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Shaped by their daughters: Executives, female socialization, and corporate social responsibility[☆]

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ABSTRACT

Corporate executives managing some of the largest public companies in the U.S. are shaped by their daughters. When a firm's chief executive officer (CEO) has a daughter, the corporate social responsibility rating (CSR) is about 9.1% higher, compared to a median firm. The results are robust to confronting several sources of endogeneity, e.g., examining first-born CEO daughters and CEO changes. The relation is strongest for diversity, but significant also for broader pro-social practices related to the environment and employee relations. Our study contributes to research on female socialization, heterogeneity in CSR policies, and plausibly exogenous determinants of CEOs' styles.

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1. Introduction

Research in social science has recently demonstrated the importance of the family environment for an individual's behavior. For example, parents may impact their chil-

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dren by instilling certain values in them.¹ Some emerging work has suggested that the opposite may also be important: children may shape their parents. In this study, we examine whether one category of top decision-makers, namely, corporate executives managing some of the largest public companies in the U.S., is systematically affected by their family environment, in particular by parenting a daughter. Evidence for such a *female socialization hypothesis* has recently been reported for other categories of top decision-makers, including Congress members and federal judges in the U.S. (e.g., Washington, 2008; Glynn and Sen, 2014), so our study expands this hypothesis into research in financial economics related to corporate executives.²

A natural domain to study such a CEO-daughter effect is decision-making related to corporate social responsibility (CSR), i.e., the ways firms make decisions with regard to society at large and stakeholders other than their shareholders. We argue that a simple theoretical framework involving a utility-maximizing CEO with social preferences may generate empirical predictions of a CEO-daughter effect in the context of pro-CSR corporate practices. First, women may exhibit stronger other-regarding preferences compared to men (e.g., Beutel and Marini, 1995; Adams and Funk, 2012). Second, parents may internalize the preferences of their children (e.g., Warner, 1991). As a result, CEOs parenting daughters may have preferences more similar to those of females. This may involve a CEO's increased concerns about diversity, but also the environment, employee relations, as well as other aspects of corporate social responsibility.

This study focuses on the largest public firms in the U.S., i.e., Standard and Poor's (S&P) 500 index constituents, during the period 1992 to 2012, and involves matching two different data sets. First, data on CEO children, and in particular whether these corporate executives have a daughter. Because a database with such information does not exist, we compile a new and comprehensive data set from a diverse set of available public sources. Specifically, we collect information regarding the gender of each CEO child, the gender of the first-born child, and the number of CEO children. The data set comprises 416 different CEOs, and

¹ Social transmission of values from parents to their children has been found to be important for, e.g., labor supply and religious preferences and values (e.g., Bisin and Verdier, 2000; Bisin, Topa and Verdier, 2004; Fernandez, Fogli and Olivetti, 2004).

² While we reference large-sample studies related to father-daughter effects, there are also ample anecdotal examples, involving some of the most prominent decision-makers in the U.S. For example, former Vice President Dick Cheney has publicly stated that he is personally supportive of same-sex marriages (a position in stark contrast with that of President George W. Bush), possibly influenced by one of his own daughters being gay (e.g., Toner, 2004). Another example involves former Supreme Court Chief Justice William H. Rehnquist, a strong proponent of states' rights, who voted that U.S. states had to abide by the *Family and Medical Leave Act*; some speculated that the personal experiences involving his own daughter impacted the decision, and *Time Magazine* ran an article called "Justice Rehnquist, Secret Feminist?" Rehnquist's daughter is a divorced single mother who had a high-pressure job as Inspector General of the U.S. Department of Health and Human Services. In fact, Greenhouse (2003) writes that several times the "Chief Justice of the United States left work early to pick up his granddaughters from school." We hypothesize that such personal experiences, attributable to an individual's child's gender, may also shape top corporate executives.

1,084 different CEO children. Second, we use the Social Ratings Data compiled by Kinder, Lydenberg, and Domini Research & Analytics (KLD) as a standard measure of firm-level corporate social responsibility. The KLD database has been used in an increasing number of research studies in economics and finance (e.g., Hong and Kostovetsky, 2012; Cheng, Hong and Shue, 2016).

Our results can be straightforwardly summarized. We find evidence of an economically sizable and statistically significant CEO-daughter effect in the context of corporate social responsibility policies, controlling for industry as well as firm and CEO characteristics, including family size (i.e., the number of CEO children). Specifically, the CSR rating of a firm is about 9.1% higher, compared to a median firm, when a firm's CEO has a daughter. Another way of quantifying the size of the effect is to emphasize that it is about one-quarter of the effect of a CEO herself being female. This is consistent with a male CEO with a daughter identifying himself more with women's preferences. An alternative way to quantify the effect is that the median firm with a CEO who has a daughter spends an extra 10.4% per year of the firm's net income on corporate social responsibility programs. The economic effect is similar if estimated from within-firm changes of CEOs.

This study is not immune to endogeneity concerns. We therefore use several approaches to confront such problems. First, we analyze first-born daughters, for which gender is arguably more exogenous, at least if parents follow a fertility stopping rule to affect the gender composition of their family. Second, we attempt to account for the so-called Trivers-Willard hypothesis in evolutionary biology, which predicts that the sex composition ratio may be different for wealthy individuals. Finally, we study the period before the *Roe v. Wade* U.S. Supreme Court case, i.e., a period with relatively stricter abortion laws, to address concerns about the selection of a child's gender through abortions, although it seems unlikely to be important in a sample of CEOs in the U.S.

We also report several additional results. Our CSR measure aggregates several categories related to different aspects of corporate decision-making with respect to social responsibility. A decomposition reveals that the largest contributors to the overall effect on CSR of parenting a daughter are diversity, the environment, and employee relations. In addition, we address the fact that an increasing number of studies in financial economics analyze the political preferences of CEOs (e.g., Di Giuli and Kostovetsky, 2014; Hutton, Jiang and Kumar, 2014; Lee, Lee and Nagarajan, 2014). Using a propensity score matching approach, we match a CEO who has a daughter with another CEO with the same political preference and comparable personal characteristics, but does not have a daughter. Our analysis shows that the CEO-daughter effect is separate from a CEO political preference effect. In addition, we find that our results are robust to a number of other concerns, e.g., look-ahead and sample selection biases, arising from the fact that we are not able to find CEO children data for all CEOs.

We contribute to several active research areas. First, we show that for some of the largest companies in the U.S., their top decision-makers' family environment has a

real impact on the firms they manage. In particular, those companies' policies regarding stakeholders other than their shareholders are shaped by whether or not the CEO has a daughter. That is, female socialization effects are pervasive and affect not only top decision-makers in politics and law (e.g., Washington, 2008; Glynn and Sen, 2014), but also corporate executives. Fundamentally, female socialization affects not only individuals, but also entire organizations.

Second, different corporate executives may have different styles (e.g., Bertrand and Schoar, 2003; Kaplan, Klebanov and Sørensen, 2012; Fee, Hadlock and Pierce, 2013). In principle, CEO styles may be shaped by both innate predispositions as well as past (i) professional experiences (e.g., Benmelech and Frydman, 2015; Dittmar and Duchin, 2016; Schoar and Zuo, 2017) or (ii) personal experiences (e.g., Malmendier, Tate and Yan, 2011; Bernile, Bhagwat and Rau, 2017).³ Our study contributes a novel personal experience, i.e., parenting a daughter, to this literature. One benefit is that this is not a choice variable for the executive, which means that our results may be less sensitive to endogeneity concerns.

The rest of the paper is organized as follows. Section 2 reviews theory and related empirical evidence and develops our female socialization hypothesis. Section 3 describes the construction of our new data set of CEO children and the empirical methodology we use. Section 4 reports our empirical evidence and several robustness checks. Section 5 presents further evidence and extensions. Section 6 concludes.

2. Theory and related empirical evidence

A simple theoretical framework involving a utility-maximizing CEO with social preferences produces empirical predictions of a CEO-daughter effect in the context of corporate decision-making with respect to stakeholders other than a firm's shareholders.⁴ Specifically, suppose a CEO has a standard utility function augmented with social preferences:

$$U_g(X, U_o, U_c) = u_g(X) + \lambda_g U_o + \gamma_g U_c \quad g \in \{m, f\} \quad c \in \{s, d\}, \quad (1)$$

where

$$U_c = u_c(x) + \lambda_c U_o, \quad (2)$$

and where g indexes the CEO's own gender, i.e., male (m) or female (f), and c indexes the CEO's own child, i.e., son (s) or daughter (d). X denotes a CEO's consumption vector and

³ A related string of research shows evidence of "behavioral consistency," i.e., CEOs behave similarly in the professional and personal domains (e.g., Cronqvist, Makhija and Yonker, 2012; Davidson, Dey and Smith, 2013).

⁴ For pioneering research on social preferences in economics, we refer to Becker (1976). While a number of experimental studies have provided support for social preference models, the extent to which these results apply outside of economists' laboratories remains less researched (e.g., Levitt and List, 2007). For comprehensive reviews of research related to gender differences in social preferences, we refer to Croson and Gneezy (2009) and Bertrand (2011).

x denotes a CEO's child's consumption vector. The CEO internalizes the utility of others in society (U_o) as well as the utility of the CEO's own child (U_c). In this context, "others in society" refers to anyone except the CEO's children. The CEO's child also has social preferences.

A CEO's social preference can be described by taking the first-order derivative with respect to the utility of others in society. For a CEO_A with a daughter, we have:

$$\frac{\partial U_A}{\partial U_o} = \lambda_g + \gamma_g \frac{\partial U_c}{\partial U_o} = \lambda_g + \gamma_g \lambda_d. \quad (3)$$

For a CEO_B with a son, we have:

$$\frac{\partial U_B}{\partial U_o} = \lambda_g + \gamma_g \lambda_s. \quad (4)$$

If $\lambda_d > \lambda_s$, then $\partial U_A / \partial U_o > \partial U_B / \partial U_o$, i.e., a CEO with a daughter has stronger other-regarding preferences than a CEO with a son. In the rest of this section, we discuss pre-existing research from the perspective of this simple framework.

2.1. Gender and other-regarding preferences

Other-regarding, or pro-social, preferences mean that an individual internalizes the utility of others in society. In Eq. (1), this means that $\partial U / \partial U_o > 0$ and $\lambda_g > 0$. Such preferences may differ by gender: If other individuals' well-being enter into women's utility functions more strongly than they enter into men's utility functions, then $\lambda_f > \lambda_m$ and $\lambda_d > \lambda_s$.⁵

There is a long-standing debate in economics and social psychology on whether women exhibit stronger social preferences compared to men (e.g., Andreoni and Vesterlund, 2001; Schwartz and Rubel, 2005; DellaVigna, List, Malmendier and Rao, 2013). One view is that women feel more responsible for the well-being of others, possibly because of evolutionary predispositions. Evidence supporting such a hypothesis exists for large general-population samples (e.g., Beutel and Marini, 1995), but also for corporate executives, such as CEOs. For example, Adams and Funk (2012) report evidence from a survey of public firms in Sweden which shows that female executives emphasize pro-social policies more than their male counterparts.⁶

2.2. Female socialization

Eq. (1) also posits that parents internalize the utility of their children, i.e., $\partial U / \partial U_c > 0$ and $\gamma_g > 0$. This is a spe-

⁵ In his discussion of "behavioral preferences," Thaler (2016) concludes that an important aspect of preferences that has received a lot of attention from behavioral economic theorists is "other-regarding preferences." In economic research, social preferences have been modeled in a variety of different ways, including altruism (e.g., Becker, 1976; Barro and Becker, 1989; Andreoni, 1989), fairness (e.g., Rabin, 1993; Charness and Rabin, 2002), and inequality aversion (e.g., Fehr and Schmidt, 1999). These models explain the way an individual may exhibit a social preference, but the specific strength of other-regarding preferences may differ by gender.

⁶ The question of why women may exhibit stronger other-regarding preferences compared to men has been subject to less research. An explanation likely requires consideration of evolutionary biology models, and specifically why such preferences would benefit the "fitness," i.e., the reproductive success, of women more than men (e.g., Robson, 2001; Robson and Samuelson, 2011).

cial case of more general other-regarding preferences. In a pioneering study in sociology, Warner (1991) predicts that men parenting daughters may adopt preferences more similar to those of females. Models in economics may also be used to argue that parenting a daughter affects a father's "identity" (e.g., Akerlof and Kranton, 2000; Chen and Li, 2009), i.e., a male with a daughter may identify himself more with what women derive utility from. In support of such a prediction, Warner (1991) and Warner and Steel (1999) report that having a daughter increases the probability that a father adopts more female preferences.

Researchers in the social sciences have recently examined the female socialization hypothesis in other contexts. Washington (2008) studies U.S. Congress members, and finds that having a daughter increases a Congress member's propensity to vote liberally, and has the most significant effect on reproductive rights issues. Oswald and Powdthavee (2010) find evidence that having daughters makes parents politically more left-oriented. Dahl, Dezsó and Ross (2012) study CEOs of small Danish family firms using a matched employer–employee data set, and report higher employee compensation, particularly to women, when the male CEO has a daughter. Glynn and Sen (2014) examine federal judges in the U.S., and find that male judges with a daughter vote more liberally.

One empirical predication based on the above simple framework is that male CEOs with daughters exhibit a higher propensity of managing firms that engage in more pro-CSR practices.

3. Data and empirical methodology

In this section, we first describe the construction of a new data set with information on CEO children, and we report summary statistics. Then, we explain the methodology used to empirically identify effects of a CEO parenting a daughter on corporate decision-making with respect to social responsibility.

3.1. Data on CEO children

The starting point for our data set is an unbalanced panel of the largest public firms in the U.S., i.e., S&P 500 firms, during the period 1992–2012. Because we use individual CEO characteristics as controls, we rely on the ExecuComp database. We exclude financial (Standard Industrial Classification (SIC) codes 6000–6999) and utility (SIC codes 4900–4999) firms, because our analysis involves some firm characteristics (e.g., debt ratios) that are subject to regulatory requirements in these industries.

A database with information related to CEO children does not exist, so we collect data from a diverse set of public sources. First, we start by using *Marquis Who's Who*, which is one of the most comprehensive databases with CEOs' personal biographical details. We also access several other databases, including Wikipedia, Notable Names Database (NNDB), Reference for Business, etc.⁷ Second, we

search the Internet using Google, because we discovered that the aforementioned databases sometimes contain incomplete information. For example, the Wikipedia page of one CEO in our sample includes only one of the CEO's two children (the daughter is not reported). In particular, we search for different versions of each CEO's first and family names as well as the company name, combined with other relevant words, including "children," "daughter," "son," "family," "marriage," "wife," etc. Finally, we contacted the international relations (IR) departments of the companies for which we did not find complete CEO children data, and received responses from 6.8% of these firms. As a result, we are able to compile a comprehensive data set with the following characteristics of CEO children: i) the gender of each CEO child, (ii) the gender of the first-born child, and (iii) the number of CEO children.

We want to explicitly confront several challenges encountered during the data collection process. First, we have incomplete data on a CEO child being biological or adopted. However, the female socialization hypothesis does not require CEO children to be biological. Also, the vast majority of CEO children are likely to be biological as statistics from the U.S. Census Bureau show that only about 3.2% of the children among individuals in the highest income category are adopted. That is, sex selection by adoption is in principle a possibility, but it is not likely to be of much practical importance in our data set. Second, some CEOs marry a spouse who already has children, resulting in "stepchildren." We include such children because it is difficult in practice to classify children as own versus stepchildren. If own daughters have a larger effect on a CEO compared to stepdaughters, then our reported CEO-daughter effect would be downward biased. Finally, some CEOs may attempt to keep a subset of their children "secret" (e.g., an out-of-wedlock child). Such circumstances are more likely to introduce idiosyncratic measurement error and increase standard errors of the reported point estimates, rather than creating a significant bias in support of the CEO-daughter effect we report.

3.2. Data on corporate social responsibility

We use data by Kinder, Lydenberg, and Domini Research & Analytics (KLD) to measure corporate social responsibility (CSR).⁸ Specifically, KLD rates companies using six CSR categories: Community, diversity, employee relations, environment, human rights, and product.⁹ Within each category, KLD rates a number of CSR "strengths" as well as CSR "concerns." As a concrete example, in the category "Diversity," KLD assigns a strength score if a firm has a strong work/life benefits program. In contrast, KLD assigns a concern score if a firm has no woman on its board or among the senior executives. In other words, these ratings by KLD reflect a firm's policies regarding society more broadly and stakeholders other than their shareholders.

⁷ The Lexis Nexis Public Records database contains data on "Potential Relatives" but a significant number of children are missing, and the database also contains data on some individuals that are not children.

⁸ We match S&P 500 firms from the ExecuComp database with KLD data using CUSIP and Ticker (TIC) identifiers.

⁹ KLD also rates firms' corporate governance, but it is different from CSR, and thus not included in this study.

For each firm-year in our data set, we compute a CSR score. Each strength adds +1 to the score and each concern adds –1. We then aggregate the scores within each of the KLD categories, and finally we aggregate across all categories. That is, the CSR score equals the number of strengths minus the number of concerns. As a result, a higher CSR score corresponds to more socially responsible corporate decision-making. We normalize these scores so that the minimum is zero for a more straightforward discussion of the economic size of the estimated CEO-daughter effect.

The KLD database is being used in an increasing number of studies in financial economics (e.g., Hong and Kostovetsky, 2012; Deng, Kang and Low, 2013; Cheng, Hong and Shue, 2016; Di Giuli and Kostovetsky, 2014; Krüger, 2015), but we also recognize that KLD ratings are not a perfect measure (e.g., Chatterji, Levine and Toffel, 2009). Nonetheless, we believe that the CSR scores from KLD measure the underlying construct regarding pro-social policies that we intend to measure in this study. In addition, there is a large market and increasing willingness to pay for KLD's ratings and it is not likely that our measure is biased in support of the CEO-daughter effect we examine.

3.3. Control variables

We include several standard firm characteristics as controls related to firm size, profitability, valuation, and financing. We obtain accounting data from S&P's Compustat Fundamentals Annual database. For each firm-year, we control for *Log (assets)* (Compustat item "AT"), *Return on assets* (item "NI" over "AT"), *Market-to-book ratio* (item "PRCC_F" over "BKVLPS"), and *Debt ratio* (items "DLTT" + "DLC" over "AT").

We also control for several standard CEO characteristics, which we obtain from S&P's ExecuComp database. In particular, we control for *Female CEO* (ExecuComp item "GENDER"), *Age* (item "AGE"), *Tenure* (item "YEAR" minus "BECAMECEO"), and *Equity ownership* (item "SHROWN_TOT_PCT").

3.4. Summary statistics

Panel A of Table 1 reports summary statistics for the number of CEO children. The average CEO has 2.6 children. The median is two children. In fact, the most common number of CEO children is also two (43.3% of the CEOs have exactly two children), i.e., the modal value of the distribution of the number of CEO children is two. This is followed by three children (27.4%), four children (12.0%), and one child (7.5%).¹⁰ Data from the World Bank reveal that the average fertility rate in the U.S. during the period we study is approximately two births per female. That is, CEOs seem to have slightly more children compared to the overall U.S. population, potentially because of their significantly higher income and wealth.

¹⁰ We classify a CEO as having zero children only if we have verified that the CEO does not have any children, e.g., Tim Cook, the CEO of Apple.

Panel B shows summary statistics for the number of CEO daughters. The average CEO has 1.3 daughters. The median is one daughter. The most common number of CEO daughters is also one. Importantly, we find that 48.1% of all the CEO children are daughters. In human populations, a sex composition ratio of about 105–106 sons for every 100 daughters is considered natural (e.g., Lazarus, 2002). That is, the sex ratio in our data set of CEOs is comparable to what would be expected in human populations. This evidence also reduces concerns that CEO careers are related to child gender. For example, if parenting daughters involves significantly less time investment, then we may expect individuals who were endowed with daughters to be more likely to become CEOs as they may have relatively more time to invest in their careers. Our evidence does not suggest that CEOs are individuals in the population who are more likely to have daughters.

Data on CEO children are not available for the full set of S&P 500 firms we study. Out of 921 different CEOs in the matched ExecuComp and KLD data set, we are able to collect data about children, and their gender, for 416 (45.2%) of them. Panel C therefore compares the characteristics of S&P 500 firms with and without CEO children information. We find that there are no dramatic differences with respect to firm characteristics of CEOs for which we find children data and CEOs for which we are not able to find children data. The S&P 500 firms for which we find children data are about 22.8% larger when comparing medians, a difference that is economically not very large. The differences are economically smaller for each of the other firm characteristics. We have also performed a detailed industry comparison, but find that only two out of 53 different industries are slightly overrepresented in our sample: Communications (SIC codes 4800–4899) and Business Services (SIC codes 7300–7399). Importantly, there is no evidence of oversampling of CEOs from the Retail industry (SIC codes 5200–5900), an industry where executives may be featured more frequently in media. That is, while we include firm size and other firm characteristics as controls in our regression model specifications, we conclude that the firms for which we have CEO children data seem representative of S&P 500 firms.

Panel D reports summary statistics for CEO characteristics, and reveals that the sample of CEOs we study is similar to those of other studies of corporate executives of large U.S. public firms. Only about 3.0% of the firm-year observations have female CEOs, the average age is 57.4 years, with 7.9 years average tenure as CEO, and the average CEO owns only 0.8% of the company's equity. That is, the characteristics of the CEOs in our sample are not very different from what would be expected among S&P 500 firms' top decision-makers during the period we study. We find no dramatic differences with respect to CEO characteristics of CEOs for which we find and do not find children data.¹¹

¹¹ We find CEO children data for 69.6% of the female CEOs, a somewhat higher percentage compared to male CEOs (44.5%). Because of their relative scarcity, female S&P 500 CEOs (e.g., Marissa Mayer of Yahoo, Indra Nooyi of PepsiCo, or Ginni Rometty of IBM) may become relatively more visible, and as a result, there is more information about them in the public domain.

Table 1

Summary statistics.

The table reports summary statistics for the data sets used in this study. The data are from S&P 500 firms for the period 1992–2012. The data on CEO children are from a diverse set of available databases, and have been cross-checked by searching the Internet using Google. The data on corporate social responsibility are from the Kinder, Lydenberg, and Domini Research & Analytics (KLD) database. The data on firm and CEO characteristics are from S&P's Compustat and ExecuComp databases. See Appendix for variable definitions.

Panel A: Number of CEO children								
Mean		2.6						
Median		2						
0		3.6%						
1		7.5%						
2		43.3%						
3		27.4%						
4		12.0%						
≥ 5		6.3%						
Total		100.0%						
Panel B: Number of CEO daughters								
Mean		1.3						
Median		1						
0		26.0%						
1		36.8%						
2		26.9%						
≥ 3		10.3%						
Total		100.0%						
Panel C: Firm characteristics								
Variables	S&P 500 firms with CEO children data				S&P 500 firms without CEO children data			
	N	Mean	Median	Standard deviation	N	Mean	Median	Standard deviation
Number of CEO sons after first son	2,662	21,119	7,432	39,645	2,812	14,391	6,053	27,845
Return on assets	2,662	7.0%	7.0%	6.0%	2,812	7.0%	7.0%	7.0%
Market-to-book ratio	2,660	4.1	3.1	4.4	2,806	4.0	3.1	4.6
Debt ratio	2,655	0.42	0.42	0.16	2,799	0.43	0.42	0.17
Panel D: CEO characteristics								
Variables	S&P 500 firms with CEO children data				S&P 500 firms without CEO children data			
	N	Mean	Median	Standard deviation	N	Mean	Median	Standard deviation
Female CEO	2,662	3.0%			2,812	0.9%		
Age	2,657	57.4	58	7.4	2,806	55.4	56	6.1
Tenure	2,662	7.9	6	7.5	2,812	5.5	4	5.3
Equity ownership	2,662	0.8%	0.0%	3.3%	2,812	0.5%	0.0%	2.1%
Panel E: Corporate social responsibility measures (N=2,662)								
Variables	Mean	Median	Min.	Max.	Standard deviation			
CSR score	10.3	10	0	27	3.6			
Community score	2.4	2	0	6	0.9			
Diversity score	3.1	3	0	9	1.7			
Employee relations score	4.2	4	0	11	1.3			
Environment score	5.1	5	0	10	1.3			
Human rights score	1.8	2	0	4	0.5			
Product score	3.7	4	0	6	0.9			

Panel E shows summary statistics related to the CSR ratings data from KLD. We refer to these numbers when we discuss the economic size of the estimated CEO-daughter effect.

3.5. Empirical methodology and identification

The quasi-natural experiment we use for identification in this study is straightforward: Nature exogenously assigns the gender of a CEO's child. As a result, we estimate the following regression model specification:

$$CSR\ Score_{ijkt} = \beta_0 + \beta_1 CEO\ Daughter_{jt} + \beta_2 F_{it} + \beta_3 C_{jt} + \phi_t + \phi_k + \epsilon_{ijkt}, \quad (5)$$

where *CSR score* is a corporate social responsibility measure, *i* indexes firms, *j* indexes CEOs, *k* indexes industries, and *t* indexes years. *CEO daughter* is an indicator variable that is one if a CEO has a daughter, and zero otherwise. This is the explanatory variable of primary interest in this study. *F* is a vector of firm characteristics, *C* is a vector of CEO characteristics, ϕ are sets of (industry

and year) fixed effects, and ϵ is an error term.¹² That is, the model compares firms with CEOs parenting a daughter or not within the same industry and year, and with similar firm and CEO characteristics. We use two-digit Standard Industrial Classification (SIC) codes to define industry, but show that our results are robust to using alternative industry definitions. The standard errors are White (1980) heteroskedasticity-robust and clustered at the firm-level to confront time-series correlation in the CSR score data (e.g., Petersen, 2009).¹³

3.6. Discussion of identification and empirical challenges

We expect the gender of CEO children to be exogenous. First, the gender composition in our data set of CEOs is very similar to what would be naturally expected in human populations. Specifically, the percentage of female children in our sample (48.1%) is statistically indistinguishable from what would be expected for humans (48.7%). That is, there is no evidence of any “missing women” problem (e.g., Sen, 1992) or other sample selection bias. Second, using abortions to select a child’s sex seems highly unlikely in the sample of CEOs we study. Third, because the average CEO age is 57.4 years in our data set, the vast majority of executives did not have access to in vitro fertilization (IVF) or other technologies at the time they had children. Also, CEOs who had access to IVF are more likely to use it to overcome infertility, rather than for sex selection.¹⁴ Finally, there is no natural method (e.g., timing of sexual intercourse relative to ovulation) that has been found to reliably predict a child’s sex (e.g., Wilcox, Weinberg and Baird, 1995).

Using CEO fixed effects or difference-in-differences regression model specifications is challenging for several reasons. First, being the CEO of an S&P 500 company is the pinnacle of most CEOs’ careers, i.e., they are likely to retire after their tenure at these firms. As a result, only 11 of the CEOs in our data set manage two different S&P 500 firms during the period we study, so estimating CEO fixed effects is empirically challenging. Second, because the average CEO in our data set is relatively old, only a very small number of CEOs is expected to have a daughter during their tenure as CEO, making difference-in-differences regressions empirically challenging. Most importantly, we do not expect the effect of having a daughter to be instantaneous but to emerge as the daughter gains experiences that are internalized by the parents. Several studies in economics and finance suggest that experiences in early adulthood are important for preferences later in life (e.g.,

Giuliano and Spilimbergo, 2014; Cronqvist, Siegel and Yu, 2015), although it is less clear whether experiences during these so-called “impressionable years” also affect individuals’ parents.

4. Empirical evidence

In this section, we report evidence on the relation between a CEO parenting a daughter and decision-making with respect to corporate social responsibility in the firm that the CEO manages.

4.1. CEO-daughter effect and corporate social responsibility

Panel A of Table 2 reports estimates from Eq. (5). In Column 1, we show estimates based on raw data, and do not control for any firm or CEO characteristics. The point estimate on the *CEO daughter* indicator variable is 1.00 and statistically significant at the 1%-level. In Columns 2–5, we include a set of standard firm controls one by one. In Column 6, we include all of the firm characteristics simultaneously. Panel B shows estimates when we also include a set of standard CEO controls, in addition to the firm characteristics. In Columns 1–3, we include them one by one, and in Column 4, we include all of the CEO controls simultaneously. Panel C reports estimates using alternative industry fixed effects (e.g., Fama and French, 1997; Hoberg and Phillips, 2010).

The evidence reveals an economically sizable and statistically significant relation between a CEO parenting a daughter and corporate social responsibility policies in the firm that the CEO manages. We want to emphasize several findings. First, the point estimate on the *CEO daughter* indicator variable is statistically significant at least at the 5%-level across all the model specifications in the table. And the significance level does not attenuate dramatically when we add controls for firm or CEO characteristics.

Second, the point estimate on the *CEO daughter* variable is consistently positive across the model specifications. The estimate is robust and ranges from 0.87 to 1.00 across the specifications. The estimate is 0.91 in the specification with all the controls included. That is, when a firm’s CEO has a daughter, our evidence shows that the firm’s corporate social responsibility ratings are about 9.1% ($= 0.91/10.00$) higher, compared to a median firm in our sample. This corresponds to approximately 25.3% ($= 0.91/3.6$) of one standard deviation of the CSR score distribution.

We have re-estimated the model specification with all the controls for each year 1992–2012 (not tabulated). All of the 21 point estimates are found to be positive, which shows that the effect we document is very robust. The smallest point estimate is 0.25 (year 2006), while the largest is 1.65 (year 1999). The smaller point estimates are not statistically significant, because of statistical power. We conclude that the estimated effect from our panel data model is in-between these year-by-year point estimates.

Finally, in Column 5, we re-estimate the model specification for only male CEOs. As the percentage of firm-year observations with a female CEOs is small (3.0%), we do not expect this change to alter our result dramatically, a prediction which we are able to confirm empirically.

¹² The year fixed effects regression model specification captures a trend over time of firms becoming more concerned about CSR. We have checked that there is no corresponding trend in the proportion of CEOs who have a daughter.

¹³ Our empirical evidence is very similar if we instead cluster the standard errors at the CEO-level.

¹⁴ Pre-implantation genetic diagnosis (PGD) to determine the expected sex of a child is controversial and illegal in many countries. In the U.S., only a very small number of pregnancies have involved PGD during the period we study. The American Congress of Obstetricians and Gynecologists opposes sex selection except in individuals who carry a genetic disease that primarily affects one sex.

Table 2

CEO-daughter effect and corporate social responsibility.

The table reports regressions of corporate social responsibility ratings. The data are from S&P 500 firms for the period 1992–2012. CSR score is the dependent variable. CEO daughter is an indicator variable that is one if a CEO has a daughter, and zero otherwise. Industry fixed effects are based on two-digit SIC codes, unless otherwise stated. Firm characteristics are the firm-level controls included in Panel A. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

<i>Panel A: Controlling for firm characteristics</i>						
Variable	(1)	(2)	(3)	(4)	(5)	(6)
CEO daughter	1.00*** (0.38)	0.92** (0.38)	0.97*** (0.37)	1.00*** (0.38)	0.98*** (0.37)	0.88** (0.38)
Log (assets)		0.31 (0.20)				0.35* (0.20)
Return on assets			3.25 (2.33)			2.87 (2.13)
Market-to-book ratio				−0.26 (1.06)		−0.41 (0.98)
Debt ratio					0.06** (0.03)	0.06** (0.02)
Constant	12.20*** (0.39)	9.21*** (1.87)	11.97*** (0.44)	12.29*** (0.57)	12.01*** (0.41)	8.66*** (1.92)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
N	2,662	2,662	2,662	2,655	2,660	2,653
R-squared	0.31	0.32	0.31	0.31	0.31	0.32
<i>Panel B: Controlling for CEO characteristics</i>						
Variable	(1)	(2)	(3)	(4)	(5)	
CEO daughter	0.89** (0.38)	0.87** (0.38)	0.89** (0.38)	0.91** (0.38)	0.97*** (0.35)	
Age	0.01 (0.14)			0.03 (0.15)	0.07 (0.15)	
Age squared	−0.00 (0.00)			−0.00 (0.00)	−0.00 (0.00)	
Tenure		−0.03 (0.04)		−0.00 (0.04)	−0.01 (0.04)	
Tenure squared		0.00 (0.00)		0.00 (0.00)	0.00 (0.00)	
Equity ownership			−0.02 (0.03)	−0.02 (0.03)	−0.01 (0.04)	
Constant	9.47** (4.33)	8.93*** (1.92)	8.72*** (1.91)	9.02* (4.63)	7.92* (4.40)	
Year fixed effects	Yes	Yes	Yes	Yes	Yes	
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	
Firm characteristics	Yes	Yes	Yes	Yes	Yes	
Male CEOs only	No	No	No	No	Yes	
N	2,648	2,653	2,653	2,648	2,573	
R-squared	0.33	0.32	0.32	0.33	0.33	
<i>Panel C: Alternative industry fixed effects</i>						
Variable	(1) Fama-French	(2) 3-Digit SIC	(3) 4-Digit SIC	(4) Hoberg-Phillips		
CEO daughter	0.95*** (0.35)	0.78** (0.36)	0.89*** (0.34)	0.82** (0.37)		
First-born CEO daughter	7.89* (4.77)	7.07 (5.12)	6.74 (5.66)	−0.30 (4.86)		
Year fixed effects	Yes	Yes	Yes	Yes		
Industry fixed effects	Yes	Yes	Yes	Yes		
Firm characteristics	Yes	Yes	Yes	Yes		
CEO characteristics	Yes	Yes	Yes	Yes		
N	2,648	2,648	2,648	2,104		
R-squared	0.33	0.47	0.52	0.46		

The point estimate is 0.97 and statistically significant at the 1%-level. This and the previously reported results in the table are consistent with female socialization playing an important role also in the domain of corporate social responsibility.

4.2. Economic size of CEO-daughter effect

4.2.1. Comparing CEO-daughter effect and female CEO effect

Panel A of [Table 3](#) compares the effect of a CEO parenting a daughter to the effect of a CEO herself being female.

Table 3

Economic size of CEO-daughter effect.

The table reports regressions of corporate social responsibility ratings. The data are from S&P 500 firms for the period 1992–2012. CSR score is the dependent variable in Panel A. Log (SG&A expenses) is the dependent variable in Panel B. CEO daughter is an indicator variable that is one if a CEO has a daughter, and zero otherwise. Female CEO is an indicator variable that is one if the CEO is a woman, and zero otherwise. Industry fixed effects are based on two-digit SIC codes. Firm characteristics are the firm-level controls included in Panel A of Table 2. CEO characteristics are the CEO-level controls included in Panel B of Table 2. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A: Comparing CEO-daughter effect and Female CEO effect				
Variable	(1)	(2)	(3)	(4)
CEO daughter		1.05*** (0.36)	0.95*** (0.35)	0.97*** (0.36)
Female CEO	3.99*** (0.93)	3.52*** (0.93)	3.71*** (0.93)	3.56*** (0.93)
Constant	10.18*** (0.17)	11.86*** (0.38)	8.44*** (1.92)	7.76* (4.46)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firm characteristics	No	No	Yes	Yes
CEO characteristics	No	No	No	Yes
N	2,662	2,662	2,653	2,648
R-squared	0.23	0.33	0.35	0.35

Panel B: Effect on cash flows	
Variable	Log (SG&A expenses)
CSR score	0.033*** (0.008)
Log (assets)	0.882*** (0.025)
Return on assets	2.284*** (0.383)
Market-to-book ratio	0.413** (0.195)
Debt ratio	0.018*** (0.006)
Constant	-2.534** (1.170)
Year fixed effects	Yes
Industry fixed effects	Yes
CEO characteristics	Yes
N	2,405
R-squared	0.89

That is, we also include in the regression model in Eq. (5) a *Female CEO* indicator variable, which is one if the CEO is a woman, and zero otherwise. We find that the effect of a CEO's own gender is strongly related to corporate social responsibility. The point estimate is 3.56 and statistically significant at the 1%-level. That is, female CEOs are associated with more socially responsible corporate practices, a conclusion which is similar to some other recent research involving corporate executives and directors (e.g., Adams and Funk, 2012; Kimball, Palmer and Marquis, 2012; Matsa and Miller, 2013).¹⁵

¹⁵ As a robustness check, we have re-estimated our model specification also for a broader data set of S&P 500 companies for which we do not have CEO children information. We find that among these firms, those with female CEOs also have higher CSR scores on average. This evidence is consistent with results recently reported by other researchers who an-

We find that the effect of a male CEO having a daughter is about 27.2% (= 0.97/3.56) of the effect of a CEO herself being female. In other words, having a daughter makes a male CEO about one-quarter more similar to a CEO who is herself a female. This result is consistent with a daughter affecting a father's identity (e.g., Akerlof and Kranton, 2000; 2005). In fact, the percentage is virtually identical (27.2% versus 27.9%) to what has previously been found when comparing the effect on legislative behavior of a U.S. Congressman having a daughter to the effect of being a U.S. Congresswoman (e.g., Washington, 2008). So while parenting a daughter does not completely transform a male CEO into having female CEO preferences towards CSR, the effect is sizeable and on par with what has been previously reported in related social science research.

4.2.2. Effect on cash flows

An alternative approach to quantify the economic size of the estimated CEO-daughter effect is to consider effects on a firm's cash flows. Panel B converts a firm's CSR score into an effect on the firm's cash flows, following the method used in Di Giuli and Kostovetsky (2014). This involves estimating what would be the predicted cash flow effect of a firm improving its CSR score. Most CSR sub-categories we study are programs that a firm may initiate by way of extra expenses (e.g., work-life benefits such as childcare, pollution prevention, or employee health and safety programs). As a result, such programs would at least partially be expected to affect the firm's Selling, General, and Administrative (SG&A) expenses, and therefore the firm's cash flows.¹⁶

We regress the *Log (SG&A expenses)* on CSR score, controlling for year and industry fixed effects, as well as the same set of firm and CEO characteristics as in the previously reported model specifications. The point estimate on CSR score is positive (0.033) and statistically significant at the 1%-level. That is, a CEO having a daughter corresponds to an extra 3.2% (= 0.97 × 0.033) SG&A expenses for a firm. This means that the median firm with a CEO who has a daughter spends an extra \$43.4 million per year on corporate social responsibility, corresponding to approximately 10.4% of the median firm's net income. Again, this demonstrates that the CEO-daughter effect we document is economically sizeable.

4.3. Evidence from decomposition of CSR ratings

Our corporate social responsibility measure is composed of several different categories: *Community, Diversity, Employee relations, Environment, Human rights, and Product*. To understand the origins of the relation between a CEO

alyze CSR, e.g., Di Giuli and Kostovetsky (2014). Absent an exogenous change related to the gender composition across firms (e.g., Ahern and Dittmar, 2012), it is challenging to infer a causal relation between female CEOs and corporate decision-making.

¹⁶ A portion of any expenses related to CSR may end up as Cost of Goods Sold (COGS) or Capital Expenditures (CAPEX). For example, some investments in environmentally friendly equipment affect the firm's CAPEX. Consequently, our estimates may provide a lower bound on the estimated cash flow effects.

Table 4

Evidence from decomposition of CSR scores.

The table reports regressions of corporate social responsibility ratings. The data are from S&P 500 firms for the period 1992–2012. In Panel A, CSR scores for different categories are the dependent variables. In Panel B, CSR scores for the subcategory Diversity are the dependent variables and only report point estimates for CEO daughter and Female CEO, although each model specification includes the same set of controls as in Panel A. CEO daughter is an indicator variable that is one if a CEO has a daughter, and zero otherwise. Female CEO is an indicator variable that is one if the CEO is a woman, and zero otherwise. Industry fixed effects are based on two-digit SIC codes. Firm characteristics are the firm-level controls included in Panel A of Table 2. CEO characteristics are the CEO-level controls included in Panel B of Table 2. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A: CSR scores of subcategories						
Variable	(1) Community	(2) Diversity	(3) Employee relations	(4) Environment	(5) Human rights	(6) Product
CEO daughter	0.11 (0.08)	0.26* (0.14)	0.21* (0.11)	0.26** (0.11)	0.00 (0.03)	0.13 (0.12)
Female CEO	0.22 (0.20)	1.89*** (0.40)	0.26 (0.21)	0.61* (0.35)	0.06 (0.06)	0.52** (0.25)
Constant	0.37 (0.92)	-2.95 (2.39)	5.41*** (1.43)	6.31*** (1.45)	3.82*** (0.40)	4.79*** (1.03)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes	Yes	Yes
CEO characteristics	Yes	Yes	Yes	Yes	Yes	Yes
N	2,648	2,648	2,648	2,648	2,648	2,648
R-squared	0.23	0.47	0.26	0.42	0.28	0.31
Panel B: CSR scores and diversity subcategories						
Variable	CEO daughter	Female CEO				
Concerns:						
Workforce diversity	-0.02 (0.03)	0.12 (0.11)				
Representation	-0.05* (0.03)	-0.11** (0.05)				
Board diversity - women	-0.01 (0.01)	-0.03** (0.01)				
Board diversity - minorities	-0.00 (0.00)	-0.01* (0.00)				
Strengths:						
CEO is woman or minority	0.02* (0.01)	0.59*** (0.08)				
Representation	-0.05 (0.04)	0.20* (0.11)				
Board of directors - gender	0.04 (0.03)	0.36*** (0.09)				
Work/life benefits	0.09** (0.04)	0.23** (0.11)				
Women & minority contracting	-0.03 (0.03)	0.23** (0.11)				
Employment of the disabled	-0.01 (0.03)	0.03 (0.07)				
Gay & lesbian policies	0.06* (0.04)	0.22*** (0.08)				
Employment of underrepresented groups	0.03** (0.01)	0.04 (0.04)				

having a daughter and decision-making about social responsibility in the firm that the CEO manages, we examine each of these categories separately. Specifically, we decompose our CSR measure to analyze for which categories we observe the strongest CEO-daughter effects.

Panel A of Table 4 reports a separate model specification for each CSR category. We want to emphasize several findings. First, a CEO having a daughter predicts socially responsible corporate decision-making for several of the categories more often than the 10% we expect simply by chance. In particular, the point estimates are statistically significant at least at the 10%-level for three of

the CSR categories. This shows that the aggregate effect is not driven by only one specific category dwarfing all the others.

Second, we find that a CEO parenting a daughter is consistently related to more socially responsible corporate decision-making for each category, as all the point estimates are positive. In addition, we compare the effect of a CEO having a daughter to the effect of a CEO herself being female. We find that own gender effects are always larger than the daughter effects. On average, the effect of a CEO having a daughter is about 35.4% of the effect of a CEO herself being female.

Finally, we find that the largest contributors to the overall effect on CSR of parenting a daughter are *Diversity*, *Environment*, and *Employee relations*, in order of the economic size of the point estimates. Importantly, the effect is strongest for a firm's diversity policy: A CEO having a daughter increases the firm's diversity policy by about 8.7% (= 0.26/3.00), compared to a median firm. We do not have a strong prior about which category may be associated with the strongest CEO-daughter effect, but the evidence that diversity is a strong effect empirically is reassuring.

Panel B of Table 4 reports evidence for each of the *Diversity* subcategories as this category has the strongest and most robust effects.¹⁷ Several interesting findings emerge from this exercise. First, among the significant effects, the signs for both *CEO daughter* and *Female CEO* are as expected, i.e., negative for CSR concerns and positive for CSR strengths. Eight subcategories are related to women, and half of those are statistically significant at least at the 10%-level. Second, the sizes of the effects are generally smaller for *CEO daughter* than for *Female CEO*, consistent with our results for the broader categories. Finally, the effects are strongest for work/life benefits, gay & lesbian policies, and employment of females among executives and directors.

4.4. Effects of family size

4.4.1. Controlling for number of CEO children

So far, we have analyzed an indicator variable for whether a CEO has a daughter. However, CEOs with a larger number of children are statistically more likely to have at least one daughter. As a result, our evidence may reflect that more CEO children per se is related to more corporate social responsibility. For example, CEOs with a larger family size may display an increased concern for society at large. If we do not control for the number of CEO children, the point estimate on the *CEO daughter* indicator variable in Eq. (5) may absorb a combination of both the effect of a CEO parenting a daughter, and the effect of a CEO having a larger number of children.

Panel A of Table 5 reports estimates where we control for the CEO's family size in several alternative model specifications. In Column 1, we simply add *Number of CEO children*. We find only very weak evidence that corporate social responsibility is increasing in the number of CEO children, and the point estimate is small (0.09) and not statistically significant. At the same time, the estimate on the *CEO daughter* variable is reduced only slightly from 0.91 to 0.82, and remains statistically significant at the 5%-level. We conclude that the number of children of a CEO is not a reliable predictor of pro-CSR practices. In Column 2, we control for *Number of CEO children fixed effects* as an alternative regression model specification which accounts for potentially nonlinear effects of CEO family size. This results in an even smaller impact on the previously reported CEO-daughter effect.

Table 5

Effects of family size.

The table reports regressions of corporate social responsibility ratings. The data are from S&P 500 firms for the period 1992–2012. CSR score is the dependent variable. *CEO daughter* is an indicator variable that is one if a CEO has a daughter, and zero otherwise. *Number of CEO children* is the total number of children a CEO has. *Number of CEO children fixed effects* are fixed effects for the number of children a CEO has. *State fixed effects* are fixed effects for the state where the firm is headquartered. *Industry fixed effects* are based on two-digit SIC codes. *Firm characteristics* are the firm-level controls included in Panel A of Table 2. *CEO characteristics* are the CEO-level controls included in Panel B of Table 2. *CEO with children* is an indicator variable that is one if the CEO has children, and zero otherwise. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A: Controlling for number of CEO children			
Variable	(1)	(2)	(3)
CEO daughter	0.82** (0.41)	0.87** (0.42)	0.90** (0.42)
Number of CEO children	0.09 (0.13)		
Constant	8.55* (4.63)	8.88* (4.54)	13.06** (5.53)
Number of CEO children fixed effects	No	Yes	Yes
State fixed effects	No	No	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes
CEO characteristics	Yes	Yes	Yes
N	2,648	2,648	2,564
R-squared	0.33	0.34	0.43
Panel B: CEOs with and without children			
Variable	(1)	(2)	
CEO with children	0.40 (0.55)		
CEO daughter		0.96** (0.40)	
Constant	9.34* (4.76)	9.02* (4.87)	
Year fixed effects	Yes	Yes	
Industry fixed effects	Yes	Yes	
Firm characteristics	Yes	Yes	
CEO characteristics	Yes	Yes	
Only CEOs with children	No	Yes	
N	2,648	2,555	
R-squared	0.32	0.33	

In some states in the U.S., CEOs may be more pro-CSR and simultaneously have a larger number of children for religious reasons. In Column 3, we therefore include *State fixed effects* (for the state where the firm is headquartered) to absorb regional variation with respect to the average number of children.¹⁸ Adding state fixed effects increases R-squared, but does not significantly change the CEO-daughter effect, which is reduced from 0.91 to 0.90. In other words, even firms within the same state and in the same industry have different CSR

¹⁷ There are several empirical challenges of delving deeper into a subcategory. First, there are concerns about overfitting as we have data on over 100 different subcategories. Second, if we only report some significant point estimates, *p*-hacking is a related concern.

¹⁸ State fixed effects may not necessarily reflect the birth location of the CEO. However, recent research shows that local matching is widespread and exists even among the largest U.S. firms, i.e., they have a strong propensity to select and recruit local CEOs (e.g., [Yonker, 2016](#)).

policies if one of the CEOs has a daughter. The importance of the state fixed effects in explaining variation in CSR policies across firms may be attributable to religious, political, or other “cultural” variation across regions. For example, [Di Giuli and Kostovetsky \(2014\)](#) show that firms have higher CSR scores when they are headquartered in Democratic-oriented rather than Republican-oriented states. In addition, [Bae, Sun and Zheng \(2015\)](#) report that regional religiosity has a significant impact on the investment behavior with respect to social responsibility of fund managers in the U.S.

4.4.2. CEOs with and without children

About 3.6% of the CEOs in our sample have no children, either because of exogenous fertility circumstances or because of choice. In Column 1 of Panel B of [Table 5](#), we include a *CEO with children* indicator variable. We find that the point estimate is 0.40, but statistically insignificant. In Column 2, we drop CEOs with no children from the data set. These regressions confirm that the CEO-daughter effect reflects a difference in CSR policies between CEOs who have daughters and those who do not, rather than a difference between CEOs with and without children.

4.5. Effects of gender composition of CEO children

The previous analysis considered the impact of CEO female socialization, i.e., the effect of a CEO parenting a daughter. In contrast, we do not expect a similar effect on CSR policies of a CEO having a son. That is, we may consider this a form of “placebo” analysis. In Column 1 of [Table 6](#), we include both *CEO daughter* and *CEO son* indicator variables at the same time. We find that the *CEO son* is statistically indistinguishable from zero, i.e., a CEO having one or more sons does not predict the CSR scores of the firm that the CEO manages.

We also distinguish between having a first daughter versus having additional daughters. In other words, what is the incremental “dosage” effect of the CEO having a first versus having additional daughters? In Column 2, we find that the effect of the first CEO daughter is 1.30, while each additional CEO daughter is associated with a smaller, although still statistically significant at the 5%-level, incremental effect of 0.33. That is, corporate social responsibility is increasing in the number of daughters parented. Our estimates reveal that one additional CEO daughter increases CSR by about 3.3% ($= 0.33/10.00$), compared to a median firm in our sample. In Column 3, we show that our previous conclusions are not affected if we simultaneously control for the CEO having one or more sons.

As an alternative empirical approach, we also analyze the CSR trend of founder CEOs and find that founder CEOs with a daughter improve their company’s CSR by 1.97, on average, during their tenure, compared to founder CEOs with a son who improve their company’s CSR by 1.00, on average. A portion of this difference may be attributable to a time trend in CSR during the time period we study, but the evidence suggests that founder CEOs with daughters improve their company’s CSR relatively more compared to founder CEOs with sons.

Table 6

Effects of gender composition of CEO children.

The table reports regressions of corporate social responsibility ratings. The data are from S&P 500 firms for the period 1992–2012. CSR score is the dependent variable. *CEO daughter* is an indicator variable that is one if a CEO has a daughter, and zero otherwise. *CEO son* is an indicator variable that is one if a CEO has a son, and zero otherwise. *CEO first daughter* is an indicator variable that is one for the first daughter a CEO has, and zero otherwise. *Number of CEO daughters after first daughter* is the total number of daughters a CEO has after the first daughter. *CEO first son* is an indicator variable that is one for the first son a CEO has, and zero otherwise. *Number of CEO sons after first son* is the total number of sons a CEO has after the first son. Industry fixed effects are based on two-digit SIC codes. Firm characteristics are the firm-level controls included in Panel A of [Table 2](#). CEO characteristics are the CEO-level controls included in Panel B of [Table 2](#). The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Variable	(1)	(2)	(3)
CEO daughter	0.96** (0.38)		
CEO son	0.50 (0.39)		
CEO first daughter		1.30*** (0.43)	1.36*** (0.46)
Number of CEO daughters after first daughter		0.33** (0.15)	0.38** (0.15)
CEO first son			0.31 (0.44)
Number of CEO sons after first son			0.21 (0.16)
Constant	8.81* (4.66)	8.97* (4.57)	8.56* (4.60)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes
CEO characteristics	Yes	Yes	Yes
N	2,625	2,648	2,625
R-squared	0.33	0.34	0.34

4.6. First-born CEO daughter

Panel A of [Table 7](#) examines whether CEOs behave consistently with a fertility stopping rule (e.g., [Clark, 2000](#)). In Column 1, we regress *Number of CEO children after first child* on a *First-born CEO daughter* indicator variable. A stopping rule with a son preference predicts a positive point estimate, i.e., if the first-born is a daughter, then the parents will continue to have more children in expectation of a son. In contrast, we find that the effect is very small (−0.02) and statistically insignificant. That is, having a first-born daughter does not predict the number of children the CEO will have after the first child. Column 2 reports that having a first-born daughter also does not correlate significantly with *Number of CEO daughters after first child*.

Examining first-born CEO daughters comes with the benefit of an arguably more exogenous CEO child gender measure.¹⁹ Panel B reports estimates where we exchange the *CEO daughter* indicator variable for a *First-born CEO*

¹⁹ [Bennedsen, Nielsen, Pérez-González and Wolfenzon \(2007\)](#) use the gender of first-born CEO children in a different context, namely, CEO successions within the family among small Danish firms. They also argue that the gender of the first-born child is an exogenous variable as most

Table 7

First-born CEO daughter and fertility stopping rules.

The table reports regressions of corporate social responsibility ratings. The data are from S&P 500 firms for the period 1992–2012. Number of CEO children after first child and Number of CEO daughters after first child are the dependent variables in Panel A. CSR score is the dependent variable in Panel B. First-born CEO daughter is an indicator variable that is one if a CEO has a first-born daughter, and zero otherwise. State fixed effects are fixed effects for the state where the firm is headquartered. Number of CEO children fixed effects are fixed effects for the number of children a CEO has. Industry fixed effects are based on two-digit SIC codes. Firm characteristics are the firm-level controls included in Panel A of Table 2. CEO characteristics are the CEO-level controls included in Panel B of Table 2. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Panel A: Evidence on fertility stopping rules			
Variable	(1) Number of CEO children after first child	(2) Number of CEO daughters after first child	
First-born CEO daughter	−0.02 (0.13)	0.05 (0.07)	
Constant	4.48 (3.05)	6.92*** (1.80)	
CEO characteristics	Yes	Yes	
State fixed effects	Yes	Yes	
Number of CEO children fixed effects	No	Yes	
N	355	355	
R-squared	0.14	0.58	
Panel B: Effect of first-born CEO daughter			
Variable	(1)	(2)	(3)
First-born CEO daughter	0.54* (0.32)	0.55* (0.31)	0.57* (0.31)
Constant	12.45*** (0.38)	8.96*** (1.83)	11.25** (4.99)
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Firm characteristics	No	Yes	Yes
CEO characteristics	No	No	Yes
N	2,216	2,209	2,204
R-squared	0.33	0.35	0.35

daughter indicator variable. Columns 1–3 show regression model specifications with and without controlling for firm and CEO characteristics. The evidence reveals an economically sizable and statistically significant relation between a CEO having a first-born daughter and decision-making about social responsibility in the firm that the CEO manages. First, the point estimate on the *First-born CEO daughter* variable is statistically significant at least at the 10%-level across all regressions. Second, the effect is consistently positive across all model specifications, whether or not we include firm or CEO characteristics. The estimate ranges from 0.54 to 0.57 across the specifications. That is, when a firm's CEO's first-born is a daughter, our evidence shows that the firm's corporate social responsibility ratings are about 5.7% (= 0.57/10.00) higher, compared to a median firm in our sample. This corresponds to approxi-

CEOs in their data set had their first child prior to 1980, i.e., before technology to identify the gender of children became more common.

Table 8

Exogeneity of gender of CEO children.

The table reports regressions of corporate social responsibility ratings. The data are from S&P 500 firms for the period 1992–2012. CSR score is the dependent variable. CEO daughter is an indicator variable that is one if a CEO has a daughter, and zero otherwise. CEO dollar equity ownership is the CEO's dollar equity ownership in the firm. Billionaire CEO is an indicator variable that is one if a CEO's dollar equity ownership in the firm is at least one billion dollars, and zero otherwise. Founder CEO is an indicator variable that is one if a CEO is the firm's founder, and zero otherwise. Before *Roe v. Wade* is a subsample of CEOs who were at least 30 years old at the time of the abortion law change in 1973. Industry fixed effects are based on two-digit SIC codes. Firm characteristics are the firm-level controls included in Panel A of Table 2. CEO characteristics are the CEO-level controls included in Panel B of Table 2. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Variable	(1)	(2)	(3)	(4)
CEO daughter	0.91** (0.38)	0.91** (0.38)	0.91** (0.38)	0.93** (0.41)
CEO dollar equity ownership	−0.03 (0.06)			
Billionaire CEO		0.09 (1.06)		
Founder CEO			−0.13 (0.50)	
Constant	8.81* (4.80)	9.04* (4.64)	9.22* (4.83)	5.14 (8.41)
Before <i>Roe v. Wade</i>	No	No	No	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
CEO characteristics	Yes	Yes	Yes	Yes
N	2,648	2,648	2,633	1,738
R-squared	0.33	0.33	0.32	0.35

mately 15.8% (= 0.57/3.6) of one standard deviation of the CSR score distribution in our sample.

4.7. Exogeneity of gender of CEO children

4.7.1. Trivers-Willard hypothesis (TWH)

Seminal research in evolutionary biology (e.g., [Trivers and Willard, 1973](#)) has suggested that parents may be able to vary the sex composition ratio of their offspring to maximize their reproductive success. For species for which male fitness variance exceeds female fitness variance, male offspring of parents in better material and nutritional conditions are expected to have greater reproductive success than their female siblings (e.g., [Almond and Edlund, 2007](#)). In fact, parents who have a genetic trait which increases the female reproductive success at a greater rate than male reproductive success (e.g., physical attractiveness) will have a higher-than-expected offspring sex ratio favoring daughters, and vice versa (e.g., [Kanazawa, 2007](#)). The empirical evidence of the TWH for humans in contemporary societies is inconclusive (e.g., [Denny, 2008](#)).

The TWH predicts that wealth, as a measure of material and nutritional conditions, may affect the gender composition of CEO children. At the same time, wealthy CEOs may be more or less pro-CSR for other reasons. [Table 8](#) reports our results. First, we control for *CEO dollar equity ownership* in the firm, a significant source of wealth for CEOs. Column

1 shows that such a change to the model specification does not alter our conclusion.²⁰

Second, recent studies have examined U.S. billionaires (e.g., Cameron and Dalerum, 2009). Specifically, Schnettler (2013) shows that heirs, but not “self-made” billionaires, have a higher ratio of male to female children than expected based on U.S. population statistics. Column 2 shows that including a *Billionaire CEO* indicator variable does not affect our evidence. In Column 3, we include a *Founder CEO* indicator variable, using data from Fahlenbrach (2009) and an Internet search, as a more general measure of CEO wealth, but our conclusion is not altered.²¹

4.7.2. Abortion law change

Using abortions to select a child’s sex seem unlikely in the sample of CEOs we study, and was arguably even less likely among CEOs who had most of their children during a period with relatively stricter abortion laws, i.e., before the *Roe v. Wade* U.S. Supreme Court case (e.g., Donohue and Levitt, 2001). Because we do not have complete data on CEO children’s birth years, we examine CEOs who were at least 30 years old at the time of the abortion law change in 1973. Column 4 of Table 8 shows that our conclusion does not change when studying this subset of CEOs and their daughters. The point estimate is 0.93 and statistically significant at the 5%-level. We conclude that there is no evidence of any bias of the reported estimates that may be explained by CEO child gender preferences and related sex-selective abortions.

4.8. Effects of CEOs’ political preferences

We also analyze the relation between a CEO parenting a daughter, the CEO’s political preferences, and corporate decision-making with respect to social responsibility. For this analysis, we rely on personal political contributions data from Hutton, Jiang and Kumar (2014). First, we find that the difference in the probability of having a daughter among Democratic versus Republican CEOs is only 2.7% and statistically insignificant. This conclusion is similar to Washington (2008) who does not find any significant differences in the probability of having a daughter among Democratic and Republican Congress members in the U.S. Recent interdisciplinary research demonstrates that political preferences are a function of “nature and nurture” (e.g., Benjamin, Cesarini, van der Loos, Dawes, Koellinger, Magnusson, Chabris, Conley, Laibson, Johannesson and Visscher, 2012), but voting behavior in some broader samples has been found to be partly explained by a daughter effect (e.g., Oswald and Powdthavee, 2010).

Second, we use a treatment and control sample approach to examine whether the CEO–daughter effect may

²⁰ One caveat is that we would have preferred to measure a CEO’s wealth at the time his child was conceived, but information about the birth year of CEO children, combined with the CEO’s wealth at that time, is not available.

²¹ Anderson and Reeb (2003) report that founding families are present in about one-third of S&P 500 firms. We find no statistically significant differences between founder-CEOs and other CEOs with respect to having a daughter or a first-born daughter.

Table 9

Effects of CEOs’ political preferences.

The table reports the average treatment effect of the treated (ATET). The data are from S&P 500 firms for the period 1992–2012. CSR score is the dependent variable. A CEO is in the treatment sample if the CEO has a daughter. For each such CEO, we identify the CEO’s political preference: Democratic, Republican, or other. We then find a matching control CEO, i.e., a CEO who has comparable CEO characteristics and the same political preference, but who does not have a daughter. Standard errors are reported within parentheses. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Variable	Treatment sample	Control sample	ATET
CSR score	10.60	9.65	0.95*** (0.18)

be explained by a political preference effect. A CEO is in the treatment sample if the CEO has a daughter. For each such CEO, we identify the CEO’s political preference: Democratic, Republican, or Other. We then find a matching control CEO, i.e., a CEO who has comparable CEO characteristics and the same political preference, but who does not have a daughter. For example, we match a Democratic CEO with a daughter to another Democratic CEO who does not have a daughter, but who is comparable with respect to other CEO and firm characteristics. We find in Table 9 that the average treatment of the treated effect is 0.95, and statistically significant at the 1%-level. That is, the CEO–daughter effect reported in this paper is separate from a CEO political preference effect documented in previous research (e.g., Di Giuli and Kostovetsky, 2014).

We note that these results have potential implications for future research in finance and economics. A CEO parenting a daughter is not a valid instrument for a CEO’s political preferences because it violates (i) the relevancy condition, i.e., parenting a daughter does not strongly predict political preferences among CEOs, and (ii) the exclusion restriction, i.e., there is a direct relation between a CEO having a daughter and outcomes that researchers analyze.

4.9. Robustness checks

4.9.1. Look-ahead bias

Because we do not have complete data on CEO children’s birth years, a concern is that some of the children included in current personal biographies or websites were not born during the time the parent was a CEO. It is important to emphasize that the median CEO of an S&P 500 company is relatively old, i.e., the average CEO age is 57.4 years in our data set. As a result, it is not common for CEOs of such companies to have a child while serving as a CEO, or afterwards. In addition, we perform two robustness checks to explicitly address this concern. First, we drop all CEOs that are 45 years or younger. Second, we exclude all founder-CEOs. The objective is to exclude all CEOs who are most likely to have had any children while serving as a CEO, or afterwards. We report these results in Columns 1 and 2 of Table 10. We find that excluding those CEOs does not change our previously reported evidence.

4.9.2. Survivorship bias

Another concern is that we may find more information on current than former CEOs’ children. In contrast, we are

Table 10

Robustness checks.

The table reports regressions of corporate social responsibility ratings for different subsamples. In Column 1, we drop all CEOs who are 45 years old or younger. In Column 2, we exclude all founder-CEOs. In Column 3, we start with a broader sample of S&P 500 firms (i.e., S&P 500 firms with and without CEO children data), and we match each firm-year observation to one for which we have data on CEO children. We match based on year, industry, and firm size, and re-estimate our baseline model specification on this matched data set. We then re-estimate our model specification on the matched data set. In Column 4, we match each firm-year observation for which we do not have CEO children information to one for which we have data on CEO children. In addition to the firm and CEO characteristics that we include as controls, we also match on CEO visibility, i.e., we search for the CEO's name (from ExecuComp, cleansed from "M.B.A." etc.) and the company's name (from ExecuComp, cleansed from "Inc." or "Corp." etc.), combined with "CEO," and count the number of Google search results. We then re-estimate our model specification on the matched data set. Industry fixed effects are based on two-digit SIC codes. Firm characteristics are the firm-level controls included in Panel A of Table 2. CEO characteristics are the CEO-level controls included in Panel B of Table 2. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Variable	(1) Exclude if CEO age \geq 45	(2) Exclude if CEO is founder	(3) Matched sample (S&P 500)	(4) Matched sample (S&P 500 with no children data)
CEO daughter	0.90** (0.39)	1.00** (0.41)	0.94** (0.38)	1.00** (0.41)
Constant	10.76 (7.26)	13.25* (7.07)	-4.62 -5.37	11.86* (6.86)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
Firm characteristics	Yes	Yes	Yes	Yes
CEO characteristics	Yes	Yes	Yes	Yes
N	2,527	2,293	5,360	2,712
R-squared	0.34	0.35	0.37	0.43

able to find children data for 41.0% of the current CEOs compared to 54.1% among former CEOs. This difference is a result of former CEOs having longer average careers and tenure, and explains why there is more information about these executives' children in the public domain. In addition, the difference in the probability of having a daughter among current and former CEOs is only 1.9% and statistically insignificant. That is, the sex composition ratio of current and former CEOs is not different. As a result, a time trend in CSR combined with a changing sex ratio of CEO children is not a significant concern for our study.

4.9.3. Sample selection bias

We concluded in Section 3.4 that the firms for which we have CEO children data seem representative of S&P 500 firms. To further address potential sample selection bias, we report evidence from two propensity score matching models. First, we start with a broader sample of S&P 500 firms (i.e., S&P 500 firms with and without CEO children data), and we match each firm-year observation to one for which we have data on CEO children. We match based on year, industry, and firm size, and re-estimate our baseline model specification on this matched data set. We then re-estimate our model specification on the matched data set. We find in Column 3 of Table 10 that the point estimate on the *CEO daughter* variable is very similar for the matched sample compared to our data set (0.91 versus 0.94).

Second, we match each firm-year observation for which we do not have CEO children information to one for which we have data on CEO children. In addition to the firm and CEO characteristics that we include as controls, we also match on an exogenous variable not included as a control: *CEO visibility*. In particular, we search for the CEO's name (from ExecuComp, cleansed from "M.B.A." etc.) and the company's name (from ExecuComp, cleansed from "Inc." or "Corp." etc.), combined with "CEO," and count the number of Google search results. We then re-estimate our model

specification on the matched data set. We find in Column 4 that the evidence is similar to the previously reported results (0.91 versus 1.00). This evidence should reduce concerns about sample selection bias.

5. Further evidence and extensions

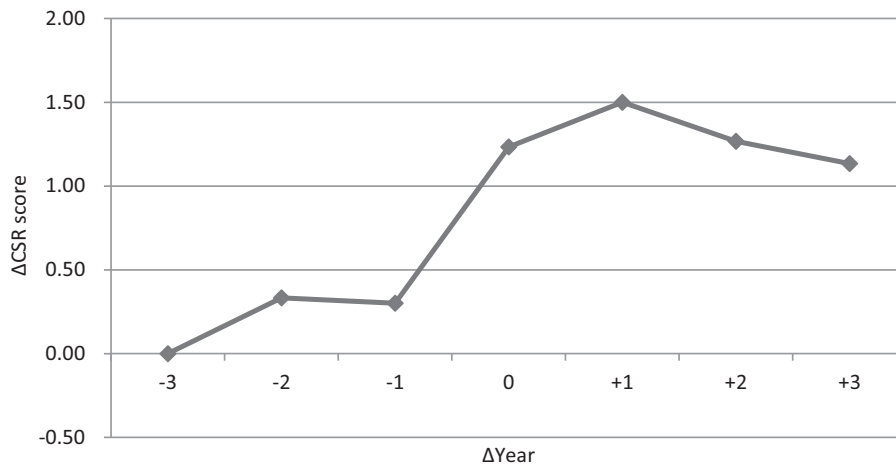
In this section, we report further evidence on the relation between a CEO parenting a daughter and decision-making with respect to corporate social responsibility in the firm that the CEO manages.

5.1. Evidence from CEO changes

We examine CEO changes and corresponding CSR policy changes. Fig. 1 reports CSR score changes around CEO changes. Panel A shows changes from a CEO without a daughter to a CEO with a daughter. On average, the CSR score increases from 11.3 to 12.3, i.e., 9.1%. Panel B shows changes from a CEO with a daughter to a CEO without a daughter. On average, the CSR score decreases from 11.9 to 10.6, i.e., 10.5%. The evidence of this CEO changes analysis is consistent with the previously reported panel regression results.

In Table 11, we show estimates from Eq. (5), in which we include firm fixed effects. This specification comes with several important benefits. First, it allows us to control for unobservable firm-specific variation that may be related to a specific firm's CSR decision-making. Some firms may have more of a pro-CSR culture compared to other firms, for reasons that are challenging to econometrically pinpoint in our empirical analysis other than through firm fixed effects. Second, in this model specification we identify the effect of interest from CEO changes within firms. That is, the effects we report are identified from a change of a CEO who does not have a daughter to a CEO who has a daughter, or vice versa, within the same firm.

Panel A: From CEO without daughter to CEO with daughter



Panel B: From CEO with daughter to CEO without daughter

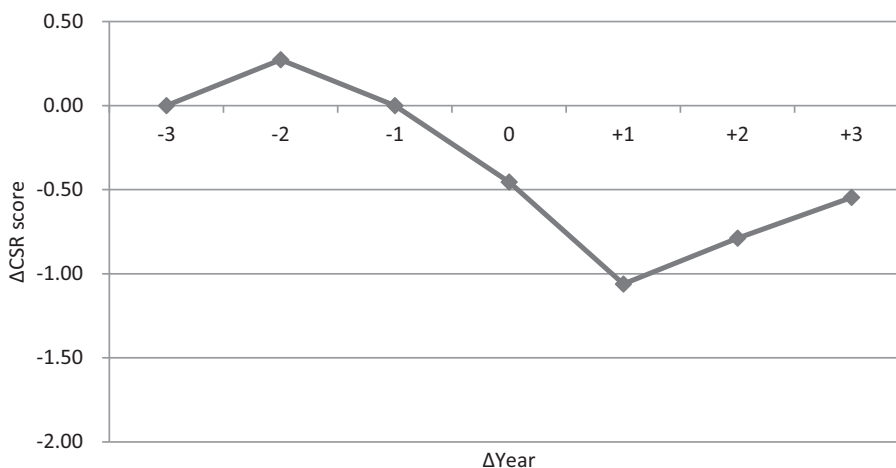


Fig. 1. Evidence from CEO changes. The figure reports changes in corporate social responsibility ratings in the years before, of, and after CEO changes compared to a matched firm. The data are from S&P 500 firms for the period 1992–2012. We match based on year, industry, and firm size. Year -3 compared to the CEO change year is normalized to zero.

Columns 1–3 show several regression model specifications. We find that the point estimate on the *CEO daughter* indicator variable is 0.93 to 0.94 across the specifications. In other words, a change from a CEO who does not have a daughter to a CEO who does, on average, increases a firm's corporate social responsibility by about 9.4% ($= 0.94/10.00$). The effect is only statistically significant at the 10%-level, which is not particularly surprising given that this is a demanding specification with respect to statistical power as the effect is identified from a small number ($N = 63$) of CEO changes. That is, we find that the change of a firm's CSR policies is, at least in part, explained by whether or not a firm's new CEO has a daughter.

5.2. Evidence on CEO sorting and imprinting

Why is a firm's CSR policies related to the CEO parenting a daughter? One explanation is sorting and endogenous

matching of CEOs with a more pro-CSR style to firms with more demand for socially responsible corporate decision-making. Our evidence suggests that there are CEOs with more or less pro-CSR styles in the market. In addition, the marginal return versus the marginal cost of a dollar spent on CSR may vary across firms. As a result, different CEO-firm pairs may differ in their match quality, so that a CEO matches more optimally with one firm than with another. Significant differences in matching quality across CEOs may explain why boards spend so much effort on ex ante screening prior to selecting a specific new top executive.

Another explanation for the CEO-daughter effect is that a CEO imprints his personal CSR preferences on the firm that he manages. Diversity, the environment, and employee relations are pro-social policies that women may value more compared to men. As a result, when a CEO with a daughter is confronted with a corporate decision related

Table 11

Evidence from CEO changes.

The table reports regressions of corporate social responsibility ratings. The data are from S&P 500 firms for the period 1992–2012. CSR score is the dependent variable. CEO daughter is an indicator variable that is one if a CEO has a daughter, and zero otherwise. Number of CEO children fixed effects are fixed effects for the number of children a CEO has. Firm characteristics are the firm-level controls included in Panel A of Table 2. CEO characteristics are the CEO-level controls included in Panel B of Table 2. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Variable	(1)	(2)	(3)
CEO daughter	0.94* (0.48)	0.93* (0.48)	0.94** (0.47)
Constant	14.00*** (0.96)	14.09** (6.56)	18.73*** (6.50)
Firm fixed effects	Yes	Yes	Yes
Number of CEO children fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Firm characteristics	No	No	Yes
CEO characteristics	No	Yes	Yes
N	2,662	2,657	2,648
R-squared	0.73	0.73	0.74

Table 12

Evidence on CEO sorting and imprinting.

The table reports regressions of external CEO changes. The data are from S&P 500 firms for the period 1992–2012. The dependent variable is CEO daughter, an indicator variable that is one if a CEO has a daughter, and zero otherwise. CSR score of prior year is a firm's CSR score of the year before the CEO change. Industry fixed effects are based on two-digit SIC codes. Firm characteristics are the firm-level controls included in Panel A of Table 2. CEO characteristics are the CEO-level controls included in Panel B of Table 2. The other variables are defined in the Appendix. Standard errors are reported within parentheses and are White (1980) heteroskedasticity-robust and clustered at the firm-level. ***, **, * means that the point estimate is significantly different from zero at the 1%, 5%, and 10% levels, respectively.

Variable	(1)	(2)
CSR score of prior year	-0.00 (0.01)	
First-born CEO daughter	5.26* (2.65)	5.25** (2.63)
Year fixed effects	Yes	Yes
Industry fixed effects	Yes	Yes
Firm characteristics	Yes	Yes
CEO characteristics	Yes	Yes
N	126	126
R-squared	0.55	0.55

to CSR, he may be more likely to make a decision that benefits women or is consistent with the preferences of women. In other words, parenting a daughter may be expected to affect a father's identity, i.e., a CEO with a daughter may identify himself more with what women derive utility from.

Table 12 reports results related to CEO sorting and imprinting. We first identify all external CEO changes in our data set ($N = 126$), i.e., the new CEO is recruited from outside the firm. In Column 1, we then regress a *CEO daughter* indicator variable for the new CEO on *Prior year CSR score*, i.e., the firm's CSR score in the year prior to an external CEO change. That is, boards of firm that are more socially

responsible may be more likely to select and recruit a top-executive with a more pro-CSR style. We use CEO daughter as a measure of more corporate social responsibility, recognizing that boards may recruit based on the CEO's past style with respect to CSR, rather than explicitly based on whether the CEO has a female child. We find that the point estimate on *Prior year CSR score* is very small and statistically insignificant. In Column 2, we re-estimate the same regression model specification but without the *Prior year CSR score*, showing that adding this variable does not affect the explanatory power.

We conclude that there is no strong evidence of sorting of CEOs with a more pro-CSR style into socially responsible firms. It is challenging to completely rule out an endogenous matching mechanism, so it is important to emphasize that also such a mechanism relies on a significant relation between a CEO parenting a daughter and corporate social responsibility. That is, a sorting mechanism does not invalidate the CEO-daughter effect, but simply alters the interpretation. Nonetheless, based on our evidence, we assign more weight to an imprinting explanation for the documented CEO-daughter effect.

6. Conclusion

We find that corporate executives managing some of the largest and most well-known public companies in the U.S. are shaped by their daughters. Specifically, a firm's policies related to stakeholders other than the firm's shareholders, collectively referred to as corporate social responsibility (CSR) practices, are systematically related to whether or not a firm's top executive is the parent of a daughter. Our empirical evidence is consistent with a simple theoretical framework involving a utility-maximizing CEO with social preferences: Women may have stronger other-regarding preferences, CEOs internalize their daughters' preferences, and this has real implications for decision-making also at the top echelons of Corporate America.

In a controversial op-ed piece in the *New York Times*, Friedman (1970) concluded that "The Social Responsibility of Business is to Increase its Profits." One interpretation of our evidence is that CEOs with daughters are less likely to subscribe to this objective function for the firm. In particular, CEOs parenting a daughter may exhibit an increased propensity to pay what we may refer to as a "stakeholder dividend." It would be interesting to estimate the welfare effects of such dividends for shareholders and other stakeholders combined. For example, work-life benefits for employees may or may not benefit a firm's shareholders, but may allow working parents to invest more in early-life care for their children, which may benefit their children and society at large and over the longer term (e.g., Cunha, Heckman, Lochner and Masterov, 2006).

This study contributes to several active research areas. First, why are some firms more pro-CSR compared to others? Our research emphasizes the role of the executives managing these firms. When a CEO with a daughter is confronted with a corporate decision related to CSR, he may be more likely to make a decision that benefits women or is consistent with the preferences of women. Second,

what experiences contribute to shaping CEOs as top corporate decision-makers? While recent research has largely focused on professional and early-career experiences (e.g., Benmelech and Frydman, 2015; Dittmar and Duchin, 2016; Schoar and Zuo, 2017), an emerging set of studies examine personal experiences (e.g., Malmendier, Tate and Yan, 2011; Bernile, Bhagwat and Rau, 2017). Our study is one of the first to emphasize the importance of the family environment in shaping CEOs, contributing a novel and exogenous personal experience to this research area.

Future work may explore several different directions. First, while corporate social responsibility is a natural starting point, other corporate policies may also be studied (e.g., Nguyen, 2015). Relevant economic outcomes include those where there are gender differences in preferences (e.g., Croson and Gneezy, 2009; Bertrand, 2011). Recent experimental evidence suggests that parenting a

daughter may reduce dishonest behaviors (e.g., Houser, List, Piovesan, Samek and Winter, 2016), possibly also in the corporate domain. Second, while having a daughter is arguably exogenous and possibly one of the strongest female socialization influences, other studies may attempt to study the impact of growing up with a female sibling, attending a college with a strong gender imbalance, and starting the career in a firm with a female CEO or a large surplus of female co-workers.²² Finally, in “The Case for Mindful Economics,” Camerer (2008) refers to parent-daughter effects as a direction for where neuroscience may add value to understanding psychological processes in economics.

Appendix

Variable definitions

1. Corporate social responsibility variables

CSR score	KLD strengths – KLD concerns, normalized so that Min(CSR score) = 0. KLD strengths is the number of CSR strengths across all categories. KLD concerns is the number of CSR concerns across all categories.
Community score	Number of KLD Community Strengths minus number of KLD Community Concerns. KLD Community Strengths include: Charitable Giving, Innovative Giving, Non-U.S. Charitable Giving, Support for Housing, Support for Education, and Other Strength. KLD Community Concerns include: Investment Controversies, Negative Economic, Tax Disputes, and Other Concern.
Diversity score	Number of KLD Diversity Strengths minus number of KLD Diversity Concerns. KLD Diversity Strengths include: Promotion, Work/Life Benefits, Women & Minority Contracting, Employment of the Disabled, Gay & Lesbian Policies, and Other Strength. KLD Diversity Concerns include: Controversies, and Other Concern.
First-born CEO daughter	Number of KLD Employee Relations Strengths minus number of KLD Employee Relations Concerns. KLD Employee Relations Strengths include: Union Relations, Cash Profit Sharing, Employee Involvement, Retirement Benefits, Health and Safety, and Other Strength. KLD Employee Relations Concerns include: Union Relations, Health and Safety, Workforce Reductions, Retirement Benefits, and Other Concern.
Environment score	Number of KLD Environment Strengths minus the number of KLD Environment Concerns. KLD Environment Strengths include: Beneficial Products and Services, Pollution Prevention, Recycling, Clean Energy, and Other Strength. KLD Environment Concerns include: Hazardous Waste, Regulatory Problems, Ozone Depleting Chemicals, Substantial Emissions, Agricultural Chemicals, Climate Change, and Other Concern.
Human rights score	Number of KLD Human Rights Strengths minus number of Human Rights Concerns. KLD Human Rights Strengths include: Indigenous Peoples' Relations, Labor Rights, and Other Strength. KLD Human Rights Concerns include: Burma Concern, Labor Rights, Indigenous Peoples' Relations, and Other Concern.
Product score	Number of KLD Product Strengths minus number of KLD Product Concerns. KLD Product Strengths include: Quality, R&D/Innovation, Benefits to Economically Disadvantaged, and Other Strength. KLD Product Concerns include: Product Safety, Marketing/Contracting, Antitrust, and Other Concern.

2. Firm characteristics

Assets	Total assets, in millions of dollars. Compustat item “AT.”
Return on assets	Net income before extraordinary items and discontinued operations divided by total assets. Compustat item “NI” divided by “AT.”
Market-to-book ratio	Market value of equity divided by book value of equity. Compustat item “PRCC_F” divided by “BKVLPS.”
Debt ratio	Total long-term debt divided by total asset. Compustat items “DLTT” plus “DLC” divided “AT.”
SG&A expenses	Selling, general, and administrative expenses, in millions of dollars. Compustat item “XSGA.”
Net income	Net income before extraordinary items and discontinued operations, in millions of dollars. Compustat item “NI.”

3. CEO characteristics

Female CEO	Indicator that is one if the CEO is female, and zero otherwise. ExecuComp item “GENDER.”
Age	Age of CEO, in years. ExecuComp item “AGE.”
Tenure	Tenure as CEO, in years. ExecuComp item “YEAR” minus “BECAMECEO.”
Equity ownership	Equity ownership of CEO, in percent. ExecuComp item “SHROWN_TOT_PCT.”

²² One challenge for any study will be to identify plausibly exogenous variation in “female socialization intensity.” Some work in economics suggests that wars is one such source of variation (e.g., Acemoglu, Auton and Lyle, 2004). As a concrete example, World War II created significant gender imbalances in some regions of Germany, but less dramatic differences in other regions.

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