Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU regards disclosure of non-financial and diversity information by certain large undertakings and groups, Official Journal of the European Union No. L 330. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0095&from=EN (accessed on 25th Jan 2019).

(iii) to examine the change in value relevance of NF disclosure for the firms listed in German capital market after the implementation of NF Directive.

Prior studies have articulated different theoretical perspectives in support of sustainability reporting that includes agency theory, stakeholder theory, legitimacy theory, institutional theory and resource dependency theory. Furthermore, a mixture of two or three theories is sometimes presented in the research designs (Hussain et al., 2018; Velte and Stawinoga, 2017; Cuadrado-Ballestros et al., 2017). This condition highlights the absence of a commonly accepted theoretical framework for understanding sustainability disclosure practice (Chan et al., 2014) and also emphasize insufficiency of one particular theoretical framework to cover all the aspects of CSR disclosure (Hussain et al., 2018). Such situation provides a rationale to combine theories in explaining CSR disclosure practice. Hence, this study considers agency theory and voluntary disclosure theory to understand the effect of CSR disclosure quality on firm value, stakeholder theory to explore the impact of CG mechanism on CSR disclosure quality and Positive Accounting Theory (PAT) to investigate the impact of NF Directive on the value relevance of NF disclosure.

This study focuses on 110 companies that are listed in Frankfurt Stock Exchange categorized under following index- DAX, MDAX and TecDAX. These three indexes are collectively represented under HDAX index. The big companies within German capital market are represented under HDAX index i.e. DAX: blue chip companies, MDAX: “Prime standard companies” that comply with higher transparency standards and TecDAX: large companies from technology sector. These types of firm because of their size and economic importance are exposed to greater scrutiny with regards to their sustainability performance (Cho et al., 2012). Limiting investigation to such companies that emphasize (“voluntarily”) on sustainability issue and that are economically important is consistent with literature i.e. Cho et al. (2012), De Villers and Marques (2016).

The sample are collected from Germany for two main reasons. First, the presence of strong unions (i.e. employee related groups) and independent agencies (i.e. environmental lobby group) and their involvement in corporate decision making characterizes Germany as a country with highly institutionalized collective bargaining systems, extensive provision of social welfare and employment protection (Verbeeten et al., 2016). Under such condition, although CSR reporting is completely voluntary in Germany (till year 2016), the firms are expected to address CSR issues (along with their disclosure) with utmost importance. Second, Germany had no official regulations regarding CSR reporting before the implementation of NF Directive in 2017, as opposed to other EU member states like France, Denmark or Belgium (Dhaliwal et al., 2014; Gulenko et al., 2018). This setting, therefore, allows for clearer observation of potential changes due to compliance with NF Directive. Hence, Germany is considered as an appropriate setting to address the intended research questions.

To fulfill the research objective, paper 1 and paper 2, covers data from year 2011 to year 2016 and investigate the determinants (CG mechanism) and consequences (firm value) of CSR disclosure quality during a time in which several progresses (although voluntary) have occurred related to CSR disclosure practice in Germany. There was two important recommendation in year 2011 with regards to CSR reporting in Germany (i) The German sustainability code by The German Council for Sustainable Development (GCSD), which includes 20 criteria and 27 GRI performance indicators that describes what should be taken into account when preparing CSR reports and (ii) The two-tier system by Deutsche Borse, according to which the companies are listed according to their level of best practice in term of robust governance practices and quarterly financial reporting among other relevant issues (IRI[5] , 2014). Even though these recommendations are voluntary in nature, this study believes

[5] Initiative for Responsible Investment.

that CSR reporting practice by German firm is affected by this progress. Similarly, year 2016 is chosen as the final sampling period because of the implementation of NF Directive which mandated all publicly listed companies in Germany to publish NF disclosure starting from year 2017 (Saenger, 2017). Further, paper 3 analyzes two years data; one year before (2016) and one year after (2017) the implementation of NF Directive, as pre and post mandated period respectively to examine the impact of NF Directive in German context,

In first study, I revisit the relationship between Corporate Social Responsibility (CSR) disclosure and firm value. Acknowledging the mix result presented in the literature (Gao et al., 2016; De Villers and Marques, 2016; Cho et al., 2015; Malik, 2015), I recognize the need of applying a more rigorous research design to explain the underlying relationship. In particular, this study improves on the measurement of CSR disclosure quality by categorizing CSR disclosure into three levels: Low, Medium and High, based on specific narrative features i.e. length, verbal tone, numerical content and forward-looking content. Relying on agency theory and voluntary disclosure theory, this study uses the sample of German companies listed under HDAX index during the period of 2011 to 2016 to understand the impact of CSR disclosure quality on firm value.

With regards to economic consequences, the results from fixed effect panel regression model shows that both high and medium quality CSR report is statistically significant and is positively associated with firm value. This suggest that both high and medium quality CSR report provide better information to analyze firms' profitability and associated risk, hence have an incremental effect on firm value relative to firms issuing low quality report. Additionally, the effect of both: high quality and medium quality disclosure, is positively significant in subsequent year, which supports the long-term valuation effect of CSR disclosure. This result further holds when controlled for simultaneous relationship between

CSR disclosure quality and firm value using two-stage least square (2 SLS) specifications, providing validity to the findings from regression model implemented.

The second study empirically examine the relationship between external[6] corporate governance (CG) mechanism and CSR disclosure quality. Prior studies (e.g. Peters and Romi, 2014; Michelon and Parbonetti, 2012) suggests that efficient CG mechanism enhances firm-stakeholder relationship by strategically fostering corporate sustainability and its reporting. Intrinsically even though the voluntary nature of CSR disclosure allow firm to indulge in opportunistic reporting, such discretion can be largely limited by active monitoring of CG mechanism. Under this approach, CG mechanism are expected to have a sense of accountability towards relevant stakeholders and thus, any improvement in CSR disclosure quality is driven by their genuine interest in enhancing transparency. More specifically, firms tend to incorporate certain type of external governance mechanism to enhance CSR disclosure quality because of their subject specific knowledge and their independence; that allows such CG mechanism to conduct monitoring and advisory role[7] in an efficient manner (Gillan, 2006; Peters and Romi, 2014; Rodrigue et al., 2013). Therefore, it is intriguing to examine the role played by specific external governance mechanism: United Nations Global Compact (UNGC) participation, institutional investors and CSR assurance, in improving CSR disclosure quality.

Relying on stakeholder theory my second study uses ordinal logistic regression to examine the effect of external CG mechanism on CSR disclosure quality of German companies listed under HDAX index during the period of 2011 to 2016. The study shows a

[6] The selected corporate governance dimensions are considered as external following Gillan (2006). This study provides a comprehensive list of stakeholders who have the potential to limit managerial discretion; not limiting to the governing role of the board members, shareholders, debtholder, but also considering the role of customers, suppliers, employees, politics, culture and community.

[7] The monitoring act requires CG mechanism to play a watchdog role which helps in aligning the firms reporting interest with relevant stakeholder need whereas advisory role includes the use of CG participants' expert knowledge to counsel firms in establishing meaningful disclosure strategies (Peters and Romi, 2014; Williams, 2014).

mixed effect of external governance mechanism on CSR disclosure quality but highlights a positive role played by UNGC participation and CSR assurance. The result suggests an effective monitoring role played by UNGC and CSR assurance in improving CSR disclosure quality by enhancing its linguistic feature.

In third study, I analyze the impact that adoption of NF Directive has on value relevance of Non-Financial disclosure. The NF Directive was transposed into German commercial law through CSR Directive Implementation Act (CDIA) in April 2017 and is largely targeted to address the issues centered around the alleged lack of value relevant, credible and comparable NF information (Uwer and Schramm, 2018; Saenger, 2017; Gulenko, 2018). Importantly investors are considered as a major beneficiaries of NF disclosure and with the implementation of NF Directive they are expected to benefit from more efficient reporting process (Grewal et al., 2018). Motivated to test such claim, this study examines whether the implementation of NF Directive (through CDIA) enhances the value relevance of NF disclosure for the firms listed in German capital market. For empirical test, this study uses modified Ohlson model to analyze the differences in value relevance of NF disclosure between two period: pre (2016) and post (2017) implementation of CDIA, for the German firms listed under HDAX index. The result from modified Ohlson model shows statistically significant but decline value relevance of NF disclosure after the implementation of NF Directive in Germany. Such decline may be attributed to any risks or unbooked liabilities that investors are able to measure more reliably due to improved disclosure after the enactment of NF Directive.

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Appendix 1- Textual Analysis Process in Python

Step 1- Obtaining CSR Reports

CSR reports are downloaded from two different sources; firm's website and CorporateRegister website. These CSR reports were published in three different formats: (i) prepared along with firms' annual/financial report, (ii) standalone CSR report (iii) report prepared under framework suggested by International Integrated Reporting Council (IIRC). This study considers only two types of CSR reporting; stand-alone reports and the ones that are published along with annual reports. Whereas, the reports that are prepared under IIRC framework are not included in the sample.

Step 2 - Extracting CSR reporting part from annual reports

The CSR reporting parts that are published along with annual report are manually stripped. Within the annual report, CSR reporting part is selected by identifying designated section which is mentioned as CSR report/ sustainability report. If the annual report doesn't have such designated section, I consider the part providing information about environmental, social and governance (ESG) issues. The pdf files (both stand alone and stripped one) were further converted to text format (utf-8 coding) to make it compatible for further analysis using Natural Language Toolkit (NLTK) program in Python.

In some of the stripped file, relevant CSR reporting part covers only half page and the other half covers information that is not related to CSR issues. These irrelevant parts were manually removed after converting the reports into text format.

Step 3 – Selecting dictionary

Following the suggestion from previous research, below mentioned dictionary were considered to analyze the textual feature of CSR report:

a) Negative and Positive wordlist – Loughran and McDonald (2011)
b) Horizon and Numerical wordlist – Muslu et al. (2017)

Negative wordlist - I obtain the list of negative words from University of Notre Dame's website at:

https://sraf.nd.edu/textual-analysis/resources/#LM%20Sentiment%20Word%20Lists

The list consists of 2355 negative words.

Positive wordlist - I obtain the list of positive words from University of Notre Dame's website at:

https://sraf.nd.edu/textual-analysis/resources/#LM%20Sentiment%20Word%20Lists

The list consists of 354 negative words.

It is to be noted that the LM wordlist (both positive and negative) is updated annually, using the process of identifying orphan tokens. All tokens with a frequency count of 100 or more and that are identifiable as words are added to the dictionary. I downloaded the required wordlist from the designated website on 15th February 2018.

Numerical Content - Number of Arabic numerals as well as Numerical words was considered as suggested by Muslu et al. (2017). Arabic numerals consist of numbers ranging from 0-9 and Numerical words consists following words: “first”, “second”, “third”, “fourth”, “fifth”, “sixth”, “seventh”, “eighth”, “ninth”, “tenth”, “eleventh”, “twelfth”, “thirteenth”, “fourteenth”, “fifteenth”, “sixteenth”, “seventeenth”, “eighteenth”, “nineteenth”, “twentieth”, “half”, “quarter”, “double”, “triple”, and “quadruple”.

Horizon Content - Horizon wordlist was considered as suggested by Muslu et al. (2017). This wordlist includes both the short-horizon and long-horizon words, that refer to future period. The wordlist consists of following words: Short term words are: “short term”, short-term”, “current fiscal/quarter/year”, “months”, “coming months/period/quarter”, “following months/period/quarter”, “incoming month/period/quarter”, “next month/period”, “subsequent months/period/quarter”, “upcoming months/period/quarter”. Long-horizon words are: “K years” where k is from 2 to 20 in number and from “two” to “twenty” in writing, “century”, “decade”, “foreseeable future”, “long-term”, “long term”, “coming year”, “following year”, “incoming year”, “next year”, subsequent year”, and “upcoming year”.

Step 4 - Adding additional words in the existing dictionary and finalizing the wordlist

In order to identify additional words that capture CSR reporting context based on our sample (in addition to Loughran and McDonald (2011) wordlist and Muslu et al. (2017) wordlist), an intensive word search is conducted using Natural Language Toolkit (NLTK) program in Python. Initially 15 reports are randomly selected for the analysis. Out of this initial list, 10 firms from different industries are selected to identify the words that are commonly used among different firms whereas CSR report for one particular firm covering 5 years period is selected to identify the words that is commonly used by same firm over time. The detail process is as mentioned below;

First step – Load the selected 15 reports in Python and remove stop words, punctuation, white space. Next tokenize the words in each file.

Second step – Load the selected wordlist: Loughran and McDonald (2011) and Muslu et al. (2017) and tokenize the words in each dictionary. Next, check the occurrence of words from these wordlists in the reports and select the “orphan words” that is not in the suggested wordlist.

Third step - Identify the most common “orphan” words; one that occurs with a frequency of over 50 or more times in entire corpus. There were total of around 500 words that fulfilled these criteria.

Fourth step – Analyze each orphan word using concordance function in NLTK to understand the context under which it was used. i.e. to understand whether the used words have negative/ positive / horizon connotation.

Out of these frequent words ("orphans"), the ones with following features are not considered for inclusion-

- Words that are highly industry specific.
- Words that are used in positive context in one report and in negative context in another report.
- Words that doesn't convey any sentiment (neutral tone).

Fifth step- To be consistent with Loughran and McDonald (2011), inflection of these shortlisted words is selected using 2of12inf dictionary. Moreover, both the singular and plural forms i.e. "opportunity and opportunities", as well as British and American English i.e. "labour and labor" are considered.

Sixth step- There are total of 38 negative words, 87 positive words and 39 horizon words that are added in the original wordlist. There is no additional word found that can be appended to numerical wordlist.

Added wordlist:

Negative wordlist - "associated", "condition", "conditioned", "conditioning", "conditions", "consumption", "consumptions", "control", "controlled", "controlling", "controls", "effect", "effected", "effecting", "effects", "emission", "emissions", "impact", "impacted", "impacting", "impacts", "include", "included", "includes", "issues", "lower", "lowered", "lowering", "lowers", "regulation", "regulations", "requirement", "requirements", "risk", "risked", "risking", "risks", "security".

Positive wordlist - "access", "accessed", "accesses", "accessing", "balance", "balanced", "balances", "campaign", "campaigned", "campaigning", "campaigns", "care", "cared", "cares", "caring", "commitment", "commitments", "compliance", "compliances", "contribution", "contributions", "create", "created", "creates", "culture", "cultured", "cultures", "diversity", "eco", "engagement", "engagements", "ensure", "ensured", "ensures", "ethics", "expansion", "expansions", "experience", "experienced", "experiences", "fair", "governances", "growth", "growths", "higher", "implementation", "implementations", "increased", "labor", "method", "methods", "natural", "performance", "performances", "potential", "potentials", "promote", "promoted", "promotes", "protection", "protections", "providing", "quality", "recycling", "reduce", "reduced", "reduces", "reducing", "reduction", "reductions", "responsibility", "responsible", "rights", "safety", "governance", "significant", "social", "support", "supported", "supporting", "supports", "sustainability", "sustainable", "value", "valued", "values", "voluntary".

Horizon content - "aim", "anticipate", "anticipates", "assume", "assumes", "believe", "believes", "commit", "commits", "confident", "continue", "continues", "could", "development", "estimate", "expect", "expects", "forecast", "foresee", "foresees", "goal", "guidance", "hope", "intend", "intends", "may", "might", "outlook", "plan", "predict", "predicts", "project", "seek", "seeks", "should", "strategy", "target", "will", "would".

Step 5- Computing CSR disclosure quality

Once the wordlist is finalized, the process of measuring CSR disclosure quality (QUALITY_SCORE) and categorizing the score into three different groups; Low, Medium and High, is done following below mentioned process using NLTK in Python. The detail process is as mentioned below;

First step – Load the firms' CSR reports (apart from the initial 15 reports that were used in Step 4) in Python and remove the stop words, punctuation, white space and then tokenize the words in each file.

Second step - Load the final dictionary and tokenize the words in each dictionary. Next, check the occurrence of words from the finalized wordlist and calculate the frequency of words in the report under each category (Positive, Negative, Horizon, Numerical). Similarly, for calculating "length" the number of words in each report is counted.

Third step – Calculate the ratio by dividing frequency under each category with the total number of words in report. Similarly, the difference between Positive ratio (Optimistic) and Negative ratio (Pessimistic), represented by TONE_RATIO is calculated to measure the net linguistic tone (OPT_RATIO - PES_RATIO).

Fourth step – Rank TONE_RATIO, LENGTH, HOR_RATIO and NUM_RATIO into deciles, with TONE_RATIO inverse ranked. All these decile ranks are aggregated into a composite measure of CSR disclosure quality score (QUALITY_SCORE).
The sum of decile ranks (scaled between 0.1 and 1) for LENGTH, HOR_RATIO and NUM_RATIO and inverse decile rank for TONE_RATIO (scaled between 0.1 and 1) results into the QUALITY_SCORE between 0.4 to 4 for each report.

Fifth step – Based on the QUALITY_SCORE, the reports are divided into three categories; Low/Medium/High. Following Muslu et al. (2017), the category was determined using the median and percentile values. The process is shown in Table 1 below.

Low Quality – If the score is 2.3 and less (sample median).

Medium Quality – If the score is between 2.4 and 2.6 (75th percentile of the sample).

High Quality – If the score is 2.7 and higher.

Table - Categorization Example

Firms	**Year**	**Decile rank LENGTH**	**Inverse decile rank TONE_RATIO**	**Decile rank HOR_RATIO**	**Decile rank NUM_RATIO**	**Quality SCORE**	**Disclosure CATEGORY**
Adidas	2011	0.7	0.1	0.9	1	2.7	**HIGH**
Adidas	2012	0.8	0.2	1	1	3	**HIGH**
Allianz	2013	0.5	1	1	0.1	2.6	**MEDIUM**
Allianz	2014	0.9	0.6	0.6	0.4	2.5	**MEDIUM**
AXEL Springer	2011	1	0.5	0.2	0.3	2	**LOW**
AXEL Springer	2013	1	0.7	0.1	0.3	2.1	**LOW**

PAPER 1: IMPACT OF CORPORATE SOCIAL RESPONSIBILITY (CSR) DISCLOSURE QUALITY ON FIRM VALUE

1. Introduction

In today's business environment when companies are increasingly demanded to be accountable for their social and environmental impact, Corporate Social Responsibility (CSR) disclosure[1] is becoming more prevalent as investors, customers, employees and other stakeholders demand greater transparency on these topics from firms' part (Sethi et al., 2017; Du et al., 2010). Capital market participant pay specific attention to CSR disclosure as it allows them to understand firms position on CSR issue, assess related risk and make informed decision accordingly (De Klerk et al., 2015). However, the empirical evidence on the relevance of CSR disclosure to capital market participants is inconclusive and presents inconsistent results (Gao et al., 2016; Fisher and Fisher, 2017). For example, Plumlee et al. (2015) document a positive association between environmental disclosure and firm value whereas Cormier and Magan, (2007) reports insignificant relationship between them. Moreover, in contrast to the belief of the new wave of mainstream researchers, Cho et al. (2015) finds no evidence of CSR disclosure being positively viewed by investors. Similarly, Verbeeten et al. (2016) finds that CSR report is partially associated with firm value; social information is positively associated yet environmental disclosures are not. These mixed findings suggest a need for further study to gain a better understanding about the relationship between CSR disclosure and firm value.

A potential weakness in previous CSR reporting studies is attributed either to the use of report quantity i.e. absence/ presence of CSR report that represents the amount of disclosure or the use of CSR reporting guideline i.e. GRI[2] that represents the theme of

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[1] The corporate social responsibility disclosure are identified by different names and may cover only a part or the entire CSR activities; CSR reports (Chen et al., 2016), accountability report (Ramanna, 2013), sustainability report (Simnett et al., 2009), environmental disclosure (Cho et al., 2010) and responsibility report (CorporateRegister, 2008). These terms are considered equivalent and used interchangeably in the literature.
[2] Global Reporting Initiative.

disclosure, as a proxy for CSR disclosure quality (Gao et al., 2016; Muslu et al., 2017; Michelon et al., 2015). Such measures are crude in nature that fails to capture the essence of quality and accuracy of information being disclosed (Gao et al., 2016).

While both the amount and the theme are equally important, earlier studies do not take another important dimension i.e. narrative feature, into account when analyzing information content of CSR reports (Cho et al., 2010; Melloni et al., 2017; Chauvey et al., 2015). The voluntary nature of CSR disclosure provides managers with considerable freedom in choosing and styling of reporting content: which topic to discuss, what details to provide under each topic, and how to frame those details (Muslu et al., 2017; Nazari et al., 2017). The literature on discretionary narrative disclosure therefore emphasizes on the analysis of linguistic characteristics, such as report length, tone, numerical content and horizon contents[3], that can improve the understandability and precision of information being disclosed (Merkl-Davies and Brennan, 2007; Li, 2010).

Drawing on sustainability accounting literature that applies textual analysis (i.e. Caglio et al., 2019; Muslu et al., 2017; Melloni et al., 2017; Nazari et al., 2017), this study focuses on four linguistic characteristics underpinning CSR disclosure quality namely report length[4], tone, numerical content and horizon content. According to Michelon et al. (2015) the content (what and how much: "themes") along with the type of information used to describe and discuss CSR issues (how it is disclosed: "qualitative, quantitative and monetary terms") and the managerial orientation (the corporate approach to CSR: "forward or backward

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[3] Horizon-content and forward-looking content is used interchangeably in the literature.

[4] Although, firms that wants to obfuscate its report could make the report lengthier (Loughran and McDonald, 2014), this study follows the line of argument i.e. Dhaliwal et al. (2011) Dhaliwal et al. (2012), that suggests longer report covers significantly more CSR issues which can help investors to better understand firms' CSR practice. Furthermore, Leung et al. (2015) analyzed the use of minimum narrative disclosure (MND) in annual report and finds that firms with poor performance and higher risk of financial distress are more likely to engage in MND behavior. The narrative in financial reports (i.e. Management Discussion and Analysis (MD&A) section of annual reports) are similar to CSR disclosure in this context as there are few standards for the narrative in these reports (Muslu et al., 2017). Additionally, longer CSR reports are found to represent better CSR performance (Nazari et al., 2017). Consequently, this suggests that CSR disclosure with enough details (length) signifies better disclosure quality.

looking") all are different yet complementary dimensions that constitute CSR disclosure quality. Since, investors don't take one particular kind of information in isolation rather requires complementary details to understand the overall valuation effect of firms' CSR activities (Plumlee et al., 2015; Clarkson et al., 2013), this study asserts that decomposing informational content into these precise measures allows investors to understand and capture the varied effect that different aspects of CSR disclosure has on firm value. Such narrative dimension represents the attributes of voluntary disclosure that not only allows firms to effectively convey their CSR activities (Melloni et al., 2017) but also helps capital market participants to understand firm's CSR performance and associated risk (Muslu et al., 2017). Perhaps not surprisingly, then, the linguistic features of CSR report have been associated with analyst forecast accuracy (Muslu et al., 2017), stock price volatility (Cormier et al., 2009) and firm value (Plumlee at al., 2015).

Relying on agency theory and voluntary disclosure theory, the current study builds on this particular line of literature and focuses on valuation effect of CSR disclosure narrative. According to Kothari et al. (2009), market participants are likely to recognize the true motive behind corporate disclosure and determine its credibility. As such, the market participants are believed to deemphasize noisy disclosure and filter out the biasness in corporate disclosure. Couched with above argument, this study uses recent advances in textual analysis techniques to investigates whether good CSR performance can be identified through linguistic character of CSR disclosure and if these features are associated with firm value[5].

According to Cahan et al. (2016), investors have an expectation about the extent of voluntary CSR disclosure that a firm is likely to provide, reducing the possibility for discriminating among firms on the basic of such routine (expected) information. They,

[5] Consistent with Cahan et al. (2016), this study relies on Tobin's Q as a proxy of firm value as it includes market's assessment of firm's future cash flow and the riskiness of those cash flow (further explained in research design).

therefore, modeled expected CSR disclosure and used the difference between actual and expected CSR disclosure (i.e. unexpected CSR disclosure) as a proxy for the informative portion of CSR disclosure. They posit and found support for their claim (positive relation with Tobin's Q) that unexpected part contains incremental information which are valued by investors. Similarly, Muslu et al. (2017) developed a disclosure score based on their narrative feature and examined the relationship between CSR disclosure scores (Low/ Medium/High) and analyst forecast accuracy. They found that CSR disclosure with high scores are associated with more accurate forecast accuracy whereas low score CSR reports are not associated with better forecasts than firms who do not issue CSR reports. This finding supports Cahan et al. (2016) assertion and suggest that it is actually "information beyond certain threshold" that has a capital market effect. Capitalizing on the findings, this study categorizes CSR disclosure quality into three levels (Low/ Medium/ High) based on a composite disclosure rank score of selected narrative dimensions: length, tone, numerical content and forward-looking content, and considers low quality disclosure as an expected level of CSR information. Therefore "low quality disclosure" act as a reference group and reports that are "above low-quality disclosure" are expected to be more informative and hence have a positive effect on firm value.

This study follows methodology suggested by Muslu et al. (2017) to measure CSR disclosure quality, however, differs in three main aspects: dictionary/wordlist adoption, calculation of CSR disclosure quality and sample selection. First, the study by Muslu et al. (2017) used adopted dictionary/wordlist: Loughran and McDonald, (2011) to measure tone, without any adjustment whereas this study expand on these wordlists by including additional word that were initially not in these dictionaries but are relevant for sustainability issues, making it more relevant to the context being studied. Similarly, the wordlist that Muslu et al. (2017) used to measure horizon content is also expanded whereas numerical wordlist remains

unchanged (process explained in Appendix 1). Second, they use both the positive tone (optimistic) and negative tone (pessimistic) as an independent construct in calculating disclosure score and considers report with higher negative news to be of better quality. Nevertheless, the process of assigning higher value to negative tone is arguable. CSR report cover multiple aspects; Environmental, Social and Governance (ESG), and provides an overview of a firms' commitment, challenge and progress under each aspect. The firm's performance for a particular year can be good in one criterion and bad on other criteria. As such, CSR report that provides both negative and positive news in a balanced way, is a neutral representation of information that overcome reporting biasness (Melloni et al., 2017). Hence, this study uses difference between positive and negative score to determine the biasness in CSR disclosure and asserts that lower the difference, better is the disclosure quality.

Similarly, readability measure like Fog/Smog Index, gives a poor result when applied to business document e.g. words like "financial", "company", "operations", "management" and "customers" that are well understood by investors are defined as complicated words according to these readability construction (Loughran and McDonald, 2014, 2016). Therefore, this study doesn't include readability measure in calculating overall disclosure score whereas Musul et al. (2017) uses readability as one of the dimensions to measure CSR disclosure quality. Moreover, disclosure length is found to better explain the understandability of firms' disclosure compared to readability index (Nazari et al., 2017; Loughran and McDonald, 2016). Since this study uses length as one of the dimensions to measure CSR disclosure quality, the exclusion of readability makes sense.

Third, this study examines German firm whereas Musul et al. (2017) examined American firms. The United States and Germany differ considerably in institutional setting, i.e. US firm operates under common law which is market oriented whereas Germany operates

under civil law which is stakeholder oriented (Verbeeten et al., 2016). These characteristics may affect the nature and the amount of disclosure and its impact on firm performance (Dhaliwal et al., 2014).

This study focuses on companies listed in Germany HDAX index for the period of six years: from year 2011 to year 2016. The sample are collected from Germany for following main reasons; active involvement of broad set of stakeholders' in firm CSR activities, voluntary CSR disclosure environment and comparability (exclusion of institutional differences across industries). The presence of strong unions (i.e. employee related groups) and independent agencies (i.e. environmental lobby group) and their involvement in corporate decision making characterizes Germany as a country with highly institutionalized collective bargaining systems, extensive provision of social welfare and employment protection (Verbeeten et al., 2016). As such although CSR reporting is completely voluntary in Germany, the firms are expected to address CSR issues (as well as their reporting) with utmost importance. Similarly, Germany has no official regulations determining how CSR reporting should be undertaken while a number of other European countries including the UK, France, Norway and the Netherlands have more specific requirements for sustainability disclosure (Dhaliwal et al., 2014). These requirements vary across different industries even within the same country, e.g. France imposes a mandatory CSR disclosure for the firms with more than 500 employees and €100 million in revenue (Morris, 2012). The commitment towards CSR activities and the way such activities are reported (however, depending on the type of industry that a firm falls under) is largely driven by these contextual factors and local condition (Matten and Moon, 2008; Maignan and Ralston, 2002). Thus, concentrating on firms that operates under a uniform context/ reporting requirement (as in German context) generate a homogenous dataset that facilitate better understanding by excluding institutional differences (difference in reporting across types on industries) (Verbeeten et al., 2016).

This study classifies CSR disclosure quality into three levels; Low, Medium and High and firms with low-quality disclosure are treated as a reference group. Next, the effect of disclosure quality on firm value in current year and subsequent year is examined, after controlling for firm specific characteristics as suggested by literature (e.g. Muslu et al., 2017; Verbeeten et al., 2016). The finding of this study shows that high-quality CSR report is statistically significant ($p < 0.05$) and is positively associated with firm value whereas medium quality CSR report too has positive impact on firms' value but at a higher significance level ($p < 0.1$). This suggest that both high and medium quality report provide better information to analyze firms' profitability and associated risk, hence have an incremental effect on firm value relative to firms issuing low quality report. This result further holds when controlled for simultaneous relationship between CSR disclosure quality and firm value using two-stage least square (2 SLS) specifications, providing validity to the findings from regression model implemented. Moreover, the effect of both: high quality and medium quality disclosure, is positive and statistically significant (at $p < 0.01$ and $p < 0.1$ respectively) in subsequent year, which supports the long-term valuation effect of CSR disclosure. The firm invest in CSR activities when they anticipate stronger future financial performance (Lys et al., 2015) and therefore the disclosure that cover both; current CSR expenditure and associated future prospects, has a greater firm value effect in lag period. Such disclosure provides investors with relevant information that enable them to judge firm's current expenses as well as understand future profitability more reliably (Chen et al., 2016; Clarkson et al., 2013).

This study contributes to sustainability accounting literature in number of ways. First, this study provides evidence on the relevance of CSR disclosure quality in a context different from traditional Canada, UK, USA settings (e.g. Cormier et al., 2009; De Klerk et al., 2015; Muslu et al., 2017). The institutional setting in Germany provides an opportunity to

investigate whether the relevance of CSR disclosure extends beyond traditional Anglo-Saxon setting (Verbeeten et al., 2016). Second, this paper enriches the stream of sustainability accounting literature that analyzes the lexical characteristics of narrative disclosure (e.g. Muslu et al., 2017; Caglio et al., 2019; Cho et al., 2010). Third, this study helps firms/managers to understand about the attributes that enhances their CSR disclosure quality; especially when the descriptive details in CSR disclosures provides firms with an opportunity to overcome information asymmetries by explaining how certain accounting number have been determined or by providing contextual information that helps in understanding firms' particular action, thereby increasing their decision-usefulness (Li, 2010). Finally, the study is equally important for analyst when preparing investment advice and for investors when making investment decision. The decision of an investor to acquire a firms' financial security depends upon the expectation about firm's future cash flows and/or its returns based on the available information (Plumlee et al., 2015; Clarkson et al., 2013). This information need can be fulfilled through voluntary disclosure such as CSR reports that provide broader, longer-horizon information than financial disclosures (Chen et al., 2016; Ramanna, 2013). In particular, given the general intuition that CSR performance can influence firms' financial performance (Orlitzky et al., 2003), disclosure that allows market participants to evaluate firms' CSR performance can have real economic consequences for the firms and its stock price (Joshi and Li, 2016; Dhaliwal et al., 2012).

The remainder of this paper is organized as follows. Section 2 provides an overview of the prior literature that explored the relationship of CSR disclosure with firm performance, discusses the theoretical framework and states the hypothesis. Section 3 provides details of data and measures of CSR disclosure quality, whereas section 4 explains the statistical model used in the analysis. Finally, Section 5 presents the empirical results and Section 6 covers the conclusion.

2. Literature Review and Hypothesis Development

2.1 Literature Review

Prior sustainability accounting research are mainly divided into three broad categories; studies that examine the capital market response to CSR disclosure, studies that analyze the relationship between CSR performance and CSR disclosure and studies that examine the factor affecting the managerial decision to disclose CSR activities (Clarkson et al., 2008). This study contributes to the first category and builds on the body of accounting literature that investigates the association between CSR reporting quality and firm performance relying on economic theory (e.g. Clarkson et al., 2013; Muslu et al., 2017; Plumlee et al., 2015; Cormier et al., 2009).

Although there is a significant amount of research on voluntary CSR disclosures and its relationship with various measures of firm performance (Du et al., 2010; Fisher and Fisher, 2017), only few sound conclusions can be drawn, except that the literature is divided and the understanding about the driver of these relationships remains inconclusive. One of the reason for indecisive result is attributed to the underlying theories used by most of the studies in this field i.e. socio - political theories v/s economic theories, which have different perspective about the impact of CSR disclosure on firm performance (Verbeeten et al., 2016; Joshi and Li, 2016). A stream of research that focuses on CSR disclosure using socio-political theories e.g. legitimacy theory and stakeholder theory, takes CSR disclosure as a function of social, political and stakeholder's pressure that a firm faces and argue that the firm reporting choices are directed toward anticipating stakeholders' reaction and influencing that perception (Reverte, 2009). In the case of poor CSR performance, because of higher political and social pressure and legitimacy threat, the firm either tries to change stakeholder perception by deflecting attention from the issue of concern and highlighting other accomplishment or tries to justify their performance and inform about the possible action

they take to improve (Cho and Patten, 2007; Verbeeten et al., 2016). This creates two different scenarios; *first*, the information under such condition may not be relevant for shareholders as it is directed towards other stakeholders and *second*, the poor performance along with the cost associated with improvement action are likely to associate with lower firm value. Therefore, the studies on sustainability disclosure that relies on socio- political theory predicts a neutral or a negative association between CSR disclosure and firm performance (Clarkson et al., 2008; Verbeeten et al., 2016).

Contrary to socio - political theories, a second stream of research that focuses on CSR disclosure using economic theories e.g. agency theory and voluntary disclosure theory, makes an assumption of rational, wealth maximizing individual operating within efficient capital market and therefore any reaction to voluntary CSR disclosure is assumed to be driven by their perceived informativeness (Clarkson et al., 2013). The additional information that are provided through voluntary reports e.g. CSR reports, enable firms to reduce information asymmetry and avoid adverse selection, generally leading to positive economic outcomes (Healy and Palepu, 2001). Market participants who do not have the relevant information about firms' operation and future liability when valuing shares will assume higher risk and therefore may require higher rate of return on investment (Dhaliwal et al., 2011). Studies on sustainability disclosure that draws on economic theory, therefore suggests a positive association between CSR report and firm value, due to incremental information, which helps investors to assess firms' risk and future return based on their CSR performance (Clarkson et al., 2013).

However, a critique of studies that relies on economic theory also has flourished in sustainability accounting literature (Muslu et al., 2017; Gao et al., 2016). Although better CSR performance can boost firms' competitiveness and their sustainability (Fisher and Fisher, 2017), as a result positively influencing firms' financial performance (Orlitzky et al.,

2003), such impact is largely contingent upon the quality of information disclosed in CSR reports (Du et al., 2010)[6].

Previous studies (e.g. Dhaliwal et al., 2011; Dhaliwal et al., 2012) that relies on economic theory to explore the relationship between CSR disclosure and capital market benefit are mainly criticized for the ways informational quality of CSR report is measured. The dependency on a dichotomous variable (i.e. absence/ presence of CSR report) to understand the effect of CSR report is crude in nature. In doing so, such studies implicitly ignore any variance in the quality of CSR report, including both a cross sectional components and an inter-temporal one (Gao et al., 2016). Such variation is important to investigate, as the quality of firms' CSR disclosure is continuously evolving (Chiu and Wang, 2015; Sethi et al., 2017). Similarly, the use of CSR reporting template i.e. GRI, (e.g. Clarkson et al., 2013) represents thematic content, however, provide firms with an opportunity to enhance their symbolic performance by being able to "tick more GRI boxes", without actually improving disclosure quality. The lack of formal national reporting regulation provides firm with higher degree of flexibility in how they carry out their CSR reporting and allows them to use these recommended guidelines in a biased way (Michelon et al., 2015). As such, they do not adequately represent the quality of information being disclosed in CSR reports (Chauvey et al., 2015). Therefore, simply the issuance of CSR reports and/or following certain reporting structure without additional informational content, does not necessarily imply better disclosure quality. Rather investors and financial analysts consider such disclosure as an obfuscation attempt and perceive it as a smoke screen for adverse performance (Melloni et al., 2017).

[6] Investors skepticism, due to lack of regulation and lack of uniform reporting standard, places a heavy burden on the firms' part to ensure that CSR disclosure is of high quality i.e. *objective* and *credible* (Sethi et al., 2015). Moreover, CSR disclosure content and the medium of communication is exclusively controlled by firm itself, allowing managers to behave opportunistically and as a result positively skew information by presenting in a manner most favorable to the firm (Du et al., 2010), in the case of inferior CSR performance.

Only if investors perceive the information provided by a company as credible, they will consider it in valuing firm. Cho et al. (2010) therefore suggests considering language and narrative tone used in CSR disclosures, in addition to their quantity and thematic content when determining the quality and evaluating the effect of such reports. It is not only the decision, to issue standalone CSR reports or to follow a specific reporting format i.e. GRI, but also the narrative quality of CSR reports (e.g. what is said and how it is said) that are equally important for market participants (Muslu et al., 2017; Michelon et al., 2015). In this vein, firms may play on information attributes, like unbiasedness and precision level, to improve its credibility and thus enhance the reliability and effectiveness of CSR reports (Cormier et al., 2009). Likewise, from investor point of view, these features are related to disclosure quality and can unveil the true motive of CSR reports; whether a firm focuses on incremental information about their CSR practice or focuses on concealing adverse CSR performance (Muslu et al., 2017).

2.2 Hypothesis Development: CSR Disclosure Quality and Firm Value

Previous studies (e.g. Nazari et al., 2017; Cho et al., 2010; Wang et al., 2018) suggests that good CSR performer can be differentiate from bad CSR performer based on the narrative features of CSR reports. The "low quality" disclosure characterized by general, qualitative and non-verifiable statements concerning firms CSR activities are associated with poor CSR performer whereas high-quality disclosure that have attributes of being specific, verifiable and forward- looking are associated with better CSR performer (Melloni et al., 2017; Muslu et al., 2017; Plumlee et al., 2015). Such disclosure attributes provide insight to the managers who need to determine about the factors that improve their CSR disclosures quality and to investors who want to understand the informational value and economic consequences of CSR disclosure (Chiu and Wang, 2015). Consistent with above arguments, this paper suggests that the linguistic characteristics of CSR report such as verbal tone,

numerical content, forward looking content and disclosure length offer the possibility of exploring variance in disclosure quality and its effect on firm value.

According to Dhaliwal et al. (2012) the length of CSR disclosure indicates higher credibility and transparency as longer report contain more information. The lengthy CSR provides an opportunity to understand organizational goals, process, risk and output in term of their effect on environmental and social welfare. This information improves the assessment of firms' risk, cost of capital and expected future cash flow, all of which are crucial inputs for firm valuation (Plumlee et al., 2015). Similarly, language used in CSR report is an important element to determine its information content. Collectively, optimistic and pessimistic tones in corporate disclosure are found to reflect firms' future performance (Melloni et al., 2017). Likewise, market participants react positively to CSR reports with quantitative content (Cormier et al., 2009) and forward-looking content (Muslu et al., 2017; Clarkson et al., 2013). This is based on the idea that quantitative items are more precise and easier to verify ex post. As a whole, CSR disclosure that uses specific language and that are represented in numerical terms which can be compared between different time periods and between different firms are considered to be of higher quality and are associated with superior CSR performance (Melloni et al., 2017).

Better CSR performance not only motivates' firm to voluntarily issue CSR reports but also encourage them to issue less complex reports (Nazari et al., 2017)[7] that cover relevant thematic items in a balanced tone (Melloni et al., 2017)[8]. By providing relevant information about various aspect of firms' operation, high-quality disclosure reduces information asymmetry between managers and investors that ultimately leads to reduction in information costs to be incurred by investors (Healy and Palepu, 2001; Clarkson et al., 2013). This in turn

[7] Size and Readability.
[8] Length, Tone, Scope and Readability.

brings benefit to firms through; lowered cost of equity and increased expected future cash flow (Plumlee et al., 2015), reduced stock price volatility and increased firm value (Cormier et al., 2009), and improved analyst forecast accuracy (Muslu et al., 2017).

The reports with unbiased tone that covers relevant content not only provide a deeper and clearer insight into firm value driver but also demonstrates clearly, why a particular CSR initiation is the right choice for firms' sustainability (Melloni et al., 2017; Nazari et al., 2017). Additionally, the use of accurate and comparable language, provides confirmation (or disconfirmation) of the firms' claim and allows comparability through time and space (Muslu et al., 2017). If such confirmation is not forthcoming, then investors may infer that managers are making misleading and confusing claims, thus resulting in a loss of firms' credibility and reputation. Given this normative potential, the report with balanced tone (Melloi et al., 2017), numerical details (Cormier et al., 2009) and outline of future plan (Hassanein et al., 2018; Clarkson et al., 2013), may signal sufficiency of corporate actions and as such can be more effective in understanding firms' response towards CSR issues.

Such corroborating detail and unbiased tone are difficult to mimic by inferior CSR performer. As a result, they will either choose to be silent on their poor CSR performance (Clarkson et al., 2008) or choose to disclose by emphasizing only on positive results (discarding negative outcome) using vague language (less quantitative details) and optimistic tone (more positive words) filled with verbal jargon (Cho et al., 2010; Muslu et al., 2017). Managers using such linguistic manipulation are motivated to decrease market response to bad news by making them costlier to analyze (Melloni et al., 2017). Consequently, investors who fail to find or understand relevant information in CSR reports, may choose to all together avoid processing the reports as they are costly and time consuming to examine (Nazari et al., 2017) or alternatively, will assume the worst-case scenario and consider as a firms' obfuscation attempt and therefore lower the stock valuation (Melloni et al., 2017).

The incremental information school of thought, which is based on efficient market hypothesis, assumes that market participants have rational expectation about future returns, which implies that, on average, the market is capable of assessing reporting bias (Merkl-Davies and Brennan, 2007). This assumption leads to an understanding that unbiased reporting would lead to improved reputation, lower cost of capital and increased firm value (Cormier et al., 2009; Plumlee et al., 2015; Muslu et al., 2017). Thus, it is argued that the comprehensible details gleaned from the narrative analysis of CSR report helps to reduce information gap and identify the true motive of the report; incremental information or impression management, as a result enhancing value for the firm with high-quality CSR reports. Summing up, CSR reports with balanced tone covering sufficient thematic content supported with numerical details and forward-looking content are considered of high-quality that influence investor assessment via reduction in uncertainty related to factors affecting firm value. This prediction is stated in the proposed hypothesis.

H - CSR Disclosure with high-quality have a positive impact upon firm value.

3. Research Design

3. 1 Sample Selection

Tables 1 provides detail about the sample used for analysis. This study focuses on 110 companies that are listed in Frankfurt Stock Exchange categorized under following index-DAX, MDAX and TecDAX. These three indexes are collectively represented under HDAX index[9]. The sample covers the data from - 2011 to 2016 in order to capture the most recent development and investigate the relationship during a time in which several progresses have occurred in CSR disclosure practice in Germany.

[9] HDAX index represents big companies within German capital market i.e. DAX: blue chip companies, MDAX: "Prime standard companies" that comply with higher transparency standards and TecDAX: large companies from technology sector. These types of firm because of their size and their economic importance are exposed to greater scrutiny with regards to their sustainability performance (Cho et al., 2012). Limiting investigation to such big companies that emphasize ("voluntarily") on sustainability issue and that are economically important is consistent with literature i.e. Cho et al. (2012), De Villers and Marques (2016).

Tables 1 - CSR Reports by Year

HDAX Index	Total Firms	Number of CSR Reports	% of Firms with CSR Reports
Panel A: Sample Composition by Year			
2011	110	60	55
2012	110	62	56
2013	110	71	65
2014	110	68	62
2015	110	78	71
2016	110	83	75

The year 2011 is considered as an initial sampling period because of two recommendation that were made in 2011 (i) The German sustainability code by The German Council for Sustainable Development (GCSD), which includes 20 criteria and 27 GRI performance indicators that describes what should be taken into account when preparing CSR reports and (ii) The two-tier system by Deutsche Borse, according to which the companies are listed according to their level of best practice in term of robust governance practices and quarterly financial reporting among other relevant issues (IRI[10] , 2014). Even though these recommendations are voluntary in nature, this study believes that CSR reporting practice by German firm is affected by this progress. Further, year 2016 is chosen as the final sampling period because German Bundestag passed CSR reporting law which is the implementation of the EU directive 2014/95/EU (targeted towards non- financial reporting, essentially, a directive on CSR reporting) and the German companies are required to report under this law starting 2017 (Saenger, 2017).

The CSR report are downloaded mainly from two sources; from companies' website and from CorporateRegister website. Further, this study considers the firm listed in selected index at the end of 2016 and only reports that are provided in English language were included in the analysis. Some company's reports are not available for the entire period and among the

[10] Initiative for Responsible Investment.

reported ones: 23 reports were published under International Integrated Reporting Framework (IIRC), 259 were issued as a stand-alone report and 197 were published along with the financial report. This study considers two types of reporting; stand-alone reports and the ones that are published along with the annual reports. Whereas, the reports that are prepared under IIRC framework are not included in the sample because such adoption takes place across institutional settings with a blend of both mandatory and voluntary regimes (Melloni et al., 2017) and thus may not serve the objective of this study. Furthermore, 19 firms' data were lost due to other missing information (e.g., unavailability of financial details). The final data set as reported in table 1 consists of 437 firm year, among which 15 reports were considered for analyzing the initial wordlist and remaining 422 reports were used for final analysis. The number of available CSR report was 60 in year 2011 that has increased to 83 in year 2016. This increase in publication of CSR report (as observed in table 1) indicate that German firms are appreciating the growing importance of CSR related news and are therefore improving the corporate informational environment. All financial details and firm specific information are downloaded from Bloomberg terminal.

3. 2 Measuring CSR Disclosure Quality

The process used to measure the quality of CSR disclosure is shown in Appendix 1. Prior studies in sustainability reporting tends to examine only one disclosure quality or textual attribute at a time e.g. Cho et al. (2010) focuses only on verbal tone, Nazari et al. (2017) focuses on narrative complexity proxied by readability and length, whereas Cormier et al. (2009) focuses on information precision. Similarly, Clarkson et al. (2013) suggests that voluntary environmental disclosure provides forward looking information, that potentially facilitate both financial performance prediction and risk analysis. Since the firm sets up a holistic disclosure policy, focusing only on one dimension may not reveal the overall quality of CSR disclosure (Muslu et al., 2017; Melloni et al., 2017). This study, therefore, considers

multiple narrative features; *length, verbal tone, numerical content and forward-looking content*, in developing a composite rank score based on which the quality of CSR disclosure is categorized into three types: Low, Medium and High.

A fundamental step in analyzing the linguistic characteristics is to transform narrative disclosure into a numerical value that represent specific dimension being measured; i.e. by counting words, sentence or sections, or by reading the whole text (Li, 2010). Among the existing methods, most widely used approach is to count the frequency of predefined list of words that represent a selected dimension and compute a score based on those frequency (Henry and Leone, 2016). This study uses words as the unit of analysis and assumes its occurrence / frequency in the report as an indicator of the subject matter's importance. Since, this study measures multiple dimension to develop a composite quality score, using an alternative measure like counting sentence (with an occurrence of a particular word in a sentence) can cause a problem of recounting, e.g. the sentence will be counted multiple times if the word representing different dimensions are in the same sentence. Hence, word count is considered to be suitable for fulfilling the requirement of this study.

The final wordlist that is used in this study is developed in three steps as suggested by Kearney and Liu (2014). *First,* two different wordlists are considered; Lourghran and McDonald (2011) wordlist to measure verbal tone and Muslu et al. (2017) wordlist to measure horizon content and numerical content. The selected wordlists are created specifically for analyzing financial text[11] and therefore this study considered them appropriate compared to alternative options like General Inquirer (GI) wordlist and DICTION (Henry and Leone, 2016). *Second,* to examine the extent to which words featured in the dictionary are used in CSR reports, an intensive text-search for a random sample of 15

[11] This study focuses on non-financial disclosure and use of such wordlist (mainly LM wordlist) is tricky in this context. However, the narrative in financial reports (i.e. Management Discussion and Analysis (MD&A) section of annual reports) are similar to CSR disclosure, as there are few standards for the narrative in these reports (Muslu et al., 2017), the use of these wordlists is argued to make sense.

CSR report narratives is conducted using Natural Language Toolkit (NLTK) program in Python software. *Third*, the "orphan words" that is not in the initial list and which occurs with a frequency of over 50 time in entire corpus is identified. These orphan words are further analyzed using concordance function in NLTK to understand the context under which it is used. i.e. the word that have negative, positive, or horizon connotation. These words are added to the dictionary to come up with the final wordlist (detail process is explained in Appendix 1). The final world list is examined for reliability and validity as explained in section 3.3.

Once the wordlist is finalized, the frequency and the ratio of each dimension is calculated using specific command in NLTK program in python. The detail process is explained under each section below.

Tone - According to incremental information school of thoughts, language is an important element to determine the information content of firms' voluntary disclosure and has a significant association with firms' financial performance (Merkl-Davies and Brennan, 2007). The firm with a weak CSR performance tends to use more optimistic (i.e. less balanced) tone in their reports (Cho et al., 2010). Therefore, considering manager's opportunistic motive to disclose only positive performance, CSR reports with a balanced tone i.e. inclusion of both negative and positive aspects in a balanced way is considered as an attribute of high-quality disclosure that reduces information asymmetry between managers and market participants. A balanced CSR report does not have any biasness in the presentation of language that is intended to change the perception (favorable or unfavorable) of the stakeholders (Melloni et al., 2017).

The tone of CSR report is measured in two steps. First, pessimistic tone, represented by PES_RATIO is calculated as the ratio of the number of financial negative words over total number of words in the report whereas optimistic tone, represented by OPT_RATIO is

calculated as the ratio of the number of financial positive words over total number of words in the report. Second, the difference between Optimistic tone and Pessimistic tone, represented by TONE_RATIO is calculated to measure the net linguistic tone (OPT_RATIO - PES_RATIO). The TONE_RATIO emphasizes the positive versus negative nature of the communication i.e., lower the score of TONE_RATIO, more balanced is the language used in the report and higher is the quality of CSR report.

Horizon Content – The market participants not only analyze firms' past activities but also requires information about firms' goals and targets to determine future cash flow and associated risk (Muslu et al., 2017). The forward-looking disclosures provide credible and useful information to market participants beyond what is strictly conveyed by historical disclosure and therefore plays an important role in assessing firm value (Hassanein et al., 2018; Clarkson et al., 2013). The horizon content is measured as the ratio of the number of references to future years plus horizon context over total number of words in the report, represented by HOR_RATIO.

Numerical Content – The numerical and quantitative information in report is not only considered credible but also understood with a stronger precision by user. Therefore, market participants reaction becomes more precise when firms' sustainability information is backed with numeric details (Muslu, et al., 2017; Plumlee et al., 2015). The numerical content is measured as the ratio of the number of Arabic numerals and quantitative words over total number of words in the report, represented by NUM_RATIO.

Length - The increased disclosure volume signifies the importance that a company attached to reported matter (Dhaliwal et al., 2011; Dhaliwal et al., 2012; Chen et al., 2016) and is suggested to be an indicator of transparency and informativeness which is associated with better economic outcomes, such as liquidity, institutional ownership and analyst following (Nazari et al., 2017; Lang and Stice-Lawrence, 2015). However, following

opposing view lengthy reports are argued to be associated with information overload, hence the use of disclosure length as a proxy for CSR disclosure quality remain equivocal in the literature (Melloni et al., 2017). In line with Muslu et al. (2017), this study argues that disclosure length if studied in isolation may act as a smokescreen for low disclosure quality, however, when accompanied with details about firms CSR performance (both positive and negative results) supported with verifiable data and future outlook, it enhances the quality of CSR reports by making it more understandable for all relevant stakeholders. The length can be computed as the natural logarithm of the number of words, the number of sentences or the number of pages of the entire report. These measures have already been successfully applied in earlier research to measure the quality of information provided in the reports and they can be easily calculated and interpreted (Loughran and McDonald, 2015). Accordingly, this study uses a natural log of the number of words in CSR reports as a measure of length.

Once the ratios are calculated for all four dimensions, these ratios are ranked into decile, with TONE_RATIO inverse ranked. Each dimension receives a decile rank between 0.1 and 1. Further, the decile ranks are aggregated into a composite score that provides the final disclosure quality score for each report, which is between 0.4 (minimum score) to 4 (maximum score). CSR reports with balanced tone, lengthy reports, more numerical content and more horizon content have higher disclosure score. Finally, this score is divided into three categories- high, medium and low, based on its median value. For e.g. if the composite score of a report is; less than median value (less than 2.3) it is categorized as low quality, between median and 75th percentile (between 2.4 to 2.6) it is categorized as medium quality and above 75th percentile (above 2.7) it is categorized as high-quality (as explained in Appendix 2).

3. 3 Reliability and Validity

The reliability test of the selected construct is done using Cronbach's alpha. It is a measure of internal consistency and reflects the homogeneity among the number of items grouped together to form a particular scale. The value of Cronbach's alpha will increase as the inter-correlation among the constructs increases, providing an internal consistency (Carmines and Zeller, 1991). For the scale used in this study, Cronbach's alpha is 74.70 %, which is above the acceptable range of 70% in social science studies.

Similarly, validity of the scale is confirmed using criterion validity, which is basically done by assessing the correlation between external criteria and a designed scale. Validity is defined as the extent to which any measuring instrument measures what it is intended to measure (Carmines and Zeller, 1991). To fulfill the objective, this study considers Bloomberg ESG disclosure score as valid external criteria against which the validity of quality scale is evaluated. The score provided by Bloomberg ESG disclosure is based on company sourced filling, which reports the degree of firms' coverage towards environmental, social and governance issues; mainly focusing on transparency (Melloni et al., 2017). The Bloomberg ESG score helps investors to evaluate the firm's risk and opportunities and therefore can proxy for CSR disclosure quality. The correlation between Bloomberg ESG disclosure and the CSR disclosure quality score developed by this study is 51. 67 % and it is statistically significant at 5 %, providing validity to the disclosure quality score.

3. 4 Regression Model

The objective of this study is to examines the association between CSR disclosure quality and the firm value and therefore in line with previous research (e.g.; Cormier et al., 2009; Nekhili et al., 2017), this study uses following regression model to understand the relationship between the interested variables:

$$TQ_{i,t} = \beta_0 + \beta_1 \ CSRReportsHigh_{i,t} + \beta_2 \ CSRReportsMedium_{i,t} + \sum \beta_n \ Controls_{i,t} + \delta \ Industry_{i,t} + \gamma \ Year_{i,t} + \varepsilon_{i,t} \text{ -- (1)}$$

Where, TQ = Tobin's Q at the end of fiscal years; CSR Reports High = High quality reports based on composite disclosure score; CSR Reports Medium = Medium quality reports based on composite disclosure score; Controls = selected firm level control variables (ROA, Firms' Size, Leverage Ratio, Sales growth, CSR performance) that are likely to drive the association between CSR disclosure quality and firm value. Moreover, the relationship between CSR disclosure quality and firm value is affected by industry membership (Muslu et al., 2017) and therefore, industry dummies are used to control for industry effect (classification based on 2 digits GICS provided by Bloomberg). Also, the year dummies are used to control for potential time effect (Verbeeten et al., 2016). To correct for cross sectional and time series dependence in the regression residuals, this study cluster standard error by firms (Cagilo et al., 2019). This study expects positive coefficient estimates of both CSR Reports High and CSR Reports Medium; that means CSR reports with higher quality have incremental positive effect on firm value compared to lower quality.

The use of Tobin's Q as a market-based measure of firm performance is pertinent to capture the impact of CSR disclosure on firm value. Tobin's Q is a suitable proxy of firms' market value because market-based measure is often taken as an assessment of reputation effects that is observed over a long period of time (Surroca et al., 2010) and Tobin's Q as a representative of market-based measure successfully capture the long-run effect of CSR activities (Cahan et al., 2016; Orlitzky, 2003). Additionally, Tobin's Q is a forward-looking measure that is based on stock market prices and can be used to compare firms across industries because it is not affected by accounting conventions (Gentry and Shen, 2010).

Consistent with previous studies (Muslu et al., 2017; Dhaliwal et al., 2014), observable firm specific characteristics are used as control variables, that are likely to drive

the association between CSR disclosure quality and firm value. The selected control variables are calculated as below: *Firm size* - (Market Capitalization) as the size of a firm is a primary factor in determining the success of a firm due to economies of scale. *Return on Assets* (Income divided by Total Assets) to control the effect (positive) of higher profitability which drives firm value. *Leverage ratio* - (Debt to Equity ratio) to control the effect (negative) of increased financial risk on firm value. *Sales Growth* – (Current year sales / Last year sales) to control the effect (positive) of growth on firm value. Moreover, the relationship between NF disclosure and firm value is affected by firms' CSR performance (Dhaliwal et al., 2014) and therefore, following previous research (Gao et al., 2016; Dhaliwal et al., 2014), this study addresses the issue by including an indicator variable; *DJSI_Member*[12], as a proxy for CSR performance. The firms for a specific year take a value of "1" if it is included in DJSI index in that particular year and "0" otherwise.

Further, if CSR disclosure contain information about the firms' current period CSR activities that are linked with firms' future performance (Lys et al., 2015; Ramanna, 2013), then the effect of such disclosure is argued to carry beyond current fiscal year. The effect of CSR disclosure quality in one-year lead period (TQ_{t+1}) is analyzed to understand the long-

[12] Dow Jones Sustainability Index: Each year Dow Jones selects firms that are industry leaders in sustainability performance for inclusion in the index (Dhaliwal et al., 2014). This study follows existing literature (Gao et al., 2016; Dhaliwal et al., 2014; Dhaliwal et al., 2012), and considers firm's inclusion in the DJSI as a measure of firms' superior CSR performance. Firms are evaluated and included in DJSI based on their performance in the following categories: Strategy, Financial, Customer and Product, Governance and Stakeholder, and Human. Hence, firms are deemed to possess higher CSR performance than those not appearing in the index (Gao et al., 2016). However, the use of DJSI index membership is not free from criticism i.e. Cho et al. (2012) reports that environmental performance scores is negatively related to membership in the DJSI and suggests that such membership to be driven more by what firms say than what they do. My study contend that such results reported by Cho et al. (2012) may be due to two specific reasons: (1) focus on firms' environmental performance only, whereas the DJSI inclusion criteria cover broader areas than mere environmental performance. (2) focus on environmentally sensitive industry: basic materials, oil and gas and utility industries. Such firms are subjected to greater scrutiny, therefore in order to manage their reputation they might engage in impression management (Melloni et al., 2017; Cho et al., 2010). As such, they might not fully represent the CSR practices and their inclusion in DJSI for other industry. The historical data of DJSI membership is downloaded from RobecoSAM website: https://www.robecosam.com/en/csa/csa-resources/dow-jones-sustainability-indices-components.html (accessed on 1st March 2019).

term valuation effect of CSR disclosure quality. This study uses following equation to analyze the relationship:

$$TQ_{i,t+1} = \beta_0 + \beta_1 \text{ CSRReportsHigh}_{i,t} + \beta_2 \text{ CSRReportsMedium}_{i,t} + \sum \beta_n \text{ Controls}_{i,t} + \delta \text{ Industry }_{i,t} + \gamma \text{ Year}_{i,t} + \varepsilon_{i,t} \text{ -- --(2)}$$

Where, the variables "t +1", represents Tobin's Q in one-year lead period. The coefficient estimates for high/medium CSR disclosure group captures the incremental effect of the CSR disclosure relative to low CSR disclosure group. Finally, Variance Inflator Factor (VIF) test is performed to assess whether the result from regression model is affected by multicollinearity. The VIF value in excess of 10 is taken as an indication of multicollinearity, the presence of which signals biased coefficient estimates (Neter et al., 1996).

3. 5 Endogeneity

There is a possibility that the estimate from above regression equation 1, might suffer from endogeneity bias due to reverse causality. On the one hand, CSR disclosure quality (narrative features) explain the variation in firm performance (Caglio et al., 2019; Plumlee et al., 2015) and on the other hand, CSR disclosure quality (narrative features) systematically depends on firm performance (Melloni et al., 2017). This leads to simultaneity bias and if this is not taken into consideration in the estimation procedure, the regression will produce biased parameter estimates (Tobin, 1958). To control for the endogeneity problem, simultaneous equation model (2 SLS) is used as explained below.

This study considers two variables; reports following GRI guideline and GRI application level check as instrumental variables (IV). The GRI reporting framework is widely acknowledged as a proxy of quality CSR reporting (Clarkson et al., 2008; Clarkson et al., 2013) and the GRI application level check reconfirms the firms claim about the application of GRI's framework in their report (GRI, 2017). These variables in combination ensures the quality of CSR report (GRI, 2017), which on later stage affect the firm value

(GRI may improves CSR disclosure quality which in turn improve firm value)[13]. Hence, are regarded as an appropriate instrumental variable for analysis. Both these variables are collected from Blomberg terminal, where the reports are represented by categorical variable, "1" for following GRI guideline and "0" for not following the GRI guideline. Similarly, GRI application level check[14] is represented by categorical variable, "1" for check and "0" for not check.

In the first stage, instrument variables along with the control variables act as explanatory variables for disclosure quality (Low/Medium/High) represented by $\widehat{QUALITY_SCORE}$ and in the second stage, $\widehat{QUALITY_SCORE}$ is included in the equation as an explanatory variable.

First stage equation-

$$\widehat{\text{QUALITY_SCORE}}_{it} = \beta_0 + \beta_1 \text{ GRI Guidelines}_{it} + \beta_2 \text{ GRI level check C}_{it} + \sum \beta_n \text{ Controls}_{it} + \delta \text{ Industry} + \gamma \text{ Year} + \varepsilon_{it} \text{ ------ (3)}$$

Second stage equation-

$$\text{TQ}_{it} = \beta_0 + \beta_1 \widehat{\text{QUALITY_SCORE}}_{it} + \sum \beta_n \text{ Controls}_{it} + \delta \text{ Industry} + \gamma \text{ Year} + \varepsilon_{it} \text{ -- (4)}$$

Where, all the variables are similar as explained in equation (1). The $\widehat{QUALITY_SCORE}$ from equation (3) is used in equation (4).

[13] In order to verify such expectation, this study conducts two different tests (untabulated results). (1) When "GRI Guidelines" is added as an additional control in the main regression (regression 1), all the results remain unchanged whereas "GRI Guidelines" is statistically insignificant. (2) When "GRI Guidelines" is applied as an explanatory variable with CSR disclosure quality as a dependent variable using glm model, it has positive and statistically significant effect upon CSR disclosure quality. As such, this study projects that GRI Guideline affect firm value through its effect on CSR disclosure quality, hence act as an instrumental variable.

[14] Although different application level is available under GRI, such analysis is beyond the scope of this study.

4. Empirical Results

4. 1 Descriptive Statistics and Correlation Matrix

Table 2 presents descriptive statistics of the components that are used for computing CSR disclosure quality along with the descriptive statistics of dependent and control variables.

Table 2 - Descriptive Statistics of Narrative Dimensions and Other Variables

Aspect of CSR Disclosure Quality	N	Mean	St. Dev.	Min	Max
Length	422	15672.1	17491.8	51	101157
POS_Ratio	422	7.0	1.6	0.9	17.4
NEG_Ratio	422	2.7	0.8	0.0	5.9
Log_length	422	3.9	0.5	1.7	5.0
TONE_Ratio	422	4.3	1.6	0.0	14.9
HOR_Ratio	422	2.0	0.5	0.0	3.9
NUM_Ratio	422	10.9	4.7	1.6	27.6
Dependent Variables	N	Mean	St. Dev.	Min	Max
Tobin's Q	422	1.63	1.11	0.78	10.15
Control Variables					
Return on Assets	422	4.59	5.50	-14.67	30.62
Firm Size	422	13502.20	18687.98	143.67	92838.93
Leverage Ratio	422	87.11	173.82	0.00	1,853.50
Sales Growth	422	5.90	16.37	-62.28	120.67

The length of CSR reports proxied by wordcount has a minimum value of 51 and maximum value of 101157. These values indicate that variation exists in firms' decision to disclose sustainability news that can ultimately lead to difference in the quality of CSR report (Muslu et al., 2017). The length is calculated to understand the difference in the report volume and finally, the log_length is used in calculating the report quality. Similarly, average POS_Ratio (mean value of 7) is higher than NEG_Ratio (mean value of 2.7), which is consistent with firms' optimism in CSR reports under voluntary disclosure environment (Cho et al., 2010). It is well established that presenting information in positive terms is more favorable evaluation than does presenting information in negative terms and therefore the

firm emphasizes their positive CSR performance more than the negative ones (Muslu et al., 2017; Loughran and McDonald, 2011). However, the higher inclination toward the use of optimistic tone may increase information asymmetry between firm and market participation, as a result decreasing the usefulness and credibility of such reports. In addition, NUM_Ratio (mean value of 10.9) and HOR_Ratio (mean value of 2) suggests that German firms frequently use numerical and forward-looking content in CSR reports. This practice mitigates an external audience's tendency to discount the credibility of discretionary disclosure (Cormier et al., 2009). Further, such attributes send a positive signal to market participants and assist them in differentiating firms based on their CSR performance (Muslu et al., 2017). Finally, the descriptive statistics of continuous variables (control) shows that the sample includes firms with diverse feature: size, profitability, growth and risk profile. These features may induce varied effect on firm's value as a result helping to isolate the clear impact of CSR disclosure quality on firm value. Similarly, 95 firm-year observations were found to be included in the DJSI index based on their superior CSR performance during the sample period (untabulated).

Table 3 reports the correlation coefficient of the narrative dimensions that are used to determine the quality of CSR disclosure (in Panel A) and of continuous variables that are used in regression (in Panel B). *, **, *** show statistical significance at 10%, 5% and 1% levels respectively. All the correlation coefficient between the dimensions of CSR disclosure are statistically significant at 5%, with the exception of the correlation between Log_length and Hor_Ratio which is not significant. The Log_length of CSR report is negatively correlated with TONE_Ratio whereas positively with NUM_Ratio. It signifies that as the length of report increases the German firm uses balanced tone and provides more numerical detail in their CSR reports. The result is consistent with Melloni et al. (2016) according to whom, shorter report tends to be more optimistic with lesser forward-looking details.

Similarly, TONE_Ratio is negatively correlated with NUM_Ratio; indicating that the report with balanced tone uses more numerical details to support their reports. This not only improves the understandability of the disclosed information but also enhances the trustworthiness of such reports from investors point of view (Muslu et al., 2017). Further, the positive correlation between TONE_Ratio and HOR_Ratio may suggest that the firm uses more positively inclined details to express their future projects and expectations whereas the negative correlation between HOR_Ratio and NUM_Ratio may suggest that the firms replace numerical content and horizon content with each other. Finally, the correlation coefficients for the continues variables (Panel B) are statistically insignificant, hence indicating no multicollinearity[15] issues with the variables included in the model used by this study.

Table 3 – Correlation Matrix

Panel A - Correlation among the Dimensions of CSR Disclosure Quality

Variables	Log_length	TONE_Ratio	HOR_Ratio	NUM_Ratio
Log_length	1			
TONE_Ratio	-.303**	1		
HOR_Ratio	-.029	.387**	1	
NUM_Ratio	.182**	-.351**	-.259**	1

Panel B- Correlation Matrix for Continuous Variables

Variables	Tobin's Q	Return on Assets	Firm Size	Leverage Ratio	Sales Growth
Tobin's Q	1				
Return on Assets	0.720	1			
Firm Size	-0.120	-0.060	1		
Leverage Ratio	-0.170	-0.170	-0.010	1	
Sales Growth	0.130	0.230	-0.040	-0.040	1

4. 2 Regression Results

Table 4 reports the result of specified model (equation 1 and equation 2), after standard errors are adjusted by clustering firms. The high-quality CSR report is statistically

[15] Further confirmed with Variance Inflator Factor (VIF), where the VIF value above 10 is considered an indication of multicollinearity. In the case of this study, the largest VIF value is 2.09 for Model 1 and 2.15 for Model 2, so multicollinearity among the variables is not a problem.

significant at 5% and positively affect firm value whereas medium quality reports is statistically significant only at 10% in contemporaneous year. Similarly, the effect of high-quality CSR report is statistically significant at 1% whereas medium quality reports is statistically significant only at 10% in subsequent year. Moreover, the magnitude of effect is much higher (coefficient value) in one-year future period firm value.

Table 4 – Regression Result

	Dependent Variable:	
	Tobin's Q (Model 1)	Tobin's Q_{t+1} (Model 2)
CSR_Reports High	0.033^{**}	0.074^{***}
	p = 0.044	p = 0.002
CSR_Reports Medium	0.025^{*}	0.044^{*}
	p = 0.084	p = 0.084
ROA	0.013^{***}	- 0.003
	p = 0.0002	p = 0.648
Firm_Size	0.00002^{**}	0.0002
	p = 0.042	p = 0.598
Leverage_Ratio	0.0003^{***}	0.0003^{*}
	p = 0.0002	p = 0.073
Sales_Growth	0.001	0.0005
	p = 0.222	p = 0.514
DJSI_Member	0.002	$- 0.036^{*}$
	p = 0.901	p = 0.060
Industry effect	Yes	Yes
Year effect	Yes	Yes
R^2	35.80 %	13.10 %
Adjusted R^2	15.30 %	0.0 %
Observations	422	331

Note: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

The significance levels are based on robust standard errors.

The effect of control variable in model 1 are generally consistent with existing literature except the coefficient for sales growth and DJSI membership which are statistically insignificant. Likewise, none of the control variables are statistically significant in model 2 except leverage ratio and DJSI membership that are significant at 10%. It is again in line with literature that suggests lack of association with firm value in a lead period. The VIF test shows an absence of multicollinearity in both regression; the largest VIF equals to 2.09 in

first model and 2.15 in second model. This result shed light on the fact that multicollinearity is not influencing the regression results.

The overall finding supports the stated hypothesis and is consistent with theoretical expectation of this study. The association of high-quality CSR disclosure with firm value indicates that CSR reports with greater emphasis on length of report, numerical content, forward-looking content and unbiased tone are considered credible and provide additional information which is not readily available from other sources to assess possible strategic advantages and CSR related risks (De Klerk et al., 2015). The finding is consistent with Plumlee et al. (2015), Cormier et al. (2009) that suggests the positive association between CSR disclosure quality and firm value. The investor's decision to buy/hold/sell depends upon their expectation about firms' future cash flow, cost of capital and/or its returns. These expectations are mainly based on the transparency and credibility of available information. On the one hand, incremental information content in high-quality report reduces uncertainty surrounding firms' future performance, that helps investor in determining their expectation about firms' future cash flow. On the other hand, incremental information content increases stock liquidity which in return reduces the rate of return required by investor. This joint outcome positively influences firm value (Plumlee et al., 2013). The result is also consistent with Muslu et al. (2017) that highlights the importance of narrative disclosure for market participants, asserting that CSR disclosure with better narrative details improves analyst forecast.

Additionally, the result shows that medium quality report has positive effect on firm value but at a higher significance level ($p < 0.1$), suggesting that medium quality reports should be used cautiously. This may be because of the methodology this study uses to measure CSR disclosure quality. Although CSR reports improvs corporate informational environment (Clarskon et al., 2013), many of them are focused only on certain attribute

leaving investors with significant information gap (Melloni et al., 2017; Dilling, 2016). The investor may consider all above mentioned narrative dimensions*; length, tone, numerical content, forward-looking content*, to be relevant in investment decision and doesn't take only one disclosure feature in isolation (Muslu et al., 2017; Melloni et al., 2017). In this study, medium quality is by default assigned to the reports that provide mixed quality information in different dimension e.g. a firm may provide report with balance tone but may not provide supporting quantitative details, as such the report score is high in one dimension (tone) but is low in other dimension (numerical content). Hence, the medium quality reports may not fulfill the information need and therefore investor may choose to lower its importance when processing it. This is consistent with Dilling (2016) according to whom, only certain aspects of sustainability information are reported extensively in CSR reports whereas supporting data and figures are not provided sufficiently which eventually affect corporate informational environment and thus firm value.

Similarly, the effect of both: high-quality and medium quality CSR disclosure, are statistically significant ($p < 0.01$ and $p < 0.1$ respectively) and has greater coefficient value in subsequent fiscal year. This may be because companies with better CSR report expect strong future performance and investors may infer insider private information about firms' future financial prospects through such reports (Lys et al., 2015). In order to attend the need of certain stakeholders, managers typically have to incur expenses in current period that have adverse effect on current years' firm profitability. However, such expenses may signal a greater cash flow in future period. For e.g. firm that invest in R&D might lower the profit in current year, but it might result in substantial increased in profitability in the future (Garcia-Castro et al., 2011). This finding suggests that market participant appreciates the firms' effort to communicate information on their firms' future prospects. Even though investor demands for additional information regarding change in the business environment and its long run

impact, most mandatory financial reports will neither address the long-term challenges and opportunities that company faces on environment and social issues nor will they explain the relevant strategy and commitment in detail (KPMG, 2017). Under such condition, the narrative in CSR disclosure facilitate investors and other important stakeholders to gauge firms' future risk and performance, which the company may have downplayed or ignored in their annual financial disclosures.

5. Additional Analysis

This study also carried out some additional analysis (untabulated), using alternative measures of CSR disclosure quality. Consistent with Muslu et al. (2017), first this study uses continuous measure of disclosure score (composite decile rank score) rather than low, medium and high category and finds that the main result (association between CSR disclosure quality and firm value) remains unchanged: positive and statistically significant (however at 10%). Second, when analyzing each narrative dimension (length, tone, numerical and horizon content), this study finds that only "Tone High" and "Horizon High" are statistically significant and have positive effect on firm value. Consistent with Muslu et al. (2017), the individual components of disclosure dimensions do not appear to affect firm value as much as the categories developed through composite disclosure score. This strengthen the argument of aggregating disclosure score to be more informative[16].

Further, as discussed earlier (part 4.2), existing literature in sustainability accounting suggests about the possibility of omitted variable bias and/or reverse causality between firms' financial performance and CSR disclosure quality, that might cause regression model to

[16] Similarly, existing literature (i.e. Cormier et al., 2009; Hassanein et al., 2018), argue that quantitative details and forward-looking information improves forecast precision and are more likely to enhance informational environment compared to qualitative information i.e. length and tone. Hence this study combines two narrative dimensions: numerical content and forward-looking contend to represent "hard information" whereas combines tone and length to represent "soft information". The findings (untabulated) suggest that hard information positively affect firm value and are statically significant: High category at 5% and Medium at 10% (exactly at 5%), whereas soft information is statistically insignificant.

produce biased parameter estimates. Even though, CSR disclosure has its distinct determinants and consequences and this study control for relevant factors that might distorted the relationship between CSR disclosure quality and firm value, it still might be the case that the suggested model provides bias results (Dhaliwal et al., 2012). In order to get the robust output, this study uses simultaneous equation model (2 SLS) with appropriate instrumental variables (explained in part 4.2). The absence/ presence of simultaneity is confirmed using Wu-Hausman test, according to which the endogeneity problem exists if the test result is statistically significant: if $p < 0.05$ (Elshandidy et al., 2013). Using 2 SLS process (untabulated results), this study failed to reject the null hypothesis (Wu- Hausman test: $p > 0.10$), which suggest that there is no endogeneity problem between CSR disclosure quality and firm value.

6. Discussion and Conclusion

This study contributes to the literature on sustainability accounting that has long been interested in understanding the factors that affect the credibility and consequences of voluntary CSR report on firm performance. Following the suggestion and building on the argument from relevant research (e.g. Muslu et al., 2017; Melloni et al., 2017; Plumlee et al., 2015; Cormier et al., 2009) this study investigates whether capital market benefit is a result of better CSR narrative quality in addition to the presence of CSR reports.

In contrast with prior research (e.g. Plumlee et al., 2015; Cho et al., 2010; Dhaliwal et al., 2011, 2014), the focus of this study is not limited to environmental disclosure or standalone CSR reports rather it considers sustainability reports covering multiple as well as particular aspect of CSR activities i.e. environmental, social and governance aspects, and that are published either as a standalone report or along with annual reports. Similarly, given the firms' holistic disclosure policy (that encourages improvement on multiple narrative dimensions), focusing only on one particular linguistic feature may not capture the overall

CSR disclosure quality (as done by previous studies e.g. Cho et al., 2010; Nazari et al., 2017; Cormier et al., 2009). This study, therefore, tries to address and overcome the limitation by incorporating multiple narrative features to understand the quality of CSR reports i.e. *length, tone, numerical content and horizon content*.

Regarding the relationship between CSR disclosure quality and firm value, the findings of this study is in line with incremental information argument empirically confirmed by previous studies (e.g. Clarkson et al., 2013; Plumlee et al., 2015; Muslu et al., 2017; Cormier et al., 2009). The result is further validated through 2SLS methodology which confirm that it is unlikely to be confounded by endogeneity. In particular, market participant tends to take cue from high-quality CSR report and use it in analyzing firm value. The result suggests that narrative details can tease out the required information from firms' disclosure and contextualize them in ways that assist the user in predicting firms' future performance. The findings are also in line with the argument laid by Merkl-Davies and Brennan (2007), according to whom the quality of narrative disclosure helps to overcome information asymmetries between firm insiders and outsiders which ultimately lowers the cost of capital, improves cash flow and thereby enhances firm value.

This study tries to rationalize the debate over the usefulness of narrative disclosure practice to various stakeholders. The findings of this study have practical implication for investors, accounting standard setters, regulators, executives as well as other stakeholders. The empirical evidence suggests that linguistics feature provides relevant information which can assist investors to distinguish between good and bad CSR performer and thus make better investment decision. It can further help other stakeholders to identify and be cautious about firms obfuscating attempt when the report focuses only on positive result and/or suspect firms' CSR claim when the reports are not clear and difficult to interpret (Merkl-Davies and Brennan, 2007). Similarly, the finding can encourage firms with good CSR performance to

publish sustainability reports with better narrative quality i.e. covering relevant topics, informing both positive and negative performances using balanced tone and providing numerical and forward-looking detail, that helps to improve its information content and consequently, enhance firm value. Moreover, the result shows that the valuation effect of disclosure quality is not only present in current period but also carries to future period, therefore committing for a long- term disclosure strategy may help firms in enhancing transparency and maintaining its credibility. Additionally, the result signals to the regulators about the necessity of providing guidance with more explicit standard and/ or regulating the narrative of CSR report that can create an environment which increase difficulties for window dressing firms to manipulate information and provide less ambiguous reports (Wang et al., 2018).

This study is not free of drawbacks and has some limitations. First, the CSR disclosure quality measured in this study is based on dictionary-based approach that can be readily applied on larger samples with lower risk of subjective evaluations, nevertheless, this measure could introduce noise (Muslu et al., 2017; Li, 2010). Although, the decile ranking method used in this study can mitigate the potential noise in measurement and enables a meaningful aggregation across the selected dimensions of the CSR disclosure (Muslu et al., 2017), the result should be used cautiously. Second, the textual analysis is an emerging area in accounting and finance, and, as a result, the corresponding taxonomies are still somewhat imprecise (Loughran and McDonald, 2016). Even though considerable attention has been given to categorize and contextualize the wordlist (Appendix 1), this study believes that there is still a room for improvement and subsequent studies may refine these linguistic measures that can be appropriate for analyzing CSR disclosure quality. Third, although the impact of overall CSR disclosure is analyzed in this study, there might be varied effect of specific types of CSR information i.e. environmental, social, and governance (Verbeeten et al., 2016),

therefore future researcher might gain a valuable insight by analyzing the kind of language used under each CSR topics. Fourth, some of the financial variables were not available for all firms covering entire sample period and therefore these firms were dropped. This reduced the sample size that might have effect on result. Finally, since the sample is from one country, this may affect the generalization of findings.

Nevertheless, this study is a good attempt to go beyond traditional measures of CSR disclosure quality focusing on linguistic construct of CSR report, which influences investors' perception through credibility and trustworthiness of the details provided in the report. In line with Muslu et al. (2017), Plumlee et al. (2015) the result of this study highlights the benefit of parsing broader measure (of CSR disclosure quality) rather than relying on crude proxies such as absence/presence of CSR report, when analyzing its impact on firm value. Similarly, if the CSR disclosure quality is measured by aggregating various dimensions of narrative disclosure, it should be carefully selected noting the importance of non-linearity as well as aggregation of the chosen dimensions (Muslu et al., 2017). This study considers four individual components to compute CSR disclosure quality and future studies can refine this measure by either adding or removing aspects of CSR report narrative and/or refine the linguistic measure appreciating the non-linearity characteristics. Additionally, future research could also investigate the impact of CSR disclosure narrative on different stakeholders.

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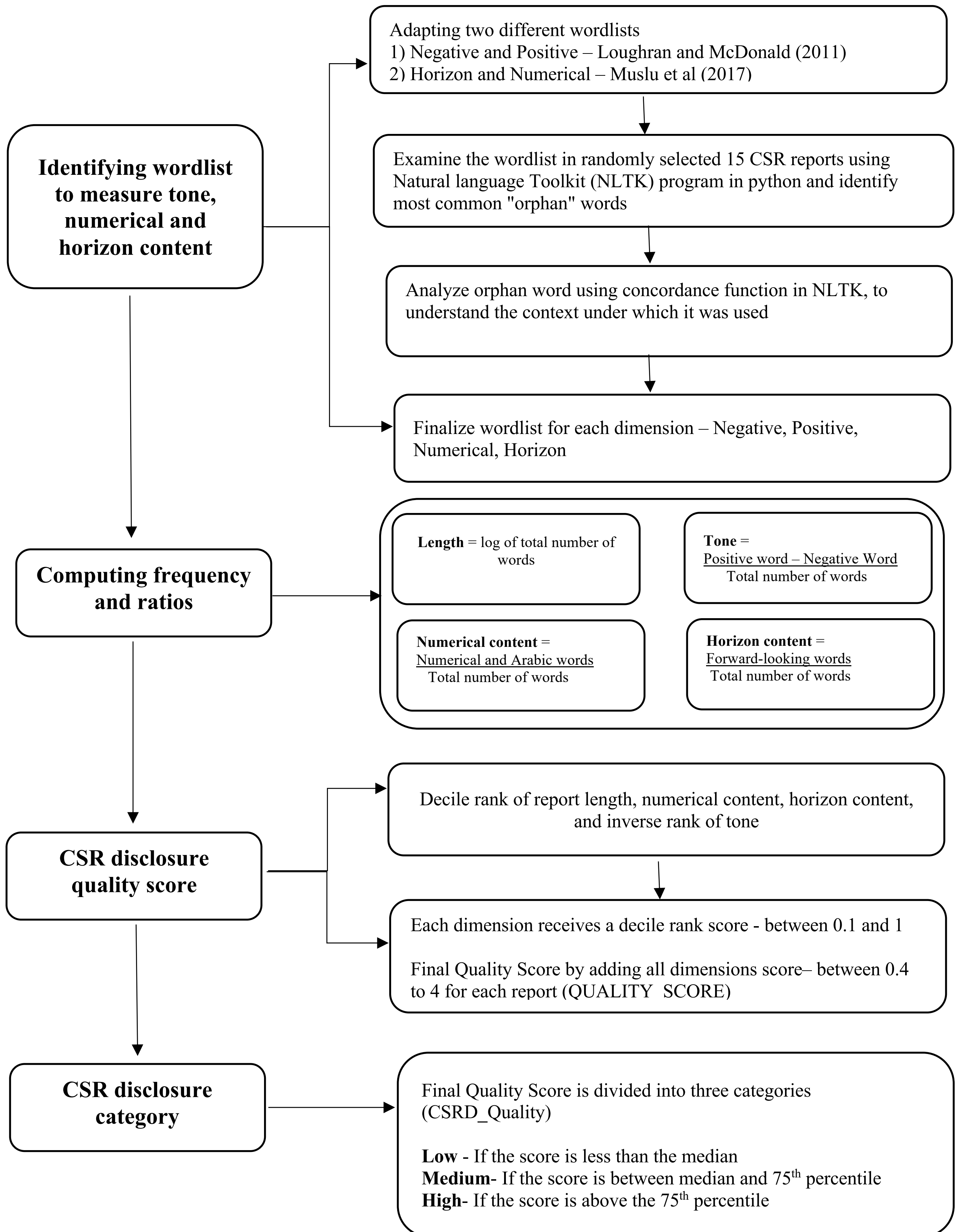
Appendix- 1 – Construction of wordlist and CSR disclosure categorization process



Appendix 2- Categorization Example

Firms	Year	Decile rank LENGTH	Inverse decile rank TONE_RATIO	Decile rank HOR_RATIO	Decile rank NUM_RATIO	Quality SCORE	Disclosure CATEGORY
Adidas	2011	0.7	0.1	0.9	1	2.7	**HIGH**
Adidas	2012	0.8	0.2	1	1	3	**HIGH**
Allianz	2013	0.5	1	1	0.1	2.6	**MEDIUM**
Allianz	2014	0.9	0.6	0.6	0.4	2.5	**MEDIUM**
AXEL Springer	2011	1	0.5	0.2	0.3	2	**LOW**
AXEL Springer	2013	1	0.7	0.1	0.3	2.1	**LOW**

Appendix 3 – Variable Definitions

Dependent Variable	
Tobin's Q	Market value of common equity plus book value of preferred stock, plus book value of long-term debt and current liabilities, scaled by book value of total assets.
Independent Variables	
CSR Reports High	High quality reports based on composite disclosure score (Appendix 1 and 2).
CSR Reports Medium	Medium quality reports based on composite disclosure score (Appendix 1 and 2).
Control Variables	
ROA	Net Income divided by Total Assets.
Firm_Size	Market Capitalization.
Leverage	Debt to Equity Ratio.
Sales_Growth	Current year sales divided by Last year sale.
DJSI_Member	Indicator variable coded "1" for the firm that are included in DJSI index for a particular year and "0" otherwise.
Industry	Industry classification based on two-digit GICS provided by Bloomberg.
Year	Year dummies (2011-2016).

PAPER 2: THE ROLE OF CORPORATE GOVERNANCE IN IMPROVING CORPORATE SOCIAL RESPONSIBILITY (CSR) DISCLOSURE QUALITY

1. Introduction

With the growth of public awareness and interest of broad spectrum of stakeholders towards sustainability issues, firms increasingly rely on Corporate Social Responsibility (CSR) disclosure[1] to address the demand for accountability and transparency (Rupley et al., 2012; Gao et al., 2016). The international institutions like Global Corporate Governance, Organization for Economic Co-operation and Development (OECD), Guideline for MNEs, the International Labor Organization (ILO) as well as institution investors such as Aviva, Hermes and California Public Employees' Retirement System (CalPERS) call on businesses to take responsibility for their adherence to a high standard of corporate behavior and ethics by incorporating social and environmental responsibilities in their core decision making process and also encourages to provide details about their participation and performance on such activities (Mallin et al., 2013; Fortanier et al., 2011). Furthermore, the emphasis on transparency is evident with the implementation of Directive 2014/95 EU[2], according to which, all publicly listed firm in European countries should comply with the directive from 2017 onwards and report their non-financial activities including environmental impact, social and employee matters, respect for human rights, and anti-corruption and bribery matters (La Torre et al., 2018).

The firms' response to such call for sustainability initiatives and its effective communication not only generate favorable stakeholder attitude and better support for them (e.g. customers' preference, seeking employment, investor attraction) but also improve corporate reputation and

[1] The corporate social responsibility disclosure are identified by different names in literature and may cover only a part or the entire CSR activities; CSR reports (Chen et al., 2016), accountability report (Ramanna, 2013), sustainability report (Simnett et al., 2009b), environmental disclosure (Cho et al., 2010) and responsibility report (CorporateRegister, 2008). These terms are considered equivalent and used interchangeably in the literature.
[2] Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU regards disclosure of non-financial and diversity information by certain large undertakings and groups, Official Journal of the European Union No. L 330. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0095&from=EN (accessed on 25th Jan 2019).

enhance stakeholder advocacy behaviors (Malik, 2015; Du et al., 2010). Moreover, CSR reporting can mitigate potential adverse regulatory pressures, and leave the firm better placed to take advantage of future business opportunities (Chiu and Wang, 2015). Nonetheless, except few mandatory disclosures about a specific aspect of CSR practices (e.g. environmental liabilities and/or social impact) in some countries[3], CSR reporting remains largely voluntary and unregulated (Kolk, 2008; Rupley et al., 2012). As such, the ultimate decision to whether or how much to disclose and what to disclose is influenced by the choices, motives and values of those who are involved in decision making and monitoring process in a firm (Khan et al., 2013; Rupley et al., 2012; Jizi et al., 2014). Therefore, corporate governance (CG) mechanism can be an important determinant of CSR disclosure quality.

However, despite the influential role that CG mechanism can play on firms' sustainability practice, they are consistently denounced for the way it operates to enhance firms' legitimacy as opposed of being a driver of proactive sustainability activities (Peters and Romi, 2014). Prior studies (e.g. Peters and Romi, 2014; Rodrigue et al., 2013; Perez-Batres et al., 2012; Rupley et al., 2012) suggest that the effectiveness of CG mechanism is largely restricted due to their limited expertise on sustainability topics and/or possible compromise on their independence.

This paper acknowledges the gap and relies on stakeholder theory to investigate the impact of external[4] CG dimensions*; UNGC[5] participation, institutional investor, CSR assurance and type of CSR assurer,* on CSR disclosure quality. These CG dimensions are of particular interest because of two main reasons. *First*, despite the importance and value addition role they play in sustainability reporting (Rasche and Waddock, 2014; Ryan and Schneider, 2002; Pflugrath et al., 2011), relevant

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[3] CSR reporting is mandatory for the public corporation and Pension funds in countries like Sweden, Norway, Denmark, the Netherlands, France, Australia (Dhaliwal et al., 2014).
[4] The selected corporate governance dimensions are considered as external following Gillan (2006). This study provides a comprehensive list of stakeholders who have the potential to limit managerial discretion; not limiting to the governing role of the board members, shareholders, debtholder, but also considering the role of customers, suppliers, employees, politics, culture and community.
[5] United Nations Global Compact

literature provides contrasting result (e.g. Sethi and Schepers, 2014; Rupley et al., 2012; Cormier et al., 2005; Wong and Millington, 2014). The inconsistent findings have fostered an interest in further investigating the relationship between these CG mechanisms and CSR disclosure quality.

Second, these external governance participants because of their subject specific knowledge and their independence, are well positioned to conduct monitoring and advisory role[6] in an efficient manner (Gillan, 2006). Additionally, the concern to maintain their own reputation may encourage them to take an active stance in improving firms' CSR disclosure quality (Peters and Romi, 2014; Michelon et al., 2015). As such these CG mechanism focuses on disclosure aspects which not only provide an opportunity for firms to effectively convey their sustainability activities[7] but also facilitate a condition that assist relevant stakeholder in more precisely understanding the organizational attitude and performance related to sustainability issues.

Provided that specific textual attribute of voluntary disclosure serves the purpose[8] (Merkl-Davies and Brennan, 2007; Li, 2010), CG mechanism can play an important role in determining the quality of CSR disclosure. Relevant literature also suggests that UNGC participation (Rasche et al., 2012; GRI 2013b), institutional investors (Iatridis, 2013), CSR assurance and assurer affiliation i.e. Big 4 accounting firms (Pflugrath et al., 2011; Velte and Stawinoga, 2017) encourage on the presentation and transparency of sustainability information: balance (not focusing only on positive achievements), forward-looking (provide information about the plans and expectations), length and accuracy (sufficient information supported with quantitative details). However, to the best of my

[6] The monitoring act requires CG mechanism to play a watchdog role which helps in aligning the firms reporting interest with relevant stakeholder need whereas advisory role includes the use of CG participants' expert knowledge to counsel firms in establishing meaningful disclosure strategies (Peters and Romi, 2014; Williams, 2014).

[7] Although these specific CG (mainly UNGC and Assurance) are meant to identify weakness and recommend improvement in CSR reporting, they are voluntary in nature and the real effect is contingent upon how formal CG mechanism (defined by company bylaws) considers their opinion and encourage management to act upon such recommendation. Hence, the specific monitoring and advisory roles of such practices is believed to complement formal CG mechanism when improving firms' CSR disclosure (Peters and Romi, 2014; Rodrigue et al., 2013; Perez-Batres et al., 2012).

[8] On the one hand, Melloni et al. (2017), Nazari et al., (2017) suggests that disclosure with high quality narrative help companies to effectively communicate their CSR activities and on the other hand, Muslu et al. (2017), Plumlee et al. (2015) finds that the investors' understanding (one of the major stakeholder) about firm CSR activities improve when the narrative content of CSR disclosure is of high quality.

knowledge, none of the existing studies has examined the impact of these CG dimensions on the narrative content of CSR disclosure. This study therefore performs a rigorous analysis of linguistic features[9] of CSR disclosure and tries to explore its relationship with external CG mechanism. Analogous to recent studies (e.g. Peters and Romi, 2014; Michelon and Parbonetti, 2012), this paper relies on stakeholder theory and argue that efficient CG mechanism enhances firm- stakeholder relationship by strategically fostering corporate sustainability and its reporting. Under this approach, high-quality CSR disclosure is considered as an outcome of a firm's sense of accountability toward various stakeholders and driven by a genuine interest in enhancing transparency.

This study focuses on companies listed in Germany HDAX index for the period of six years: 2011 to 2016. The sample is collected from Germany mainly for following reasons; voluntary CSR disclosure environment, active involvement of broad set of stakeholders in firms' operation and stakeholder friendly institutional settings (Cormier et al., 2005). CSR reporting is completely voluntary in Germany and there is no official regulation determining the way in which the reporting of CSR activities should be conducted. However, given the authority of union (i.e. employee related group) and the influence of independent agencies (i.e. environmental lobby group), the German context highlight stakeholders' sensitiveness toward CSR issues (Verbeeten et al., 2016). Additionally, Germany being a code law country, it carefully delineates the rights and obligation of economic agents (Cormier et al., 2005). Since, complimentary monitoring mechanisms along with country's stakeholder orientation act as an important determinant of CSR disclosure quality (Dhaliwal et al., 2014; Cormier et al., 2005), German firms with these external CG mechanisms; *UNGC participation, higher proportion of institutional investor and CSR assurance*, are expected to

[9] A common feature of sustainability accounting literature is their reliance on the use of report quantity (absence/ presence of standalone CSR report) or the use of CSR reporting guideline (Global Reporting Initiative) as a proxy for CSR disclosure quality. These measures are crude in nature and therefore fails to adequately capture any variance in the quality of CSR disclosure (Gao et al., 2016; Plumlee et al., 2015). Such measurement error may be a major cause for "mix result" in sustainability literature (Fisher and Fisher, 2017; Malik, 2015). Since decomposing CSR reports based on its linguistic feature allow to more accurately measure its informational content (Muslu et al., 2017; Melloni et al., 2017), this may help to gain a better understanding about the relationship between CG mechanism and CSR disclosure quality.

issue a higher quality and more comprehensive CSR disclosure. On contrary, Volkswagen (VW) emissions scandal (which occurred during the sample period)[10], presents a case of misguided representation of firms' CSR performance even in the presence of well-structured CG mechanism (Berthoin Antal et al., 2009)[11]. The efficacy of corporate governance mechanisms, therefore, can be doubted. Germany thus offer a unique opportunity to investigate the relationship between CG mechanism and CSR disclosure quality.

Following the methodology suggested by Muslu et al. (2017), this study examines the linguistic features of the CSR reports; *length[12], verbal tone, numerical content and forward-looking content[13],* and develop a composite score to determine its quality. Based on the composite score, CSR reports are categorized into three quality levels; low, medium and high and firms with low-quality disclosure are treated as a reference group. As the dependent variable indicates levels of disclosure quality in an ordered form, an ordered logit model is used to understand the hypothesized relationship. Next, the effect of selected CG dimensions; *UNGC participation, institutional investor, CSR assurance and type of CSR assurer,* on CSR disclosure quality is examined, after controlling for firm-specific characteristics as suggested by the literature.

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[10] Germany has maintained high standards for many years in assuring good product quality, better employment and working conditions, workers' involvement and environmental protection. Despite the voluntary nature of CSR activities, socially responsible practices were expected, and these expectations were generally met in German context (Berthoin Antal et al., 2009). However, VW was found falsifying CSR reports when disclosing the environmental impact of their diesel vehicle: the problem was reported by The California Resources Board (CARB) in May 2014 and VW admitted deception and issued public apology in September 2015. Although VW were committed to UNGC and CSR assurance (by accounting firm PWC) during this period, such misrepresentation was detected. As such, this incident raises a question about fair business practice and effect of CG mechanism in Germany. https://www.reuters.com/article/us-volkswagen-emissions-timeline/timeline-volkswagens-long-road-to-a-u-s-dieselgate-settlement-idUSKBN14V100 (accessed on 25th March 2019).

[11] Other corporate scandals in leading German corporation like Deutsche Bank and Siemens has also highlighted the problem, calling into the appropriateness of corporate practice in Germany (Berthoin Antal et al., 2009).

[12] Although firms that wants to obfuscate its report could make the report lengthier (Loughran and McDonald, 2014), this study follows the line of argument i.e. Dhaliwal et al. (2011) Dhaliwal et al. (2012), that suggests longer report covers significantly more CSR issues which can help investors to better understand firms' CSR practice. Furthermore, Leung et al. (2015) analyzed the use of minimum narrative disclosure (MND) in annual report and finds that firms with poor performance and higher risk of financial distress are more likely to engage in MND behavior. The narrative in financial reports (i.e. Management Discussion and Analysis (MD&A) section of annual reports) are similar to CSR disclosure in this context as there are few standards for the narrative in these reports (Muslu et al., 2017). Additionally, longer CSR reports are found to represent better CSR performance (Nazari et al., 2017). Consequently, this suggests that CSR disclosure with enough details (length) signifies better disclosure quality.

[13] Horizon-content and forward-looking content is used interchangeably in the literature.

The overall finding supports two of the stated hypotheses; positive effect of UNGC participation and positive effect of assurance on CSR disclosure quality. Whereas the other two hypotheses are not in line with expectation; the effect of institutional investors is either insignificant or negatively significant (depending on sample group) and the difference in the effect of assurer type is statistically insignificant. Moreover, this study also carried out some additional analysis by using alternative model specifications; changing proxies for control variables, testing the possible effect of VW emissions scandal (by dividing the sample between pre and post VW scandal and analyzing whether the selected CG mechanism has different effect upon CSR disclosure quality between these two periods) and by dropping financial firms from the sample. Altogether the result doesn't change with alternative measures and the effect of VW scandal is statistically insignificant. The results from sensitivity test are consistent with those of the main model, except the outcome of *assurance type* when using the sample of only non-financial firms; the result shows significant effect of non-accounting firms whereas accounting firms is statistically insignificant in improving CSR disclosure quality. This may signify the context and industry-specific effect of assurer type as suggested by Pflugrath et al. (2011).

This study contributes to sustainability reporting literature in the following ways. First, for many years Germany was considered role model in sustainable business practice and "doing well by doing good" was an essential mantra embedded in German corporate culture by multiple institutional mechanisms. However, the revelation of several major scandals in German corporation (e.g. Volkswagen, Siemens, Deutsche Bank) has highlighted the problem in the realm of business ethics in recent years (Berthoin Antal et al., 2009). In response, Germany is strengthening the role of business in society by being more receptive to sustainable issue and encouraging high quality CSR disclosure (Berthoin Antal et al., 2009; Verbeeten et al., 2016). Hence, by putting the topic of corporate governance in agenda, this study improve understanding about how the adoption of specific external CG mechanism affect corporate transparency in German context where any

perceived sustainability misstatement by a firm is likely to lead to a serious consequence (Verbeeten et al., 2016; Cormier et al., 2005).

Second, the specific external CG mechanism (“ones considered by this study”) are argued to enhance corporate transparency by improving disclosure content (GRI 2013b; Iatridis, 2013; GRI 2013a; Pflugrath et al., 2011). Therefore, rather than measuring CSR disclosure quality with mere initiation/issuance of CSR reports (e.g. Dhaliwal et al., 2011; Dhaliwal et al., 2012; Dhaliwal et al., 2014), this study analyzes the linguistic feature of CSR reports to do so. The issuance of CSR reports alone does not necessarily imply better disclosure quality because such proxy ignores any variance in their content, including both cross-sectional components and an inter-temporal one (Gao et al., 2016). Such variation is important to investigate, as the quality of firms' CSR disclosure is continuously evolving (Chiu and Wang, 2015; Sethi et al., 2017). Thus, by analyzing the linguistic structure of CSR disclosure, this study contributes to a greater understanding about how CG mechanism actually improve the informational content of CSR reports.

Third, earlier studies that analyzed the narrative feature of CSR reports have extensively focused either on partly disclosure such as environmental disclosure (e.g. Cho et al., 2010) or only on standalone reports (e.g. Muslu et al., 2017). However, this study considers all published CSR reports; stand-alone report and ones along with the financial report that may cover only part or all areas of CSR activities. Since, the way in which CSR information is disseminated, captures the level of its importance and the firms’ commitment to improve transparency (Dhaliwal et al., 2011), this study better captures the variation in CSR disclosure quality by considering all kinds of reports.
The remainder of this paper is organized as follows. Section 2 provides an overview of the prior literature that explored the relationship between CG dimensions and CSR disclosure quality, discusses the theoretical framework and states the hypothesis. Section 3 provides details of data and measures of CSR disclosure quality and explains the statistical model used in the analysis. Finally,

section 4 presents the empirical results whereas section 5 present the results for additional analysis and section 6 covers the conclusion and discussion.

2. Literature Review and Hypothesis Development

2.1 Literature Review

Prior studies have articulated different theoretical perspectives in support of sustainability reporting that includes agency theory, stakeholder theory, legitimacy theory, institutional theory and resource dependency theory. Furthermore, a mixture of two or three theories is sometimes presented in the research designs (Hussain et al., 2018; Velte and Stawinoga, 2017; Cuadrado-Ballestros et al., 2017). This condition highlights the absence of a commonly accepted theoretical framework for understanding sustainability disclosure practice (Chan et al., 2014). According to Ullmann (1985), the lack of a unified theoretical framework in CSR research has led to inconsistent findings without a clear tendency. In particular, he argued that the model used in CSR disclosure studies are incorrectly specified because they do not consider voluntary disclosure as an element of strategy by a company.

Review of existing literature reveals that stakeholder theory, which considers CSR disclosure practice as a strategic response of a firm designed to cater the need of most important stakeholder, is one of the dominant perspectives used by research in sustainability reporting to explain the organization – society relationship (e.g. Ullmann, 1985; Michelon and Parbonetti, 2012; Chan et al., 2014; Peters and Romi, 2014; Chiu and Wang, 2015). According to Freeman (1984), stakeholders are "*any group or individual who can affect or is affected by the achievement of an organization's objective*". While holding Freeman's definition of a stakeholder as a foundation, some researchers have embraced a contextual approach to be more specific on categorizing these stakeholders in different ways i.e. managerial and ethical, primary and secondary, voluntary and involuntary. This classification highlights the existence of various stakeholder groups with a different and sometimes conflicting expectation from a firm (Fernando and Stewart, 2014; Chiu and Wang, 2015).

Among these classification two major branches of stakeholder theory stand out in the sustainability literature; managerial based and ethical based. First approach is grounded in the early economic position of Friedman's shareholder wealth maximization argument and views voluntary disclosure decision as a response to the demand resulting from economic relationship between the firms and its investors whereas the second perspective highlights the role played by managers in ethically balancing and meeting the conflicting demands of various stakeholder groups when the disclosure is voluntary in nature (Peters and Romi, 2014; Michelon and Parbonetti, 2012). However, Donaldson and Preston (1995) argue that all the branches of the stakeholder theory are jointly supportive. This argument is further reinforced by (Peters and Romi, 2014), according to whom these two perspectives promote the conflict-free relationship between management and stakeholder and need not be mutually exclusive when explaining voluntary disclosure pattern.

The managerial perspective of stakeholder theory asserts that stakeholders have the power to influence firms' decision through their control over the resources that are critical for firms' operation and therefore a firm should seek and maintain stakeholders' support to ensure its continued existence. However, not all stakeholder group are equally important to the company, differing in power and the legitimacy of their claims. Due to limited time and resources, managers may only respond to the most pressing demands of the powerful groups, ignoring requests from others (Chiu and Wang, 2015; Chan et al., 2014). On the other hand, the ethical perspective of stakeholder theory suggests that the organization are accountable to all the stakeholders and therefore irrespective of their power, these stakeholders have the same right to be treated fairly by the firm. But this approach faces a major challenge when stakeholders have different and contradictory expectation from firms. If such conflict arises, the firms should manage to attain an optimal balance among them (Fernando and Stewart, 2014; Peters and Romi, 2014). As such, *both approaches* involve strategically balancing and meeting the conflicting demands of various stakeholder groups to achieve the firms' objective, at the same time explaining their choices, actions and results (Chan et al., 2014; Peters and

Romi, 2014; Ullmann, 1985). Within this framework, the success of a firm is dependent upon the ways a firm manages its relationship with its relevant stakeholders, and CSR disclosure is considered as a tool of communication used by management to win necessary support (Chiu and Wang, 2015; Michelon and Parbonetti, 2012).

In this communication nexus, the CG mechanism may act as a foundation upon which good CSR practice can be built (Rupley et al., 2012). Even though sustainability disclosure act as an important part of the dialogue with stakeholder, the CG model adopted by the company gives an indication about how stakeholders' interests related to CSR issues are considered by a firm (Michelon and Parbonetti, 2012). Especially after 2008 global financial crisis, the impetus on a new understanding of CG mechanism can be found in the strengthening role of formal CG mechanism that not only encourages corporate board of directors to focus on well informed strategic direction and engage in action beyond short term performance, but also motivates to adopt specific initiative such as OECD principles of Corporate Governance and the UNGC, that encourages businesses to recognize and safeguard stakeholders' rights including their legitimate interest and information needs (Mallin et al., 2013; Vigneau et al., 2015).

The contemporary CSR studies analyze the association between CG mechanisms and CSR reporting mainly in two ways. The first group (Peters and Romi, 2014; Rodrigue et al., 2013; Michelon et al., 2015) categorize CG mechanisms into voluntary/informal CG mechanism (e.g. CSR committee) and formal CG mechanism (e.g. board character). These studies pay specific attention to the voluntary mechanism and analyze whether they operate to merely enhance a firm's environmental legitimacy without actually transforming organizational activities. The second group (Rupley, et al., 2012; Mallin et al., 2013), view CG mechanisms as falling into one of two groups; internal (e.g. board character) and external (e.g. laws and regulation) to firms. This classification offers a 'beyond the balance sheet' model of CG and provides a comprehensive set of governance mechanism, that has

the potential to limit managerial discretion and influence decision-making process (Rupley et al., 2012).

In line with the second group of studies, this paper considers Gillian (2006) categorization of CG mechanism and examine the effect of external CG mechanism; *UNGC participation, institutional investor, CSR assurance and type of CSR assurer* on CSR disclosure quality. Following this perspective, the external CG mechanism is set with an objective of overseeing management's behavior (Mallin et al., 2013; Gillan, 2006) and therefore act as a monitoring mechanism that pressurizes management to act in the best interest of all relevant stakeholders (Rupley et al., 2012). Per se, the firms with these external CG mechanisms is expected to be diligent in assuring high-quality information on CSR related issues.

2.2 Hypothesis Development

2.2.1 United Nations Global Compact (UNGC) Signatory

CSR reports in recent time has been criticized for its lack of relevance and credibility, as a result they are met with skepticism and many times considered as a symbolic action that is designed to manage firms' positive impression and influence stakeholder's perceptions (Perez-Batres et al., 2012; Michelon et al., 2015; Peters and Romi, 2014; Rodrigue et al., 2013). Under such condition, the voluntary participation in UNGC can act as a strategic move to address stakeholder doubt about firms' CSR reporting and to gain their necessary support (GRI, 2013b; Fortanier et al., 2011).

Launched in 2000, the United Nations Global Compact (UNGC) is the worlds' largest CSR program that encourage companies to voluntarily adopt sustainable business practice by; aligning their operational and strategies with ten universally accepted principles (in the area of human rights, labor standards, environment stewardship and anti-corruption), assessing their impact, setting forward-looking goals and communicating results in a credible manner (UNGC, 2017; UN, 2015; Knudsen, 2011; Perez-Batres et al., 2012). The UNGC can act as a governance arrangement, offering a platform for business and non-business actors to engage in discussion around pressing issues like

global warming, human rights and anti-corruption. Such initiative inspires innovation and proactive management among companies who are ready to be leaders in good practice. Moreover, in the case of a poor governance environment, it can also help to set an ethical bar that would otherwise be absent (Rasche at al., 2012). For example, Williams, (2014) argue; "*had Apple Inc. been a member of UNGC, they might have been proactive rather than reactive to the case like the inhuman treatment of workers by its Chinese contract supplier in 2012, which was corrected by the company only after it was reported by media*". As such, the UNGC participation encourages firms to strategically facilitate border societal goals and at the same time enhance transparency by disclosing their ongoing efforts towards sustainability issues (UNGC, 2017). In particular, UNGC, given their strong orientation towards stakeholder, enhances the monitoring quality with regards to firms' CSR disclosure and hence promote the issuance of high-quality CSR reports. As a result, it may act as a means to seek favored status and gain access to critical resources from relevant stakeholders that are vital for firms' sustainability.

As a chief accountability measure, UNGC participants /signatories[14] are required to share their progress publicly by producing an annual communicate on progress (COP), that highlight the firms' allegiance towards sustainable issues and demonstrate their commitment towards transparency and accountability (GRI, 2013b; Rasche et al., 2012). These COP contain three elements: (1) A statement by the chief executive expressing continued support to the initiative and its principles, (2) A description of practical actions that firms have taken or plan to undertake in the relevant areas covered by UNGC, (3) A measurement of outcomes; qualitative and quantitative measurement of results, and the degree to which targets were met. The firm needs to provide an explanation under

[14] The choice between two status: Signatory and Participant was implemented in 2018. Although same in other context, the Participant option provides more networking activities, access to more resources and materials among other perks. Before 2018, there was only one option and the commitment to UNGC required issuance of COP. https://dfge.de/ungc-updates-terms-companies-participation/ (accessed on 25th November 2019).
However, many firms were found to use either of these terms: participants and signatories, to reveal their committed to UNGC before 2018. Since, this study considers sampling period from year 2011 to year 2016, UNGC participants and UNGC signatories are used interchangeably.

"*report or explain*" rule if the COP doesn't address any of the four UNGC relevant issues (UNGC, 2015). Moreover, failure to submit a COP will result in a change of participation status and can eventually lead to expulsion from the initiative (Knudsen, 2011; Orzes et al., 2018).

The UNGC further improve CSR disclosure quality by adopting GRI Guidelines as the recommended reporting framework for participants to prepare COP. The UNGC and GRI signed a memorandum of understanding (MoU) in the year 2010, which was renewed in 2013 and agreed to work together in promoting corporate responsibility and transparency (GRI, 2013b; UN, 2015). It is worth pointing out that GRI reflects the de facto standard for sustainability reporting (Etzion and Ferraro, 2010; Brown et al., 2009). The GRI Guidelines follow reporting principles to ensure that sustainability reports: (1) present a reasonable and balanced account of sustainability performance, (2) facilitate comparison over time and across organizations, and (3) credibly address issues of concerns to stakeholders (Clarkson et al., 2008). The finding by Michelon et al. (2015), provides an encouraging (although limited) evidence indicating that disclosures by GRI adopting firms are more likely to be balanced, comparable and precise. Similarly, Mahoney et al. (2013), supports the claim that CSR reporting under GRI guideline is building value for companies and enhancing reputation by providing robust information on tough CSR issues.

The principles of materiality, stakeholder inclusiveness, sustainability context and completeness outlined in the GRI guideline are pertinent in preparing a COP (GRI, 2013b). Hence, the commitment to COP and adoption of GRI reporting framework not only ensure a balanced and reasonable presentation of firms’ CSR activities but also convey the result along with supporting data/details in a meaningful way (Clarkson et al., 2008; GRI, 2013b). Therefore, UNGC participation is hypothesized to improve CSR disclosure quality.

H1- Firms' participation in the UNGC is positively associated with their CSR disclosure quality.

2.2.2 Institutional Investors

Sustainability issue can pose a risk to firm's survival and affects the economies and society at large (Garcia-Meca and Pucheta-Martinez, 2018). These concerns cause investors to encourage firms to incorporate social and environmental responsibilities in their core decision-making process as they lessen these risks and leads to long-term value creation (Mallin et al., 2013). According to Solomon and Solomon (2006), institutional investors represent an important CG mechanism that can promote sustainability issues. More specifically, institutional investors including pension funds, mutual funds, insurance agencies etc. have resources and specialize knowledge for extensively analyzing the effect and consequences of firms' CSR practice and therefore play an active role in monitoring firms' attitude towards sustainability issues to safeguard their investment (Rupley et al., 2012; Mallin et al., 2013). On the one hand, institutional investors as a main supplier of funds represent a powerful stakeholder group for companies in which they hold substantial investment (Wang and Hussainey, 2013; Saleh et al., 2010). On the other hand, companies aim at accessing vital financial resources required for firms' operation and therefore they strategically comply with the demand of such powerful stakeholder group (Freeman, 1984; Ullman, 1985). Thus, firms with a greater proportion of institutional investors integrate CSR activities in their business activities (Dyck et al., 2018) and also discloses high-quality CSR report to demonstrate that they are complying with investors' expectations (Saleh et al., 2010).

Modern institutional investors bear little resemblance to the individual shareholders of the last century; the ones that were heavily focused on financial reward. Rather many of today's institutional investors pursue social goals as well as financial ones (Ryan and Schneider, 2002, 2003; Holder-Webb et. al., 2009). These investors not only undertake an active role in monitoring firm's behavior to safeguard their investment (Jensen and Meckling, 1976; Wang and Hussainey, 2013) but also encourage firms to treat their stakeholders (along with shareholders) in a better way because it is the moral thing to do (Donaldson and Preston, 1995; Ryan and Schneider, 2002, 2003).

Addition to moral reason, institutional investors favor the firms with better CSR performance because of its effect on firms' profitability and sustainability. Institutional investors generally have long term investment horizon and therefore consider relevant factors that affect the long-run sustainability of firm i.e. strategy towards climate change, environmental liabilities, employee well-being and globalization (Rupley et al., 2012; Ryan and Schneider, 2002). Since, the voluntary CSR disclosure contain broader/ longer horizon information about organizational goals, process, risk and output in term of their effect on environmental and social welfare issues that are detrimental for firms' earnings and sustainability (Chen et al., 2016; Ramanna, 2013; Dhaliwal et al., 2014), institutional investor demands for such reports. For example, institutional investors like Aviva, Hermes and CalPERS expect firms in its portfolio to measure and report on sustainability issues (Mallin et al., 2013; Rupley et al., 2012). Similarly, institutional investors like pension fund groups are more interested in investing firms with better social performance (e.g. better employee relation, preference to community, woman and minority) and superior product quality along with its impact on the environment (Johnson and Greening, 1999). This constitutes a situation where the institutional investors tend to act as stakeholder representative and compel firms to find a balance between financial and non-financial goals and to assume a higher level of accountability by issuing relevant information on their CSR activities (Holder-Webb et. al., 2009; Iatridis, 2013).

Although institutional investors can gather required information from companies via one-on-one meeting (Garcia-Meca and Pucheta-Martinez, 2018), disseminating information to all institutional investors through such method can be costly when a large number of institutional shareholders exists. Consequently, publishing high-quality CSR reports with the disclosure of useful narrative and numerical information about firms' sustainability policies can be a more efficient way to improve the informational environment (Wang and Hussainey, 2013; Iatridis, 2013). Firms that report their CSR activities along with explicit information about their judgement, assumptions and estimation relating to valuation and projection models can act as a means of effective communication

between two parties and as a result attract institutional investment (Saleh et al., 2010; Iatridis, 2013). This assertion is supported by Iatridis (2013), Dhaliwal et al. (2011), who reports a positive association between institutional investors and sustainability reporting quality. Therefore, this study argues that the presence of a higher proportion of institutional investor encourages firms to issue high-quality CSR reports. Thus, the following hypothesis is proposed.

H2- A higher proportion of institutional investor in a firm is positively associated with their CSR disclosure quality.

2.2.3 CSR Assurance and Types of CSR Assurance

Assurance of sustainability reports can enhance the credibility[15] and the quality of CSR reports by promoting fairness (*understandable, appropriate and comprehensive*) and transparency (*clear, conscious and balanced view*) (Boiral et al., 2017; Velte and Stawinoga, 2017; CorporateRegister, 2008; UN, 2015). More specifically, the mechanism reassures stakeholders that the information contained in CSR disclosure is trustworthy and can be relied upon (Simnett et al., 2009a). According to GRI, (2013a), "*CSR assurer conduct the assurance process in a manner that is systematic, documented and evidence-based and also assess whether the report provides a reasonable and balanced presentation of CSR activities, taking into consideration the veracity of data in the report as well as the overall selection of content"*. Although, this process allow assurer to recommend improvements in disclosure quality, the voluntary context means that management does not have to follow assurer's recommendation (Moroney at al., 2012). Hence, provided the recommendations are followed, CSR assurance serves as a monitoring mechanism, that helps to align firms' reporting practice with the informational need of relevant stakeholders (Velte and Stawinoga, 2017). Nonetheless, getting a CSR report voluntarily verified by external auditors to render it more credible is a costly exercise for companies (Chen et al., 2016). As such, undertaking voluntary CSR

[15] Disclosure credibility is defined as stakeholders' perception of the believability of a particular disclosure (Mercer, 2004).

assurance shows firms' seriousness towards sustainability issues and at the same time represent a strategic action (cost-benefit analysis) in reducing uncertainty and information asymmetry between stakeholders and organization (Boiral et al., 2017).

The existing literature (O' Dwyer, 2011; Simnett et al., 2009a; Simnett, 2012; Cohen and Simnett, 2015; Casey and Grenier, 2015; Cuadrado - Ballesteros et al., 2017; GRI, 2013a) suggests that CSR assurer along with fulfilling a monitoring role, might minimize managerial obfuscation attempt[16] and also reduce opportunistic reporting[17]. Also, if a company follow any international norms for the rights of workers, consumer protection, environment protection etc. (e.g. the UN Global Compact or OECD norms for multinationals), the assurer verifies firms' reporting with respect to these norms by seeking confirmation in the report and the company information system (Manetti and Becatti, 2009).

Furthermore, when a firm collates a wealth of information from different sources under publishing deadline pressure, the potential for human error arises. By hiring independent assurer and providing them access to records and reporting process, such mistakes can be identified and corrected, provided the assurer evaluates and questions rather than accepts on trust (CorporateRegister, 2008). This benefit of CSR assurance is lagged, and the real effect of CSR assurance effect is largely contingent upon how management follow assurer's recommendation. Nevertheless, assurer can use assurance guidelines to assess the adequacy of CSR disclosure to provide credible CSR information to stakeholders in the current period (Moroney at al., 2012).

Such extensive process improves the consistency, as well as the credibility and reliability of the information being disclosed (Cohen and Simnett, 2015; GRI, 2013a), ultimately increasing the value of the final report, both for internal decision maker as well as for other relevant stakeholders

[16] Use of convoluted sentences in report to make it difficult to understand.
[17] "Cherry picking" of the topics that paint the firm in a most positive light.

(CorporateRegister, 2008). This study, therefore, posits that external assurance enhances the quality of CSR disclosures and hence state below hypothesis.

H3a- External Assurance is positively associated with firms' CSR disclosure quality.

Although CSR assurance ensure the credibility of sustainability disclosure, the lack of technical competencies and independence of assurance providers are argued to hinder the process (Michelon et al., 2015; Pflugrath et al., 2011). Stakeholder, therefore, trust and value CSR assurance only if it comes from an independent person or entity ("assurer") who is not connected with reporting organization, has sufficient expertise and is trained in evidence-gathering technique (Wong and Millington 2014; Huggins et al., 2011; Cuadrado - Ballesteros et al., 2017). Such assurer has a disciplinary effect on firms' sustainability practice because it helps in identifying weakness and motivates companies to improve; their CSR performance, their internal controls and the accuracy and reliability of the information disclosed (Boiral et al., 2017; La Torre et al., 2018). Hence, the firms' decision to take service from such assurer can be a strategic decision to increase stakeholders' awareness about firm sustainability efforts.

Professional accountants, especially Big 4 accounting firms, because they possess a skill set developed from their training as statutory auditors are believed to fulfill this requirement (Velte and Stawinoga, 2017; Simnett et al., 2009a). The exposure and reference to the financial statement audit procedures encourage professional accountant to follow similar rigorous process during CSR assurance and focus on the accuracy and relevance of the issues that matter to stakeholders, hence improving CSR disclosure quality (Pflugrath et al., 2011; Cuadrado - Ballesteros et al., 2017). Further, they are bounded by the requirement of International Federation of Accountant (IFAC) code of ethics that includes professionalism, independence, objectivity and understanding of the evidence quality (IFAC, 2013; Moroney et al., 2012). Also, they can easily hire subject (CSR) matter expert as and when required (Pflugrath et al., 2011). Previous studies therefore not only suggest that assurance of sustainability reports enhances their quality, but also finds that the quality of these reports will be

greater when assurance is provided by a professional accountant (Manetti and Becatti, 2009; Casey and Grenier, 2015).

In an experimental setting, Pflugrath et al. (2011) found that the credibility of a CSR report is greater when it is assured, and the credibility is further enhanced when the assurer is a professional accountant. Similarly, Casey and Grenier, (2015) find that the reduction in firms' cost of capital and analyst forecast dispersion is larger when the assurance provider is an accounting firm. Therefore, given the competence in assurance "process", their ability to acquire "subject matter expertise" as and when required, their brand reputation and the quality control mechanism, professional accountant lowers the overall audit risk (Pflugrath et al., 2011) and improve the information content of CSR report (Cuadrado - Ballesteros et al., 2017). On this basis, below hypothesis is proposed.

H3b- Assurance by professional accountant improves CSR disclosure quality to a greater extent than assurance provided by other professionals.

3. Research Design

3.1 Sample Selection

Tables 1 provides the annual distribution of the sample. This study focuses on 110 companies that are listed in the Frankfurt Stock Exchange categorized under the following index: DAX, MDAX and TecDAX during the period of 2011-2016. These three indexes are collectively represented under the HDAX index[18]. The sample covers the data from 2011 to 2016 in order to capture the most recent development in sustainability reporting and investigate its relationship with firms' CG mechanism during a time in which Germany has strengthen the role of CG mechanism and became more receptive to sustainable issue, mainly in response to the revelation of corporate scandals in leading

[18] HDAX index represents big companies within German capital market i.e. DAX: blue chip companies, MDAX: "Prime standard companies" that comply with higher transparency standards and TecDAX: large companies from technology sector. These types of firm because of their size and their economic importance are exposed to greater scrutiny with regards to their sustainability performance (Cho et al., 2012). Limiting investigation to such big companies that emphasize ("voluntarily") on sustainability issue and that are economically important is consistent with literature i.e. Cho et al. (2012), De Villers and Marques (2016).

German corporations like Volkswagen, Deutsche Bank and Siemens (Berthoin Antal et al., 2009). German companies have acknowledged several *voluntary* actions to improve transparency i.e. non-mandatory code providing a framework for CSR reporting such as (i) The German sustainability code by The German Council for Sustainable Development (GCSD) (ii) The two-tier system by Deutsche Borse (IRI[19] , 2014). These recommendations were made in the year 2011 and therefore is considered as an initial sampling period. Even though these recommendations are voluntary in nature, this study believes that the CG- CSR reporting relationship in the German firm is affected by this progress. Furthermore, year 2016 is chosen as the final sampling period because German Bundestag passed CSR reporting law (which is the implementation of the EU directive 2014/95/EU that is targeted towards non- financial reporting, essentially a directive on CSR reporting), according to which the German firms are under legal obligation to report their CSR performance starting from year 2017 (Saenger, 2017). The period of 2011 through 2016 covers the voluntary CSR reporting period without any changes and modification in between. As the objective of this study is to understand the role of CG mechanism under a voluntary reporting setting, the sample selection and the sample period fulfills the requirement of this study.

The number of available CSR report was 51 in the year 2011 that has increased to 83 in the year 2016. This increase in publication of CSR report indicates that German firms are appreciating the growing importance of CSR related news and are therefore improving the corporate informational environment.

Table 1- CSR Reports by Year

HDAX Index	Total Firms	Number of CSR Reports	% of Firms with CSR Reports
2011	110	51	46
2012	110	53	48
2013	110	62	56
2014	110	60	55
2015	110	76	69
2016	110	83	75

[19] Initiative for Responsible Investment

The relevant data for corporate governance dimension and firm-specific information are downloaded from Bloomberg terminal. Similarly, CSR report is downloaded mainly from two sources; companies' website and CorporateRegister website. Further, this study considers the firm listed in the selected index at the end of 2016 and only reports that are provided in English language were included in the analysis. In contrast with prior research (Plumlee et al., 2015; Cho et al., 2010; Dhaliwal et al., 2011, 2014), the focus of this study is not limited to environmental disclosure or standalone CSR reports rather it considers sustainability reports covering multiple as well as only one aspects of CSR activities i.e. environmental, social and governance aspects, and that are published either as a standalone report or along with annual reports.

Some company's reports are not available for the entire period and among the reported ones: 23 reports were published under International Integrated Reporting Framework (IIRC), 259 were issued as a stand-alone report and 197 were published along with the financial report. This study considers two types of reporting; stand-alone reports and the ones that are published along with the annual reports. Whereas, the reports that are prepared under IIRC framework are not included in the sample because such adoption takes place across institutional settings with a blend of both mandatory and voluntary regimes (Melloni et al., 2017) and thus may not serve the objective of this study. Furthermore, 56 firms' data were lost due to other missing information (e.g., unavailability of financial details). The final data set consists of 400 firm-year reports, among which 15 reports were considered for developing initial wordlist that is used to analyze CSR disclosure quality and the remaining sample of 385 firm-year is used for final analysis. Finally, the sample is divided into two different groups in order to test the proposed hypothesis. *Sample1* comprises the whole sample of 385 firm-year observations and is used to test hypothesis 1, 2 and 3a. The CSR disclosure without assurance is removed from the whole sample and the subset of 134 firm-year observations is used to form *Sample 2,* which is used to test hypothesis 3b. By considering only assured firms, the subset of

134 firm-year observations allows focusing on the attributes of assurer (*accounting versus non-accounting*) for companies that assure their CSR reports.

3.2 Regression Model

The objective of this study is to examine the impact of CG mechanism on CSR disclosure quality. In this study, the value of dependent variables CSR disclosure quality is represented by three different categories and are in an ordered form (Low/ Medium/High). Given that the dependent variable is not continuous but indicates the levels of disclosure quality, an ordered logistic regression model[20] is used to understand the hypothesized relationship. Furthermore, the standard error of the results from ordinal logistic regression is clustered by firms to achieve a robust output. Following De Villers and Marques, (2016), De Villers et al. (2011), Fortanier et al. (2011), Liu and Sun (2010), this study uses following regression model to understand the relationship between the interested variables.

$$CSRD_Quality_{i,t} = \beta_0 + \beta_1 \ UN_Signatory_{i,t} + \beta_2 \ Institutional_Investors_{i,t} + \beta_3 \ Assurance_{i,t} + \beta_4 \ ROA_{i,t} + \beta_5 \ Leverage_{i,t} + \beta_6 \ Firm_Size_{i,t} + \beta_7 \ DJSI_Member_{i,t} + \beta_8 \ Sen_Industry_{i,t} + \beta_9 \ Year_{i,t} + \varepsilon_{i,t} \quad \text{------ (1)}$$

First regression model examines the impact of selected CG dimensions; UNGC participation, Assurance and Institutional Investors, on CSR disclosure quality. Similarly, this study also analyzes whether the type of assurance provider influences the CSR disclosure quality, therefore the variable *Assurance* in replaced with the *Type_Assurer* in the second regression model. The effect of *Type_Assurer* is analyzed using both; the whole sample (385 firm-years) and with only firms that are assured (134 firm-years). The regression with the whole sample evaluates the effect of assurer types over non-assurer and the regression with subsample analyzes the difference in effect between type of assurer.

[20] The ordered probit model is a popular alternative to the ordered logit model. However, the ordered probit model does not require nor does it meet the proportional odds assumption, which is the main test needs to conduct when confirming the model validity with multiple categories (Williams, 2016). In the case of this study, there are three categories that need to be statistically different to draw a valid conclusion, therefore ordered logit model is chosen to confirm with assumption.

$$\text{CSRD_Quality}_{i,t} = \beta_0 + \beta_1 \text{ UN_Signatory}_{i,t} + \beta_2 \text{ Institutional_Investors}_{i,t} + \beta_3 \text{ Type_Assurer}_{i,t} + \beta_4 \text{ ROA}_{i,t} + \beta_5 \text{ Leverage}_{i,t} + \beta_6 \text{ Firm_Size}_{i,t} + \beta_7 \text{ DJSI_Member}_{i,t} + \beta_8 \text{ Sen_Industry}_{i,t} + \beta_9 \text{ Year}_{i,t} + \varepsilon_{i,t} \text{ ------ (2)}$$

Where, *CSRD_Quality* (Dependent variable) = category of the reports based on narrative quality (High/ Medium/ Low); CG Factors (Explanatory variables) = UNGC participation, Institutional investors, CSR assurance, Type of assurer; Control variables = selected firm-level control variables that are likely to drive CSR disclosure quality (Profitability, Leverage Ratio, Firms' Size, CSR performance). Further, *industry dummies* are used to control for any systematic difference in the incentive to issue CSR reports across industries and *year dummies* to control for potential time effect. Each of these variables is explained in the section below.

3.3 Dependent Variable: CSR Disclosure Quality

The process used to measure the quality of CSR disclosure is shown in Appendix 1. Prior studies in sustainability reporting tends to examine only one disclosure quality or textual attribute at a time e.g. Cho et al. (2010) focuses only on verbal tone, Nazari et al. (2017) focuses on narrative complexity proxied by readability and length, whereas Cormier et al. (2009) focuses on information precision. Similarly, Clarkson et al. (2013) suggests that voluntary environmental disclosure provides forward looking information, that potentially facilitate both financial performance prediction and risk analysis. Since the firm sets up a holistic disclosure policy, focusing only on one dimension may not reveal the overall quality of CSR disclosure (Muslu et al., 2017; Melloni et al., 2017). This study, therefore, considers multiple narrative features; *length, verbal tone, numerical content and forward-looking content*, in developing a composite score to measure CSR disclosure quality.

This study follows the methodology suggested by Muslu et al. (2017) to determine CSR disclosure quality, however, differs in three main aspects. First, the study by Muslu et al. (2017) used adopted dictionary/wordlist: Loughran and McDonald, (2011) to measure tone, without any adjustment whereas this study expand on these wordlists by including additional word that were

initially not in these dictionaries but are relevant for sustainability issues, making it more relevant to the context being studied. Similarly, the wordlist that Muslu et al. (2017) used to measure horizon content is also expanded whereas numerical wordlist remains unchanged (process explained in Appendix 1). Second, the study by Muslu et al. (2017) use both the positive tone (optimistic) and negative tone (pessimistic) as an independent construct in calculating disclosure score and considers report with higher negative news to be of better quality. However, firms report multiple CSR activities related to environmental, social and governance aspect, and the outcome can be both: positive in one area and negative in another. Therefore, the sustainability report is considered of higher quality if it includes all material aspects, both positive and negative in a balanced way (Melloni et al., 2017). Hence, this study uses the difference between positive and negative score to determine the biases in CSR disclosure and asserts that lower the difference, better is the disclosure quality. Third, the readability measure like Fog/Smog Index, gives a poor result when applied to business document e.g. words like “financial”, “company”, “operations”, “management” and “customers” that are well understood in business context are defined as complicated words according to these readability constructions (Loughran and McDonald, 2014, 2016). Therefore, this study doesn't include readability measure in calculating overall disclosure score whereas Muslu et al. (2017) use readability as one of the dimensions to measure CSR disclosure quality. Moreover, disclosure length is found to better explain the understandability of firms’ disclosure compared to readability index (Nazari et al., 2017; Loughran and McDonald, 2016). Since this study uses length as one of the dimensions to measure CSR disclosure quality, the exclusion of readability further makes sense.

A fundamental step in analyzing the linguistic characteristics is to transform narrative disclosure into a numerical value that represents specific dimension being measured; i.e. by counting words, sentence or sections, or by reading the whole text (Li, 2010). Among the existing methods, the most widely used approach is to count the frequency of predefined list of words that represent a

selected dimension and compute a score based on those frequencies (Henry and Leone, 2016). This study uses words as the unit of analysis and assumes its occurrence/frequency in the report as an indicator of the subject matter's importance. Since, this study measures multiple dimension to develop a composite quality score, using an alternative measure like counting sentence (with an occurrence of a particular word in a sentence) can cause a problem of recounting, e.g. the sentence will be counted multiple times if the word representing different dimensions are in the same sentence. Hence, word count is considered to be suitable for fulfilling the requirement of this study.

The final wordlist that is used in this study is developed in three steps as suggested by Kearney and Liu (2014). *First,* two different wordlists are considered; Lourghran and McDonald (2011) wordlist to measure verbal tone and Muslu et al. (2017) wordlist to measure horizon content and numerical content. The selected wordlists are created specifically for analyzing financial text[21] and therefore this study considered them appropriate compared to alternative options like General Inquirer (GI) wordlist and DICTION (Henry and Leone, 2016). *Second,* to examine the extent to which words featured in the dictionary are used in CSR reports and to identify any additional important words that are useful in CSR reporting context, an intensive text-search for a random sample of 15 CSR report narratives is conducted using Natural Language Toolkit (NLTK) program in Python software. *Third*, the "orphan words" that is not in the initial list and which occurs with a frequency of over 50 times in entire corpus is identified. These orphan words are further analyzed using concordance function in NLTK to understand the context under which it is used. i.e. the word that has negative, positive, or horizon connotation. These words are added to the dictionary to come up with the final wordlist (detail process is explained in Appendix 1). The final word lists are also examined for reliability and validity as explained in this section.

[21] This study focuses on non-financial disclosure and use of such wordlist is tricky (mainly LM wordlist) in this context. However, the narrative in financial reports (i.e. Management Discussion and Analysis (MD&A) section of annual reports) are similar to CSR disclosure in this context as there are few standards for the narrative in these reports (Muslu et al., 2017), the use of these wordlists are argued to make sense.

Once the wordlist is finalized, the frequency and the ratio of each dimension is calculated using a specific command in the NLTK program in python. The detail process is explained under each section below.

Tone - The language used in the CSR reports is an important element to determine the information content of firms' voluntary disclosure (Cho et al., 2010). CSR report covers multiple aspects: Environmental, Social and Governance (ESG), and provides an overview of a firms' commitment, challenge and progress under each aspect. The firm's performance for a particular year can be good in one area and bad in another area. Thus, the CSR report that provides both negative and positive news in a balanced way, is a neutral representation of information that overcomes reporting biases. Such report does not have any prejudice in the use of language that is intended to change the perception (favorable or unfavorable) of the stakeholders (Melloni et al., 2017).

The tone of the CSR report is measured in two steps. First, pessimistic tone, represented by PES_RATIO is calculated as the ratio of the number of financial negative words over the total number of words in the report whereas optimistic tone, represented by OPT_RATIO is calculated as the ratio of the number of financial positive words over the total number of words in the report. Second, the difference between Optimistic tone and Pessimistic tone, represented by TONE_RATIO is calculated to measure the net linguistic tone (OPT_RATIO - PES_RATIO). The TONE_RATIO emphasizes the positive versus negative nature of the communication i.e., lower the score of TONE_RATIO, more balanced is the language used in the report and higher is the quality of CSR report.

Horizon Content – The stakeholders not only analyze firms' past activities but also requires information about firms' goals and targets to determine its sustainability and operational risk (Wang, and Hussainey, 2013; Muslu et al., 2017). The forward-looking content provide credible and useful information beyond what is strictly conveyed by historical disclosure and therefore plays an important role in understanding firms' CSR activities (Hassanein et al., 2018; Clarkson et al., 2013).

The horizon content is measured as the ratio of the number of references to future years plus horizon context over the total number of words in the report, represented by HOR_RATIO.

Numerical Content – The numerical and quantitative information in the report is considered credible and is also understood with a stronger precision by a user. Therefore, the information value is higher when the firms' CSR information is backed with numeric details (Muslu et al., 2017; Plumlee et al., 2015). The numerical content is measured as the ratio of the number of Arabic numerals and quantitative words over the total number of words in the report, represented by NUM_RATIO.

Length - The increased disclosure volume signifies the importance that a company attached to reported matter (Dhaliwal et al., 2011; Dhaliwal et al., 2012; Chen et al., 2016) and is suggested to be an indicator of transparency and informativeness which is associated with better economic outcomes, such as liquidity, institutional ownership and analyst following (Nazari et al., 2017; Lang and Stice-Lawrence, 2015). However, following opposing view lengthy reports are argued to be associated with information overload, hence the use of disclosure length as a proxy for CSR disclosure quality remain equivocal in the literature (Melloni et al., 2017). In line with Muslu et al. (2017), this study argues that disclosure length if studied in isolation may act as a smokescreen for low disclosure quality, however, when accompanied with details about firms CSR performance (both positive and negative results) supported with verifiable data and future outlook, it enhances the quality of CSR reports by making it more understandable for all relevant stakeholders. The length can be computed as the natural logarithm of the number of words, the number of sentences or the number of pages of the entire report. These measures have already been successfully applied in earlier research to measure the quality of information provided in the reports and they can be easily calculated and interpreted (Loughran and McDonald, 2015). Accordingly, this study uses a natural log of the number of words in CSR reports as a measure of length.

Once the ratios are calculated for all four dimensions, these ratios are ranked into decile, with TONE_RATIO inverse ranked. Each dimension receives a decile rank between 0.1 and 1. Further, the decile ranks are aggregated into a composite disclosure rank (QUALITY_SCORE) that provides the final rank score for each report, which is between 0.4 (minimum score) to 4 (maximum score). CSR reports with balanced tone, lengthy reports, more numerical content and more horizon content have higher QUALITY_SCORE. Finally, the QUALITY_SCORE is divided into three categories; high, medium and low, based on the median value of the rank score. For e.g. if the composite score of a report is; less than median value (less than 2.3) it is categorized as low quality, between median and 75th percentile (between 2.4 to 2.6) it is categorized as medium quality and above 75th percentile (above 2.7) it is categorized as high quality (as explained in Appendix 2). These three categories are represented by a categorical variable under *CSRD_Quality*; "0" for low quality, "1" for medium quality and "2" for high quality.

Moreover, the reliability test of the selected construct (narrative dimensions) is done using Cronbach's alpha[22] and the validity of the scale is confirmed using criterion validity[23]. For the scale used in this study, Cronbach's alpha is 70.10 % and the correlation between external criteria (Bloomberg ESG disclosure score) and the CSR disclosure quality score developed by this study is 53. 75 % with statistical significance at 5 %. These statistical results confirm both; *internal consistency* among the selected construct that is used to develop the scale and provides *validity* to the CSR disclosure quality scale.

[22] Cronbach's alpha is a measure of internal consistency and reflects the homogeneity among the number of items grouped together to form a particular scale. The value of Cronbach's alpha will increase as the inter-correlation among the constructs increases, providing an internal consistency (Carmines and Zeller, 1991).

[23] This study considers Bloomberg ESG disclosure score as a valid external criterion against which the validity of CSR disclosure quality scale, developed in this study, is evaluated. The score provided by Bloomberg ESG disclosure is based on company sourced filling, which reports the degree of firms' coverage towards environmental, social and governance issues; mainly focusing on transparency (Melloni et al., 2017). The Bloomberg ESG disclosure score helps to evaluate the firm's CSR performance in a reliable way and therefore can proxy for CSR disclosure quality.

3.4 Independent Variables: Corporate Governance Dimension

This paper investigates the impact and the value addition role played by external corporate governance dimensions; *UNGC participation (*Rasche and Waddock, 2014; Rasche et al., 2012; UNGC, 2017)*, institutional investor (*Ryan and Schneider, 2002, 2003; Iatridis, 2013; Rupley et al., 2012)*, CSR assurance and type of CSR Assurer* (Pflugrath et al., 2011; Casey and Grenier, 2015), on CSR disclosure quality. The CG elements; UNGC participation, CSR assurance and type of assurer are represented by a categorical variable; "1" for UNGC participation, hiring CSR assurer, assurance by accounting firms and "0" otherwise. Similarly, institutional ownership is calculated by aggregating the percentage of share owned by institutional investors; holding at least 3% of the firms' share.

3.5 Control Variables

Consistent with previous studies in CSR disclosure (e.g. Rupley et al., 2012; De Villers and Marques, 2016; Peters and Romi, 2014; Michelon and Parbonetti, 2012; Chan et al., 2014), observable firm-specific characteristics that are likely to drive CSR disclosure level, are used as control variables. *Firm size* (log of market capitalization) is controlled because larger firms are able to commit greater resources to collect and disseminate information (Rupley et al., 2012). Similarly, a firm with superior performance have higher disclosure propensity to reveal their good news, this study controls firm *profitability* using return on assets (ROA - income divided by total assets). *Leverage* (debt to equity ratio), represents the proportion of debt holders and are controlled because debt servicing plays a monitoring role and demand for greater disclosure (Clarkson et al., 2008).

Further, the way a firm discloses their CSR activities is highly influenced by its CSR performance (Clarskson et al., 2008). Better CSR performing firms are more likely to make high-quality disclosure to distinguish themselves from firms with poorer performance (Melloni et al., 2017; Nazari et al., 2017). Nonetheless, controlling for CSR performance is difficult due to the lack of consensus in an appropriate empirical measure (Dhaliwal et al., 2014). Following previous

research (Gao et al., 2016; Dhaliwal et al., 2014), this study addresses the issue by including an indicator variable; DJSI_Member[24], as a proxy for CSR performance. The firms for a specific year take a value of "1" if it is included in DJSI index in that particular year and "0" otherwise.

In addition, industry classification is identified as a major driver of CSR disclosure (De Villers and Marques, 2016). The companies from specific sector i.e. mining, chemical, oil and gas exploration are under greater pressure to maintain their image and thus are more likely to disclose extensive CSR information (Chan et al., 2014). In line with the prior research (Rupley et al., 2012; De Villers and Marques, 2016), this study controls for industry effect by using indicator variable; "1" for firms included in sensitive industry[25] category and "0" otherwise. Finally, year dummies are used to control for potential time effect.

4. Empirical Results

4. 1 Descriptive Statistics and Correlation Matrix

Table 2 summarizes the descriptive statistics of CSR disclosure narrative (Panel A) and continuous variables; both independent and control variables (Panel B), that are used to fulfill the objective of this study. Panel A shows that the length of CSR reports proxied by wordcount has a minimum value of 51 and a maximum value of 101157. These values indicate that variation exists in firms' decision to disclose sustainability news that can ultimately lead to a difference in the quality of

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[24] Dow Jones Sustainability Index: Each year Dow Jones selects firms that are industry leaders in sustainability performance for inclusion in the index (Dhaliwal et al., 2014). This study follows existing literature (Gao et al., 2016; Dhaliwal et al., 2014; Dhaliwal et al., 2012), and considers firm's inclusion in the DJSI as a measure of firms' superior CSR performance. Firms are evaluated and included in DJSI based on their performance in the following categories: Strategy, Financial, Customer and Product, Governance and Stakeholder, and Human. Hence, firms are deemed to possess higher CSR performance than those not appearing in the index (Gao et al., 2016). However, the use of DJSI index membership is not free from criticism i.e. Cho et al. (2012) reports that environmental performance scores is negatively related to membership in the DJSI and suggests that such membership to be driven more by what firms say than what they do. My study contend that such results reported by Cho et al. (2012) may be due to two specific reasons: (1) focus on firms' environmental performance only, whereas the DJSI inclusion criteria cover broader areas than mere environmental performance. (2) focus on environmentally sensitive industry: basic materials, oil and gas and utility industries. Such firms are subjected to greater scrutiny, therefore in order to manage their reputation they might engage in impression management (Melloni et al., 2017; Cho et al., 2010). As such, they might not fully represent the CSR practices and their inclusion in DJSI for other industry. The historical data of DJSI membership is downloaded from RobecoSAM website: https://www.robecosam.com/en/csa/csa-resources/dow-jones-sustainability-indices-components.html (accessed on 1st March 2019).

[25] Sensitive industries are identified, and categorization based on 2-digit NAICS code https://www.partneresi.com/sites/default/files/sba_sop_50_10_5_naics_codes.pdf

CSR report (Muslu et al., 2017). The length is calculated to understand the difference in the report volume and finally, the log_length is used in calculating the composite quality score. Similarly, average POS_Ratio (mean value of 7) is higher than NEG_Ratio (mean value of 2.7), which is consistent with firms' optimism in CSR reports under voluntary disclosure environment (Cho et al., 2010). It is well established that presenting information in positive terms is more favorable evaluation than presenting information in negative terms and therefore the firm emphasizes their positive CSR performance more than the negative ones (Muslu et al., 2017; Loughran and McDonald, 2011). However, the higher inclination toward the use of optimistic tone may increase information asymmetry between firm and stakeholders, as a result decreasing the usefulness and credibility of such reports.

Table 2 – Descriptive Statistics

Panel A - Descriptive Statistics of Narrative Dimensions of CSR Disclosure

Variables	N	Mean	St. Dev.	Min	Max
Aspect of CSR Disclosure Quality					
Length	385	16296.6	17890.4	51	101157
POS_Ratio	385	7.0	1.6	0.9	11.4
NEG_Ratio	385	2.7	0.8	0.0	5.9
Log_length	385	3.9	0.5	1.7	5.0
TONE_Ratio	385	4.3	1.6	0.0	9.6
HOR_Ratio	385	2.1	0.5	0.0	3.9
NUM_Ratio	385	10.9	4.7	1.7	27.7

Panel B - Descriptive Statistics of Independent and Control Variables

Variables	N	Mean	St. Dev.	Min	Max
Independent Variables					
Institutional Investors	385	46.08	21.91	4.46	98.47
Control Variables					
ROA	385	4.45	5.56	-14.67	30.62
Log (Firm Size)	385	8.67	1.36	4.97	11.33
Leverage Ratio	385	89.26	180.79	0.00	1853.50

Finally, NUM_Ratio (mean value of 10.9) and HOR_Ratio (mean value of 2.1) suggests that German firms frequently use numerical and forward-looking content in CSR reports. This practice mitigates

an external audience's tendency to discount the credibility of discretionary disclosure (Cormier et al., 2009). Further, such attributes send a positive signal to stakeholders and assist them in differentiating firms based on their CSR performance (Muslu et al., 2017).

The descriptive statistics of continuous variables are presented in Panel B. The firm size is highly right skewed and therefore normalized by taking log whereas other variables are used without any transformation. Notably, the table shows high ownership by institutional investors[26]. Similarly, 84 firm-year observations were found to be included in the DJSI index based on their superior CSR performance during the sample period (untabulated).

Table 3- Distribution across Reporting Practice

				Assurance		***Type of Assurer***	
CSR Disclosure Quality		UNGC Signatory		No	Yes	Accountant	Non-Accountant
Low	204	No	142	130	12	10	2
		Yes	62	41	21	19	2
Medium	92	No	33	30	3	2	1
		Yes	59	14	45	40	5
High	89	No	27	19	8	5	3
		Yes	62	17	45	37	8
Total	385		385	251	134	113	21

Table 3 presents the distribution of reporting practices with respect to CSR disclosure quality. Particularly, based on narrative feature 23.11%, 23.89%, 52.98% of all the observations are categorized into three quality; high, medium and low respectively. Among these, almost 47.50% are voluntary signatory of UNGC, 34.80% provide assurance over CSR information and 84.32% of assured reports are audited by accounting firms. It is noteworthy that 5.97% of the observation

[26] This statistic is in line with Wang and Hussainey (2013). When further analyzing the ownership structure, the high percentage of institutional ownership is found to be due to either of these two reasons. (1) Slow updates: The ownership figures correspond to an institutional holding's date. These dates differ among all the institutions that hold a company stock and the number presented are updated on a monthly basic with a lag of approximately four weeks. Therefore, any delay in the reporting date among these institutional investors can distort actual figure. (2) Short selling: Such trading practice allows multiple trader to book their ownership position in a particular firm at same time. As a result, this misrepresent actual ownership structure. Because of these reasons, this study suggests interpreting impact of institutional investors with caution.
https://www.investopedia.com/ask/answers/07/institutional_holdings.asp (accessed on 25th November 2019).

provide assurance of their CSR information even if they are not UNGC signatory, interestingly majority of these reports (73.91%) are assured by accounting firms. Finally, the overlap between UNGC signatory and assurance is 28.80% of the total observation; the majority of which (86.48%) are assured by accounting firms.

Table 4 reports the correlation coefficient of the narrative dimensions that are used to determine the quality of CSR disclosure (in panel A) and of continuous variables that are used in regression (in panel B). *, **, *** show statistical significance at 10%, 5% and 1% levels respectively. All the correlation coefficient between the dimensions of CSR disclosure (Panel A) are statistically significant at 5%, with the exception of the correlation between Log_length and Hor_Ratio which is not significant. The Log_length of CSR report is negatively correlated with TONE_Ratio whereas positively with NUM_Ratio. It signifies that as the length of report increases the German firm uses balanced tone and provides more numerical detail in their CSR reports. The result is consistent with Melloni et al. (2016) according to whom, shorter report tends to be more optimistic with lesser forward-looking details.

Table 4 – Correlation Matrix

Panel A - Correlation among the Dimensions of QUALITY_SCORE

Variables	Log_length	TONE_Ratio	HOR_Ratio	NUM_Ratio
Log_length	1			
TONE_Ratio	-0.307**	1		
HOR_Ratio	-0.067	0.378**	1	
NUM_Ratio	0.190**	-0.352**	-0.259**	1

Panel B- Correlation Matrix for Independent and Control variables

Variables	Institutional Investors	ROA	Log (Firm Size)	Leverage Ratio
Institutional Investors	1			
ROA	0.025	1		
Log (Firm Size)	0.005	-0.026	1	
Leverage Ratio	0.148**	-0.165**	0.033	1

Similarly, TONE_Ratio is negatively correlated with NUM_Ratio; indicating that the report with balanced tone uses more numerical details to support their reports. This not only improves the

understandability of the disclosed information but also enhances the trustworthiness of such reports from users' point of view (Muslu et al., 2017). Further, the positive correlation between TONE_Ratio and HOR_Ratio may suggest that the firm uses more positively inclined details to express their future projects and expectations whereas the negative correlation between HOR_Ratio and NUM_Ratio may suggest that the firms replace numerical content and horizon content with each other. Similarly, the correlation coefficients for the continues variables (Panel B) are either insignificant or significant with a very low correlation value, hence indicating no multicollinearity[27] issues with the variables included in the model used by this study.

4.2 Regression Results

Table 5 presents the results from ordered logistic regression for each corporate governance variables, after controlling for the effects of control variables. The main regression model is run in parts. Regression 1 estimate the effect of CG variables; UNGC participation, institutional investors and assurance, on CSR disclosure quality. The *assurance* is replaced by *assurance type* in regression 2, considering firms *without CSR assurance* as a reference group. This helps to understand whether both types of assurer; *accountant and non-accountant*, are statistically significant and effective in improving CSR disclosure quality when compared to *non-assured ones*. Both regressions 1 and 2 uses the full sample of 385 firm-year observations. Similarly, in order to analyze the difference in the effect of *types of assurer* on CSR disclosure quality, regression 3 uses only firm with assurance; a sample of 134 firm-year observations and considers firms with *assurance by a non-accounting firm* as a reference group.

Since this study uses ordered logistic regression with three levels (two intercepts) and repeated annual firm observations; regression assumptions are tested before considering the regression output and standard error of the results are clustered. First, the use of ordinal logistic

[27] This study checks for multicollinearity with Variance Inflator Factor (VIF), where the VIF value above 10 is considered an indication of multicollinearity. In the case of this study, the largest VIF value is 1.94, so multicollinearity among the variables is not a problem.

regression is justified only if the intercepts are statistically different from each other and if the model meets the proportional odds assumption. For all three regressions, the cut off points for intercepts is statistically different ($p < 0.05$) and the test result for proportional odds assumption confirms that the

Table 5 – Regression Results

	Regression 1 with 385 firm-year	*Regression 2 with 385 firm-year*	*Regression 3 with 134 firm-year*
	Dependent variable: CSRD_Quality	*Dependent variable:* CSRD_Quality	*Dependent variable:* CSRD_Quality
UN_Signatory	0.618^{**} p = 0.032	0.641^{**} p = 0.021	1.406^{*} p = 0.061
Institutional_Investors	- 0.005 p = 0.373	- 0.005 p = 0.348	$- 0.025^{**}$ p = 0.033
Assurance	0.777^{**} p = 0.025		
Type_Assurer			
Accountant		0.622^{**} p = 0.043	-0.977 p = 0.123
Non- Accountant		1.380^{***} p = 0.000	
ROA	- 0.030 p = 0.123	- 0.028 p = 0.153	- 0.070 p = 0.313
Leverage	0.001 p = 0.211	0.001 p = 0.218	0.003^{*} p = 0.060
Firm_Size	0.397^{**} p = 0.012	0.414^{***} p = 0.007	0.209 p = 0.749
DJSI_Member	- 0.466 p = 0.120	- 0.412 p = 0.171	- 0.211 p = 0.618
Sensitive_Industry	- 0.356 p = 0.131	- 0.311 p = 0.191	0.774^{*} p = 0.067
Year	Included	Included	Included
Pseudo R^2	0.2569	0.2623	0.2536
Observations	385	385	134
Note:	$^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$		

The significance levels are based on robust standard errors.

explanatory variables are consistent across different thresholds ($p > 0.05$). Second, to control for the lack of independence and heteroscedasticity, the results from ordered logistic regression are reported after clustering standard errors. Finally, the VIF test affirms the absence of multicollinearity in all three regressions; the largest VIF value for model 1, 2 and 3 are 1.94, 1.40 and 1.89 respectively. These results show that multicollinearity is not influencing the regression results. Therefore, the results drawn from the regressions are valid. Furthermore, the pseudo R^2 shows that the overall variance explained by three regression models are 25.69%, 26.23 % and 25.36 % respectively.

Overall the study finds mix support for the stated hypothesis. UNGC participation and assurance have a positive effect on CSR disclosure quality. Whereas the other two hypotheses; positive effect of institutional investors and a higher effect of assurance by accounting firms are not in line with expectations. The hypothesis results are explained below.

Firstly, as expected, UNGC participation has a positive impact on firms' CSR disclosure quality, validating hypothesis 1. The effect is statistically significant ($p < 0.05$) with sample 1 (whole sample with 385 firm-year observations) whereas the effect with sample 2 (only assured firms with 134 firm-year observations) is weakly supported ($p < 0.10$). The finding is in line with Knudsen (2011), Williams, (2014), according to whom the participation in UNGC encourages the firm to produce high-quality CSR report. Moreover, the positive impact may be the result of alignment between COP and GRI reporting framework (GRI, 2013b), as the adoption of GRI reporting framework improves CSR disclosure quality (Michelon et al., 2015; Mahoney et al., 2013). Since, the majority of UNGC signatories[28] uses GRI guidelines to report their CSR activities, the adoption of GRI may have augmented CSR disclosure quality[29].

[28] In the case of this study; 183 firm-year reports are prepared by UNGC signatory, out of which 145 firm-year reports (80%) are prepared using GRI framework.

[29] In order to analyze such assertion, this study rerun the main regression model with two changes (untabulated results). (1) When GRI compliance by reporting firm is included as an additional control variable, the effect of UN_Signatory becomes insignificant whereas GRI compliance and Assurance are statistically significant. (2) When GRI compliance by the reporting firm is included instead of UN_Signatory as an explanatory variable, both GRI compliance and Assurance is statistically significant.

Although accounting for CSR has been an area of contention because of ambiguity and difficulty in objectively measuring and reporting CSR activities (Arvidsson, 2010), with the change in global landscape, new set of standards i.e. UNGC, GRI, have emerged to help corporations implement, manage and report their CSR activities in a meaningful way (Vigneau et al., 2015). The UNGC signatory firms not only submit a letter of commitment to Secretary-General of the United Nation but also publicize its participation in the Compact and agree to submit an annual COP. In doing so, the company creates a set of standards that can be used by others to monitor and challenge its conduct (Knudsen, 2011; Rasche et al., 2012). The power of public transparency, the watchdog role of media and stakeholders (e.g. labor union and environmental lobby group in German context) serve as an accountability structure when COP is published in UNGC platform (Williams, 2014). Hence, the UNGC participation stimulates sustainability communication process in a balanced and meaningful way, enhancing the quality of CSR reports.

Secondly, the coefficients of aggregated institutional ownership are negative but are statistically insignificant ($p > 0.10$) in regression with sample 1 (full sample with 385 firm-year observations). However, the effect is negative and statistically significant ($p < 0.05$) in regression with sample 2 (only assured firms with 134 firm-year observations). These results, therefore, reject hypothesis 2 and asserts that institutional investors, who typically holds around 46% of the ownership in the sample firms do not have a positive association with CSR disclosure quality as hypothesized, which are consistent with Rupley et al. (2012) and Garcia-Meca and Pucheta-Martinez (2018).

This study followed the argument made under stakeholder theory framework to hypothesize a positive association between institutional investors and CSR disclosure quality. Under this framework, institutional investors are expected to acknowledge the vital role played by relevant stakeholders in enhancing firms' sustainability and profitability and are, therefore, argued to demand high-quality CSR reports as they are interested in understanding firms' attitude and action towards all

relevant stakeholders (Saleh et al., 2010). However, the CSR literature reveals that despite the widespread academic and business interest about the impact of institutional investors on firms' CSR practice, no commonly accepted theoretical perspective exists in explaining their relationship with firms' CSR disclosure practice (Reverte, 2009; Garcia-Meca and Pucheta-Martinez, 2018). As suggested by Hussain et al. (2018) one theory alone cannot fully explain the CG-CSR disclosure link and therefore should seek theoretical aid to explain such association. An alternative view from economic theory such as agency theory, considers CSR disclosure strictly as an economic decision, with management assessing various cost and benefits derived from such voluntary reporting (Cormier and Magnan, 1999; Ducassy and Montandrau, 2015). The results from this study seem to suggest that CSR disclosure quality is driven by such assessment and therefore can be better explained through the argument provided by agency theory.

Institutional investors act as the main supplier of the capital required by companies. They invest and manage funds on others' behalf; serving a delegated monitoring role and seeking to maximize risk- returns relationship (Ducassy and Montandrau, 2015). Institutional investors as a dominant owner have access to firms' internal information, and they can gather needed details from companies via one-on-one meeting as and when required (Garcia-Meca and Pucheta-Martinez, 2018; Wang and Hussainey, 2013). As such they might not play an active role in monitoring/ improving firms' CSR disclosure practice as it may risk firms to lose their competitive advantages. Moreover, institutional investors because of their large stake in a company may discourage the release of high-quality voluntary disclosure or even manipulate such disclosure, to maximize their own private gain at the cost of minority shareholders or other stakeholders' interest (Liu and Sun, 2010; El-Diftar et al., 2017; Garcia-Meca and Pucheta-Martinez, 2018). It is, therefore, plausible, to find either insignificant or a negative impact of institutional investors on CSR disclosure quality.

Thirdly, assurance is found to have a positive and statistically significant impact ($p < 0.05$) upon CSR disclosure quality, validating hypothesis 3a. The result is in line with Moroney et al.

(2012), Pflugrath et al. (2011), Casey and Grenier (2015), Cuadrado - Ballesteros et al. (2017), and tends to suggest that CSR assurance improve the narrative features of firms CSR reports. Moreover, the positive effect is consistent, irrespective of the type of assurer; as both types of assurer (accountant and non-accountant) have statistically significant ($p < 0.05$) and positive impact on CSR disclosure quality compared to non-assurer. This result further strengthens the argument that because of the rigorous assessment of disclosed report by independent third-party assurer, the assurance reinforce transparency and significantly improve the quality of CSR report.

Similarly, hypothesis 3b posits that the assurance by professional *accounting firms* has a higher impact on CSR disclosure quality compared to assurance by *non-accounting firms*. But the result from regression 3, shows that there is statistically no difference ($p > 0.10$) between the CSR disclosure quality assured by these two groups and hence fails to support hypothesis 3b. The result is consistent with Moroney et al. (2012), suggesting that the quality of CSR disclosure is similar whether a professional accountant or non-accountant assurer is used. This may be because of two main reasons; the possibility of hiring subject matter specialist by accounting firms and the institutional context faced by disclosing firms (Pflugrath et al., 2011). According to Wong and Millington (2014), assurance by specialist/ non-accounting firms who has subject-specific expertise enhances CSR disclosure quality rather than accounting firms who are competent in the auditing process. On the other hand, accountant assurers do not appear to be applying the skill and expertise gained from statutory audit training when assuring CSR reports because of the difference in nature of information in it (Moroney et al., 2012). This might lead to a situation where non-accountants are in a position to affect CSR disclosure quality in a better way. However, many of the employees in accounting firm come from a diverse background who possess subject-specific knowledge and also, the accounting firms can easily hire subject matter expert as and when required (Pflugrath et al., 2011). As such, the service provided by both type of assurer may be similar in nature and therefore,

the assurer's professional affiliation doesn't have a significantly greater impact on CSR disclosure quality.

Additionally, most of the earlier studies that find the incremental effect of assurance by an accounting firm i.e. Big 4 accounting firms are conducted using a sample from American market where the perceived reputation of Big 4 accounting firm is higher than non-accounting firms (Pflugrath et al., 2011). However, such reputational status for Big 4 accounting firms may not be as prominent in other countries like Germany. Hence, the difference in its effect upon CSR disclosure quality may not be as pronounced as American market.

Turning to the control variable, a scan of all three regression results shows that only a few of the variables are statistically associated with CSR disclosure quality. Regression result with sample 1 indicated that only firm size has statistically significant ($p < 0.05$) and positive impact on CSRD quality. This is consistent with the literature and implies that size captures various factors; such as public pressure or financial resources, that motivates a firm to issue high-quality CSR reports (Dhaliwal et al., 2011; Rupley et al., 2012). Similarly, the regression result with sample 2 shows that two variables; leverage and industry classification, are weakly significant ($p < 0.10$) and positively associated with CSR disclosure quality. These results support the pattern noted in previous research, that firm with higher debt proportion (Clarkson et al., 2008) and in sensitive industries are more likely to disclose higher quality CSR reports (Rupley et al., 2012). Other control variables; ROA and DJSI membership are statistically insignificant ($p > 0.10$) in all three models.

5. Additional Analysis

This study also carried out some additional analysis (untabulated), using alternative model specifications in the determination of CSR disclosure quality; (1) The various estimation methods are based on different assumption and therefore have distinct strength and weakness (Dhaliwal et al., 2011). To provide assurance that the main results are not sensitive to the choice of these measures, the analysis is repeated using different proxies for control variables separately i.e. return (ROE-

return on equity) and leverage ratio (total debt divided by total assets). (2) Any corporate scandal generates stakeholders' mistrust and has a ripple effect from the company caught in the scandal, to the overall market (Zou et al., 2015). Since, the information that shapes stakeholders' perception of firms' risk and performance becomes particularly important for firms' sustainability (Jizi et al., 2014), the act of publishing high-quality CSR reports become all too apparent especially in the light of such scandalous scenario and resulting public disgrace (Sethi et al., 2017). As such, the VW scandal, that occurred during the sampling period may introduce bias in CSR reporting practice in the German context. This study, therefore, divides the sample between pre and post VW scandal and analyzes whether VW scandal has any effect upon CSRD disclosure quality. Following VW admission about its deceit in September 2015[30], this study considered 2011 through 2014 – *before scandal* and 2015 to 2016 – *after scandal*. The period is represented by a categorical variable; "1" for *after scandal* and "0" otherwise. (3) Because of the specific nature of financial firms' operation i.e. business model, regulatory requirement, board characteristics etc. the financial industry disclose CSR with different intensity and vary in their focus among the identified CSR categories (Jizi et al., 2014). This study, therefore, tests if the result varies in any way when the financial sector is dropped from the sample. *First*, this study divides the main sample (385 firm-year) into financial and non-financial sectors; represented by a categorical variable; "1" for the financial sector and "0" otherwise. The result shows that the financial industry has a statistically significant and positive effect on CSR disclosure quality. *In the next step*, similar to Cuadrado-Ballestros et al. (2017), the analysis is repeated after removing the financial industry; with 314 firm-year observations.

Taken together, results are consistent with main analysis and do not alter the inferences drawn from the main model findings. When other proxies for return and leverage are used, all the results are consistent with those of the main model. Also, the effect of VW scandal is statistically

[30] https://www.reuters.com/article/us-volkswagen-emissions-timeline/timeline-volkswagens-long-road-to-a-u-s-dieselgate-settlement-idUSKBN14V100 (accessed on 25th March 2019).

insignificant, confirming that the scandal doesn't change the way CSR reporting is conducted during the sampling period. However, when analyzing the interacting effect of each CG variables; UNGC, Assurance and institutional investors with pre-post VW scandal, only institutional investors have a positive effect on CSR disclosure after the scandal. This is consistent with Dyck et al. (2018), who argue that such unexpected event serves as an exogenous shock to institutional investors, encouraging them to assign higher importance on sustainability issues. Similarly, when financial firms are removed from the sample, the results are consistent with those reported in Table 5, except the outcome of *assurance type*. The assurance by *an accounting firm* is statistically insignificant whereas *non-accounting firm* is statistically significant and positively associated with CSR disclosure quality. This is in line with Pflugrath et al. (2011), according to whom the value of assurance and the value of assurer is context specific, as assurance in non-financial firms may be more used to specialist assurer.

6. Discussion and Conclusion

This study answers the call from prior literature (Melloni et al., 2017; Nazari et al., 2017), to investigate the relationship between CG mechanism and CSR disclosure quality with a specific focus on its narrative quality. Majority of the earlier studies in this area focuses either on the influence of corporate characteristics, such as size, industry grouping, risk, profitability etc. on firms' CSR disclosure decision/level (e.g. Gao et al., 2016; De Villers et al., 2016) or on the influence of firm's CSR performance matrix on CSR disclosure quality[31] (e.g. Cho et al., 2010; Melloni et al., 2017; Nazari et al., 2017), and largely neglects investigating the impact of key CG dimensions (Jizi et al., 2014; Mallin et al., 2013). To address the gap, this study investigates the role of external CG mechanism; *UNGC participation, institutional shareholding, CSR assurance and type of assurer*, in determining the quality of CSR reports. In summary, this paper provides valuable empirical evidence

[31] CSR Disclosure quality is based on disclosure narrative features as suggested by existing literature i.e. Muslu et al. (2017), Cho et al. (2010), Nazari et al. (2017), Melloni et al. (2017), Li, (2010).

of the relationship between external CG mechanism and the quality of CSR disclosure, measured by its linguistic feature.

Overall the study finds mix support for the stated hypothesis. The effect of UNGC participation and CSR assurance are supported whereas the effect of assurer type and institutional investor are not as expected. As a voluntary initiative, UNGC relies on public accountability, transparency and disclosure to complement regulation (Orzes et al., 2018; UN, 2015). The COP prepared by a participant not only adhere to the UNGC's 10 principle that covers key sustainability issues, but the majority of that COP is prepared using GRI guideline. The adoption of GRI guideline emphasizes on quality reporting that reflects a balance of information reported (both positive and negative) with comparable, accurate and reliable details (Moroney et al., 2012; Michelone et al., 2015). Hence, the commitment to report on pressing issues following a standard reporting framework like GRI, ensures a complete and clear presentation of firms' CSR activities, as a result improving the reporting quality. The finding is consistent with previous studies like Knudsen (2011), Williams, (2014).

Similarly, the quality of sustainability reports is found to vary in a systematic way with the presence of third-party assurance. This result is consistent with previous studies (e.g. Casey and Grenier, 2015; Pflugrath et al., 2011) according to whom the third-party assurers verify firm's claims and moderate the details presented in CSR reports, as a result improving its quality. However, there is no significant difference in the quality of CSR reports based on assurer affiliation i.e. assured by the members of accounting profession or independent experts outside the profession. This may be because of the possibility of accounting firm hiring subject matter specialist as and when needed (Pflugrath et al., 2011). As a result, the auditing procedure and its nature followed by both assurers may be similar in German context and therefore, the effect may not be statistically different.

Moreover, this study fails to support the hypothesis about the positive effect of institutional investors on CSR disclosure quality. This may be because of the variation in investment motives or

institutional investors' direct access to the firms' internal information (Garcia-Meca and Pucheta-Martinez, 2018; Saleh et al., 2010) and the resulting effect may be better explained by seeking theoretical aid from agency theory. Institutional investors tend to use their position to act passively (and collect required information through one-on-one meeting) or act opportunistically (discourage or manipulate sustainability reporting) to expropriate wealth from other stakeholders, which explain the insignificant or a negative effect of institutional investors on CSR disclosure quality. Institutional investors include heterogeneous investors with different investment horizon and motives (Rupley et al., 2012; Saleh et al., 2010), however, this study takes all institutional investors (ownership of 3% and above) as one homogenous group, which might not capture the specific interest and influence of particular types of institutional investors. It might be wise to segregate institution investors based on their investment focus and study the effect of each group upon CSR disclosure quality. Future study can analyze the effect of different categories of institutional investors (e.g. investors with short investment horizon and long investment horizon) on CSR disclosure narratives.

Altogether, the results partly support the theoretical assertions of stakeholder theory regarding the role of the external CG in enhancing CSR disclosure quality. This study improves the understanding about the effect of external CG mechanism like UNGC and CSR assurance on the narrative quality of sustainability reports, as both act as a superior governance mechanism for monitoring and stimulating high-quality CSR report. This study also makes a methodological contribution by relying on recent work on narrative disclosure (Muslu et al., 2017; Melloni et al., 2017), that can contextualize relevant information and enhance stakeholders understanding about firms' CSR activities. Moreover, the findings have practical implication for accounting standard setters, regulators, and firm executives. Many regulatory agencies/firms have made consistent effort to encourage the use of clear and precise language in corporate disclosure. Nevertheless, for most stakeholders, CSR disclosure remains difficult to read and assess (Nazari et al., 2017). The regulator,

as well as stakeholders, can encourage firms to incorporate such CG mechanism that can act as a moderator and improve the informational content of their CSR disclosure.

This study is not free of drawbacks and has some limitations. First, the CSR disclosure quality measured in this study adopts a dictionary-based approach that can be readily applied on larger samples with a lower risk of subjective evaluations; nevertheless, this measure could introduce noise (Muslu et al., 2017; Li, 2010). Although, the decile ranking method used in this study can mitigate the potential noise in measurement and enables a meaningful aggregation across the selected dimensions of the CSR disclosure (Muslu et al., 2017), the results should be used cautiously. Second, if the CSR disclosure quality is measured by aggregating various dimensions of narrative disclosure, it should be carefully selected noting the importance of non-linearity as well as aggregation of the chosen dimensions (Muslu et al., 2017). While this study carefully considers four independent components to compute CSR disclosure quality based on the literature suggestion, there can be some other dimensions that can add value to understand sustainability reports' quality. Future studies can refine this measure by either adding or removing aspects of CSR report narrative, appreciating the non-linearity characteristics. Third, although this study analyzed the effect of VW scandal (in additional analysis) by dividing the sample period between pre (2011 to 2014) and post (2015 to 2016), it can be interesting for future researchers to examine the effect under balanced panel or consider an interaction for automobile industry to identify any industry specific pattern due to this incident. Fourth, some of the financial variables were not available for all firms covering the entire sample period and therefore these firms were dropped. This reduced the sample size that might have an effect on the overall result. Finally, since the sample is from one country, this may affect the generalization of findings.

Future researcher can also examine the effect of other CG elements on CSR disclosure narrative, as they relate to improving the quality of non-financial disclosure. Although important this study doesn’t control the possible effect of internal CG mechanisms like audit committee, firms

experience in CSR reporting practice, presence of CSR committee, presence of Chief Sustainability Officer (CSO) (Ruley et al., 2012; Peters and Romi, 2014; Moroney et al., 2012) on CSR disclosure quality. As suggested by other scholars (Rupley et al., 2012), internal CG mechanism such as audit committees are involved in the financial reporting process and it may be interesting to examine whether the attributes of internal CG are associated with improving narrative features used in CSR disclosure. Similarly, the inclusion of management variables i.e. the presence of finance directors on the board, qualification and the relevant background (CSR experience) of top management, the presence of CSR committees, may uncover interesting facts and add value to the understanding about broader research field of CG.

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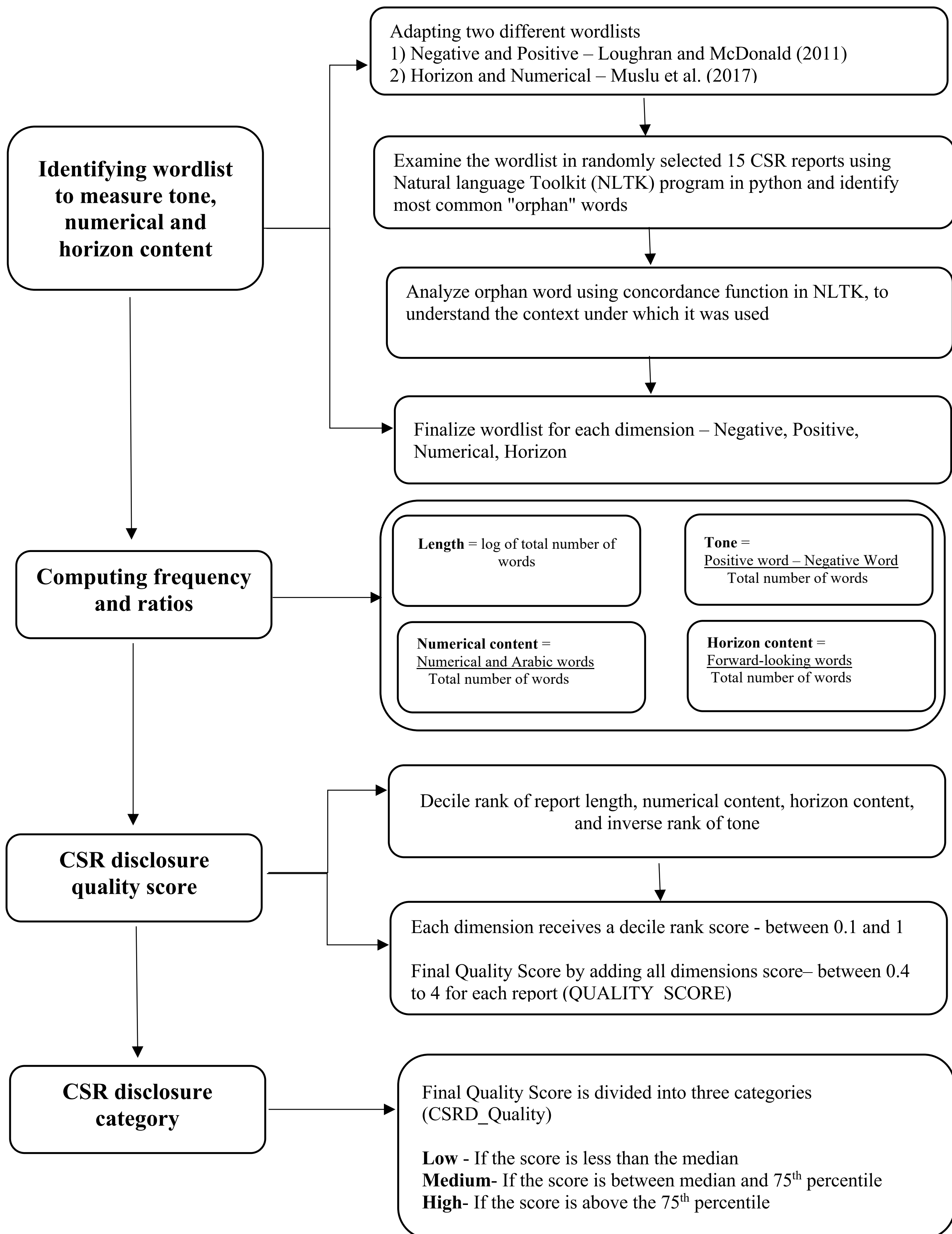
Appendix- 1 – Construction of wordlist and CSR disclosure categorization process



Appendix 2- Categorization Example

Firms	Year	Decile rank LENGTH	Inverse decile rank TONE_RATIO	Decile rank HOR_RATIO	Decile rank NUM_RATIO	Quality SCORE	Disclosure CATEGORY
Adidas	2011	0.7	0.1	0.9	1	2.7	**HIGH**
Adidas	2012	0.8	0.2	1	0.9	2.9	**HIGH**
Allianz	2013	0.4	1	0.9	0.1	2.4	**MEDIUM**
Allianz	2014	0.9	0.6	0.6	0.4	2.5	**MEDIUM**
AXEL Springer	2011	1	0.5	0.2	0.3	2	**LOW**
AXEL Springer	2013	1	0.7	0.1	0.3	2.1	**LOW**

Appendix 3 – Variable Definitions

Dependent Variable	
CSRD_Quality	Category of the reports based on narrative quality (Appendix 1 and 2).
Independent Variables	
UNGC_Signatory	Indicator variable coded "1" for firm participating in UNGC and "0" otherwise.
Assurance	Indicator variable coded "1" for firm assuring their CSR reports and "0" otherwise.
Type_Assurer	Indicator variable coded "0" for the firm without assurance, "1" if the assurer is accounting firms (Big 4) and "2" if the assurer is other than Big 4 accounting firms (for regression with – 385 firm years; that includes all firms). Indicator variable coded "1" if the assurer is accounting firms (Big 4) and "0" if the assurer is other than Big 4 accounting firms (for regression with – 134 firm years; that includes only firms with assurance).
Institutional_Investors	Aggregating the percentage of share owned by institutional investors; holding at least 3% of the firms' share.
Control Variables	
Profitability	Net Income divided by Total Assets.
Firm_Size	Log of Market Capitalization.
Leverage	Debt to Equity Ratio.
DJSI_Member	Indicator variable coded "1" for the firm that are included in DJSI index for a particular year and "0" otherwise.
Sen_Industry	Indicator variable coded "1" for firm belonging to sensitive industry and "0" otherwise.
Year	Year dummies (2011-2016).

PAPER 3: VALUE RELEVANCE OF NON-FINANCIAL DISCLOSURE AFTER THE IMLEMENTATION OF DIRECTIVE 2014/95/EU: EMPIRICAL EVIDENCE FROM FIRMS LISTED IN GERMAN CAPITAL MARKET

1. Introduction

Acknowledging the important role that Corporate Social Responsibility (CSR) disclosure[1] plays in promoting transparency, several European countries has taken a stricter stance on the issue of disclosing firms' CSR activities by imposing Non-Financial (NF) disclosure regulation since early 2000, for e.g. New Economic Regulations Act 2001 (Nouvelles Regulations Economiques) in France, Coordination of the Federal Policy for Sustainable Development 1997 in Belgium, Danish Financial Statements Act 2009 in Denmark, Environmental Reporting Decree (Besluit Milieuverslaglegging) 1999 in the Netherlands (Dhaliwal et al., 2014; Aureli et al., 2018). However, despite the commendable initiation, prior literature largely criticizes and highlight the inadequacy of such regulation in encouraging firms to disclose relevant NF activities that can sufficiently satisfy the informational need of stakeholders i.e. objective and credible[2] (Chauvey et al., 2015; Aureli et al., 2018; Arvidsson, 2019; Costa and Agostini, 2016).

As a result, partly to enhance corporate accountability and partly to improve NF disclosure by enhancing the consistency and comparability of NF information disclosed, the EU Parliament and Council has adopted Directive 2014/95/EU[3] (henceforth "NF Directive") on 6th December 2014. Every EU member state were then required to transpose NF Directive into their national law within two years; from the starting of financial year on 1st January

[1] The corporate social responsibility disclosure are identified by different names in literature and may cover only a part or the entire CSR activities; Non-Financial Disclosure (Bernardi and Stark, 2018b), CSR reports (Chen et al., 2018), accountability report (Ramanna, 2013), sustainability report (Simnett et al., 2009), environmental disclosure (Cho et al., 2010), and responsibility report (CorporateRegister, 2008). These terms are considered equivalent and used interchangeably in the literature.

[2] Disclosure credibility is defined as investors' belief about firms' NF disclosure (Mercer, 2004).

[3] Directive 2014/95/EU of the European Parliament and of the Council of 22 October 2014 amending Directive 2013/34/EU regards disclosure of non-financial and diversity information by certain large undertakings and groups, Official Journal of the European Union No. L 330. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0095&from=EN (accessed on 25th Jan 2019).

2017 or during the calendar year 2017 (European Union, 2014; CSR Europe and GRI, 2017; Bernardi and Stark, 2018b).

The NF Directive was transposed into German commercial law through CSR Directive Implementation Act (CDIA)[4] on 18th April 2017, requiring all publicly listed companies in Germany from 2017 to publish NF disclosure that covers detail on environmental issues, social and employee matters, respect for human rights, anti-corruption and bribery matters "*to the extent necessary for an understanding of the undertakings' development, performance, position and impact of their non-financial activities*" (European Union, 2014; Uwer and Schramm, 2018; Saenger, 2017). By imposing such requirements, CDIA intent to achieve higher level of transparency with respect to policies, risks and outcomes of firms' NF activities (Global Compact, 2018; Saenger, 2017).

Importantly investors are considered as a major beneficiaries of NF disclosure and with the implementation of NF Directive they are expected to benefit from more informed and efficient process (Gulenko, 2018; Grewal et al., 2018). As such, if the objective of CDIA is to improve the informational content of NF disclosure and to provide investors with a comprehensive picture of firms' performance that offers bases for better analyzing investment alternatives, then it should have a higher effect on firms' market value. However, the adoption of NF Directive is a fairly new concept[5] and, even though the implementation of NF Directive is expected to address the informational need of capital market (European Union, 2014; Ioannou and Serafeim, 2018; Grewal et al., 2018), there isn't enough empirical evidence on whether investors find post mandated NF disclosure more decision-useful than

[4] Also known as CSR- Richtlinien- Umsetzungsgestez (CSR-RUG) is the amendment of and addition to the Third Book of the German Commercial Code (*Handelsgesetzbuch*, "HGB"). Issuance of NF disclosure relates within the regulatory system and the firms affected by the CSR-RUG can either "scatter" their "non- financial statement" (sec. 289c HGB) over the management report, assigned according to topic, or bundle it in a separate section. According to sec. 289b para. 3 No. 2 HGB an entirely separate "non-financial report" is also admissible (Uwer and Schramm, 2018).

[5] The German listed firms are issuing their NF disclosure for the first time in year 2018 (*that covers firms' NF activities for the year 2017*) following the requirement of CDIA.

pre mandated NF disclosure (Ioannou and Serafeim, 2018). Using Positive Accounting Theory (PAT) lens, this study therefore, investigates whether the implementation of NF Directive enhances the value relevance of NF disclosure for the firms listed in German capital market.

This study considers Germany as an appropriate setting to understand the effect of NF Directive mainly for following reasons. According to Ramanna (2013), Cahan et al. (2016), complementary institution plays an important role in monitoring firms' action and the effective enforcement of NF disclosure related rules. Given the strict legal environment in Germany that carefully delineates the right and obligation of economic agents (Cormier et al., 2005; Gulenko et al., 2018), the authority of union i.e. employee related groups and the influence of independent agencies i.e. environmental lobby group (Verbeeten et al., 2016), this study expects such factors to act as a governance mechanism that may assure effective implementation of NF Directive. Similarly, there weren't any official requirement in term of disclosing NF activities before the implementation of CDIA in Germany, as opposed to other EU member states like France, Denmark or Belgium (Dhaliwal et al., 2014; Gulenko et al., 2018). This setting, therefore, allows for clearer observation of potential changes due to compliance with CDIA.

Disclosure regulation such as CDIA, promotes the measurement of key informational metrics that could enhance corporate transparency and facilitate value creation (Ioannou and Serafeim, 2018). As such, the analysis of disclosure nuances, such as length[6], tone, numerical

[6] Although, firms that wants to obfuscate its report could make the report lengthier (Loughran and McDonald, 2014), this study follows the line of argument i.e. Dhaliwal et al. (2011) Dhaliwal et al. (2012), that suggests longer report covers significantly more CSR issues which can help investors to better understand firms' CSR practice. Furthermore, Leung et al. (2015) analyzed the use of minimum narrative disclosure (MND) in annual report and finds that firms with poor performance and higher risk of financial distress are more likely to engage in MND behavior. The narrative in financial reports (i.e. Management Discussion and Analysis (MD&A) section of annual reports) are similar to CSR disclosure in this context as there are few standards for the narrative in these reports (Muslu et al., 2017). Additionally, longer CSR reports are found to represent better CSR performance (Nazari et al., 2017). Consequently, this suggests that CSR disclosure with enough details (length) signifies better disclosure quality.

and forward-looking content[7], becomes logical dimension to be affected by disclosure regulation[8] (Costa and Agostini, 2016; Chauvey et al, 2015). These disclosure dimensions not only provide an opportunity for firms to effectively convey their NF activities (Melloni et al., 2017) but also provide an insight to investors who want to understand the economic consequences of firms NF activities (Muslu et al., 2017). Therefore, following the methodology suggested by Muslu et al. (2017), this study examines the narrative features of the NF disclosure; *length, verbal tone, numerical content and forward-looking content,* and develop a composite score to determine its quality. Based on the composite score, NF disclosure are categorized into three quality levels; low, medium and high and firms with low-quality disclosure are treated as a reference group. From methodological point of view, this study uses modified Ohlson model (1995) to examine the difference in value relevance of NF disclosure between two period (pre and post mandate).

The result from modified Ohlson model shows statistically significant ($p < 0.050$) but declined value relevance of *NF disclosure high* after the implementation of CDIA. The negative coefficient (decline in value relevance) is consistent with investors anticipating costs of directive to outweigh benefit in short run (Grewal et al., 2018). Similarly, *NF disclosure medium* show no changes in the value relevance between two period. The result suggest that this category may not add any value relevant information post mandate compared to pre mandate (McNemar-Bowker test shows no statistical difference in this category), hence the insignificant result. Additionally, the model estimates (Model 3) with alternative specification i.e. change in proxy for control variables, and regression model for each year

[7] Forward-looking content and horizon-content is used interchangeably in the literature.
[8] The finding of this study from McNemar-Bowker test (Table 4) suggests that NF disclosure (analyzed based on narrative features) improves significantly ($p < 0.05$) after the implementation of CDIA for firms listed in German capital market.

independently, are statistically significant at appropriate level ($p < 0.05$ and $p < 0.10$), supporting the results from main model.

This study contributes to NF disclosure literature in following ways. First, the investors are identified as a key party in the formulation of the NF Directive (Grewal et al., 2018). By using value relevance approach (modified Ohlson model), this study allows to understand the effect that implementation of CDIA has on improving NF disclosure quality. The effectiveness is observed through market reaction and the way they perceive the informational value of NF disclosure after implementing CDIA. Second, the transposition of NF Directive by EU member states is a recent development and relevant studies evaluating the consequences of NF Directive transposition are limited. The result from this paper can improve regulator's understandings about the kind of information that can enhance corporate informational environment, hence mandate such types of information. Furthermore, the disclosure narrative features like length (Dhaliwal et al., 2011), tone (Cho et al., 2010), quantitative content (Plumlee et al., 2015) and forward-looking content (Muslu et al., 2017) plays an important role in improving the understanding of capital market participants. Hence, by analyzing the linguistic structure of NF disclosure, this study contributes on methodological side as well and offers a better understanding about the effect that regulation has on improving these particular narrative dimensions of NF disclosure.

The remainder of this paper is organized as follows. Section 2 provides an overview of CDIA whereas section 3 discusses the theoretical framework and states the hypothesis. Section 4 provides details of data and explains the statistical model used in the analysis. Finally, section 5 and section 6 presents the empirical results and section 7 covers the conclusion and discussion.

2. Implementation of Directive 2014/95/EU in Germany

Directive 2014/95/EU was transposed into German law with an implementation of CSR Directive Implementation Act (CDIA) on 18th April 2017. The extended reporting duties under CDIA, comprises firms' NF activities (covering environmental, social and employee matters, respects for human rights, anti-corruption and bribery matters) starting from fiscal years 2017 and is applicable to German firms that (a) are capital market oriented, credit institutions and insurance companies (b) employs more than 500 people on average per year (c) have an annual balance sheet total exceeding € 20 millions or annual sales exceeding € 40 millions (Uwer and Schramm, 2018; CSR Europe and GRI, 2017; Global Compact, 2018). CDIA requires companies to produce a NF disclosure either as a part of their annual management report or as a separate standalone report; explaining business model and declaring firms' goals along with the details of current and foreseeable impacts of their NF activities. Furthermore, "comply or explain" principle applies in respect of the reporting policy i.e. if a firm does not pursue any aim for one of the aforementioned areas due to its irrelevance with business model, then an explanation must be provided. Similarly, certain concepts can be referred to multiple fields whereas non-compliance can lead to a fine and/or imprisonment for the directors and in exceptional cases firms are subjected to fine too (Uwer and Schramm, 2018; Global Compact, 2018).

3. Literature Review and Hypothesis Development

3.1 Literature Review

Prior studies (Chauvey et al., 2015; Cormier et al., 2005; Dhaliwal et al., 2014; Ramanna, 2013; Cahan et al., 2016), suggests that institutional context along with the relevant regulation and law governing firms' NF disclosure practice, plays a major role in improving its informational content. The proponents of disclosure regulation, argue that the implementation of NF Directive by EU member states will limit the use of NF disclosure as a

legitimation strategy and would enhance corporate accountability (La Torre et al., 2018), improve transparency (Doshi et al., 2013; Aureli et al., 2018; Camilleri, 2015) and consequently enhances capital market efficiency (Ioannou and Serafeim, 2018; Baboukardos and Rimmel, 2016; Grewal et al., 2018). However, some of the forces involved in translating NF Directive into actionable policies by EU member states (such as implementation of NF Directive by Germany through CDIA) allows firm to act in a way that limit the original intent of NF Directive (La Torre et al., 2018).

Although disclosure regulation which generally comes with a legal enforcement and penalties, could encourage firms to act responsibly and provide credible information (Ioannou and Serafeim, 2018; Chauvey et al., 2015; Leuz, 2010), the lenient disclosure requirement under CDIA[9] allows German listed firms to maintain the requisite level of disclosure without actually improving its quality i.e. Gulenko (2018) reported an improvement in *quantity* i.e. number of sentences, words or types of NF activities disclosed but not on *quality* i.e. relevance and credibility, of NF disclosure after the implementation of CDIA in Germany. CDIA does not clarify what the potential sanctions results from non-disclosure or how the enforcement and monitoring system works in case of non- compliance. While CDIA requires firm to cover specific areas of their NF activities (environmental, social and employee matters, respects for human rights, anti-corruption and bribery matters), it does not require specific reporting guidelines, providing a high level of flexibility for reporting firm in disclosing their NF activities (Saenger, 2017; Global Compact, 2018). Furthermore, the inclusion of "comply or explain" clause, provides an option for reporting firm to briefly explain about a reason if it is not releasing details on a specific topic (La Torre et al., 2018;

[9] The NF Directive establishes a minimum requirement for the type of information to be disclosed and encourages EU member states to take further necessary steps in improving NF disclosure requirement in their constituency; especially where the NF Directive itself does not provide adequate clarity i.e. how to report the business model. However, CDIA passively transpose the NF Directive into German national law and is essentially 1:1 implementation of NF Directive without any improvement (Uwer and Schramm, 2018; Saenger, 2017; Aureli et al., 2018; Global Compact, 2018).

Camilleri, 2015; Ioannou and Serafeim, 2018). Similarly, "safe harbour" clause allows firms to omit the information related to impending development or matters in the course of negotiation (CSR Europe and GRI, 2017; Saenger, 2017) which might limit the knowledge about firms' future prospects. Collectively, this provide a considerable discretion and reporting choices to firm in disclosing their NF activities, even while fulfilling CDIA requirement.

The existing literature mainly consider two theories in explaining firms reporting choices; Positive Accounting Theory (PAT) and Institutional Theory (Collin et al., 2009). Institutional theory explains the variation in the informational content of NF discourse as a result of firms' heterogenous response to institutional pressure i.e. mimetic, normative and coercive isomorphism (Doshi et al., 2013; Gulenko 2018), whereas PAT explains the real-world consequences of accounting choices: making prediction of reporting practice and providing explanation about outcomes (Watts and Zimmerman, 1978, 1990). PAT is based on work undertaken in economics and is heavily dependent on Agency theory and Efficient Market Hypothesis (EMH)[10]. It views firm as a nexus of contracts (interest, decisions and actions) between economic agents that addresses agency problem (Omran and El-Galfy, 2014; Reverte, 2016; Collin et al., 2009). Therefore, the studies that tries to explain the firms reporting choices and investors reaction to corporate disclosure largely relies on PAT (Ball and Brown, 1968; Watts and Zimmerman, 1978; Healy and Palepu, 2001). Since the objective of this study is to analyze the change in value relevance after the implementation of CDIA in Germany, PAT is considered to be appropriate theoretical framework to understand this phenomenon.

[10] Agency theory explains the firms' disclosure choice whereas EMH explains the capital market reaction to such disclosure (Watts and Zimmerman, 1978, 1990).

PAT considers two perspective in explain firms' disclosure behavior; opportunistic form and efficiency form (Watts and Zimmerman, 1978, 1990; Omran and El-Galfy, 2014). The opportunistic perspective takes the negotiated contractual arrangements of the firm as given and seeks to explain and predict certain opportunistic behavior that will subsequently occur. The economic consequences (wealth effect) of the accounting choice is assumed to explain the motivation behind managers' reporting choice under this perspective (Omran and El-Galfy, 2014; Collin et al., 2009). Manager apply their idiosyncratic accounting discretion and are believed to work towards enhancing informational environment only if they have an incentive to do so (Omran and El-Galfy, 2014). Therefore, particular NF activities and their related disclosure would shape in a way that will have positive wealth implication for the management involved. In the case of poor NF performance[11], the opportunistic managers can either choose to "explain" rather than "comply" or exploit information asymmetry by engaging in impression management i.e. by highlighting only positive achievement or by using unreasonable complex words and convoluted sentences in reporting firms' NF activities (Melloni et al., 2017; Cho et al., 2010). The managers motive is to decrease capital market response to bad news by making them costlier to analyze (Merkl-Davies and Brennan, 2007).

Likewise, efficiency perspective considers the contracting mechanism as a means to minimize agency cost and the disclosure choice as a means to enhance informational environment by truthfully reflecting the underlying performance of the firm (Watts and Zimmerman, 1978; Collin et al., 2009). As disclosure regulation like CDIA, raises the perceived importance of sustainability issues among stakeholders (Chauvey et al., 2015; Leuz, 2010), firm show their commitment and their willingness to be responsible/accountable by enhancing transparency through improved NF disclosure (Ioannou and Serafeim, 2018; Costa and Agostini, 2016). Similarly, the higher level of commitment enacted through CDIA

[11] Good CSR performance is associated with better firm performance and vice versa (Orlitzky et al., 2003).

requirement may lead to greater inspection from stakeholders and any detection of opportunistic reporting can lead to consumer boycotts and/or resources withdrawal (because of assigned importance on the topic) that can have far ranging financial impact (Cahan et al., 2016). Furthermore, firms' obfuscation attempt including omission (not reporting particular aspect even though such information can influence economic decision of users)[12], may meet with penalties and/or sanction (European Union, 2014; Uwer and Schramm, 2018; Aureli et al., 2018).

On the other hand, even firms with poor NF performance can gain support from stakeholders by explaining their position, the reason for adverse result and the future action plan to correct it (Du et al., 2010; Matsumura et al., 2014). Under such condition, it becomes progressively more costly for the firms to behave opportunistically and adopt disclosure practice that depart significantly from the economics underlying firms' NF activities (Dye and Sridhar, 2008). Therefore, this study considers that the implementation of CDIA encourage firms to take an efficiency perspective in making reporting choice that ultimately improve the value relevance of NF disclosure.

3.2 Hypothesis Development: Value Relevance of Non-Financial Disclosure

Investors are identified as a key constituent in the formulation of NF Directive[13] and are also considered as a major audience of NF disclosure (European Union, 2014; Grewal et al., 2018). Therefore, with an objective to provide "*relevant, useful and comparable disclosure of non-financial information*", CDIA requires German firm to publish NF disclosure that not only contains information on the current state of their NF activities but also the details on their foreseeable impact on firms' future prospects, opportunities and

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[12] CDIA encourages *"reporting to the extent necessary for an understanding of the undertakings' development, performance, position and impact of their non-financial activities*" (Saenger, 2017).

[13] Investors' access to nonfinancial information is a step towards reaching the milestone of having in place by 2020 market and policy incentives rewarding business investments in efficiency under the roadmap to a resource-efficient Europe (European Union, 2014).

associated risks (Uwer and Schramm, 2018; Global Compact, 2018). In other words, CDIA can be considered an act of policy that enhance *corporate accountability* and improve the *comparability* of NF disclosure by considering clear, concise and consistent format (La Torre et al., 2018).

Appreciating the efficiency perspective under PAT, firm fulfills CDIA requirement by covering relevant topics in an unbiased tone supported with quantitative details and their future prospects[14]. Firms operating in settings where NF information is required by law to be disclosed in formal filings, are found to be more responsive to the information demands of relevant stakeholder groups (Chauvey et al., 2015; Cahan et al., 2016; Cormier et al., 2015) and fulfill such requirement by improving specific dimension of NF disclosure; balanced content (covering both negative and positive NF performance), more numeric, proactive and forward looking details (Costa and Agostini, 2016; Chauvey et al., 2015)[15]. Such NF disclosure reduces information asymmetry between managers and investors (Healy and Palepu, 2001). As a result, lowering cost of capital and increasing firm value (Plumlee et al., 2015), reducing stock price volatility (Cormier et al., 2009), improving analyst forecast accuracy (Muslu et al., 2017) and enhancing the value relevance of NF disclosure (Bernardi and Stark, 2018b; Ioannou and Serafeim, 2018; Grewal et al., 2018; Baboukardos and Rimmel, 2016).

Prior studies (i.e. Costa and Agostini, 2016; Chauvey et al., 2015; Gulenko et al., 2018) suggests that the improvement in NF disclosure in response to NF Directive (i.e.

[14] While prior research suggests that much of the earlier (before the implementation of NF Directive) NF disclosure appear to be driven by concerns surrounding legitimacy and image enhancement (e.g. Clarkson et al., 2008; Cho et al., 2010; Michelon et al., 2015; Melloni et al., 2017), implementation of NF disclosure regulation, such as CDIA, is expected to enhance the informational content of NF disclosure by improving its narrative details (Gulenko, 2018; Chauvey et al., 2015; Costa and Agostini, 2016).

[15] Costa and Agostini (2016) analyzed the effect of Italian Legislative Decree 32/2007 on the disclosure of environmental and employee matter in terms of overall volume, completeness, presence of bad/good news and target oriented information. Similarly, Chauvey et al. (2015) analyzes the impact of *New Economic Regulations Act 2001 (Nouvelles Regulations Economiques)* in French context and examines the change in informational quality of NF disclosure through length, relevance, comparability, verifiability, clarity and neutrality.

CDIA) requirement is mainly driven by *benchmarking*. The implementation of NF Directive enhances the prominence of NF disclosure by not only require firms to adopt uniformity in disclosure but also by encouraging them to use accurate and comparable language. This allows investors to compare firms' NF performance over time and between competitors and assess any progress made on important NF issues (Chauvey et al., 2015; Muslu et al., 2017; Crawford and Williams, 2010). Collectively, such details help investors to better understand firms' NF activities and evaluate their impact in a consistent and objective way when analyzing firm value (Chauvey et al., 2015; Plumlee et al., 2015; Verbeeten et al., 2016).

An important aspect when analyzing the effect of CDIA is to understand how firm with poor NF performance respond to the disclosure requirement. Fulfilling CDIA requirement might be too costly for such firms because of proprietary, preparation or political costs (Ioannou and Serafeim, 2018; Grewal et al., 2018). As a result, they might choose to "explain" rather than "comply" (Ioannou and Serafeim, 2018). However, efficient market hypothesis assumes that market participant can detect the biasness and decompose noise in corporate disclosure (Kothari et al., 2009; Merkl-Davies and Brennan, 2007). If investors don't find relevant information in NF disclosure, they may altogether avoid processing them as they are costly and/or time consuming (Nazari et al., 2017) or alternatively, they will assume worst-case scenario and consider it as a firms' obfuscation attempt (Melloni et al., 2017). Since, disclosure regulation i.e. CDIA, enhances the salience of NF disclosure (Chauvey et al., 2015), investors and public are more likely to use them in decision making process. They are interested in understanding whether or not a company is following disclosure requirement and whether effective Compliance Management System (CMS) are in place to ensure companies behave like "good corporate citizen" (Saenger, 2017). If firms are suspected of opportunistic behavior, they might face boycotts (i.e. from customers,

employees, suppliers), and in extreme cases even imposed with penalties and/or sanction that have a wide financial impact (Cahan et al., 2016; Aureli et al., 2018)

On the other hand, Matsumura et al. (2014) argue that such adverse effect is largely mitigated if firm truthfully disclose information on their NF activities even in the case of poor performance. They studied how the carbon emission disclosure affects firm value and finds that market penalizes all firm for their carbon emission, but a further penalty is imposed on firms that do not disclose emission information. Du et al. (2010) also suggests that stakeholders respond negatively to any NF disclosure that seem manipulative and deceptive. As such the firms with poor NF performance are better off improving their disclosure and complying with CDIA requirement. Such firms can mitigate the negative consequences by enhancing informational quality of their NF disclosure and providing details about; their initiation on NF areas (content), what they achieved and where they failed (unbiased tone), details on missed target and any corrective action they plan to take (numerical and forward-looking content**).** Hence, NF disclosure following CDIA requirement increases the availability of value relevant information that helps investors in; forming clearer expectation of firms' risk, reliably assessing firms' cost of capital and improving firms' cash flow prediction (Grewal et al., 2018). Thus, the following hypothesis is proposed.

H - The value relevance of Non-financial disclosure improves after the implementation of CDIA for publicly listed companies in Germany.

4. Research Design

4.1 Sample Selection

This study focuses on 110 companies that are listed in Frankfurt Stock Exchange under following indexes; DAX, MDAX and TecDAX. These three indexes are collectively

represented under HDAX index[16]. The publicly listed German companies are required to report on important NF issues starting from fiscal year 2017 after Directive 2014/95/EU was transposed into German law through CDIA in April 2017 (Uwer and Schramm, 2018; Global Compact, 2018). The purpose of this study is to examine whether the value relevance of NF disclosure is improved, after the implementation of CDIA in Germany. In order to do so, this paper compare the market valuation coefficient of NF disclosure between two period; one year before (2016) and one year after (2017) the implementation of CDIA as pre and post mandated period respectively.

The financial details and firm specific information are downloaded from Bloomberg terminal. Similarly, NF disclosures are downloaded mainly from two sources; from companies' website and from CorporateRegister website and only the disclosures that are published in English language are included in the analysis. Although all 110 German firms that are listed under HDAX index, published NF disclosure covering their NF activities for year 2017 (post mandate), there were only 99 firms issuing NF disclosure for 2016 (pre mandate). Altogether 209 firm year observation was collected, however 1 firms' data was dropped from sample following the announcement of accounting irregularity[17].

NF Disclosure includes all relevant material information about firms' non-financial activities that are mandated by CDIA. However, CDIA doesn't mandate on reporting format

[16] HDAX index represents big companies within German capital market i.e. DAX: blue chip companies, MDAX: "Prime standard companies" that comply with higher transparency standards and TecDAX: large companies from technology sector. These types of firm because of their size and economic importance are exposed to greater scrutiny with regards to their sustainability performance (Cho et al., 2012). Limiting investigation to such big companies that emphasize ("voluntarily") on sustainability issue and that are economically important is consistent with literature i.e. Cho et al. (2012), De Villers and Marques (2016). Hence, considering year 2016 as period for voluntary issuance of CSR disclosures (pre mandate) and the possibility of analyzing with balanced sample after the implementation of CDIA (post mandate in 2017), this study focuses on HDAX index.

[17] Dated 5 December 2017, Steinhoff International Holdings announced that PwC had been approached to undertake an investigation into certain accounting irregularities and therefore the firms' report can no longer be relied upon.
http://www.steinhoffinternational.com/downloads/2018/Restatement-of-financial-statements-of-subsidiary-companies-2Jan2018.pdf (accessed on 1st March 20).

and allow companies to produce a NF disclosure: as a part of their annual management report, disclosure under IIRC: International Integrated Reporting Framework or as a separate standalone report (Uwer and Schramm, 2018; Global Compact, 2018). This study, therefore, considers all type of NF disclosure that covers relevant topics as mandated by CDIA. Among the reported ones; 10 reports were published under IIRC framework (the same 5 companies that adopted IIRC framework in year 2016 used it in year 2017 as well), 114 reports were issued as a stand-alone report (there was a considerable increase in standalone reports after the implementation of CDIA: 65 standalone reports in year 2017 compared to only 49 standalone reports in year 2016) and 74 NF disclosure were part of group management report (there was a noticeable decrease in publishing NF disclosure within group management reports after the implementation of CDIA: 45 in year 2016 compared to 29 in year 2017).

The existing literature (i.e. Baboukardos and Rimmel, 2016; Bernardi and Stark, 2018a) suggest the use of balanced sample when conducting "pre-post" analysis, as doing so is expected to diminish the probability that the regression results are driven by differences in firm specific characteristics included in the post mandated period but not in the pre mandated period and vise-versa i.e. by including balanced sample, each pre mandated firm observation acts as a control for itself. This study therefore considers a balanced sample of 99 firms that are found to be active and have all the required financial data for both period (i.e. total of 198 firm/ year observation). The final sample consists of altogether 208 firm year observation; 99 firms covering year 2016 (pre mandate) and 109 firms covering year 2017 (post mandate), among which 10 reports[18] were considered for developing initial wordlist that is used to analyze NF disclosure (explained in part 4.3) and the remaining sample of 198 firm-year is used for final analysis.

[18] These reports are from post mandated period (year 2017) and therefore will help in identifying frequent words that are important in improving informational environment after the implementation of CDIA.

4.2 Regression Model

The objective of this study is to examines whether the value relevance of NF disclosure improves after the implementation of CDIA (year 2017) compared to pre implementation (year 2016) for the firms listed in German capital market. First, the change in informational content of NF disclosure is measured through its narrative feature; length, tone, numerical and forward-looking content (explained in part 4.3). These dimensions are used to form a composite score that are represented in three different categories in an ordered form (Low/ Medium/High). Second, in line with previous studies (i.e. Elbakry et al., 2017; Reverte 2016), this paper examines the value relevance of NF disclosure by using modified Ohlson (1995) model, where share price is a function of book value (BV), earnings (EPS), the variables of interest (*NF disclosure*) and control variables. In doing so, below mentioned three equations are employed to better understand the effect of CDIA upon value relevance of NF disclosure: (1) The basic Ohlson model (2) The modified Ohlson Model (3) The extended modified Ohlson model. Overall, these models help to systematically analyze the effect of accounting (BV and EPS) and non-accounting variables (NF disclosure) upon firm value as a result of implementing CDIA in Germany[19].

$$P_{i,t} = \beta_0 + \beta_1 BV_{i,t} + \beta_2 EPS_{i,t} + \beta_3 Pre_Post_{i,t} + \beta_4 (BV \times Pre_Post)_{i,t} + \beta_5 (EPS \times Pre_Post)_{i,t} + \varepsilon_{i,t} \text{ ----- } (1)$$

$$P_{i,t} = \beta_0 + \beta_1 BV_{i,t} + \beta_2 EPS_{i,t} + \beta_3 NF_Disclosure_{i,t} + \beta_4 Pre_Post_{i,t} + \beta_5 (BV \times Pre_Post)_{i,t} + \beta_6 (EPS \times Pre_Post)_{i,t} + \beta_7 (NF_Disclosure \times Pre_Post)_{i,t} + \varepsilon_{i,t} \text{ ----- } (2)$$

$$P_{i,t} = \beta_0 + \beta_1 BV_{i,t} + \beta_2 EPS_{i,t} + \beta_3 NF_Disclosure_{i,t} + \beta_4 Pre_Post_{i,t} + \beta_5 (BV \times Pre_Post)_{i,t} + \beta_6 (EPS \times Pre_Post)_{i,t} + \beta_7 (NF_Disclosure \times Pre_Post)_{i,t} + \beta_8 Firm_Size_{i,t} + \beta_9 Leverage_Ratio_{i,t} + \beta_{10} DJSI_Member_{i,t} + \beta_{11} Sen_Industry_{i,t} + \varepsilon_{i,t} \text{ ----- } (3)$$

[19] By comparing adjusted R^2 between models, the result helps in understanding whether the NF disclosure provides incremental value relevant information to market participants beyond that provided by accounting information alone (Reverte, 2016).

Where, P = share price at the end of fiscal years (December end); BV = book value per share at the end of fiscal years; EPS = earnings per share at the end of fiscal years; NF_Disclosure = category of the reports based on narrative feature (High/ Medium/ Low); Pre_Post = categorical variables, "0" represents observation for year 2016 and "1" for observation from year 2017; Controls = selected firm level control variables (Firms' Size and Leverage Ratio) along with firms' CSR performance and industry membership.

Consistent with previous studies (De Villers and Marques, 2016; Moneva and Cuellar, 2009; Baboukardos and Rimmel, 2016), observable firm specific characteristics are used as control variables, that are likely to drive the association between NF disclosure and firm value. The selected control variables are calculated as below: *Firm size* - (Market Capitalization) as the size of a firm is a primary factor in determining the success of a firm due to economies of scale. *Leverage ratio* - (Debt to Equity ratio) to control the effect (negative) of increased financial risk on firm value. Moreover, the relationship between NF disclosure and firm value is affected by firms' CSR performance (Dhaliwal et al., 2014) and industry membership (Cho et al., 2015). Following previous research (Gao et al., 2016; Dhaliwal et al., 2014), this study addresses the issue by including an indicator variable; *DJSI_Member*[20], as a proxy for CSR performance. The firms for a specific year take a value

[20] Dow Jones Sustainability Index: Each year Dow Jones selects firms that are industry leaders in sustainability performance for inclusion in the index (Dhaliwal et al., 2014). This study follows existing literature (Gao et al., 2016; Dhaliwal et al., 2014; Dhaliwal et al., 2012), and considers firm's inclusion in the DJSI as a measure of firms' superior CSR performance. Firms are evaluated and included in DJSI based on their performance in the following categories: Strategy, Financial, Customer and Product, Governance and Stakeholder, and Human. Hence, firms are deemed to possess higher CSR performance than those not appearing in the index (Gao et al., 2016). However, the use of DJSI index membership is not free from criticism i.e. Cho et al. (2012) reports that environmental performance scores is negatively related to membership in the DJSI and suggests that such membership to be driven more by what firms say than what they do. My study contend that such results reported by Cho et al. (2012) may be due to two specific reasons: (1) focus on firms' environmental performance only, whereas the DJSI inclusion criteria cover broader areas than mere environmental performance. (2) focus on environmentally sensitive industry: basic materials, oil and gas and utility industries. Such firms are subjected to greater scrutiny, therefore in order to manage their reputation they might engage in impression management (Melloni et al., 2017; Cho et al., 2010). As such, they might not fully represent the CSR practices and their inclusion in DJSI for other industry. The historical data of DJSI membership is downloaded from RobecoSAM website: https://www.robecosam.com/en/csa/csa-resources/dow-jones-sustainability-indices-components.html (accessed on 1st March 2019).

of “1” if it is included in DJSI index in that particular year and “0” otherwise. Similarly, following previous studies (Rupley et al., 2012; De Villers and Marques, 2016), this study controls for industry effect by using indicator variable; “1” for firms included in *Sen_Industry*[21] (sensitive industry) category and “0” otherwise.

Table 1 – Variables Definition

Dependent Variable	
P	Share price at the end of fiscal years (December end)
Independent and Control Variables	
NF_Disclosure	Category of the NF disclosure based on its narrative feature
BV	Book value per share at the end of fiscal years
EPS	Earnings per share at the end of fiscal years
Pre_Post	Categorical variables, “0” represents observation for year 2016 and “1” for observation from year 2017
BV × Pre_Post	Interaction variable that is used to capture any differences in the value relevance of BV over two sample periods
EPS × Pre_Post	Interaction variable that is used to capture any differences in the value relevance of EPS over two sample periods
NF_Disclosure × Pre_Post	Interaction variable that is used to capture any differences in the value relevance of NF disclosure over two sample periods
Firm_Size	Market Capitalization
Leverage_Ratio	Debt to Equity Ratio
DJSI_Member	Indicator variable coded "1" for the firm that are included in DJSI index for a particular year and "0" otherwise.
Sen_Industry	Indicator variable coded “1” for firm belonging to sensitive industry and “0” otherwise.

To measure the effect of NF disclosure across two periods, this study includes a year indicator variable (Pre_Post) where “1” designates observations for 2017 and “0” otherwise. Following Elbakry et al. (2017), Chen et al. (2018), Cho et al. (2015), Baboukardos and

[21] Sensitive industries are identified, and categorization based on 2-digit NAICS code https://www.partneresi.com/sites/default/files/sba_sop_50_10_5_naics_codes.pdf (accessed on 1st March 2019).

Rimmel, (2016), *"NF_Disclosure × Pre_Post"* interaction variable is added in the model to capture any differences in the impact of NF disclosure on firm value over two periods. The coefficient of interaction term *"NF_Disclosure × Pre_Post",* reflects the impact of post mandated NF disclosure compared to pre mandated NF disclosure. According to Barth et al. (2001), "*…. accounting information is defined as value relevant if it has a predicted association with equity values*". Hence, the interaction term is regarded as value relevant as long as its coefficient are found to be significantly different than zero. A positive and statistically significant coefficient value of *"NF_Disclosure × Pre_Post"* indicates the enhanced value relevance of NF disclosure, whereas the negative and statistically significant value of *"NF_Disclosure × Pre_Post"* indicates the decline in value relevance of NF disclosure after the implementation of CDIA. If the coefficient value of *"NF_Disclosure × Pre_Post"* are statistically insignificant, it can be argued that CDIA has no effect on the value relevance of NF Disclosure.

4.3 Non-Financial Disclosure

There is a considerable debate in literature over the methods used to measure the informational content of NF disclosure. Previous studies show that the processing is not straight forward, and many papers relies on rather crude measure such as space measure (i.e. word count, sentence count, page count) and content score (i.e. number of items disclosed) (Chauvey et al., 2015; Gulenko, 2018). However, increase in disclosure length is a natural outcome of CDIA as it requires firms to disclose on NF issues if they have not already done so (Costa and Agostini, 2016; Gulenko, 2018). As such it does not signifies improvement in quality (Chauvey et al., 2015) and therefore the use of disclosure length as a proxy for informational quality remain equivocal in the literature (Gulenko, 2018; Melloni et al., 2017). Nevertheless, in line with Muslu et al. (2017), this study argues that disclosure length if studied in isolation may not fulfill the criteria, but when accompanied with other narrative

dimensions: unbiased tone (both positive and negative results), numerical details and future outlook, it enhances the informational quality of NF disclosure. Although these narrative dimensions are different yet complementary in nature that constitute CSR disclosure quality (Michelon et al., 2015). Further, this dimensions collectively fulfill the objective set by NF Directive (Chauvey et al., 2015; Costa and Agostini, 2016). Hence, similar to Muslu et al. (2017), this study develops a composite disclosure score based on narrative dimensions; length, tone, numerical and forward-looking details and divided into three categories: high, medium and low, to better understand the improvement in NF disclosure after the implementation of CDIA.

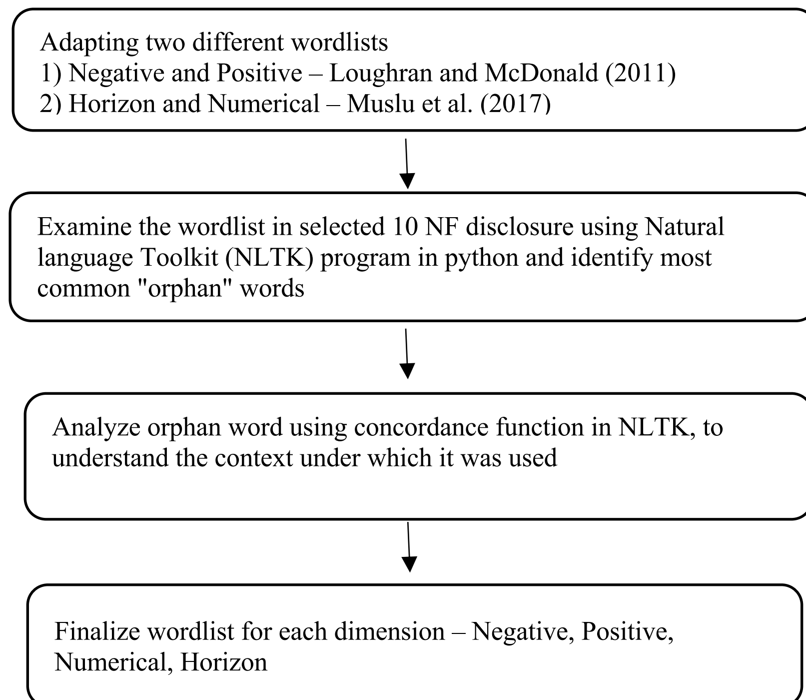
A fundamental step in analyzing the linguistic characteristics is to transform narrative disclosure into a numerical value that represents specific dimension being measured; i.e. by counting words, sentence or sections, or by reading the whole text (Li, 2010). Among the existing methods, the most widely used approach is to count the frequency of predefined list of words that represent a selected dimension and compute a score based on those frequencies (Henry and Leone, 2016). This study uses words as the unit of analysis and assumes its occurrence/frequency in the report as an indicator of the subject matter's importance. Since, this study measures multiple dimension to develop a composite disclosure score, using an alternative measure like counting sentence (with an occurrence of a particular word in a sentence) can cause a problem of recounting, e.g. the sentence will be counted multiple times if the word representing different dimensions are in the same sentence. Hence, word count is considered to be suitable for fulfilling the requirement of this study.

The final wordlist that is used in this study is developed in three steps as suggested by Kearney and Liu (2014), as explained in figure 1. *First,* two different wordlists[22] are

[22] This this study further expand on both wordlists by including additional word (negative wordlist, positive wordlist and horizon wordlist whereas numerical wordlist remains unchanged) that were initially not in these dictionaries but are relevant for sustainability issues, making it more relevant to the context being studied.

considered; Lourghran and McDonald (2011) wordlist to measure verbal tone and Muslu et al. (2017) wordlist to measure horizon content and numerical content. The selected wordlists are created specifically for analyzing financial text[23] and therefore this study considered them appropriate compared to alternative options like General Inquirer (GI) wordlist and DICTION (Henry and Leone, 2016). *Second,* to examine the extent to which

Figure 1 - Construction of wordlist to measure the dimension of NF disclosure



words featured in the dictionary are used in NF disclosure and to identify any additional important words that are useful in NF reporting context, an intensive text-search for a sample of 10 NF report narratives is conducted using Natural Language Toolkit (NLTK) program in Python software. *Third*, the "orphan words" that is not in the initial list and which occurs with a frequency of over 50 times in entire corpus is identified. These orphan words are further

[23] This study focuses on non-financial disclosure and use of such wordlist (mainly LM wordlists) is tricky in this context. However, the narrative in financial reports (i.e. Management Discussion and Analysis (MD&A) section of annual reports) are similar to CSR disclosure in this context as there are few standards for the narrative in these reports (Muslu et al., 2017), the use of these wordlists are argued to make sense.

analyzed using concordance function in NLTK to understand the context under which it is used. i.e. the word that has negative, positive, or horizon connotation. These words are added to the dictionary to come up with the final wordlist.

Once the wordlist is finalized, the frequency and the ratio of each dimension is calculated using a specific command in the NLTK program in python. The detail process is explained under each section below.

Tone - The language used disclosing firms' NF activities act an important element to determine the information content of firms' NF disclosure (Cho et al., 2010). Following CDIA requirement NF disclosure covers multiple aspects; environmental issues, social and employee matters, respect for human rights, anti-corruption and bribery matters, and provides an information on firms' commitment, challenge and progress under each aspect (Uwer and Schramm, 2018; Saenger, 2017). The NF performance for a particular year can be good in one area and bad in another area and the firm might be reluctant to disclose bad news owing to potential proprietary cost (Chauvey et al., 2015; Grewal et al., 2018). However, CDIA encourages firm to provides both negative and positive news in a balanced way, as it provides an opportunity to neutrally present the information that overcomes reporting biases (Uwer and Schramm, 2018). Such a report does not have any prejudice in the use of language that is intended to change the perception (favorable or unfavorable) of the investors and therefore allow for a reasoned assessment of overall performance (Chauvey et al., 2015; Melloni et al., 2017).

The tone of the NF disclosure is measured in two steps. First, pessimistic tone, represented by PES_RATIO is calculated as the ratio of the number of financial negative words over the total number of words in the report whereas optimistic tone, represented by OPT_RATIO is calculated as the ratio of the number of financial positive words over the total number of words in the report. Second, the difference between Optimistic tone and

Pessimistic tone, represented by TONE_RATIO is calculated to measure the net linguistic tone (OPT_RATIO - PES_RATIO). The TONE_RATIO emphasizes the positive versus negative nature of the communication i.e., lower the score of TONE_RATIO, more balanced is the language used in the report and higher is the informational quality of NF disclosure.

Horizon Content – The investors not only analyze firms' past activities but also requires information about firms' goals and targets to determine its sustainability and operational risk (Wang, and Hussainey, 2013; Muslu et al., 2017). As such the forward-looking details provide useful information beyond what is strictly conveyed by historical disclosure (Hassanein et al., 2018). Since CDIA requires the firm to provide "*.... details of the current and foreseeable impacts of the undertakings operation ....*" (Uwer and Schramm, 2018), this study expects forward-looking details to cover an important dimension that helps in understanding the informational quality of NF disclosure. The horizon content is measured as the ratio of the number of references to future years plus horizon context over the total number of words in the report, represented by HOR_RATIO.

Numerical Content – The numerical and quantitative information in the NF disclosure is considered credible and is also understood with a stronger precision by a user. Therefore, the information value is higher when the firms' NF information is backed with numeric details (Muslu et al., 2017; Plumlee et al., 2015). Because the objective of CDIA is to improve decision usefulness of NF disclosure (Uwer and Schramm, 2018; Saenger, 2017), it encourages firm to provide verifiable information that can be tied back to the underlying phenomena (Chauvey et al., 2015). This is based on the idea that quantitative items are easier to verify ex post and therefore improves the informational value of NF disclosure. The numerical content is measured as the ratio of the number of Arabic numerals and quantitative words over the total number of words in the report, represented by NUM_RATIO.

Length – Since the emphasis of CDIA is to improve NF disclosure by requiring information on issues that were not reported earlier (pre implemented), in line with Chauvey et al. (2015), this study also expect the length of disclosure to increase during the period of diffusion. The increased disclosure volume signifies the importance that a company attached to disclosed matter (Chen et al., 2016) and is argued to be an indicator of transparency and informativeness which is associated with better economic outcomes, such as liquidity, institutional ownership and analyst following (Nazari et al., 2017; Lang and Stice-Lawrence, 2015). The length can be computed as the natural logarithm of the number of words, the number of sentences or the number of pages of the entire report. These measures have already been successfully applied in earlier research to measure the quality of information provided in the reports and they can be easily calculated and interpreted (Loughran and McDonald, 2015). Accordingly, this study uses a natural log of the number of words in NF disclosure as a measure of length.

Once the ratios are calculated for all four dimensions, these ratios are ranked into decile, except TONE_RATIO which is inverse ranked. Each dimension receives a decile rank between 0.1 and 1. Further, the decile ranks are aggregated into a composite disclosure rank that provides the final rank score for each NF disclosure, which is between 0.4 (minimum score) to 4 (maximum score). NF disclosure with balanced tone, lengthy reports, more numerical content and more horizon content have higher rank score. Finally, the NF disclosure is divided into three categories; high, medium and low, based on the median value of the rank score. For e.g. if the composite score of a NF disclosure is; less than median value (less than 2.3) it is categorized as low, between median and 75th percentile (between 2.4 to 2.6) it is categorized as medium and above 75th percentile (above 2.7) it is categorized as high. These three categories are represented by a categorical variable under *NF_Disclosure*; “0” for low, “1” for medium and “2” for high.

5. Empirical Result

5.1 Descriptive Statistics and Correlation Matrix

Table 2 summarizes the descriptive statistics of NF disclosure narrative (Panel A) and distribution of NF disclosure categories (Panel B) for two years; 2016 covering pre mandated NF disclosures whereas 2017 covering post mandated NF disclosure.

The mean value of narrative features (Panel A); length of report and use of unbiased tone (along with comparatively decrease in positive tone and increase in negative tone), is improved after the implementation of CDIA. This is an expected result, as more NF themes are covered in disclosure subsequent to implementation of CDIA. Similarly, the main objective of CDIA is to enhance transparency and improve understanding about firms' NF activities (Uwer and Schramm, 2018). Since, NF disclosure that uses unbiased tone (covering both positive and negative results) allow stakeholders to reasonably assess firms' overall NF performance (Chauvey et al., 2015), CDIA might have acted as an enforcer that pushes firm to disclose relevant information in a balanced tone (Fallan, 2016).

Table 2 – Descriptive Statistics of NF Disclosure

Panel A - Descriptive Statistics of Narrative Dimensions of NF Disclosure

Variables	N	Mean	St. Dev.	Min	Max	N	Mean	St. Dev.	Min	Max
			2016					**2017**		
Length	99	15773.98	17253.82	483	91709	99	17586.84	14511.90	1772	96609
POS_Ratio	99	4.03	1.19	1.07	7.42	99	3.83	0.86	1.53	6.38
NEG_Ratio	99	1.80	0.71	0.39	3.76	99	2.16	0.68	0.65	3.93
Log_length	99	3.92	0.54	2.68	4.96	99	4.11	0.36	3.25	4.99
TONE_Ratio	99	2.22	1.20	0.0	6.88	99	1.67	0.99	0.0	5.07
HOR_Ratio	99	1.05	0.39	0.26	2.42	99	1.08	0.29	0.55	2.21
NUM_Ratio	99	11.53	4.87	1.79	27.18	99	11.31	4.32	3.11	24.27

Panel B – Distribution of NF Disclosure Categories

	2016	**2017**
High Category	21	29
Medium Category	15	23
Low Category	63	47
TOTAL REPORT	99	99

However, the horizon content (forward looking) and numerical content of NF disclosure seems to remain unchanged between two period. Furthermore, a non-parametric Wilcoxon test[24] reveals that length and tone are significantly different[25] between two period ($p < 0.01$) whereas horizon content and numerical content does not show a significant difference between two period (untabulated).

Similarly, Panel B shows that there is an increase in the number of firms that improves their NF disclosure after the implementation of CDIA; comparatively increase in *High Category* and decrease in *Low Category* in year 2017. This is an expected result as two of the narrative dimensions; tone and length, shows a significant improvement (Wilcoxon test result) whereas two others; horizon and numerical content, remain unchanged. As a result, the overall informational content of NF disclosure is expected to be better after the implementation of CDIA.

Table 3- Descriptive Statistics and Correlation Matrix of Continuous Variables

Panel A - Descriptive Statistics of Independent and Control Variables

Variables	N	Mean	St. Dev.	Min	Max
Dependent Variables					
Share Price	198	62.02	48.34	3.10	268.60
Control Variables					
BV	198	28.34	32.09	-0.54	200.86
EPS	198	3.27	3.90	-9.29	22.28
Firm Size	198	16751.03	23956.94	239.63	114803.72
Leverage Ratio	198	85.92	184.56	0.00	1398.20

Panel B- Correlation Matrix for Independent and Control Variables

Variables	BV	EPS	Firm Size	Leverage Ratio
BV	1			
EPS	0.726**	1		
Firm Size	0.415**	0.446**	1	
Leverage Ratio	-0.074	-0.124	0.004	1

[24] All four narrative dimensions are found to be non-normal, hence Wilcoxon test is used.

[25] Disclosure following CDIA requirement shows increase in report length that improves completeness and decrease in tone that minimize biasedness.

Table 3 reports the descriptive statistics (Panel A) and correlation coefficient (in Panel B) of continuous variables that are used in regression models. *, **, *** show statistical significance at 10%, 5% and 1% levels respectively. The important observation from Table 3 is the result from Panel B which shows statistically significant and high correlation for few continuous variables (i.e. 0.726 for BV/EPS, 0.415 for BV/ Firm Size and 0.446 for EPS/ Firm Size). Even though these values are below conventional threshold of 0.90 to detect multicollinearity problem (Bose et al., 2017), this study further confirms this issue with Variance Inflator Factor (VIF), where the VIF value above 10 is considered an indication of multicollinearity (Gujarati, 2003). The result shows that the VIF value are within range for all variables, suggesting that multicollinearity problem is unlikely in this study.

5.2 Difference in NF Disclosure

Furthermore, to better understand the changes in NF disclosure, this study uses McNemar-Bowker test to assess the significance of difference between two period (pre and post implementation of CDIA). Similar to Bayerlein and Al Farooque (2012), Table 4 presents the result of 3 × 3 interaction table to understand the change in NF disclosure along with the result of three 2 × 2 contingency table to determine the effect of CDIA captured within each group. The result from Longitudinal Interaction table (3 × 3) shows that the NF disclosure differs significantly between two period ($p < 0.05$).

Table 4 – McNemar Bowker Test Results for NF Disclosure Categories

	N	McNemar-Bowker Test Value	Significance (p-value)
***Longitudinal Interaction Table* (3 × 3)**			
Low Medium and High Category	99	10.257	0.017
Two-way Contingency Tables (2 × 2)			
Low and Medium Category	62	1.19	0.383
Medium and High Category	26	1	0.508
Low and High Category	65	8.07	0.007

However, this result doesn't suggest about the direction of change (negative or positive) or information about where the effect actually came from. Hence, post hoc analysis is conducted through 2 × 2 contingency table to understand the root cause of significance of difference. A close examination of change in NF disclosure frequencies (within each 2 × 2 contingency table) reveals that the significant effect came from only one set; the firms that changed group from "*Low Category*" to "*High Category*" whereas other two group does not have significant changes. The Bonferroni test further verify (supported at $p < 0.05$) that the positive effect came from firms improving their category from Low to High. The result shows that the firms tend to be more responsive to NF information demand when operating in settings where the NF disclosure is required by law i.e. CDIA (Cahan et al., 2016).

5.3 Regression Results

Table 5 presents the estimated coefficient values and significance level from the regression model for the balanced two-year sample, after controlling for the effects of control variables. Given that the change in value relevance of NF disclosure is tested, this study expects the coefficient associated with the main variable ("*NF_Disclosure × Pre_Post*") will be statistically different from zero (Baboukardos and Rimmel 2016; Moneva and Cuellar, 2009). The VIF test affirms the absence of multicollinearity problem, hence the results drawn from the regressions are valid[26]. Furthermore, R^2 shows that 42.80%, 46.60%, and 48.50% of overall variance in share price is explained by Model 1, Model 2 and Model 3 respectively. Similarly, adjusted R^2 improves after the inclusion of NF disclosure in Model 2 and Model 3, suggesting that NF disclosure provides incremental value relevant information beyond what is provided by accounting information alone (Model 1).

[26] Although the VIF are in suggested range, the interaction variables *"BV × Pre_Post"* and *"EPS × Pre_Post"* shows slightly higher VIF with the value of 6.34 and 6.94 respectively. The main regression (Model 3) is estimated excluding these two interacting variables, however the result remains same (*significance and coefficient signs)*, with a small change in coefficient value. Additionally, the largest VIF without these two interacting variables in Model 3 is noted to be 3.07 (untabulated).

Table 5 – Regression Results

	Dependent variable: P		
	Model 1	Model 2	Model 3
BV	0.718***	0.699***	0.639***
	p = 0.000	p = 0.000	p = 0.000
EPS	1.508**	1.523**	1.425**
	p = 0.032	p = 0.021	p = 0.032
Pre_Post (Year)	7.628***	9.464***	9.299***
	p = 0.002	p = 0.003	p = 0.003
BV × Pre_Post (Year)	- 0.035	- 0.039	- 0.045
	p = 0.743	p = 0.697	p = 0.659
EPS × Pre_Post (Year)	1.062	1.403	1.396
	p = 0.251	p = 0.115	p = 0.123
NF_Disclosure High		8.380**	7.613*
		p = 0.038	p = 0.052
NF_Disclosure Medium		- 5.827	- 5.204
		p = 0.185	p = 0.216
NF_Disclosure High × Pre_Post (Year)		- 11.475**	- 10.802**
		p = 0.037	p = 0.042
NF_Disclosure Medium × Pre_Post (Year)		0.766	0.331
		p = 0.910	p = 0.961
Firm_Size			0.0002*
			p = 0.091
Leverage_Ratio			- 0.001
			p = 0.815
DJSI_Member			5.145
			p = 0.412
Sensitive Industry			12.032
			p = 0.105
Constant	31.453***	31.058***	20.989***
	p = 0.000	p = 0.000	p = 0.007
R^2	44.30 %	46.60 %	48.50 %
Adjusted R^2	42.80 %	44.00 %	44.80%
Observations	198	198	198

Note: *p<0.1; **p<0.05; ***p<0.01

The significance levels are based on robust standard errors

As expected, the coefficient of variables BV and EPS are positive and statistically significant, suggesting that basic summary accounting information affect firms' market value during the two-year period. However, this effect is statistically insignificant when compared between two period, indicating that accounting variables are not affected by implementation of CDIA and therefore doesn't show any change in their value relevance between two

periods. Similarly, when analyzing the value relevance over the entire two years period, *NF disclosure high* shows a positive and statistically significant effect ($p < 0.050$ in Model 2 without firm level control variables and $p < 0.10$ in Model 3 with firm level control variables) upon firms' market value whereas *NF disclosure medium* is statistically insignificant, suggesting that they do not have incremental effect on firm value relative to *NF disclosure Low.*

Turning towards the effect of main variable ("*NF_Disclosure × Pre_Post*"), the value relevance of *NF disclosure high* is statistically significant ($p < 0.050$) for both; Model 2 and Model 3. However, the coefficient is negative, - 11.475 for Model 2 and -10.802 for Model 3, suggesting a decline in value relevance after the issuance of NF disclosure following CDIA requirement. Such decline may result due to any risks and/or unbooked liabilities that are identified and measured more reliably by capital market participants after the implementation of NF Directive in German context (Baboukardos and Rimmel, 2016; Moneva and Cuellar 2009).

Arguably, the objective of CDIA is not only to improve NF disclosure but also influence organizational attitude toward NF activities (Saenger, 2017; Ioannou and Serafeim, 2018). CDIA requirement might incentivize firms to change their managerial practice and adopt more productive and innovative configurations, as a result, performing better in sustainability dimensions that improve risk management and firms' profitability (Ioannou and Serafeim, 2018; Baboukardos and Rimmel, 2016). However, such process also incurs major costs i.e. report preparation cost, proprietary cost, political cost (Grewal et al., 2018), and brings a considerable financial constraint upon firm in short run. Furthermore, the firm divert their valuable resources in attempt to fulfill their new commitment towards firms' NF activities (Chen et al., 2018). As such, it can lower the firm value in the period following NF disclosure regulation (Grewal et al., 2018; Chen et al., 2018).

Additionally, the value relevance of *NF_Disclosure medium* is statistically insignificant, suggesting that they do not have an enhanced role in determining firm share price compared to pre mandate period. The result from McNemar-Bowker test shows that the significant change in NF disclosure after the implementation of CDIA is found to come *only* from firms changing their category from low to high whereas there is no significant change in NF disclosure associated with *NF_Disclosure medium*. This may indicate that firms with *NF_Disclosure low* faces greater scrutiny after the implementation of CDIA whereas firms with *NF_Disclosure medium* has an acceptable pre mandate quality and hence are unaffected. Since, the associated cost is borne by the firms that were in low category before (pre mandate) but improves their NF disclosure in response to CDIA requirement and shifts to high category, the value relevance effect is observed only for *NF_Disclosure high*.

6. Additional Analysis

This study also carried out some additional analysis (untabulated), using alternative model specifications in determining the change in value relevance of NF disclosure: (1) The various estimation methods are based on different assumption and therefore have distinct strength and weakness (Dhaliwal et al., 2011). To provide assurance that the main results are not sensitive to the choice of these measures, the regression analysis is repeated using different proxies for control variables separately i.e. firm size (total assets and annual sales) and leverage ratio (total debt divided by total assets). (2) To further validate the result from regression, following Baboukardos and Rimmel (2016), the modified Ohlson model is applied in each year independently using simple ordinary least square (OLS) model[27]. If

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[27] Estimating the regression for separate period helps to validate the result from main model (Model 3) and also provide better insight into the effect of NF disclosure. By removing the interaction variable *Pre_Post,* the result is free from collinearity effect that arises from *"BV* × *Pre_Post"* and *"EPS* × *Pre_Post"* which shows slightly higher VIF with the value of 6.34 and 6.94 respectively,

CDIA improves NF disclosure, its value relevance is expected to be higher in year 2017 compared to year 2016.

The inferences drawn from the main model (Model 3) findings does not change when altering these specifications. When other proxies for firm size and leverage are used, all the results are consistent with those of the Model 3 for *NF_Disclosure high* (negative and significant at 5% for change in proxy for leverage ratio whereas the effect is negative and significant at 10% for change in proxy for firm size), except small variation in the magnitude of coefficient values. Similarly, the value relevance of *BV, EPS* and *NF_Disclosure high* is positive and statistically significant ($p < 0.05$) over the period of two years (not interaction). Furthermore, when the regression analysis is conducted using sample from two years differently, both category of NF disclosure (*both medium and high*) are statistically insignificant for year 2016 (pre mandated) whereas, only *NF disclosure high* is statistically significant and have negative effect on firm value for year 2017. These findings further validate the main result of this study.

7. Discussion and Conclusion

This study answers the call from prior studies (i.e. Arvidsson, 2019; Gulenko, 2018), to investigate the effect of NF Directive on value relevance of NF disclosure. Although NF Directive is expected to improve transparency (Uwer and Schramm, 2018; Costa and Agostini, 2016) and enhance the impact of NF disclosure on firm value (Ioannou and Serafeim, 2018; Grewal et al., 2018), it is a recent phenomenon[28] and the empirical evidence is not conclusive (i.e. Moneva and Cuellar 2009; Bernardi and Stark, 2018b; Grewal et al., 2018; Ioannou and Serafeim, 2018). Therefore, with a motivation to gain a better understanding about the impact of NF Directive on NF disclosure and consequently on firm

[28] Each EU member state are required to transpose NF Directive into their national law by the end of year 2016. The NF disclosure following the requirement of NF Directive will cover firms NF activities starting from year 2017 (European Union, 2014; La Torre et al., 2018).

value, this study examines whether the implementation of CDIA enhances value relevance of NF disclosure for the firms listed in German capital market.

The overall finding supports the stated hypothesis and is consistent with theoretical assertion made under efficiency perspective in PAT. The study shows statistically significant and declined value relevance of *NF disclosure high* after the implementation of CDIA. The finding is in line with previous studies (i.e. Chen et al., 2018; Grewal et al., 2018), asserting that investors will update their belief about the value relevance of NF disclosure during the passage of regulation and will anticipate higher costs for firms with weak pre mandate quality to either maintain their poor NF performance (penalty/fines) or to improve their NF performance (additional costs associated with corrective actions)[29]. Similarly, *NF disclosure medium* doesn't have comparative change on its effect on firm value. The pre mandated quality of *NF disclosure medium* category might be at an acceptable level and hence doesn't get affected by CDIA requirement (as suggested by McNemar-Bowker test there is no statistical change in this particular group, neither from high category nor from low category). Furthermore, the value relevance result of main model (Model 3) is consistent with alternative model specifications, strengthening the findings.

This study contributes to the existing stream of literature that examines the consequences of disclosure requirement (i.e. NF Directive) on investors response (e.g. Ioannou and Serafeim, 2018; Chen et al., 2018; Grewal et al., 2018; Baboukardos and Rimmel, 2016; Moneva and Cuellar 2009). CDIA clearly states the intention of improving transparency by requiring German firms to provide NF disclosure by not only accounting the multidimensional nature of NF activities but also recognizing the outcome of such activities

[29] The result from McNemar-Bowker test shows that the significant change in NF disclosure after the implementation of CDIA is found to come *only* from firms changing their category from low to high. As such, the decreased value relevance for "*NF Disclosure High"* reflects the associated cost borne by the firms that were in low category earlier (pre mandated) but improves their NF disclosure in response to CDIA requirement and shifts to high category.

(Saenger, 2017; Global Compact, 2018). Similarly, investors are considered as a major beneficiaries of NF disclosure (European Union 2014; Gulenko, 2018). This paper empirically validates whether CDIA act as a mechanism for monitoring and stimulating better NF disclosure, as a result improving the availability of value relevant information for market participants. This study also makes a methodological contribution by relying on recent work on narrative disclosure (e.g. Muslu et al., 2017; Melloni et al., 2017), which on the one hand provides an effective way for firms to convey their NF activities (at the same time addressing CDIA requirement) and on the other hand enhance investors' understanding about the impact of such activities on firm value (Gulenko, 2018; Bernardi and Stark, 2018b). Similarly, many regulatory agencies have made consistent effort to encourage the use of clear and precise language in NF disclosure (Nazari et al., 2017). As such, the findings from this study have practical implication for regulators, and policy makers, who have already implemented or in the process of implementing NF Directive.

This study is not free of drawbacks and has some limitations. First, the informational content of NF disclosure is measured using a dictionary-based approach that can be readily applied on larger samples with a lower risk of subjective evaluations. Nevertheless, this measure could introduce noise (Muslu et al., 2017; Li, 2010). Although considerable attention has been given to contextualize the wordlist (Part 4.3), this study believes that there is still a room for improvement and subsequent studies may refine these dictionaries that can effectively capture NF disclosure quality. Second, overall NF disclosure is categorized by aggregating various dimensions of narrative disclosure. While this study carefully considers four independent components to measure NF disclosure based on the literature suggestion, future study can refine or extend the dimension that can yield more insight in understanding informational content of NF disclosure. Third, since the sample is from one country, this may affect the generalization of findings. Finally, the study examines only two years and the

investigation is limited to 99 firms. As such, this study cannot observe the detailed pattern of change in information quality of NF disclosure and firms' response to such changes over time.

Several opportunities exist for future research. Future study can improve the methodological aspect in order to better measure and understand the change in NF disclosure (*as discussed above*). Although, all EU member states have to implement NF Directive from year 2017 onwards, high degree of flexibility is allowed in adoption process. While one country may simply opt for normalization process, another country could amend the NF Directive to fit particular requirements (Aureli et al., 2018). Future studies can explore the extent to which the result from this study generalizes to different and diverse regulatory settings. Similarly, NF Directive are believed to positively influence firms' NF activities (Ioannou and Serafeim, 2018; Grewal et al., 2018), future research can investigate the real effect of CDIA on firms' NF performance. Finally, the improved NF disclosure not only affect investors but also the perception of other stakeholders i.e. consumer, employee, society (Saenger, 2017; Du et al., 2010), hence investigating their reaction could enhance the understanding about the impact of NF Directive.

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CONCLUSION

Following the suggestion and building on arguments from relevant research (e.g. Muslu et al., 2017; Melloni et al., 2017; Nazari et al., 2017; Plumlee et al., 2015; Cormier et al., 2009) this study investigates the determinants and economic consequences of CSR disclosure quality using sample from German capital market. Overall, the findings of this dissertation are in line with expectation and reports a significantly positive impact of CSR disclosure quality on firm value. With regards to the determinants of CSR disclosure quality, the findings show a mixed effect of external governance mechanism but highlights a positive role played by UNGC and CSR assurance. Similarly, implementation of NF Directive is found to improve CSR disclosure quality.

Theoretically, my research supports the dominant paradigms of accounting research suggested under agency theory, voluntary disclosure theory, stakeholder theory and positive accounting theory (PAT). The findings are consistent with incremental information argument empirically confirmed by previous studies (e.g. Gao et al., 2016; Grewal et al., 2018; Plumlee et al., 2015; Muslu et al., 2017; Cormier et al., 2009; Clarkson et al., 2013) which considers the content of voluntary CSR disclosure to be valuable for both firms and investors to benefit from firms' CSR activities.

My thesis contributes to sustainability accounting literature at least in the following three aspects. First, the primary contribution lies in refining the measure employed in analyzing CSR disclosure quality. Instead of considering mere initiation/issuance of CSR reports (e.g. Dhaliwal et al., 2011; Dhaliwal et al., 2012; Dhaliwal et al., 2014), as a measure of CSR disclosure quality, this study analyzes the linguistic feature of CSR reports to capture any variance in its quality. Similarly, this study improves on existing dictionary; Loughran and McDonald, (2011) and Muslu et al. (2017), by including additional word that are important to understand CSR disclosure but were initially not in these dictionaries. As a

result, making it more relevant to the context being studied. Moreover, prior studies in sustainability accounting tends to examine one disclosure quality or textual attribute at a time e.g. Cho et al. (2010) focuses only on verbal tone, Nazari et al. (2017) focuses on narrative complexity proxied by readability and length whereas Cormier et al. (2009) focuses on information precision. Since managers sets up a holistic disclosure policy, focusing only on one narrative dimension may not reveal the overall quality of CSR disclosure (Muslu et al., 2017; Melloni et al., 2017). Hence, following the methodology suggested by Muslu et al. (2017), this study categorizes CSR disclosure into three levels: Low, Medium, High, based on composite disclosure rank score of selected linguistic features; *length, verbal tone, numerical content and forward-looking content*.

By improving on existing wordlists and by analyzing various narrative dimension of CSR disclosure, this study contributes to a greater understanding of CSR disclosure quality and its effect on firm value. The findings of this study related to economic consequences are in line with incremental information argument empirically confirmed by previous studies i.e. Clarkson et al. (2013), Cormier et al. (2009), Muslu et al. (2017). The result suggests that capital market participant considers narrative feature of CSR disclosure and uses it during firm valuation process. The results are also in line with argument laid by Plumlee et al. (2015), Merkl-Davies and Brennan, (2007), according to whom the quality of narrative disclosure helps to overcome information asymmetries between firm insiders and outsiders which ultimately lowers the cost of capital, improves cash flow and thereby enhances firm value. The finding of this study complements and extend those provided in Muslu et al. (2017), Plumlee et al. (2015), who contend that decomposing voluntary disclosure into precise measure allows to capture variation in aspects of the disclosures that are expected to affect firm value.

Second, this research adds to the literature that studies the relationship between corporate governance (CG) mechanism and CSR disclosure quality. The selected external CG governance mechanism; *UNGC participation, institutional investor, CSR assurance and type of CSR assurer,* because of their subject (CSR) specific knowledge and their independence, are expected to monitor and advice in much efficient manner (Gillan, 2006). As a result, the presence of such CG mechanism is expected to enhance corporate transparency by improving CSR disclosure quality. This study refines understanding about the relationship between CG mechanism and CSR disclosure quality by empirically examining such assertion and analyzing whether external CG mechanism act as a superior governance mechanism that stimulates high-quality CSR reporting.

Although this study finds mix support for the stated hypothesis, two external CG mechanism; UNGC participation and CSR assurance, are found to act as a significant determinant of CSR disclosure quality. The commitment to report on pressing CSR issues following UNGC reporting guidelines and the rigorous assessment of CSR reports by independent third-party assurer tends to ensure a complete and clear presentation of firms' CSR activities, as a result improving CSR disclosure quality. The finding is consistent with previous studies like Knudsen (2011), Williams, (2014), Casey and Grenier, (2015), Pflugrath et al. (2011). Similarly, failure to support the hypothesis about the positive effect of institutional investors on CSR disclosure quality is in line with Rupley et al. (2012) and highlights the need of seeking theoretical aid from alternative theory i.e. agency theory. Institutional investors seem to use their position to act passively (and collect required information through one-on-one meeting) or act opportunistically (discourage or manipulate sustainability reporting) to expropriate wealth from other stakeholders, which explain the insignificant or a negative effect of institutional investors on CSR disclosure quality (Garcia-Meca and Pucheta-Martinez, 2018). Moreover, indifference between the effect of assurance

provided by accounting firm and non-accounting is consistent with Moroney et al. (2012), suggesting that institutional context (i.e. American v/s Non-American) faced by disclosing firms plays an important role in ascertaining the effectiveness of assurer in determining CSR disclosure quality (Pflugrath et al., 2011).

Finally, this research improves the understanding about the effect that regulatory reporting requirement has on the value relevance of NF disclosure. The NF Directive clearly states the intention of improving transparency by requiring German firms to provide NF disclosure that not only accounting the multidimensional nature of NF activities but also recognizing the outcome of such activities (Saenger, 2017; Global Compact, 2018). However, the adoption of NF Directive is fairly new concept and even though the implementation of NF Directive is expected to address the informational need of capital market (European Union, 2014; Ioannou and Serafeim, 2018; Grewal et al., 2018), there isn't enough empirical evidence on whether investors find post-mandated NF disclosure more decision-useful than pre-mandated NF disclosure (Baboukardos and Rimmel, 2016; Ioannou and Serafeim, 2018). By using value relevance approach (modified Ohlson model), this study allows to analyze market reaction and understand the impact that regulation have on improvement of NF disclosure.

The result supports the hypothesis stated by this study and shows statistically significant and declined value relevance of NF disclosure after the implementation of NF Directive in Germany. The finding is in line with previous studies (i.e. Chen et al., 2018; Grewal et al., 2018), asserting that such a decline may be due to any risks and/or unbooked liabilities that are identified and measured more reliably by capital market participants after the adoption of NF Directive. This study contributes to the existing stream of literature that examines the consequences of disclosure requirement (i.e. NF Directive) on investors

response (e.g. Ioannou and Serafeim, 2018; Chen et al., 2018; Grewal et al., 2018; Baboukardos and Rimmel, 2016).

Altogether, the findings of this study is consistent with stream of sustainability literature (e.g. Caglio et al., 2019; Muslu et al., 2017; Melloni et al., 2017; Nazari et al., 2017; Plumlee et al., 2015; Cormier et al., 2009) that highlights the benefit of decomposing disclosure quality into precise measure (i.e. specific linguistic dimensions) when capturing the variation in disclosure aspects that are expected to affect informational environment. On the one hand, external CG mechanism and regulatory factor act as a major force in promoting companies to include useful narrative information and details in order to efficiently communicate their position on CSR issues (i.e. risk, choice and action). On the other hand, the use of explicit language in defining managerial judgments, assumptions and estimations (related to firms' CSR practice) are found to improve investors' understanding about firms' attitude toward sustainability issues.

The findings of this study have practical implication for investors, accounting standard setters, regulators, executives as well as other stakeholders. The empirical evidence suggests that linguistics feature provides relevant information which can assist investors to distinguish between good and bad CSR performer and thus make better investment decision. This study helps investors to critically analyze firms' CSR performance and main reporting issues as well as to evaluate how meaningful and relevant the reported information is. Similarly, CSR communication is as crucial as CSR engagement itself in enhancing firms' effort to maximize return from their CSR activities (Du et al., 2010). Hence, this study can encourage firms with good CSR performance to improve their CSR disclosure; especially when the descriptive details in CSR disclosures provides firms with an opportunity to overcome information asymmetries by explaining how certain accounting number have been

determined or by providing contextual information that helps in understanding firms' particular action, thereby increasing their decision-usefulness and reducing the cost of capital.

Although institutional investors may develop private CSR informational channel (Garcia-Meca and Pucheta-Martinez, 2018), individual investors can only use information that is publicly available (Iatrids, 2013). It is, therefore, regulator's responsibility to protect shareholder interest by improving the quality of publicly available information. As such, this study is useful for policy makers and accounting standard setters to understand the importance of clear and precise language in corporate disclosure and to encourage companies to adopt such reporting practice. Furthermore, regulator, as well as stakeholders, can motivate firms to incorporate effective CG mechanism; independent and subject specific expert, that can act as a moderator and improve informational content of their CSR disclosure. This study also improves regulators understanding about the positive impact that NF Directive have upon firms' NF disclosure practices. Therefore, the constituencies who have already implemented or in the process of implementing NF Directive can impose more explicit guidelines or standards related to NF disclosure narrative, that can enhance corporate informational environment.

This study is not free of drawbacks and has some limitations. First, the wordlist/ dictionary that is applied by this study to measure CSR disclosure quality are also used by other research (e.g. Muslu et al., 2017), nonetheless these wordlists are mainly targeted for financial text (e.g. LM wordlists). Although considerable attention has been given to contextualize the wordlist, this study believes that there is still a room for improvement and subsequent studies may refine these dictionaries to effectively capture CSR disclosure quality. Second, when CSR disclosure quality is measured by aggregating various dimensions of narrative disclosure, it should be carefully selected noting the importance of non-linearity as well as aggregation of the chosen dimensions (Muslu et al., 2017). While this study

carefully considers four independent components to compute CSR disclosure quality based on the literature suggestion, there can be some other dimensions that can add value to sustainability reporting quality. Future studies can refine this measure by either adding or removing aspects of CSR disclosure narrative, appreciating their non-linearity characteristics. Third, other internal CG mechanism such as audit committees could potentially possess financial reporting expertise that will spill over sustainability reporting issues (Peters and Romi, 2014). It may be interesting for future researchers to examine whether such attributes of internal CG are associated with narrative features used in CSR disclosure. Similarly, the inclusion of management variables i.e. the presence of finance directors on the board, qualification and the relevant background (CSR experience) of top management, the presence of CSR committees, may uncover interesting facts and improve understanding about the factors that determines the quality of CSR disclosure. Fourth, although all EU member states are required to implement NF Directive from year 2017 onwards, high degree of flexibility is allowed in adoption process. While one country may simply opt for normalization process, another country could amend the NF Directive to fit particular requirements (Aureli et al., 2018). Future studies can explore the extent to which the result from this study generalizes to different and diverse regulatory settings. Finally, NF Directive are believed to positively influence firms' NF activities (Ioannou and Serafeim, 2018; Grewal et al., 2018), future research can investigate the real effect of CDIA on firms' NF performance.

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