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Corporate life cycle, organizational financial resources and corporate social responsibility ☆

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ABSTRACT

This study examines the association between the corporate life cycle and corporate social responsibility (CSR). Motivated by the resource-based theory, we hypothesize and find supportive evidence that the resource base and competitive advantages allow mature firms to invest more in CSR-related activities than firms at other stages of the corporate life cycle. We further examine the role of financial resources in explaining the relation between the corporate life cycle and CSR. Our results show that size, profitability and slack resources moderate the association between the corporate life cycle and CSR. These findings are robust when subjected to a series of sensitivity tests.

1. Introduction

Corporate social responsibility (CSR) has become an integral part of conducting business around the world. Companies allocate a significant portion of their expenses to CSR-related activities. According to the Sustainable and Responsible Investing (SRI) report of 2014,[1] SRI assets had grown by 76 percent since the beginning of 2012 to a total $6.57 trillion, which manifests the dramatic increase in CSR investment, as well as in CSR-related initiatives, in recent years. Because of its strategic and practical implications for the business world, a wide body of academic literature has also emerged around CSR (Margolis and Walsh, 2003; Orlitzky et al., 2003; Wang et al., 2016).

Various firm-level attributes are likely to affect firms' CSR investment, and an understanding of these attributes is essential as firms attempt to derive strategic value from CSR (Udayasankar, 2008). Previous studies, such as those by Campbell (2007), Chih et al. (2010), Clarkson et al. (2011), McWilliams and Siegel (2001), Padgett and Galan (2010) and Russo and Fouts (1997), advance the thesis that the resource base and profitability of the firm play an important role in CSR investment decisions. In particular, McWilliams and Siegel (2001) and Russo and Fouts (1997) posit that the industry life cycle is an important supply-side determinant of CSR investment, but they cannot test this conjecture empirically and, hence, call

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[1] http://www.ussif.org/files/Publications/Annual_%20Report_14_FINAL.PDF

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for more research in this area. We respond to this call for additional research. We incorporate the "dynamic resource-based view" as a theoretical lens for understanding firms' CSR investment. We argue that firms' ability and incentives to become involved in CSR activities vary at different life cycle stages; therefore, it is important to understand the life cycle implications of CSR involvement.

The "dynamic resource-based view" of the firm posits that the general patterns and paths in the evolution of organizational capabilities change over time. This resource-based view argues that the application of the bundle of valuable, interchangeable, immobile and imitable resources generates the basis of the competitive advantage of a firm and that this resource base is the basis of heterogeneity in organizational capabilities (Penrose, 1959; Rumelt, 1984; Wernerfelt, 1984). The dynamic resource-based theory incorporates the founding, development and maturity of capabilities and suggests that the competitive advantages and disadvantages in terms of resources and capabilities evolve over time in important ways (Helfat and Peteraf, 2003). The extant studies (e.g., Russo and Perrini, 2010; Williamson et al., 2006) show that investments in CSR are costly and that firms need to conduct cost–benefit analysis in pursuing such investments. Thus, the evolution of firms' competitiveness, in terms of their resource base and capabilities, should have implications for their ability to engage in CSR investments.

Firms at different life cycle stages are associated with varying levels of resources that shape their CSR behavior. Campbell (2007) argues that firms' slack resources are important determinants of CSR investment and proposes that, "corporations will be less likely to act in socially responsible ways where they are currently experiencing relatively weak financial performance" (p. 952). Likewise, Clarkson et al. (2011) document that better financial performance leads to better environmental performance. Hong et al. (2012) also confirm that less-constrained firms spend more on CSR activities. We argue that a competitive advantage, rich resource base and better financial performance allow mature firms to invest more in CSR-related activities. Therefore, we expect a positive association between firm maturity and CSR-related involvement.

Using a large sample of US firms with available CSR data from the *Kinder, Lydenberg, Domini Research & Analytics* (*KLD*) database, we find that mature firms are associated with significantly higher CSR initiatives than firms in other life cycle stages. We further examine the moderating effects of the firm-level resource base through which the life cycle may influence CSR. Our results show that firm size, profitability and slack resources make mature firms more capable of investing in CSR-related activities. Our results remain robust to alternative specifications of CSR scores, life cycle proxies and controls for potential endogeneity.

Withisuphakorn and Jiraporn's paper (2016) is closely related to ours. They use firm age as a proxy for the firm life cycle and show that mature firms invest significantly more in CSR and that the investment varies across CSR dimensions. Our paper differs from theirs in the following important ways.

First, instead of taking an *indirect* and *imprecise* approach to the firm life cycle, our study uses a *direct* and *precise* life cycle measure to examine the relation between the firm life cycle and CSR engagement. In particular, age and size, as life cycle measures, cannot clearly differentiate among different stages of the firm life cycle, since these proxies rely on the assumption that a firm *moves monotonically* through its life cycle (Dickinson, 2011). Our direct measure, on the other hand, is free from this contentious assumption and shows that firms' engagement in CSR differs significantly across life cycle stages. Second, Withisuphakorn and Jiraporn (2016) do not identify a specific channel through which the firm life cycle affects CSR engagement. We use firms' financial resources as a channel that influences their ability to engage in CSR initiatives. Third, possibly due to data limitations, Withisuphakorn and Jiraporn (2016) do not control for corporate governance and managerial incentives in their analysis: factors that could undermine their main findings because of omitted variable bias. This is particularly important, since corporate governance and managerial incentives may differ across firms and across the corporate life cycle (within the firm) and relate to both slack resources and CSR. Fourth, to rule out the possibility that firm age captures life cycle dynamism, we explicitly control for firm age in all our regression specifications. We show that the association between our firm life cycle measure and CSR is robust, even after controlling for age and other determinants of CSR, implying that age as a life cycle measure cannot truly capture the life cycle dynamics.

Our study contributes to the literature in several ways. *First*, we extend the CSR literature by examining the role of the firm life cycle in influencing CSR initiatives directly. While prior research investigates the role of the firm life cycle in dividend payments, capital structure, cost of equity, risk taking and tax avoidance (Bender and Ward, 1993; DeAngelo et al., 2006; Fama and French, 2001; Habib and Hasan, forthcoming-a; Hasan et al., 2015, forthcomming), little attention is paid to the role of the firm life cycle in determining CSR initiatives. *Second*, we bridge the literature on the determinants of CSR and firm life cycle theory by providing a direct link between them. We also show the channels through which the life cycle may affect firms' ability to invest in CSR (Aguinis and Glavas, 2012). Our study in this context complements the findings of Clarkson et al. (2011) that the organizational resource base determines the level of environmental performance. We not only incorporate CSR other than environmental dimensions but also show how the interaction of the life cycle and resource-based differences affects corporate CSR involvement. *Third*, our study reconciles the conflicting findings of the prior CSR literature. For example, Erhemjamts et al. (2013) and Udayasankar (2008) suggest a U-shaped relationship between firm size and CSR participation, suggesting that small firms also invest in CSR to differentiate themselves from their competitors. Contrary to this, Withisuphakorn and Jiraporn (2016) show that older firms invest significantly more in CSR. Using a life cycle proxy that is more theoretically aligned with the organizational life cycle transition, we show that mature (introduction, growth, shake-out and decline) firms exhibit more (less) CSR involvement.

2. Literature review and hypothesis development

2.1. Corporate life cycle

Corporate life cycle theory derives its roots from the organizational science literature. Penrose (1959) provides a general theory of the growth of the firm and argues that firms' growth depends on their resources and productive opportunities. The resource-based theory of Wernerfelt (1984) suggests that resources are the ultimate source for establishing and maintaining a competitive advantage. In a later study, Helfat and Peteraf (2003) argue that the resource-based view must incorporate the emergence, development and progression of organizational resources and capabilities over time and, hence, they introduce "the dynamic resource-based theory." They document that firms' portfolios of resources, capacities and characteristics change over time across different stages of the firm life cycle.

Recent empirical studies in accounting and finance investigate the impact of the firm life cycle on corporate investment, financing and dividend decisions. Bender and Ward (1993) report that firms' financial structure changes over their life cycle. Berger and Udell (1998) argue that small and young firms generally resort to private equity and debt markets, whereas larger and mature firms mainly rely on public markets. Richardson (2006) suggests that firms are more likely to undertake relatively larger, growth-oriented investments in the initial stage while, in the mature stage, their investments are more likely to be geared toward the maintenance of assets in place.

2.2. Proxies for the corporate life cycle

The extant literature proposes some univariate measures of the corporate life cycle, ranging from firm age to the profitability ratio. While age and size do provide some indications about firm maturity, they have limitations and thus are unlikely to be a good proxy for a firm's life cycle on their own (Faff et al., 2016). Both Dickinson (2011) and Faff et al. (2016) stress the importance of using a proper proxy for firm life cycle stages. In particular, they argue that firm age is not a good proxy for the life cycle for several reasons. First, the time required for firms' transition across life cycle stages varies across industries. Second, firms of the same age can learn at different rates depending on their feedback mechanisms. Third, the extant studies mostly use the listing year as the starting point of a firm. However, before they become a listed company, some firms may exist for a longer (or shorter) time than others; thus, the listed firm age is a misleading measure of a firm's actual age (Faff et al., 2016).

In view of the fact that the corporate life cycle is determined by a range of factors, Anthony and Ramesh (1992) use four variables – age, sales growth, dividend yield and capital expenditures – to categorize firms into five life cycle stages: growth, growth/mature, mature, mature/stagnant and stagnant. However, this measure requires a five-year history of these variables, removing true "introduction stage" firms from the sample. Thus, no data on introduction stage firms are available (and, therefore, no meaningful analysis of introduction stage firms is possible).

DeAngelo et al. (2006) argue that retained earnings (as a proportion of total assets or total equity) give a good indication of the corporate life cycle. This measure implicitly assumes that retained earnings capture essential information regarding the corporate life cycle. Recent empirical studies (Faff et al., 2016; Habib and Hasan, forthcoming-a; Hasan et al., 2015; Owen and Yawson, 2010) use this as a suitable life cycle proxy in their empirical analysis. Dickinson (2011) provides a parsimonious *firm-specific* life cycle measure using data from the firm's cash flow statement. She argues that cash flows capture differences in a firm's profitability, growth and risk and, hence, one may use the cash flow from operating (*OANCF*), investing (*IVNCF*) and financing (*FINCF*) to group firms into life cycle stages such as "introduction," "growth," "mature," "shake-out" and "decline." The identification of life cycle stages based on Dickinson (2011) combines the implications from diverse research areas, such as production behavior, learning/-experience, investment, market share and entry/exit patterns. Recent studies in finance and accounting (Faff et al., 2016; Hasan et al., 2015; Koh et al., 2015, among others), therefore, use this measure as a suitable proxy for firm life cycle stages.

2.3. Corporate social responsibility

Corporate social responsibility (CSR) refers to firms' discretionary initiatives toward their different stakeholders, such as customers, suppliers, regulators, employees, investors and communities (Campbell, 2007; Cooper, 2004; Malik, 2014). Stakeholder theory argues that firms perform in a socially responsible manner by looking after the interests of their stakeholders (McGuire et al., 2003). Corporate managers use CSR as a strategic tool to differentiate their firms from competitors, build customer loyalty, improve their operating efficiency, attract and retain higher-quality employees (Greening and Turban, 2000) and maximize firm value (Clarkson et al., 2013; Malik, 2014; Servaes and Tamayo, 2013; Valentine and Fleischman, 2008). Studies argue that CSR provides better access to valuable resources (Cochran and Wood, 1984; Waddock and Graves, 1997), allows for better marketing of products and services (Fombrun, 1996) and contributes to gaining social legitimacy (Hawn et al., 2011).

However, CSR involvement is also described as value-destroying for investors (Friedman, 1970), thus predicting a negative relationship between CSR involvement and firm value. For instance, Preston and O'Bannon (1997) argue that managerial self-serving interests might lead to CSR overinvestment: an action that is detrimental to the interests of the stakeholders, creating a competitive disadvantage and affecting a firm's value negatively (Bénabou and Tirole, 2010).

With respect to the determinants of CSR, Reverte (2009) finds that larger firms and firms with greater media exposure are associated with higher levels of CSR involvement. Cormier and Magnan (1999) also document that the firm size, industry and regulatory environment explain the variability in CSR levels. The comparative advantages of large and mature firms, in terms of resources and financial performance, allow them to engage in CSR-related activities. Moreover, large and mature firms may act in socially responsible ways to retain and enhance their competitive advantages when the market competitiveness is more intense (Chih et al., 2010; Hull and Rothenberg, 2008). Drawing on the resource-based view of the firm, Campbell (2007) and Russo and Fouts (1997) suggest that less profitable and low-growth firms have fewer resources to spare for CSR activities than their more profitable and high-growth counterparts do. McWilliams and Siegel (2001) analyze the demand and supply sides of CSR and posit that firms must devote resources (i.e., CSR-related capital, land and equipment, labor, materials and purchased services) to generating an output that satisfies the demand for CSR, and this requires the firm to be capable of performing CSR activity. Using the context of the four most polluting industries in the US, Clarkson et al. (2011) show that better financial resources lead to better environmental performance, which contributes to subsequent financial performance.

2.4. Association between the corporate life cycle and corporate social responsibility

Resource-based theory assumes that firms differ in terms of their bundle of resources (e.g., financial, physical, human capital, technological, reputation and organizational resources) and capabilities (Barney, 1991; Grant, 1991) and that these firm-specific resources and capabilities are crucial in explaining firms' growth, performance (Penrose, 1959) and ability to spend money for philanthropic purposes (Campbell, 2007). According to this view, the resource base and capabilities of mature firms are large, diverse and rich, while those of young and declining firms are small, concentrated and limited.

Firms in the introduction stage of the life cycle lack an established customer base and suffer from knowledge deficits about potential revenues, costs and industry dynamics (Jovanovic, 1982). These firms suffer from "liability of newness" and are exposed to initial exit probabilities. Although growth firms experience dramatic increases in sales and in the number of products, they are subject to acute market competition. Growth firms invest more in product modification and improvement than in product differentiation (Hay and Ginter, 1979). Firms in the shake-out and decline stages have limited and/or downgraded resources and resource combinations. These firms focus more on survival strategies. It follows, then, that firms with such fragile financial performance are likely to jeopardize shareholder value should they invest in CSR. It is also likely that firms in the aforementioned stages may be less inclined to meet even the minimum threshold of socially responsible behavior (Campbell, 2007). Thus, limited capabilities and resource bases constrain these firms in using valuable, scarce funds for socially responsible projects, and this effectively reduces their CSR engagements.

However, given the reputational and strategic values associated with CSR involvement, competing arguments can be advanced suggesting that early-stage firms are equally likely to invest in CSR activities. Younger firms are in greater need of stakeholder support given their need for external resources. CSR engagement can be an effective tool for garnering such support. Although CSR is costly, the marginal benefit of CSR investments may be greater for younger firms than their mature counterparts. Udayasankar (2008) models small firms' participation in CSR activities across three firm attributes: visibility, performance and organizational complexity. Less visible firms may use CSR as a legitimacy tool to access external resources for which they have a greater need than mature firms. With respect to resource availability as a precursor for CSR investments, Udayasankar (2008) argues that even resource-constrained firms might benefit from CSR activities, since CSR participation can enable constrained firms to gain exclusive access to critical resources.

Nonetheless, the extant studies overwhelmingly show that resource availability dominates firms' CSR investment decision (Campbell, 2007; Clarkson et al., 2011). CSR investments are costly, and some of them are often irreversible: the so-called strategic CSR investments. Thus, we argue that the irreversible nature of such investments as well limited available resources will constrain younger firms' capacity to make meaningful CSR investments.

On the other hand, mature firms have a well-established customer base and focus more on product differentiation strategies (Hay and Ginter, 1979). As a strategic response to the threat from competitors, mature firms can exploit strategies to create a unique reputation that cannot be imitated easily (McWilliams et al., 2002), and one way of achieving this is to invest in environmental and social reputation (Fombrun and Shanley, 1990). The expertise and abilities emanating from organizational maturity allow these firms to make meaningful CSR investments. Specialization in CSR activities by reorganizing or reallocating resources can be achieved by firms with a larger scale of operations. Such specialization allows mature firms to participate actively in CSR activities by reducing their costs (Udayasankar, 2008). Viewed from this perspective, we posit that mature firms, owing to their adequate resource base, capacities and superior competitive advantages, should be in a better position to invest sufficiently in CSR-related activities. Therefore, we hypothesize that:

H_1. The mature stage of the firm life cycle is positively associated with CSR involvement.

2.5. Corporate life cycle and corporate social responsibility: Moderating role of financial resources

The extant studies suggest a variety of firm and industry characteristics that influence firms' CSR participation, of which firm-specific factors are of prime importance. For example, Clarkson et al. (2011) and Cormier and Magnan (1999) show that firms' financial condition (e.g., profitability and organizational slack) is a key determinant of their environmental CSR involvement. Reverte (2009) argues that profitable corporations have the necessary financial means and slack resources to participate in CSR activities. On the other hand, firms with fewer financial resources focus on activities that have a more direct effect on their earnings than participation in CSR initiatives (Roberts, 1992). In a similar vein, Artiach et al. (2010) argue that slack resources indicate that a firm has sufficient financial resources to allow investment in CSR programs without sacrificing the demands of economic claimants.

It is well established in the literature that employing valuable resources to engage in CSR provides firms with better access to critical resources. Therefore, long-term CSR investment is not only a response to external pressure but also an internal strategic choice for future growth and development. Investment in CSR-related activities is a managerial deliberate resource commitment decision. Once committed, it is not easy to scale back resources without incurring some kind of adjustment costs, defined as "economic sacrifices, social, contracting or psychological costs which emerge during the resource-adjustment process" (Venieris et al., 2015). This gives rise to CSR cost stickiness (Habib and Hasan, forthcoming-b). We argue that firms with slack resources are in a much better position to absorb the adjustment costs associated with long-term CSR investments. Prior studies (Dickinson, 2011; Hasan et al., 2015) document that mature-stage firms are larger, are more profitable and have more slack resources. On the other hand, compared with the mature stage, firms in other life cycle stages (introduction, growth, shake-out and decline) are smaller and less profitable and have fewer slack resources. Therefore, it follows that size, profitability and slack resources enable mature firms to invest more in CSR initiatives. Therefore, we hypothesize that:

H_2. Larger size, higher profitability and slack resources moderate the positive association between firm maturity and CSR activities.

3. Research design

3.1. Measurement of the firm life cycle

We use the life cycle proxies of DeAngelo et al. (2006) and Dickinson (2011) to capture the dynamic nature of the firm life cycle.[2] DeAngelo et al.'s (2006) life cycle proxy, namely retained earnings-to-total assets (*RE/TA*), measures the extent to which a firm is self-financing or reliant on external capital. A high *RE/TA* implies that the firm is more mature or old with declining investment, while firms with a low *RE/TA* tend to be young and growing (DeAngelo et al., 2006).

The identification of life cycle stages based on Dickinson (2011) captures firms' different life cycle stages. We classify all the sample firms into different life cycle stages based on the following cash flow pattern:

(1) Introduction: if OANCF < 0, IVNCF < 0 and FINCF > 0;
(2) Growth: if OANCF > 0, IVNCF < 0 and FINCF > 0;
(3) Mature: if OANCF > 0, IVNCF < 0 and FINCF < 0;
(4) Decline: if OANCF < 0, IVNCF > 0 and FINCF $\leq$ or $\geq$ 0; and
(5) Shake-out: the remaining firm years are classified into the shake-out stage.

3.2. Measurement of CSR

We use information from one of the most widely adopted CSR scoring standards, that is, Kinder, Lydenberg and Domini Research & Analytics, Inc. (hereby KLD). KLD rates companies on a wide range of activities that reflect how well they perform their social responsibilities and build relationships with various stakeholders. KLD captures over 94 measurement items along 7 social dimensions: community, diversity, employee relations, environment, corporate governance, human rights and product safety. For each measure KLD offers "strength" and "concern" (e.g., Waddock and Graves, 1997; Waldman et al., 2006) for each firm year.[3] Following prior studies (Attig et al., 2014; Kim et al., 2014), we exclude the corporate gover-

[2] Anthony and Ramesh (1992) provide one of the first empirical procedures for classifying firms into different life cycle stages. However, we do not use their method for two reasons: (i) life cycle classification based on Anthony and Ramesh's (1992) procedure leads to an erroneous classification of the stage of firms in the life cycle (Dickinson (2011); and (ii) this classification procedure is "ad hoc" and relies on portfolio sorts to classify the firm into different life cycle stages.

[3] In an early work on the construct validity of the KLD database, Sharfman (1996) documents a positive correlation ranging from a low of 0.18 to a high of 0.55 between the KLD ratings and the other available CSR measures (e.g., Fortune corporate reputation survey). Chatterji et al. (2009) find KLD "concern" ratings to be fairly good summaries of past environmental performance. In addition, firms with more KLD concerns appear to be involved in more pollution and regulatory compliance violations in subsequent years.

nance dimension from our CSR score, because it is distinct from the other social and environmental dimensions. We calculate a net score for each of the remaining six dimensions of CSR as the number of strengths minus the number of concerns. Thus, our primary dependent variable, *CSR_NET*, is the sum of the net score from the six CSR dimensions.

In addition to the *CSR_NET* as a proxy for CSR, following Kim et al. (2014), we transform *CSR_NET* to create a CSR score that ranges from zero to one to facilitate the comparison of CSR scores across years (*CSR_IND*). The formula is:

$$CSR\_IND_{i,t} = \frac{CSR\_NET_{i,t} - MIN.CSR\_NET_{j,t}}{MAX.CSR\_NET_{j,t} - MIN.CSR\_NET_{j,t}} \quad (1)$$

where i, j, t denote firm i, industry j (two-digit SIC codes) and year t, respectively. Moreover, MIN and MAX refer to the minimum and maximum *CSR_NET* for firm i's industry in year t, respectively. We also use positive CSR scores (*CSR_STR*) and negative CSR scores (*CSR_CON*) in our regression analyses.

3.3. Empirical model

We develop the following regression specifications to test the association between the corporate life cycle and CSR-related activities (test of *H1*).

$$CSR = \gamma_0 + \gamma_1 LCS + \gamma_2 SIZE + \gamma_3 PM + \gamma_4 SLACK + \gamma_5 LEV + \gamma_6 MTB + \gamma_7 R\&D + \gamma_8 STD\_CF + \gamma_9 AGE + \gamma_{10} ANALYST + IndustryFE + YearFE + \varepsilon \quad (2)$$

In the above equation, *LCS* denotes *RE/TA* and *MATURE*, the life cycle proxies of DeAngelo et al. (2006) and Dickinson (2011), respectively. When we use the *MATURE* stage in the equation, the other four life cycle stages are used as a benchmark in the empirical analysis. We use four proxies for *CSR*, namely *CSR_NET*, *CSR_IND*, *CSR_STR* and *CSR_CON*. For the first three proxies for CSR, we expect a positive and significant coefficient for the *LCS*, while for the last measure of CSR (i.e., *CSR_CON*), we expect a negative and significant coefficient for the *LCS* (Eq. (2)).

Following the prior literature, we include a set of control variables that are likely determinants of firms' CSR involvement. *SIZE* is the natural log of the market value of equity, and we would expect it to be positively associated with CSR. Better-performing firms, as proxied by operating income scaled by equity (*PM*), participate more in CSR. *SLACK* (cash and marketable securities scaled by total assets) relates to fewer resource constraints and more managerial discretionary activities (Jensen and Meckling, 1976). These are likely to enhance firms' ability to invest in CSR. Leverage (*LEV*) may indicate constraint in resources and may be associated with increased monitoring, constraining managerial discretionary activities (Jensen and Meckling, 1976). This, in turn, can affect CSR investments adversely. McWilliams and Siegel (2001) suggest that firm growth (*MTB*), measured as the market value of equity divided by the book value of equity, and research and development (*R&D*) have important implications for firm-level CSR activities. Hence, we control for *MTB* and *R&D* in the regression models. Firms with more volatile performance, as proxied by the standard deviation of operating cash flows scaled by the total assets over the prior three years (*STD_CF*), participate less in CSR activities. Firm age (*AGE*) is the natural log of the firm age. Firms with a long existence in the market are better able to respond strategically to CSR opportunities and constraints (Attig et al., 2014). Prior studies show that CSR activities are particularly influenced by public policy pressures from external stakeholders (Bansal and Clelland, 2004; Reverte, 2009). Therefore, we control for analyst following (*ANALYST*), measured as the natural log of one plus the number of analysts following a firm in a given year. All the variables are defined in the Appendix A.

To test H2, we regress CSR on the life cycle proxy, interactive terms (interaction between life cycle proxy and controls) and standard controls used in Eq. (2). This allows us to examine the effect of the firm life cycle, financial resources and other controls that also vary with firm life cycle stages.

$$CSR = \gamma_0 + \gamma_1 LCS + \gamma_2 LCS * SIZE + \gamma_3 LCS * PM + \gamma_4 LCS * SLACK + \gamma_5 LCS * LEV + \gamma_6 LCS * MTB + \gamma_7 LCS * R\&D + \gamma_8 LCS * STD\_CF + \gamma_9 LCS * AGE + \gamma_{10} LCS * ANALYST + \gamma_{11} SIZE + \gamma_{12} PM + \gamma_{13} SLACK + \gamma_{14} LEV + \gamma_{15} MTB + \gamma_{16} R\&D + \gamma_{17} STD\_CF + \gamma_{18} AGE + \gamma_{19} ANALYST + IndustryFE + YearFE + \varepsilon \quad (3)$$

Since H_2 tests for the moderating effects of financial resources, we focus on the interactive coefficients for $LCS * SIZE$, $LCS * PM$ and $LCS * SLACK$ in Eq. (3).

4. Sample selection and descriptive statistics

4.1. Sample selection

We begin with an initial sample of 40,518 firm-year observations from 1991 to 2013. Our sample starts in 1991 as this is the first year when KLD data become available. We match these data with COMPUSTAT and lose 4033 firm-year observations. We then exclude 9203 firm-year observations pertaining to utility (two-digit SIC codes 48 and 49) and financial institutions (two-digit SIC codes 60–69), as is consistent with the prior literature. Finally, we lose another 1865 firm-year observations because of missing values for the regression variables. Our final sample for conducting the regressions thus

Table 1
Sample selection and distribution of the sample.

Panel A: Data and sample

Description	Total number of observations
CSR data available from 1991 to 2013 from KLD	40,518
Less:	
Observations dropped after merging data with Compustat file	(4033)
Financial and utility firms (7673 + 1530)	(9203)
Firms with missing values for the variables used in the regression model	(1865)
Final sample	25,417

Panel B: Industry distribution

Industry category	Observations	% observations
Consumer non durables	1798	7.07
Consumer durables	793	3.12
Manufacturing	3681	14.48
Oil, gas and coal extraction and products	1468	5.78
Chemicals and allied products	1032	4.06
Electric & electrical equipment	5481	21.56
Telephone and television transmission	937	3.69
Wholesale, retail and some services	3342	13.15
Healthcare, medical equipment and drugs	3221	12.67
Other	3664	14.42
Total	25,417	100.00

varies from 25,417 to 25,327 firm-year observations depending on the model-specific data requirements. Panel A, Table 1, describes the sample selection procedure. Panel B shows that the firm-year observations come from a wide variety of industries, with the electric and electrical equipment and the manufacturing sectors commanding the largest industry representation with 21.56% and 14.48% of the sample, respectively.

4.2. Descriptive statistics

Panel A in Table 2 provides pooled and life cycle-wise descriptive statistics for the variables used in the regression models. The average *CSR_NET* is −0.08, with a large standard deviation of 2.37, although the overall median is 0, suggesting a relatively balanced distribution of firms with negative and positive CSR involvement. The mean (median) *CSR_IND* is 0.38 (0.33). The mean for CSR strengths (*CSR_STR*) is lower than the mean for CSR concerns (*CSR_CON*). The firms in our sample are relatively large, profitable and low-levered and exhibit high growth opportunities. The life cycle-wise descriptive statistics show that *RE/TA*, *SIZE*, *PM* and *ANALYST* are highest in the mature stage but lowest in the decline stage. Moreover, consistent with the findings of Dickinson (2011), we find that the highest (lowest) observations belong to the mature (decline) stage with 50% (4%) of the observations. Overall, the descriptive statistics are consistent with those reported by Dickinson (2011) and Habib and Hasan (forthcoming-a).

Fig. 1 indicates that *CSR_NET*, *CSR_IND* and *CSR_STR* increase from the introduction to the growth stage and from the growth to the mature stage but decrease from the mature to the shake-out stage and from the shake-out to the decline stage, thus resembling an inverted "U" shape pattern.

4.3. Correlation

Panel B, Table 2, presents the correlation between the variables included in the regression models. *RE/TA* is positively and significantly correlated with *CSR_NET*, *CSR_IND* and *CSR_STR* (all at $p < 0.001$). The correlations between the mature stage (*MATURE*) and *CSR_NET*, *CSR_IND* and *CSR_STR* are also positive and significant. However, the correlations of *CSR_NET* and *CSR_STR* with other life cycle stages (*INTRO*, *GROWTH* and *DECLINE*) are negative and significant ($p < 0.001$). Furthermore, correlation of *INTRO* and *DECLINE* (*GROWTH*) stages with *CSR_IND* are negative and significant at $p < 0.001$ ($p < 0.05$), suggesting that these firms are involved in fewer CSR-related initiatives. The positive (negative) correlation of *RE/TA* with the growth and mature (introduction, shake-out and decline) stages suggests that the *RE/TA* measure of the life cycle captures mainly the effect of the growth and mature stages. Furthermore, the correlation between CSR scores and controls is in line with the expectation.

4.4. Life cycle-wise mean difference of CSR involvement: HSD test and TK test

Table 3 reports the pair-wise comparison of CSR involvement for different life cycle stages. We perform an ANOVA test followed by Tukey's HSD (honest significant difference) and the Tukey–Kramer (TK) method to determine whether the means of CSR involvement for the various pair-wise relationships are significantly different from each other. This table

Table 2
Pooled and life cycle-wise descriptive statistics.

Panel A: Descriptive statistics

Variable	Stat.	Pooled	INTRO	GROWTH	MATURE	SHAKE-OUT	DECLINE
CSR_NET	Mean	−0.083	−0.610	−0.292	0.150	−0.105	−0.568
	Median	0.000	−1.000	−1.000	0.000	1.000	−1.000
	Std. Dev.	2.368	1.725	2.087	2.615	2.331	1.587
CSR_IND	Mean	0.384	0.317	0.377	0.407	0.363	0.295
	Median	0.333	0.273	0.333	0.364	0.333	0.250
	Std. Dev.	0.252	0.221	0.248	0.261	0.240	0.199
CSR_STR	Mean	1.281	0.688	1.041	1.532	1.346	0.720
	Median	1.000	0.000	0.000	1.000	1.000	0.000
	Std. Dev.	1.997	1.284	1.638	2.255	1.997	1.285
CSR_CON	Mean	1.630	1.441	1.535	1.696	1.761	1.512
	Median	1.000	1.000	1.000	1.000	1.000	1.000
	Std. Dev.	1.501	1.168	1.347	1.619	1.573	1.279
RE/TA	Mean	−0.058	−1.038	0.035	0.235	−0.158	−1.326
	Median	0.207	−0.775	0.168	0.306	0.146	−1.263
	Std. Dev.	1.084	1.925	0.683	0.569	1.228	2.092
SIZE	Mean	7.103	5.777	7.120	7.425	6.902	5.580
	Median	7.000	5.557	7.006	7.327	6.715	5.354
	Std. Dev.	1.621	1.493	1.499	1.558	1.615	1.438
PM	Mean	0.110	−0.318	0.121	0.200	0.076	−0.357
	Median	0.156	−0.172	0.146	0.490	0.102	−0.236
	Std. Dev.	0.577	0.969	0.408	0.195	0.616	1.059
SLACK	Mean	0.191	0.378	0.182	0.137	0.259	0.469
	Median	0.111	0.298	0.103	0.086	0.203	0.471
	Std. Dev.	0.209	0.317	0.197	0.146	0.213	0.28
LEV	Mean	0.186	0.189	0.205	0.182	0.158	0.165
	Median	0.150	0.077	0.187	0.150	0.092	0.011
	Std. Dev.	0.192	0.236	0.189	0.180	0.194	0.252
MTB	Mean	3.233	3.961	3.189	3.203	2.935	3.470
	Median	2.358	2.629	2.414	2.381	2.062	2.212
	Std. Dev.	4.349	6.434	3.664	4.143	4.446	6.463
R&D	Mean	0.045	0.146	0.036	0.024	0.053	0.195
	Median	0.005	0.082	0.004	0.000	0.015	0.145
	Std. Dev.	0.090	0.174	0.061	0.044	0.082	0.191
STD_CF	Mean	0.052	0.127	0.049	0.039	0.052	0.119
	Median	0.033	0.084	0.033	0.028	0.035	0.079
	Std. Dev.	0.064	0.118	0.055	0.039	0.057	0.113
AGE	Mean	22.855	13.817	19.856	26.190	23.347	14.387
	Median	16.766	10.282	14.234	20.06	16.764	17.663
	Std. Dev.	19.233	13.542	17.732	20.167	19.341	13.576
ANALYST	Mean	12.412	8.460	12.997	13.064	11.149	8.394
	Median	10.000	7.000	11.000	11.000	9.000	7.000
	Std. Dev.	9.467	7.075	9.402	9.777	9.112	7.062
N		25417	1555	7596	12895	2336	1035

Panel B: Correlation analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
CSR_NET (1)	***1.00***																		
CSR_IND (2)	***0.66***	***1.00***																	
CSR_STR (3)	***0.74***	***0.54***	***1.00***																
CSR_CON (4)	***−0.32***	***−0.20***	***0.26***	***1.00***															
RE/TA (5)	***0.11***	***0.16***	***0.13***	0.01	***1.00***														
INTRO (6)	***−0.06***	***−0.07***	***−0.08***	***−0.04***	***−0.34***	***1.00***													
GROWTH (7)	***−0.06***	*−0.01*	***−0.08***	***−0.04***	***0.06***	***−0.18***	***1.00***												
MATURE (8)	***0.10***	***0.09***	***0.13***	***0.05***	***0.27***	***−0.27***	***−0.65***	***1.00***											
SHAKEOUT (9)	0.00	***−0.03***	*0.01*	***0.03***	***−0.03***	***−0.08***	***−0.21***	***−0.31***	***1.00***										
DECLINE (10)	***−0.04***	***−0.07***	***−0.06***	***−0.02***	***−0.35***	***−0.06***	***−0.14***	***−0.21***	***−0.07***	***1.00***									
SIZE (11)	***0.23***	***0.25***	***0.47***	***0.37***	***0.36***	***−0.22***	0.00	***0.21***	***−0.04***	***−0.19***	***1.00***								
PM (12)	***0.05***	***0.08***	***0.08***	***0.04***	***0.46***	***−0.34***	***0.10***	***0.18***	***0.03***	***−0.31***	***0.23***	***1.00***							
SLACK (13)	0.00	***−0.18***	***−0.08***	***−0.08***	***−0.43***	***0.24***	***−0.02***	***−0.27***	***0.10***	***0.27***	***−0.45***	***−0.36***	***1.00***						
LEV (14)	***−0.04***	***0.06***	*−0.01*	***0.06***	***−0.07***	−0.01	***0.06***	*−0.01*	***−0.05***	***−0.02***	***0.28***	*−0.01*	***−0.32***	***1.00***					

(*continued on next page*)

Table 2 (*continued*)

Panel B: Correlation analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
MTB (15)	***0.09***	***0.03***	***0.08***	***−0.03***	***−0.05***	***0.05***	0.00	*−0.01*	***−0.02***	0.01	***−0.04***	*−0.04*	***0.17***	***−0.10***	***1.00***				
R&D (16)	***0.02***	***−0.16***	***−0.04***	***−0.05***	***−0.59***	***0.30***	***−0.07***	***−0.23***	***0.03***	***0.35***	***−0.35***	***−0.50***	***0.60***	***−0.16***	***0.14***	***1.00***			
STD_CF (17)	***−0.09***	***−0.12***	***−0.13***	***−0.06***	***−0.45***	***0.31***	***−0.03***	***−0.21***	0.00	***0.22***	***−0.39***	***−0.34***	***0.47***	***−0.12***	***0.12***	***0.46***	***1.00***		
AGE (18)	***0.13***	***0.13***	***0.27***	***0.19***	***0.24***	***−0.16***	***−0.12***	***0.21***	***0.03***	***−0.08***	***0.43***	***0.14***	***−0.29***	***0.03***	***−0.06***	***−0.18***	***−0.25***	***1.00***	
ANALYST (19)	***0.21***	***0.14***	***0.30***	***0.18***	***0.14***	***−0.12***	***0.05***	***0.08***	***−0.04***	***−0.07***	***0.55***	***0.09***	***−0.08***	***0.06***	***0.09***	−0.01	***−0.15***	***0.22***	***1.00***

Notes: Variable definitions are in the Appendix A.
Coefficients in bold and italic, bold, and italic are significant at $p < 0.001$, $p < 0.01$, and $p < 0.05$, respectively.

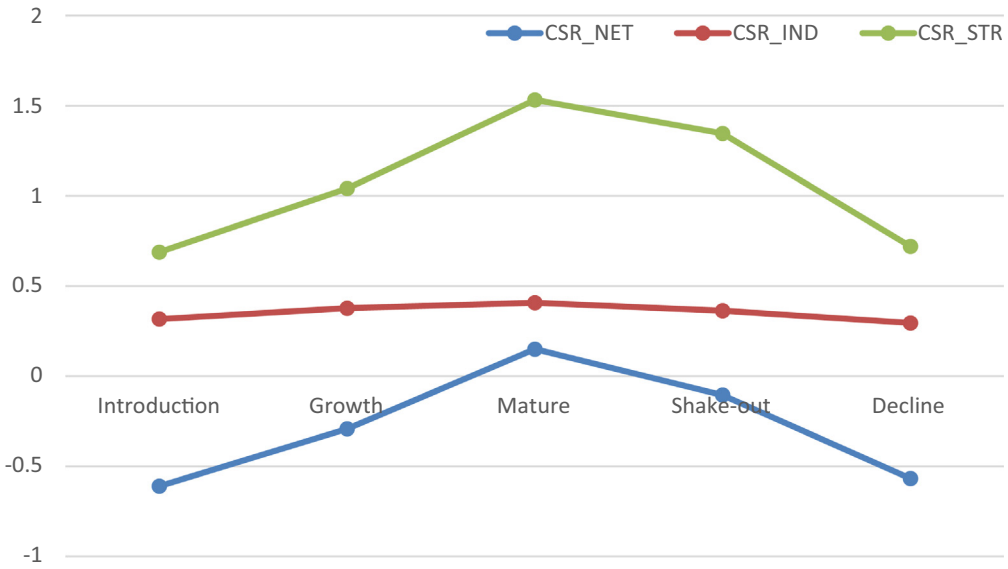

Fig. 1. Life cycle-wise mean CSR.

shows that the means for *CSR_NET* and *CSR_IND* increase significantly from the introduction to the growth stage, from the growth to the mature stage, from the introduction to the mature stage and from the introduction to the shake-out stage. However, the mean level of CSR decreases significantly from the mature to the shake-out stage, from the shake-out to the decline stage, and from the growth to the decline stage. Both Tukey's HSD and the TK test results support the theoretical argument that firms in the mature stage engage more in CSR activities because of their rich resource base and capabilities.

5. Multiple regression results

5.1. Regression results: corporate life cycle and CSR

Table 4 presents the regression results for Eq. (2). Columns (1) to (4) report the results for the corporate life cycle and *CSR* for the *RE/TA* measure, while Columns (5) to (8) contain the results for the *MATURE* stage of the Dickinson (2011) life cycle measure. In all the regression specifications, we estimate *t*-statistics using standard errors that are clustered at the firm level (Petersen, 2009). Column (1) of Panel A reveals that the coefficient for *RE/TA* is positive and significant (coefficient = 0.155, $p < 0.01$), implying that mature firms are associated with more CSR activities.[4] In terms of economic significance, our coefficient implies that a one standard deviation increase in *RE/TA* is associated with a 16.8% increase in net CSR. Furthermore, the role of firm life cycle in improving net CSR is expected to accentuate from −1% to 6.36% when *RE/TA* moves from the 1st quartile to 3rd quartile. One plausible explanation for such an increase in net CSR is that mature firms, owing to their abundant resource base and economies of scale, have the capacity to invest a substantial amount in CSR in an attempt to differentiate themselves

[4] To mitigate the concern that our results might be biased because of the multicollinearity problem, we check the variance inflation factor (VIF) values of all the regression models. We find that multicollinearity is not a problem, as the VIFs are within the tolerance limit. For example, in column (1) the highest VIF is 2.83, related to *R&D*, followed by 2.68 for *SIZE*. The rest of the VIFs pertinent to the variables are below 2.25.

Table 3
Life cycle-wise mean difference of CSR engagement: HSD-test and TK-test.

Mean difference of CSR involvement using Dickinson's (2011) life cycle stages					
Estimates	Group means		Mean differences	HSD-test[a]	TK-test[a]
	(Stage 1)	(Stage 2)			
	Introduction	**Growth**			
CSR_NET	−0.610	−0.292	0.318	6.357*	6.898*
CSR_IND	0.317	0.377	0.060	11.502*	12.481*
	Growth	**Mature**			
CSR_NET	−0.292	0.150	0.442	9.096*	18.586*
CSR_IND	0.377	0.407	0.030	5.820*	11.876*
	Mature	**Shake–out**			
CSR_NET	0.150	−0.105	0.255	5.426*	7.135*
CSR_IND	0.407	0.363	0.044	8.641*	11.355*
	Shake–out	**Decline**			
CSR_NET	−0.105	−0.568	0.463	9.307*	7.447*
CSR_IND	0.363	0.295	0.068	12.928*	10.346*
	Introduction	**Mature**			
CSR_NET	−0.610	0.150	0.760	15.454*	17.412*
CSR_IND	0.317	0.407	0.090	17.322*	19.519*
	Introduction	**Shake–out**			
CSR_NET	−0.610	−0.105	0.505	10.028*	9.199*
CSR_IND	0.317	0.363	0.046	8.681*	7.964*
	Introduction	**Decline**			
CSR_NET	−0.610	−0.568	0.042	0.721	0.542
CSR_IND	0.317	0.295	0.022	4.247*	3.192
	Growth	**Shake–out**			
CSR_NET	−0.292	−0.105	0.187	3.671	4.588*
CSR_IND	0.377	0.363	0.014	2.821	3.524
	Growth	**Decline**			
CSR_NET	−0.292	−0.568	0.276	5.636*	5.097*
CSR_IND	0.377	0.295	0.082	15.749*	14.244*
	Mature	**Decline**			
CSR_NET	0.150	−0.568	0.718	14.732*	13.672*
CSR_IND	0.407	0.295	0.112	21.569*	20.020*

Notes: Variable definitions are in the Appendix A.
[a] For both Tukey HSD (honest significant difference) pairwise comparisons and Tukey-Kramer (TK) pairwise comparisons studentized range critical value at 5% significance level is 3.858.

from others, enhance their reputational capital and competitiveness and generate long-term benefit (Brammer and Millington, 2008; Porter and Kramer, 2006) to safeguard their position in the most favorable life cycle stage (i.e., the mature stage). In column (2) the coefficient for the alternative CSR proxy (*CSR_IND*) is also positive and significant (coefficient = 0.013, $p < 0.01$), supporting H1.

In Columns (3) and (4), we decompose the CSR score into total CSR strengths (*CSR_STR*) and total CSR concerns (*CSR_CON*) and rerun Eq. (2). This is useful because the aggregation of "strengths" and "concerns" into a single CSR score may overlook the cross-sectional variation in CSR behavior (Chatterji et al., 2009; Mattingly and Berman, 2006). The coefficient for *CSR_STR* is positive and significant (coefficient 0.11, $p < 0.01$), while that for *CSR_CON* is negative and significant (coefficient −0.17, $p < 0.01$). This indicates that mature firms not only engage in positive CSR but also refrain from participating in negative CSR activities.

Columns (5) to (8) present the regression results for CSR and the life cycle proxy of Dickinson (2011). Dickinson (2011) classifies the firm life cycle into five stages: introduction, growth, mature, shake-out and decline. However, for ease of interpretation, we use the mature stage of the firm life cycle in the regression models, making the other life cycle stages a benchmark for the analysis. Columns (5) and (6) show that, compared with firms in other life cycle stages, mature firms are associated with significantly higher *CSR_NET* and *CSR_IND* scores, with coefficients of 0.229 and 0.021 (*t*-statistics of 5.56 and 5.06), respectively. Column (7) indicates a significantly positive ($p < 0.01$) relation between maturity and CSR strengths, while Model (8) exhibits a significantly negative relation between maturity and CSR concerns (coefficient = −0.07, $p < 0.01$).

Among the control variables, the coefficients for *SIZE* and *SLACK* are positive and significant across all the specifications. The coefficient for *PM*, a financial resource proxy, is positive and significant in Columns (5) to (7) and negative in Column (8). The regression results further suggest that *R&D*-intensive and growth firms, and firms with a larger analyst following, are associated with more CSR initiatives. On the other hand, highly leveraged firms undertake fewer CSR initiatives.

In Panel B of Table 4, we perform the regressions for individual net CSR categories with respect to the firm life cycle. Columns (1) to (6) report the results for the *RE/TA* measure of the firm life cycle. The regression results indicate that the coef-

Table 4
Regression results.

Panel A: Corporate life cycle and CSR engagement

$$CSR = \gamma_0 + \gamma_1 LCS + \gamma_2 SIZE + \gamma_3 PM + \gamma_4 SLACK + \gamma_5 LEV + \gamma_6 MTB + \gamma_7 R\&D + \gamma_8 STD\_CF + \gamma_9 AGE + \gamma_{10} ANALYST + IndustryFE + YearFE + \varepsilon \quad (2)$$

	DeAngelo et al. (2006) life cycle measure (RE/TA)				Dickinson (2011) life cycle measure – Mature stage			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	*CSR_NET*	*CSR_IND*	*CSR_STR*	*CSR_CON*	*CSR_NET*	*CSR_IND*	*CSR_STR*	*CSR_CON*
Constant	−4.625***	0.383***	−4.629***	−1.747***	−4.685***	0.378***	−4.66***	−1.432***
	[−8.34]	[5.98]	[−7.91]	[−3.76]	[−8.19]	[5.79]	[−7.99]	[−2.62]
RE/TA	0.155***	0.013***	0.110***	−0.170***	–	–	–	–
	[5.89]	[5.65]	[5.67]	[−11.08]				
MATURE	–	–	–	–	0.229***	0.021***	0.150***	−0.070***
					[5.56]	[5.06]	[4.66]	[−3.04]
SIZE	0.342***	0.027***	0.694***	0.477***	0.340***	0.027***	0.684***	0.377***
	[7.37]	[6.60]	[16.10]	[19.24]	[7.42]	[6.62]	[16.11]	[15.91]
PM	0.023	0.002	0.042***	0.027**	0.079***	0.006**	0.050**	−0.097***
	[1.39]	[1.21]	[3.32]	[2.42]	[2.80]	[1.99]	[2.39]	[−5.22]
SLACK	0.582***	0.032**	0.729***	0.243***	0.585***	0.032**	0.758***	−0.167*
	[3.60]	[1.98]	[5.46]	[2.78]	[3.69]	[2.02]	[5.74]	[−1.91]
LEV	−0.524***	−0.055***	−1.133***	−0.567***	−0.630***	−0.063***	−1.086***	0.170*
	[−3.31]	[−3.42]	[−8.30]	[−5.84]	[−4.13]	[−4.14]	[−8.31]	[1.82]
MTB	0.026***	0.003***	0.023***	−0.001	0.026***	0.003***	0.022***	−0.022***
	[4.86]	[5.82]	[5.49]	[−0.43]	[5.05]	[6.09]	[5.56]	[−7.73]
R&D	1.929***	0.117***	1.854***	0.194	1.008***	0.036	1.759***	0.453**
	[4.25]	[3.02]	[5.18]	[0.91]	[2.66]	[1.07]	[5.70]	[2.38]
STD_CF	−0.524	−0.048	0.760***	1.137***	−0.816**	−0.069**	0.806***	1.151***
	[−1.55]	[−1.37]	[2.91]	[5.77]	[−2.47]	[−1.99]	[3.11]	[5.88]
AGE	0.070*	0.002	0.179***	0.097***	0.066	0.002	0.173***	0.174***
	[1.67]	[0.45]	[5.42]	[4.33]	[1.56]	[0.38]	[5.32]	[7.19]
ANALYST	0.213***	0.019***	0.001	−0.097***	0.219***	0.019***	0.002	−0.072***
	[5.12]	[4.48]	[0.03]	[−4.26]	[5.30]	[4.58]	[0.07]	[−3.00]
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,327	25,327	25,327	25,327	25,417	25,417	25,417	25,417
Adj. R-squared	0.19	0.23	0.31	0.32	0.18	0.23	0.31	0.28

PANEL B: Corporate life cycle and CSR categories

	DeAngelo et al. (2006) life cycle measure (RE/TA)						Dickinson (2011) life cycle measure – Mature stage					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Variables	*CSR_ENV*	*CSR_EMP*	*CSR_COM*	*CSR_PRO*	*CSR_DIV*	*CSR_HUM*	*CSR_ENV*	*CSR_EMP*	*CSR_COM*	*CSR_PRO*	*CSR_DIV*	*CSR_HUM*
Constant	−0.726*	−0.548**	−0.515***	0.533*	−1.588***	−0.126	−0.744*	−0.568**	−0.533***	−0.401	−3.253***	−0.141
	[−1.89]	[−1.98]	[−4.21]	[1.77]	[−4.30]	[−1.13]	[−1.92]	[−2.08]	[−4.28]	[−0.65]	[−9.89]	[−1.04]
RE/TA	0.039***	0.077***	0.006	0.031***	0.027*	0.012***	–	–	–	–	–	–
	[5.11]	[6.23]	[1.22]	[4.65]	[1.87]	[5.33]						
MATURE	–	–	–	–	–	–	0.044***	0.056***	0.037***	0.034**	0.097***	0.011**
							[3.13]	[3.77]	[4.29]	[2.43]	[4.79]	[2.32]
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	25,327	25,327	25,327	25,327	25,327	25,327	25,417	25,417	25,417	25,417	25,417	25,417
Adj. R^2	0.15	0.16	0.13	0.17	0.32	0.11	0.15	0.15	0.13	0.17	0.34	0.15

Notes: Variable definitions are in the Appendix A.
Robust *t*-statistics in brackets.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.10$.

ficients for environment (*CSR_ENV*), employee relations (*CSR_EMP*), product (*CSR_PRO*), diversity (*CSR_DIV*) and human rights (*CSR_HUM*) are positive and significant (mostly at $p < 0.01$). Columns (7) to (12) exhibit the regression results for the *MATURE* stage of the Dickinson (2011) life cycle measure. The regression results show that all the CSR categories are positively associated ($p < 0.05$ or better) with firm maturity (*MATURE*).

5.2. Corporate life cycle and CSR: moderating role of financial resources

In Table 5 we explore whether the variation in financial resources across the life cycle stages moderates the association between the corporate life cycle and CSR. McWilliams and Siegel (2001) note that greater CSR involvement requires addi-

tional capital. For example, the installation of pollution abatement to achieve an environmental standard beyond that required by law will require the firm to purchase additional equipment. Clarkson et al. (2011) suggest that CSR activities rise with firms' performance. Hong et al. (2012) show that when firms "do well" they build up financial slack that makes them able to "do good" by engaging in CSR activities. Erhemjamts et al. (2013) also document that firms with better financial performance are more inclined to invest in CSR-related activities. It therefore follows that financial resources play a moderating role in the association between the life cycle and CSR.

To test our conjecture empirically, we regress the CSR score on the firm life cycle, the various determinants of CSR interacted with the firm life cycle stage and the control variables for CSR. This helps to ascertain whether any particular variable, importantly financial resources and operating performance, has additional significance in a given firm life cycle stage by explaining the variation in CSR activity.

The results reported in Table 5 show that, in all the regression models, the firm life cycle proxy remains significant ($p < 0.01$), which reinforces the importance of the firm life cycle stages in explaining the variation in CSR activities. The value of the life cycle stage in explaining variations in CSR is also evident from the significance of the coefficients in terms of the life cycle stage dummy variable, CSR determinants and life cycle stage–CSR interaction terms.[5] Several observations are worth noting from this analysis: (i) the interactive coefficients *RE/TA* ∗ *SIZE* and *MATURE* ∗ *SIZE* are both significantly positive ($p < 0.01$). These results generally suggest that a larger size, associated with the mature stage of the firm life cycle, allows mature firms to participate more in CSR-related activities. For example, the base coefficient and interaction coefficient, together, in Column (1) imply that the effect of *RE/TA* on *CSR_NET* is expected to increase from 1.771 to 2.334 when *SIZE* moves from the first quartile to the third quartile.[6] Likewise, Column (3) indicates that the effect of the *MATURE* stage on *CSR_NET* is expected to increase from 1.643 to 2.208 when *SIZE* moves from the first quartile to the third quartile.

(ii) The coefficients for *RE/TA* ∗ *PM* and *MATURE* ∗ *PM* are significantly positive (mostly $p < 0.01$), suggesting that higher profitability in the mature stage helps firms to be involved in more CSR. The coefficients in Column (1) imply that the effect of *RE/TA* on *CSR_NET* is expected to increase from 0.317 to 0.321 when *PM* moves from the first quartile to the third quartile. Similarly, Column (3) indicates that the effect of the *MATURE* stage on *CSR_NET* increases from 0.200 to 0.345 when *PM* moves from the first quartile to the third quartile.

(iii) The coefficients for *RE/TA* ∗ *SLACK* and *MATURE* ∗ *SLACK* are positive, implying that adequate slack resources in their mature stage help firms to engage in more CSR activities. For example, the coefficients in Column (3) suggest that the effect of the *MATURE* stage on *CSR_NET* is expected to increase from 0.206 to 0.351 when *SLACK* moves from the first quartile to the third quartile. Similar interpretations hold for the *CSR_IND* measure of the CSR score. Taken together, these results suggest that financial resources and profitability play an important moderating role in affecting CSR activities in the mature stage of the firm life cycle.

5.3. Sensitivity analysis

5.3.1. Alternative proxy for CSR

Following prior studies (e.g., Attig et al., 2014; El Ghoul et al., 2011; Kim et al., 2014), in our main analysis, we exclude the corporate governance category when constructing the *CSR_NET* metric. We find similar results even when we incorporate the corporate governance category into our scoring process and recode *CSR_NET* (results untabulated). For example, the regression results for *RE/TA* (coefficient = 0.201, $p < 0.01$) and *MATURE* (coefficient = 0.227, $p < 0.01$) largely corroborate the findings reported in our main analysis (Table 4).

A potential concern relating to the KLD database is that KLD has been adding and deleting item ratings over time. As a result, the CSR scores may not be comparable over time. To address this concern, we transform the CSR score into decile ranks for each year. A higher decile rank indicates a higher level of CSR performance. Untabulated regression results using the decile CSR scores corroborate our earlier findings. For example, decile *CSR_NET* is positively associated with *RE/TA* ($\gamma_1 = 0.18$, $p < 0.01$). We obtain consistent results for the *MATURE* stage of the Dickinson (2011) life cycle measure.

5.3.2. Alternative life cycle proxy – RE/TE

As a robustness check, we use the alternative life cycle measure of DeAngelo et al. (2006) – *RE/TE* (retained earnings to total equity). In untabulated results the coefficients for *RE/TE* are 0.049 and 0.005 (both at $p < 0.01$) for the *CSR_NET* and *CSR_IND* measures of CSR proxies, respectively.

5.3.3. Inclusion of corporate governance and managerial incentives as additional controls

In our main regression analysis, we do not control for corporate governance and managerial incentives explicitly, which may bias the findings of our study. This is particularly true since corporate governance and managerial incentives may differ

[5] Following the prior literature, the continuous variables used in the interaction terms are mean-centered before they are included in the analysis to mitigate multicollinearity problems as well as to facilitate the interpretation of the main effects (Aiken and West, 1991; Chen et al., 2012). Note that the VIFs, for example, in model (1) are 57.68 for *RE/TA* followed by 44.20 for *RE/TA* ∗ *SIZE* and 21.59 for *RE/TA* ∗ *AGE*, implying the importance of mean centering for interactive variables.

[6] The first (third) quartile value of *SIZE*, *PM* and *SLACK* is 5.89 (8.17), 0.03 (0.27) and 0.04 (0.28), respectively. The moderating effect of *SIZE* on *CSR_NET* for the first quartile of *SIZE* is calculated as 0.316 + 0.247 ∗ 5.89 = 1.771, and that for the third quartile of SIZE is calculated as 0.316 + 0.247 ∗ 8.17 = 2.334.

Table 5
Variation in organizational financial resources across life cycle stages and CSR engagement. $CSR = \gamma_0 + \gamma_1 LCS + \gamma_2 LCS * SIZE + \gamma_3 LCS * PM + \gamma_4 LCS * SLACK + \gamma_5 LCS * LEV + \gamma_6 LCS * MTB + \gamma_7 LCS * R\&D + \gamma_8 LCS * STD\_CF + \gamma_9 LCS * AGE + \gamma_{10} LCS * ANALYST + \gamma_{11} SIZE + \gamma_{12} PM + \gamma_{13} SLACK + \gamma_{14} LEV + \gamma_{15} MTB + \gamma_{16} R\&D + \gamma_{17} STD\_CF + \gamma_{18} AGE + \gamma_{19} ANALYST + IndustryFE + YearFE + \varepsilon$ (3).

	DeAngelo et al. (2006)		Dickinson (2011)	
	(1)	(2)	(3)	(4)
	RE/TA	*RE/TA*	*MATURE*	*MATURE*
Variables	*CSR_NET*	*CSR_IND*	*CSR_NET*	*CSR_IND*
Constant	−4.246***	0.409***	−3.596***	0.453***
	[−7.94]	[6.45]	[−6.46]	[6.92]
LCS	0.316***	0.027***	0.182***	0.019***
	[6.36]	[6.47]	[4.08]	[4.31]
LCS∗SIZE	0.247***	0.019***	0.248***	0.015***
	[7.01]	[6.96]	[4.35]	[3.08]
LCS∗PM	0.019***	0.002**	0.607***	0.047***
	[2.68]	[2.57]	[5.55]	[5.25]
LCS∗SLACK	0.148*	0.019*	0.603**	0.059**
	[1.71]	[1.68]	[2.40]	[2.42]
LCS∗LEV	−0.185**	−0.015*	−0.446**	−0.049**
	[−2.29]	[−1.77]	[−1.97]	[−2.17]
LCS∗MTB	0.008***	0.001***	0.017*	0.000
	[3.05]	[3.66]	[1.74]	[0.48]
LCS∗R&D	1.000***	0.078***	4.016***	0.477***
	[5.50]	[5.32]	[3.75]	[5.39]
LCS∗STD_CF	0.046	0.004	0.018***	0.003***
	[1.38]	[1.20]	[2.93]	[2.66]
LCS∗AGE	0.066	0.003	0.042	0.007
	[1.51]	[0.97]	[0.78]	[1.26]
LCS∗ANALYST	−0.064**	−0.004*	−0.052	0.003
	[−2.38]	[−1.75]	[−1.01]	[0.52]
SIZE	0.331***	0.024***	0.202***	0.018***
	[7.31]	[5.97]	[4.83]	[4.42]
PM	0.021	0.003	0.013	0.001
	[0.96]	[1.20]	[0.87]	[0.73]
SLACK	0.482***	0.032**	0.349**	0.009
	[2.91]	[2.00]	[2.22]	[0.55]
LEV	−0.919***	−0.048***	−0.255	−0.021
	[−4.83]	[−2.75]	[−1.61]	[−1.31]
MTB	0.025***	0.003***	0.016***	0.002***
	[4.11]	[5.73]	[3.25]	[5.05]
R&D	2.362***	0.160***	0.395	−0.038
	[4.26]	[3.47]	[1.19]	[−1.20]
STD_CF	−0.623*	−0.057	−0.823**	−0.072**
	[−1.80]	[−1.58]	[−2.53]	[−2.12]
AGE	0.042	0.000	0.047	−0.002
	[1.02]	[0.05]	[1.11]	[−0.38]
ANALYST	0.173***	0.018***	0.236***	0.017***
	[4.16]	[4.36]	[5.71]	[3.79]
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	25,327	25,327	25,417	25,417
Adj. R-squared	0.21	0.24	0.19	0.23

Notes: Variable definitions are in the Appendix A. Robust *t*-statistics in brackets.
*** p<0.01.
** p<0.05.
* p<0.10.

across firms and across life cycles within firms and relate to both firm resources and CSR. To allay this concern, we perform additional tests after including (i) the net corporate governance score from KLD, (ii) the percentage of shares held by institutions retrieved from Thomas Reuter's F13 File and (iii) finally, the natural log of the total compensation from EXECUCOM, and we rerun the regressions. The results tabulated in Panel A of Table 6 provide a qualitatively similar conclusion, and the sign and significance of the main variables of interest remain the same.

5.3.4. Regression results using the lead CSR score (CSR_{t+1}) as the dependent variable

In our main analysis, we use contemporaneous life cycle stages and the CSR score to examine the association between firm maturity and CSR involvement. However, studies indicate that the current-period *KLD CSR* score reflects both past envi-

Table 6
Sensitivity analysis.

Panel A: Control for corporate governance and managerial incentives

DeAngelo et al. (2006) life cycle measure (RE/TA)

Variables	(1) *CSR_NET*	(2) *CSR_IND*
Constant	−4.998***	0.372***
	[−6.20]	[4.11]
RE/TA	0.313***	0.025***
	[5.24]	[4.75]
COR_GOV	0.659***	0.046***
	[9.87]	[8.21]
INST_SHA	−0.955***	−0.082***
	[−3.20]	[−2.98]
COMP	0.029	0.001
	[0.47]	[0.17]
Other controls	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	15,977	15,926
Adj. R-squared	0.25	0.23

Dickinson (2011) life cycle measure

Variables	(3) *CSR_NET*	(4) *CSR_IND*
Constant	−5.011***	0.368***
	[−6.07]	[4.03]
MATURE	0.211***	0.022***
	[4.11]	[4.33]
COR_GOV	0.664***	0.046***
	[9.92]	[8.27]
INST_SHA	−0.847***	−0.074***
	[−2.88]	[−2.70]
COMP	0.012	−0.001
	[0.20]	[−0.08]
Other controls	Yes	Yes
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	15,992	15,941
Adj. R-squared	0.24	0.23

Panel B: Change analysis

Variables	(1) *ΔCSR_NET*	(2) *ΔCSR_IND*	(3) *ΔCSR_STR*	(4) *ΔCSR_CON*
Constant	−0.056	−0.089***	0.190***	0.291***
	[−0.48]	[−2.79]	[3.39]	[3.84]
ΔRE/TA	0.112***	0.012**	0.044*	−0.072**
	[2.67]	[2.43]	[1.68]	[−1.99]
Δ Other controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	21,251	21,171	21,251	21,251
Adj. R-squared	0.04	0.07	0.02	0.27

Notes: Variable definitions are in Appendix A. Robust *t*-statistics in brackets.
COR_GOV is the sum of corporate governance strengths and concerns as reported in the KLD database. *INST_SHA* is the percentage of shares held by institutions retrieved from Thomas Ruter's F13 File. *COMP* is the natural log of the incentive-based compensation retrieved from Execucomp.
*** $p < 0.01$.
** $p < 0.05$.
* $p < 0.10$

ronmental outcomes and investment decisions (Chatterji et al., 2009). To address this concern, we regress CSR_{t+1} on concurrent life cycle stages and controls in the sensitivity analysis. Untabulated results largely corroborate the findings reported in our main analysis (Table 4). For example, the regression coefficient for *RE/TA* is 0.194 (at $p < 0.01$) and that for *MATURE* is 0.230 (at $p < 0.01$) when CSR_NET_{t+1} is used as the dependent variable.

5.3.5. Change analysis

Although the preceding analyses control for a variety of firm characteristics that might account for the association between CSR and the firm life cycle, endogeneity is always a concern in studies such as this. One way to address the potential endogeneity concern is to conduct a "change" analysis. We argue that, if a firm's maturity drives the increase in CSR activities, then the firm's progression to maturity from other life cycle stages should exhibit an increase in CSR-related activities. Therefore, we modify the "level" specification in Eq. (2) to a "change" specification, wherein we regress changes in CSR on changes in the firm maturity along with changes in other economic determinants (Panel B, Table 6). We continue to find a positive association between changes in *RE/TA* and changes in CSR over time (e.g., the coefficient is 0.112, $p < 0.01$ for the ΔCSR_NET measure). Our findings with respect to changes in *RE/TA* and changes in CSR strengths and concerns also remain the same. Overall, we are able to document that more mature firms are associated with more CSR-related activities over time.[7]

[7] As an additional sensitivity analysis, we use the propensity score-matching (PSM) methodology that provides an alternative method to control for self-selection by matching sample firms with control firms with similar characteristics according to a function of covariates. In our setting the basic approach to PSM is first to model a firm belonging to the mature stage on its firm-specific determinants. We consider mature firms as the treated group and firms in other life cycle stages as the control group. We calculate the propensity score using a logit model and include a set of firm characteristics (i.e., *SIZE*, *MTB*, *LEV*, *PM*, *CAPEX*, *AGE*, *R&D* and *year and industry dummies*) that may explain the likelihood that a given firm will be in the mature stage. Untabulated results show that the CSR for treated (i.e., mature) firms is significantly higher ($p < 0.01$) than that for control firms. Thus, our results are robust to corrections for the self-selection problem.

6. Conclusion

This paper examines the association between the corporate life cycle and CSR. By this means, it also examines the channels through which the corporate life cycle may affect CSR initiatives. Using a large set of US data, we document that firm maturity is associated positively with CSR initiatives. We also document that the financial resources of firms moderate the variation in CSR across the life cycle stages. These findings are consistent with the dynamic resource-based view, which suggests that the resource base and competitive advantages vary across corporate life cycle stages and underlie firms' ability to engage in CSR activities. Our findings are robust across a number of alternative measures.

We contribute to the extant firm life cycle and CSR literature by documenting the role of firms' life cycle stages in voluntary CSR involvement. Although the prior literature examines a number of firm-level outcomes with respect to CSR involvement, ours is the first study to provide robust evidence of the life cycle as a key determinant of CSR involvement. We also enrich the CSR literature that documents the antecedents of CSR engagement.

In this study we use data from the KLD, which is the most comprehensive and prominent source of CSR data and is used extensively in scholarly research to operationalize the social performance of firms (Attig et al., 2014; Kim et al., 2014; Perrault and Quinn, forthcoming). However, significant concerns remain regarding the use of the KLD database for CSR research. Some of the inherent limitations of KLD include: the lack of connection with corporate values (Johnson and Greening, 1999), the lack of a systematic theory for multidimensional sets of CSR categories (Mattingly and Berman, 2006), the "crude" and "equal-weight" nature of the CSR score (Wood and Jones, 1995), the use of binary variables to indicate a "strength" or a "weakness" of a firm concerning a certain social issue that makes it impossible to differentiate gradually between inferior and superior performers (Schreck, 2011) and the lack of an explanation for why certain aspects of social categories are selected and others excluded in the database (Wood and Jones, 1995). Finally, the KLD measure is in fact a blend of CSR investment and CSR disclosure, which, to some extent, complicates the interpretation of the score. Despite these limitations, this study contributes to a better understanding of the association between the corporate life cycle and CSR involvement.

An interesting avenue for future research would be to conduct "process-based" CSR research across corporate life cycle stages. Process studies are aimed at understanding the process of CSR decision making and implementation and stakeholders' response to such activities (Wang et al., 2016). Although archival empirical research may not be appropriate for such a purpose, rigorous qualitative research enquiring into managers' CSR decision making across corporate cycle stages would be a welcome contribution. Importantly, a study of the ways in which managers leverage firm-level financial resources to implement a value-maximizing CSR process decision better would add to the existing body of CSR research.

Appendix A. Variable definition and measurement

Variable	Definition
CSR_NET	The net CSR score is estimated as the total strengths minus total concerns across the main six social rating areas: community, diversity, employee relations, environment, human rights, and product
CSR_IND	$CSR\_IND_{i,t} = \frac{CSR\_NET_{i,t} - MIN.CSR\_NET_{j,t}}{MAX.CSR\_NET_{j,t} - MIN.CSR\_NET_{j,t}}$
CSR_STR	The CSR total strength score, estimated as the sum of the strength score from the community, diversity, employee, environment, human rights, and product characteristics qualitative issues
CSR_CON	The CSR total concern score, estimated as the sum of the concern score from the community, diversity, employee, environment, human rights, and product characteristics qualitative issues
RE/TA	Retained earnings-to-total assets. This proxy measures the extent to which a firm is self-financing or reliant on external capital. A high *RE/TA* implies that the firm is more mature or old with declining investment, while the firm with a low *RE/TA* tends to be young and growing (DeAngelo et al., 2006)
LCS	A vector of dummy variables that capture firms' different stages in the life cycle (Dickinson, 2011)
Control Variables	
SIZE	Natural logarithm of total assets
PM	Profitability, measured as operating income scaled by total assets
SLACK	Cash and short-term investments scaled by total assets
LEV	Leverage, measured as total long-term debt scaled by lagged assets
MTB	Market-to-book ratio, measured as the market value of equity scaled by the book value of equity
R&D	Research and development expenses scaled by total asset. We replace R&D by 0 if R&D is missing for any firm in any given year
STD_CF	Standard deviation of cash flow from operation scaled by total assets over the prior three years
AGE	Age is measured as the number of years since the firm was first covered by the Center for Research in Securities Prices (CRSP). In the regression analysis, we measure AGE as the natural log of (1+ age of the firm)
ANALYST	Number of analysts following a firm in a given year. In the regression analysis, we measure ANALYST as the natural log of (1+ number of analysts.)
Year	Dummy variables to control for fiscal year effect
IND	Industry dummy (Two-digit SIC codes) to control for industry fixed effect

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