

Earnings Quality in Private SMEs: Do CEO Demographics Matter?*

by François Belot and Stéphanie Serve

This study investigates the impact of CEO demographics on earnings quality for private SMEs. Using a 2012 sample of 30,476 French firms, we first find strong empirical support for a gender effect: female-run firms engage in less earnings management than do male-run firms. This result is consistent with female CEOs being more risk averse than their male counterparts are when making financial decisions. Second, CEO age is negatively correlated with the magnitude of discretionary accruals, and the relationship between gender and earnings quality is stronger for older CEOs. Overall, our findings suggest that CEO demographics affect the quality of accounting information.

Introduction

A long tradition of research argues that organizations are reflections of their top managers' characteristics and values (see, e.g., Hambrick 2007; Hambrick and Mason 1984), leading to a strong heterogeneity in corporate practices (Bertrand and Schoar 2003). Recent financial studies highlight a "CEO effect" (captured by means of various observable characteristics [such as age and gender] and behavioral features [such as overconfidence and narcissism]) on corporate decision-making for listed firms.¹ However, the link between CEO characteristics and financial decisions remains an under-examined issue for private small and medium-sized enterprises (SMEs).

SMEs' "uniqueness" creates specific financial management issues that stand in contrast to the

vast body of corporate finance theory traditionally dedicated to listed firms (Ang 1991). In contrast to publicly traded firms, most private SMEs are run by a CEO who is also the dominant owner (Brunninge, Nordqvist, and Wiklund 2007) and whose investment in the business represents a significant portion of his/her wealth. Moreover, family-owned SMEs typically feature limited corporate governance, particularly the control exercised by the board (Ford 1988). Given these patterns, it should be expected that CEOs (and, therefore, CEO characteristics) would have a substantial impact on corporate decision-making in SMEs (Ang, Cole, and Lawson 2010).

This paper focuses on a particular corporate practice—the production of accounting information—and on the related quality of reported earnings numbers.² Watts and Zimmerman

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François Belot is an assistant professor of Finance at Université de Cergy-Pontoise and researcher at THEMA. Stéphanie Serve is a professor of Finance at Université Paris-Est Créteil (UPEC) and researcher at IRG.

Address correspondence to: S. Serve, IAE Gustave Eiffel, Place de la porte des champs, Route de Choisy, 94010 Créteil, France. E-mail: stephanie.serve@u-pec.fr.

¹For observable characteristics, see Serfling (2014), Faccio, Marchica, and Mura (2016), and Yim (2013). For behavioral considerations, see Malmendier and Tate (2005) and Aktas et al. (2016).

²We consider reported earnings to be of high quality when "[they] provide more information about the features of a firm's financial performance that are relevant to a specific decision made by a specific decision maker" (Dechow, Ge, and Schrand 2010, p. 344).

(1986) argue that corporate managers may exercise discretion over the production of accounting information for their own benefit or to reduce certain political costs. Such “earnings management” misleads the stakeholders’ perception of the firm and necessarily erodes firms’ earnings quality.³

As research on earnings management mainly examines samples of listed firms, the magnitude of this phenomenon in small businesses is not well documented. As emphasized by Burgstahler, Hail, and Leuz (2006), private companies experience agency problems that differ from those of public firms. These problems stem from their peculiar relationships with their main stakeholders, which translate into specific incentives to manage earnings. For instance, SMEs are frequently strongly dependent upon banks and can be subject to substantial financial constraints (see, e.g., Cenni et al. 2015). Another prevalent stakeholder for firms located in code-law countries is the tax administration service because financial reporting is strongly influenced by tax regulation in those countries (Coppens and Peek 2005).

Our paper offers the first analysis of the impact of CEO characteristics on private SMEs’ decision to engage in earnings management. In so doing, we focus on two observable demographic traits in CEOs, namely gender and age, that have previously been shown to affect organizational behaviors and performance (for gender, see Davis et al. 2010; Pfeffer 1983; for age, see Wiersema and Bantel 1992). We first contribute to the strand of research that investigates whether CEO characteristics affect corporate financial decisions. The existence of a “CEO effect” on corporate decision-making recently became controversial (Fee, Hadlock, and Pierce 2013). Our paper provides strong empirical support for a “gender effect” and an “age effect” concerning the relationship between CEO demographics and earnings management. Second, we extend a line of emerging research that analyzes the interaction between the gender of top management (Barua et al. 2010; Francis et al. 2015; Peni and Vähämaa 2010), the age of top management (Huang, Rose-Green, and Lee

2012), and earnings quality. Our study also fills a gap in the literature by considering CEO gender and age in the context of private firms.

Our empirical analysis relies on a sample of private French SMEs. It is well suited for our investigations, as France, like most European countries, is characterized by a prevalence of closely held private firms (according to the Family Business network, 83 percent of French SMEs are family-owned). In addition, female managers are statistically more represented in the French SME population than they are in listed firms.⁴ In addition to documenting significant earnings management in private French SMEs, we find strong empirical evidence that CEO demographics (gender and age) are both negatively correlated with the magnitude of earnings management. We also observe that the relationship between gender and earnings quality is stronger for older CEOs.

The remainder of the paper is structured as follows. We first review the relevant areas of research concerning both the impact of CEO demographics on financial decisions and earnings management incentives for private firms. Then, we present our research design, including sample selection and summary statistics. This section is followed by our empirical results and robustness checks. In the last section, we discuss our findings, their limitations and extensions, and their implications for researchers and practitioners.

Theoretical Framework and Hypotheses

CEO Gender and Earnings Quality

Gender-Based Differences. There is evidence in several fields of academic literature that men and women may act and behave differently. Studies in psychology (Byrnes and Miller 1999; Powell and Ansic 1997) and economic experiments (Charness and Gneezy 2012; Croson and Gneezy 2009; Eckel and Grossman 2008) suggest that women, on average, are more cautious, less aggressive, and, consequently, more risk averse than men in a variety of decision settings. These gender-based differences in risk attitude

³According to Healy and Wahlen (1999, p. 368), “Earnings management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying performance of the company or to influence contractual outcomes that depend on reported accounting numbers.”

⁴According to INSEE (the French national statistical office), only 4.4 percent of listed firms are run by women.

may have be rooted not only in biology (Sapienza, Zingales, and Maestripieri 2009) but also in social identity (because identity stereotypes prescribe normative behaviors to men and women, see Mischel 1966). In any event, such differences may translate into diverse economic behaviors. Men have been shown to trade more aggressively than women when facing personal financial opportunities (Barber and Odean 2001). Olsen and Cox (2001) find that female professional investors are more likely to reduce risk than their male counterparts, given a target return.

This statement also applies to the field of corporate decision-making. Recently, a stream in the empirical literature focuses on gender-based differences and highlights their impact on firm risk. Faccio, Marchica, and Mura (2016) document that female CEOs tend to avoid riskier investment and financing opportunities; consequently, firms run by female CEOs are less leveraged, have less volatile earnings, and have a higher likelihood of survival than firms run by males. In the same vein, Huang and Kisgen (2013) examine earnings forecasts, debt issuance, and acquisitions decisions to disentangle men's and women's financial choices. Their results support the hypothesis of relative overconfidence for male compared with female executives.

Another stream of gender studies in the financial literature examines the interaction between CEO/CFO gender, access to credit, and financing conditions. Several works using SME samples provide evidence that access to credit is more difficult for female-run firms (Aristei and Gallo 2016; Bellucci, Borisov, and Zazzaro 2010) and that firms run by women pay a higher interest rate than firms run by men (Alesina, Lotti, and Mistrulli 2013). These findings are consistent with discrimination against women and suggest that banks impose credit procedures and criteria subjectively against female entrepreneurs (Carter and Shaw 2006). Conversely, Francis, Hasan, and Wu (2013) show that firms run by female CFOs benefit from lower bank loan prices than firms run by male CFOs and conclude that banks recognize the benefits of female CEOs in reducing information risk *ex ante*.

Finally, beyond gender-based difference in attitude toward risk, the literature also highlights that men and women behave differently in terms of ethical decision-making (see, e.g., the literature review by Craft 2013 and the

related research note by Lehnert, Park, and Singh 2015). These gender-based ethical differences stem from differences related to a concern for competitive success: women are believed to emphasize money and advancement less and to prioritize task performance and developing satisfying relationships. Consequently, they will be less inclined to engage in unethical behavior, such as breaking the law or violating firm policies.

Gender and Earnings Quality. An emerging research area focuses on accounting issues by examining the interaction between gender and the quality of reported earnings (see Habib and Hossain 2013). This research is primarily empirical and is conducted on samples of listed firms. A first stream of studies investigates gender diversity in boards and top management teams (Krishnan and Parsons 2008; Srinidhi, Gul, and Tsui 2011) and concludes that greater female participation positively affects earnings quality. Krishnan and Parsons (2008) consider this phenomenon to be driven by women behaving more ethically than men.

A second stream of studies focuses on the interaction between the gender of top executives, that is, the CEO or the CFO, and earnings quality. Peni and Vähämaa (2010) find that CFO gender but not that of CEOs (or other executives) affects earnings quality. Barua et al. (2010) corroborate these findings. Finally, Francis et al. (2015) compare the evolution of earnings quality before and after a change in CFO gender. They highlight a positive effect of female CFOs on earnings quality, which is consistent with the greater risk aversion of women when making accounting choices. This CEO/CFO gender effect appears to apply in several geographical areas, including in emerging markets (see the study by Liu, Wei, and Xie 2016 for the Chinese market), and with respect to the earnings quality of financial institutions (Palvia, Vähämaa, and Vähämaa 2015).

Gender and Earnings Management: The Peculiar Context of SMEs. Earnings management strongly involves firms' attitudes toward risk and ethics. Opportunistic earnings management might be used by SMEs to hide financial distress or to make more credit available from their banks. However, such behavior is risky over the long term because firms will not be able to maintain distorted reported earnings without a

“reversal effect.”⁵ These firms also risk being discovered and having to relinquish the advantages resulting from long-term banking relationships. Earnings management is also likely to be unethical when users of financial information are fooled by reported earnings because such behavior induces a distortion in resource allocation among stakeholders (Healy and Wahlen 1999; Krishnan and Parsons 2008).

As the gender literature suggests that women tend to be more risk averse and to behave more ethically than men when making financial decisions, we thus expect earnings management to be associated with significant gender-based differences. The remaining question is to determine the extent to which men and women might manage SMEs differently, particularly when producing financial information. Paradoxically, although the CEO is the primary decision-maker concerning corporate strategic issues, the entrepreneurship literature highlights the lack of theoretical development regarding CEO gender (see, for instance, Brush, De Bruin, and Welter 2014; Henry et al. 2015). The latter authors contend that studies in entrepreneurship mainly adopt an empirical gender-as-variable approach to compare male and female entrepreneurs and identify gender-based differences. Notably, however, a fundamental specificity of SMEs is that they strongly rely on the “owner-manager” status of the CEO, who has invested a substantial portion of his/her personal wealth in the business. Given this pattern of undiversified portfolios, we expect this attitude toward risk and ethics in CEOs’ personal portfolios to translate into attitude toward risk and ethics in their businesses. Consequently, we expect gender-based differences concerning risk and ethics to influence the production of accounting information by CEOs in SMEs. We, therefore, propose the following hypothesis:

H1: Private SMEs run by female CEOs are less likely to engage in earnings management.

CEO Age and Earnings Quality

Beyond gender, CEO age is another observable demographic variable that could affect the risk levels of corporate policies and in turn the

production of accounting information. Strikingly, the impact of CEO age remains a relatively under-researched issue (Serfling 2014). Prior theoretical models develop two conflicting predictions for the effect of a corporate manager’s age on his/her risk attitude. On one hand, Prendergast and Stole (1996) predict that younger managers undertake riskier investment strategies than older managers to signal their capabilities and talent. On the other hand, Holmström (1999) posits the career concern hypothesis that argues that younger managers are more risk averse because they can lose their reputation based on one bad investment decision. This hypothesis predicts more conservative corporate policies.

Recent empirical papers (Li, Low, and Makhija 2017; Serfling 2014; Yim 2013) examine firms’ risk exposure to disentangle these competing effects. They document a negative association between CEO age and corporate risk-taking, consistent with the signaling explanation. This association also holds for accounting choices. Huang, Rose-Green, and Lee (2012) note that older CEOs are less likely to engage in aggressive earnings management and conclude that CEO age positively correlates with financial reporting quality.

The generalization of this result is questionable insofar as the samples in these studies consist of large and/or listed companies whose agency and incentive problems differ substantially from those of SMEs. However, we believe that the managerial signaling hypothesis might also take precedence over the career concern hypothesis for SMEs in which the owner-manager status of the CEO provides him/her with strong protection. He/she indeed can hardly be fired for poor performance. Moreover, the incumbent CEO cannot be easily replaced by an outside manager, given his/her idiosyncratic investment in the business (Duran et al. 2016). As the threat of dismissal is not particularly credible, the career concern hypothesis seems less relevant for SMEs. Moreover, a young CEO might find it necessary to signal his/her ability to the SME’s stakeholders—particularly in the context of asymmetric information—and above all, to those who supply external financing (bankers, private equity investors, etc.). We

⁵The “reversal effect” refers to firms attempting to mislead stakeholders by upwardly managing earnings. Such action has been shown to reverse in the future and lead to a decrease in economic performance (Lara, Osma, and Neophytou 2009; Rangan 1998).

thus expect a negative (positive) association between CEO age and the magnitude of earnings management (financial reporting quality).

Our first hypothesis pertains to the impact of gender on the propensity to engage in earnings management. Building on previous literature, we now consider a potential “age effect” and a potential moderating role of age on the gender/earnings quality relationship. To the best of our knowledge, there are no studies that have focused on this issue: the question remains open as to whether the relation between gender and financial reporting quality differs across CEO age groups. Assuming that (1) women CEOs (H1) and (2) older CEOs (the managerial signal hypothesis) are less likely to engage in earnings management, one should expect CEO age to deepen the negative relationship between gender and earnings management. We thus propose the following hypothesis

H2: Gender-based differences in earnings management are stronger for older CEOs than for younger CEOs.

Earnings Management Incentives for Private SMEs

Differences of Earnings Quality among Firms. Givoly, Hayn, and Katz (2010) analyze differences in earnings quality between public and private equity firms and find strong support for an “opportunistic behavior hypothesis”: because firms with public equity are subject to pressure from the capital markets and therefore to the need to meet earnings targets (such as analyst forecasts or stock-based compensation thresholds), they have greater incentives to engage in earnings management. Several studies performed in Anglo-American countries (Ball and Shivakumar 2005; Beatty and Harris 1999; Hope, Thomas, and Vyas 2013) confirm that earnings management is higher (and earnings quality lower) for public than for private firms. However, another strand of studies conducted in various geographical areas suggests that the institutional framework—and related degree of investor protection—has a more salient impact on the magnitude of earnings management than does the status of the firm (see, e.g., Arnedo, Lizarraga, and Sánchez 2007; Burgstahler, Hail, and Leuz 2006; Enomoto, Kimura, and Yamaguchi 2015; Leuz, Nanda, and Wysocki 2003).

Incentives for Earnings Management in French Private Firms. Allen, Carletti, and Marquez (2015) remind that firms’ objectives vary significantly across countries. They distinguish the shareholder corporate governance model (that is typical of Anglo-Saxon countries and relies on shareholder value maximization) from the stakeholder governance model (in which the interests of various stakeholders—and not only shareholders—are pursued). This latter model applies to France, an economy characterized by concentrated ownership structures and dominated by banks, the government (via the tax authorities) and (to a lesser extent) unions. We thus believe that the opportunistic behavior hypothesis is also suitable for private firms and expect incentives for earnings management to be driven by contractual outcomes with these stakeholders (Othman and Zeghal 2006; Vander Bauwhede and Willekens 2000).

First, banks are the main providers of finance for French SMEs and they rely extensively on financial statements in assessing an SME’s reimbursement capacity. Consequently, accounting rules are more conservative because creditors demand low-volatility income (Ball, Kothari, and Robin 2000). Therefore, managers are incentivized to act upon earnings quality for at least two reasons: (1) to hide the reality of their default risk to maintain the support of their banks and/or (2) to obtain more credit or better financing conditions. Campa and Camacho-Minano (2015) report upward earnings management for financially distressed SMEs. Vander Bauwhede, De Meyere, and Van Cauwenberge (2015) document a lower cost of debt for SMEs with higher earnings quality.

Second, another characteristic of the French system is the strong influence of the Tax Code on accounting. French firms are subject to a regulated accounting framework that defines Generally Accepted Accounting Principles (GAAP) and strict reporting requirements. French GAAP are strongly influenced by tax rules, and these rules prescribe, for example, specific valuation methods for assets that affect deductible depreciation and amortization, which impacts taxable income. In sum, a primary role of financial accounting in France is to determine how much income tax a company owes the government (Coppens and Peek 2005; Othman and Zeghal 2006). However, despite strict reporting rules, managers may nonetheless exercise discretion over depreciation and amortization

expenses to manipulate taxable income. Thus, decreasing the tax payable appears to be another strong motive for earnings management in French SMEs.

Research Design

Earnings Management and Firms' Characteristics

Discretionary Accrual Models. We employ discretionary accruals as a proxy for earnings management. Earnings have two major components: cash flow and accounting elements. Accruals are accounting elements that distinguish a firm's operating cash flow from its reported earnings. Total accruals equal the difference between net income and cash flow from operations and may not stem from voluntary earnings manipulations. They can be disaggregated between normal (nondiscretionary) accruals and abnormal (discretionary) accruals. Normal accruals are accounting adjustments that reflect firms' fundamental performance. Such accruals are induced by the evolution of the firm's activities and are related to sales growth and depreciation policy. Conversely, abnormal accruals capture distortions and the flexibility used by managers to influence reported earnings. Technically, abnormal accruals can be estimated through econometric modeling and computed as residuals from regressing total accruals on their economic drivers. We rely on the models developed by Jones (1991), Dechow, Sloan, and Sweeney (1995, also called the "modified Jones model"), and Kothari, Leone, and Wasley (2005) to estimate discretionary accruals (see Appendix A for a detailed description). According to Dechow, Ge, and Schrand (2010, p. 351), "the use of such models has become the accepted methodology in accounting to capture discretion."

Following Hope, Thomas, and Vyas (2013), our tests use absolute values of discretionary accruals as a proxy for earnings management. Therefore, we do not make hypotheses concerning the direction (income increasing or income decreasing) of earnings manipulation. *DA_J* and *DA_MJ* denote the absolute value of discretionary accruals generated from the Jones and modified Jones models, respectively. *DA_K* (*DA_PM*) refers to the absolute value of (performance-matched) discretionary accruals derived from the equation of Kothari, Leone, and Wasley (2005).

Control Variables: Firms' Characteristics and Earnings Quality. To test our hypotheses, we control for certain firm characteristics that have been shown to affect financial reporting quality. First, a size effect on earnings quality is expected. Firm size is frequently used as a proxy for information asymmetry in the predisclosure information environment, and Dechow and Dichev (2002) predict that larger firms will be associated with higher accrual quality because they have more stable and predictable operations. Second, following Ashbaugh-Skaife et al. (2008) and Hope, Thomas, and Vyas (2013), we assume that (1) rapidly growing firms are likely to report noisier accruals because they invest in anticipation of future sales; (2) differences in firms' asset structures (the proportion of tangible/intangible assets) are also likely to induce differences in accrual adjustments; and (3) the volatility of the firm's operating revenues will cause estimation errors in accruals. Moreover, because earnings management is influenced by "banking relationship incentives" (hiding financial distress or negotiating better access to credit and better financing conditions), we assume that the level of default risk is another prevalent control variable (Campa and Camacho-Minano 2015). Finally, the business sector influences both the level of default risk and the structure of assets, but it also affects the length of the operating cycle (longer operating cycles indicate more uncertainty, more estimation errors and therefore lower earnings quality, according to Dechow and Dichev 2002).

Our proxies for size, sales growth, asset structure, and the volatility of operations are the logarithm of total assets (*Log(Assets)*), the average value of one-year sales growth computed over a three-year period (*Growth*), the ratio of property, plants, and equipment to total assets (*PPE*), and the standard deviation of return on assets computed over a five-year period (*Std_ROA*), respectively. We include several variables to capture firms' default risk and financial distress situations. We compute *Leverage* as the ratio of financial debts to total assets and the ranked value of a default score (*Score_decile*). This score is generated by a model (Conan and Holder 1979) developed and used by Banque de France to estimate the default risk of French SMEs. It is computed as follows: the higher the score, the lower the default risk. In addition, we compute the cumulative percentage of the last

five years in which a firm reports losses (*% Loss*). To control for the possible effect of outliers, these control variables (except *Score_decile* and *% Loss*) are winsorized at 1 percent and 99 percent. Finally, the business sector is identified by the 2-digit NACE code. All variable definitions are provided in Appendix B.

Data and Summary Statistics

Sources. We rely on a sample of privately held French SMEs, which must comply with French GAAP. A focus on a single country avoids the problem of heterogeneity in accounting standards that is inherent in cross-country studies. Previous studies document the specific role of financial information for U.S. privately held SMEs, which are not subject to a regulatory framework in the production of their financial statements (Allee and Yohn 2009; Minnis 2011).⁶ French private firms are not required to comply with International Financial Reporting Standards (IFRS). However, in contrast to U.S. private firms, the publication of a financial statement is mandatory for all firms, irrespective of company size.

We exploit a proprietary database provided by ALTARES, a French subsidiary of the Dun & Bradstreet group. It offers an extensive coverage of more than two million privately held French firms. The ALTARES database contains comprehensive historical accounting and financial data, the NACE code and location, and certain CEO characteristics, including gender and age. The database does not provide CEO demographics as historical series. Thus, as data were extracted in 2013, CEO demographics are available for only 2012. We require the following: (1) the company has net sales lower than 50 million euros and/or total assets lower than 43 million euros (these accounting thresholds are in line with the SME definition provided by the European Union) and (2) the number of employees is more than 20 but less than 250.⁷ Because we need a longer time period to compute certain control variables,

we also require accounting data to be complete for the years 2008–2012. After excluding firms from the financial sector and holding companies, we are left with 30,476 private SMEs.

CEO Gender and Other Gender Variables. ALTARES provides a description of the firm's CEO (specifically, her first/last name and gender). We rely on this description to create a binary variable (*Woman*) that is set equal to one when the firm is run by a female CEO.⁸ We also compute two other proxies of the feminization of the top management team; *Female%Ex.Com.* is the percentage of management positions held by women in the executive committee, and *Woman Ex.Com.* is a binary variable that is set equal to one when there is at least one woman in the executive committee.

Descriptive Statistics. Summary statistics are reported in Table 1. To save space, the Pearson correlation matrix is not reproduced but is available from the authors on request. The first important figure relates to the prevalence of female CEOs. Of a sample of 30,476 SMEs, 2,869 (9.4 percent) are run by women. This proportion is very similar to that reported by Faccio, Marchica, and Mura (2016) for a sample of European privately held and publicly traded firms and is nearly double that observed for French public companies. The sample exhibits, on average, a feminization rate (*Female%Ex.Com.*) of 19.4 percent. Interestingly, it appears that more than one-half of the sample firms have a woman in the top management team. For the full sample, the magnitude of earnings management (as proxied by the absolute value of discretionary accruals) varies, on average, between 9.2 percent and 9.4 percent of the total assets. Univariate standard statistical tests show that this magnitude is significantly higher, regardless of model, for firms run by male CEOs (between 9.3 percent and 9.4 percent) than

⁶According to Hope, Thomas, and Vyas (2013), financial and accounting data for private firms are more difficult to obtain in the United States because of the lack of reliable databases. Consequently, there is only limited evidence concerning the accounting practices of private firms in the United States.

⁷The French Tax Code distinguishes “very small firms.” This category is used to refer to all firms with fewer than 20 employees.

⁸The gender of the CEO is missing for 10.3 percent of the sample firms. In such cases, we look for the gender of the second (third, fourth, etc.) executive of the company cases, as ALTARES also provides information about other members of the management team. We estimate our empirical models by excluding firms with missing CEO gender data. This does not affect the pattern of results (tables are available upon request).

Table 1
Descriptive Statistics

	Full Sample			Male CEOs Woman = 0		Female CEOs Woman = 1	
	Mean	Median	S.D.	Mean	Median	Mean	Median
Full Sample Observations		30,476		27,607		2,869	
DA_J	0.094	0.062	0.106	0.094	0.063	0.086***	0.057***
DA_MJ	0.093	0.062	0.106	0.093	0.062	0.085***	0.056***
DA_K	0.092	0.061	0.104	0.093	0.062	0.084***	0.056***
DA_PM	0.092	0.062	0.106	0.093	0.062	0.085***	0.055***
Assets	5,459	3,404	5,572	5,526	3,457	4,817***	2,957***
Log(Assets)	3.573	3.532	0.363	3.579	3.539	3.520***	3.471***
Leverage	0.163	0.112	0.171	0.162	0.111	0.173***	0.118***
PPE	0.482	0.342	0.441	0.477	0.336	0.532***	0.393***
Growth	0.070	0.046	0.138	0.071	0.046	0.063***	0.042***
% Loss	0.163	0.000	0.249	0.164	0.000	0.158	0.000*
Std_ROA	0.053	0.040	0.043	0.053	0.040	0.053	0.040
Score	16.910	16.020	12.224	16.813	15.960	17.842***	16.650***
Score_decile	5.498	5.000	2.872	5.475	5.000	5.722***	6.000***
Female%Ex.Com.	0.194	0.100	0.248	0.149	0.000	0.627***	0.600***
Woman Ex.Com.	0.505	1.000	0.500	0.453	0.000	1.000***	1.000***
Nonmissing Age Data Observations		27,016		24,577		2,439	
CEO Age	52.249	52.000	9.633	52.319	52.000	51.553***	51.000***
Ln(CEO Age)	3.939	3.951	0.188	3.941	3.951	3.920***	3.932***

The sample consists of 30,476 French SMEs for the year 2012. This table reports means, medians, standard deviations, and tests of differences in means and medians between firms run by male CEOs and firms run by female CEOs in their accounting and financial characteristics. Variable definitions are provided in Appendix B. Student t-statistics test for differences in means, Wilcoxon z-statistics test for differences in medians. ***, **, * indicate that the difference in mean (median) for characteristics in the female CEO versus male CEO samples is significant at 1 percent, 5 percent, or 10 percent, respectively.

for firms run by female CEOs (between 8.4 percent and 8.6 percent). This preliminary result tends to validate our H1. Statistically significant differences also exist in firm characteristics: firms run by female CEOs are smaller, have more tangible assets, experience lower growth rates, and seem to be less vulnerable in terms of default risk as they report better Conan and Holder scores.

The last rows of Table 1 report CEO ages. Although the difference is statistically significant, it is not economically substantial: the median CEO age of female-run SMEs is 51, whereas it is 52 for SMEs with a male manager.

Empirical Findings **The Impact of CEO Gender on Earnings Management**

Table 2 reports the results of OLS estimations performed with the absolute value of discretionary accruals as the dependent variable. Discretionary accruals are calculated with the four models described in the research design. For brevity, we focus only on the discretionary accruals generated from the Jones (DA_J) and modified Jones models (DA_MJ) and do not report the regressions with DA_K and DA_PM as dependent variables. These unreported estimations are available upon request and clearly show

Table 2
Gender and Earnings Management

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable	DA_J	DA_J	DA_MJ	DA_MJ	DA_MJ	DA_MJ
Sample	Full Sample	Full Sample	Full Sample	Full Sample	Full Sample	Woman = 0
Woman	-0.009*** (-4.60)	-0.008*** (-4.23)	-0.008*** (-4.27)			
Woman Ex.Com.				-0.005*** (-3.84)		-0.004*** (-2.74)
Female%Ex.Com.					-0.008*** (-3.26)	
Log(Assets)		-0.002 (-0.92)	-0.000 (-0.03)	0.001 (0.64)	0.000 (0.23)	0.001 (0.63)
Leverage		-0.008 (-1.57)	-0.008 (-1.59)	-0.008 (-1.64)	-0.008 (-1.61)	-0.006 (-1.18)
PPE		-0.017*** (-9.51)	-0.017*** (-9.28)	-0.016*** (-9.12)	-0.016*** (-9.21)	-0.017*** (-8.98)
Growth		0.019*** (3.05)	0.020*** (3.14)	0.019*** (2.98)	0.020*** (3.08)	0.020*** (2.97)
% Loss		0.026*** (7.08)	0.027*** (7.61)	0.028*** (7.65)	0.028*** (7.64)	0.030*** (7.77)
Std_ROA		0.550*** (23.88)	0.559*** (24.05)	0.559*** (24.03)	0.559*** (24.04)	0.558*** (22.65)
Score_decile		-0.001*** (-3.93)	-0.001*** (-4.56)	-0.001*** (-4.66)	-0.001*** (-4.60)	-0.001*** (-4.14)
Industry Dummies	Y	Y	Y	Y	Y	Y
Constant	0.084*** (23.49)	0.079*** (9.91)	0.073*** (9.11)	0.071*** (8.76)	0.072*** (9.01)	0.071*** (8.25)
Observations	30,476	30,476	30,476	30,476	30,476	27,607
R ²	0.029	0.095	0.098	0.098	0.098	0.101
Adjusted R ²	0.028	0.093	0.097	0.097	0.096	0.099

The sample consists of 30,476 French SMEs for the year 2012. In column (6), firms run by female CEOs are excluded. Variable definitions are provided in Appendix B. Industry dummies (based on 2-digit NACE codes) are included in the regressions, but their coefficients are not reported. The t-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. Asterisks indicate statistical significance at the 1 percent (***), 5 percent (**), or 10 percent (*) level.

that our findings are robust to using various proxies for earnings management. Regardless of the accrual measure, the coefficient for *Woman* is negative and statistically significant at the 1 percent threshold. Thus, the regressions tend to support the hypothesis that firms run by female CEOs engage in less earnings management than their counterparts run by male CEOs. In addition

to the statistical significance, the economic magnitude of the gender effect on earnings management is large. Having a female CEO induces a 0.008 decrease in discretionary accruals (see column 2), or a decrease of more than 8.5 percent (12.9 percent) of the average (median) value.

Moreover, the signs of the control variables are consistent with our expectations: the more

tangible assets firms have, the less they report discretionary accruals. Sales growth and the volatility of operating revenues are positively related to the level of discretionary accruals. Finally, discretionary accruals increase with the firm's default risk (higher reported losses and a lower Conan and Holder score).

Alternative Gender Variables

Table 2 also displays the results of the regressions using gender metrics other than the dummy variable *Woman*. As demonstrated by previous studies, gender may have an effect on earnings quality not only at the CEO level but also, more generally, at the top management level. It appears from column (4) that the propensity to manage earnings weakens when there is at least one woman in the management team. The results reported in column (5) corroborate our previous findings: the proportion of women in top management teams has a negative effect on the level of discretionary accruals. Finally, as a robustness check, we exclude firms run by a female CEO (see column 6). *Woman Ex.Com.* still receives a negative and significant coefficient, which suggests that women tend to limit the earnings management behavior of male CEOs.

Robustness: Matched Sample Procedure

Thus far, we find strong evidence that companies with female CEOs have lower absolute discretionary accruals. However, our empirical analysis, as with many others in the field of corporate governance and accounting, is susceptible to endogeneity concerns. In theory, the negative correlation between discretionary accruals and female CEOs could be caused by a tendency for firms with a low propensity to manage earnings to choose to hire a woman (reverse causality). More generally, firms' choices to nominate a woman as a top executive may be influenced by firm specificities. The comparison of firms run by male CEOs and those run by female CEOs clearly shows that the latter are smaller, experience lower growth rates, or have more tangible assets than the former. It may be that firms with a female CEO are not randomly selected from the population of

French SMEs. In other words, CEO gender may be a selection criterion. One attractive means of addressing such a selection bias is to design a one-to-one match between firms run by a woman (treated subjects) and firms with a male CEO (control subjects). If treated and control firms are identical in terms of observable (e.g., accounting, financial) characteristics, we should not expect them to behave differently in terms of earnings management.

A major difference between the two groups of firms is their size (i.e., firms with female CEOs are significantly smaller). Thus, we compute a match based on size and industry using the 2-digit NACE code. Because many other observable factors are likely to affect discretionary accruals, we also design a multi-dimensional matching using the propensity score method developed by Rosenbaum and Rubin (1983) (see Lee and Masulis 2011 for a discussion of the advantages of this methodology and its application to earnings management studies). We first estimate the probability of being led by a woman (propensity score) from a Probit regression in which the dependent variable is *Woman* and the explanatory variables are those we use as controls in Table 2. Then, we select each firm run by a female CEO and search for the firm run by a male CEO with the closest propensity score.⁹

In Table 3, we present the matched subsamples of firms run by female CEOs and firms run by male CEOs. The univariate tests of Panel A show that regardless of how control groups are selected, firms with female CEOs report lower discretionary accruals than do their male-run counterparts. Interestingly, the differences are larger than those reported for the whole sample. Focusing on the propensity score-matched subsamples, we note that the average *DA_MJ* for firms run by female CEOs is 0.085, compared with 0.095 for otherwise similar firms with male CEOs. Panel B displays the results of the multivariate estimations. Once again, the coefficients for *Woman* are always negative and statistically significant at the 1 percent threshold. Overall, this additional matching analysis corroborates the existence of a gender effect and indicates

⁹We require that the absolute difference between the propensity scores of the treated and control firms is not greater than 0.000005. The use of such a stringent criterion implies that some firms with a female CEO cannot be matched with firms run by male CEOs, but it ensures that the two samples are as similar as possible. Unreported tests show that there are no statistically significant differences in accounting and financial characteristics between the treated and control samples.

Table 3
Matching Based on Size and Industry/Propensity Score Matching

		Male CEOs		Female CEOs		Test for Differences in		
		N	Mean	Median	n	Mean	Median	Means
Panel A: Univariate Tests								
Matching Based on Size and Industry								
DA_J	2,869	0.096	0.064	2,869	0.086	0.057	3.760***	3.250***
DA_MJ	2,869	0.096	0.063	2,869	0.085	0.056	3.977***	3.819***
DA_K	2,869	0.096	0.064	2,869	0.084	0.056	4.452***	4.490***
DA_PM	2,869	0.096	0.064	2,869	0.085	0.055	4.070***	4.141***
Propensity Score Matching								
DA_J	1,975	0.097	0.065	1,975	0.086	0.058	3.333***	3.362***
DA_MJ	1,975	0.095	0.064	1,975	0.085	0.057	3.215***	3.515***
DA_K	1,975	0.094	0.063	1,975	0.083	0.057	3.366***	3.710***
DA_PM	1,975	0.095	0.064	1,975	0.084	0.056	3.304***	3.891***
Panel B: Multivariate Analysis								
Dependent Variable	(1)		(2)		(3)		(4)	
		DA_MJ		DA_MJ		DA_MJ		DA_MJ
Woman	-0.011*** (-4.02)		-0.010*** (-3.74)		-0.010*** (-3.13)		-0.010*** (-3.38)	
Log(Assets)			-0.002 (-0.57)				0.001 (0.20)	
Leverage			-0.021** (-2.21)				-0.025** (-2.01)	
PPE			-0.011*** (-3.24)				-0.021*** (-4.49)	

Table 3
Continued

Dependent Variable	(1)	(2)	(3)	(4)
	DA_MJ	DA_MJ	DA_MJ	DA_MJ
Growth		0.015 (0.95)		0.021 (1.07)
% Loss		0.023*** (2.70)		0.026*** (2.80)
Std_ROA		0.536*** (11.17)		0.599*** (9.55)
Score_decile		-0.001** (-2.47)		-0.002*** (-2.69)
Industry Dummies	Y	Y	Y	Y
Constant	0.078*** (11.01)	0.077*** (4.55)	0.078*** (9.45)	0.071*** (3.66)
Observations	5,738	5,738	3,950	3,950
R ²	0.030	0.095	0.033	0.119
Adjusted R ²	0.022	0.086	0.020	0.106

In this table, we identify control samples of firms that are run by male CEOs. We design a one-to-one match between firms run by female CEOs and firms run by male CEOs based on firm size and industry (“Matching based on size and industry”) and a propensity score matching procedure (“Propensity score matching”). The propensity score (PS) is estimated using all variables aimed at controlling for firm characteristics. For each firm run by a female CEO, we search for the control unit (i.e., a firm run by a male CEO) with the closest PS and require that the absolute difference between the PS for a firm run by a female CEO and the PS for a firm run by a male CEO be no greater than 0.000005. This condition implies that some firms with a female CEO do not have any matching peer, which reduces the number of observations. Variable definitions are provided in Appendix B. Panel A provides univariate tests. The student t-statistics test for differences in means, and the Wilcoxon z-statistics test for differences in medians. Panel B presents a multivariate analysis. In columns (1) and (2), we use the sample that is derived from the matching based on size and industry. In columns (3) and (4), we use the sample that is derived from the propensity score matching. Industry dummies (based on 2-digit NACE codes) are included in the regressions, but their coefficients are not reported. The t-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. Asterisks indicate statistical significance at the 1 percent (***), 5 percent (**), or 10 percent (*) level.

that our results are not driven by observable differences in the characteristics of firms run by women and those run by men.

The Impact of CEO Age on Earnings Management

The results presented in Table 4 are consistent with reduced CEO engagement in earnings management as CEOs age (column 1). These findings, generated from a sample of private SMEs, are in line with those obtained by Huang, Rose-Green, and Lee (2012) for public companies. Moreover, they suggest that younger CEOs report lower earnings quality, which is consistent with the willingness of young leaders to signal their ability using more aggressive accounting practices (managerial signaling hypothesis).

This result raises a methodological concern. If we assume that CEO age is not randomly distributed across gender, with (for example) female CEOs being over-represented in top age deciles, a positive correlation between female CEOs and earnings quality might then be spurious to the extent that it could capture an “age effect” rather than a “gender effect.” In other words, we must check whether our findings relative to gender are robust to the inclusion of age as another control variable (and vice versa). When including gender in the regressions (columns 2 and 3), we observe that both age and gender have a negative impact on abnormal accruals. The negative effect of gender on the decision to engage in earnings management is thus robust to the inclusion of age as an additional demographic control variable.

To further investigate the potentially moderating role of age, we include an interaction term between our demographic variables. For simplicity’s sake, we create binary variables (*Mid. age CEO* and *Old CEO*) that correspond to terciles of the *CEO age* variable and interact them with our indicator variable for gender (*Woman*). Our models are estimated using discretionary accruals that are derived from the modified Jones model (column 4) and Kothari, Leone, and Wasley’s (2005) equation (column 5) as dependent variables. First, we observe that the results closely parallel earlier findings, as the coefficient on *Old CEO* is negative and significant, whereas that on *Mid. age CEO* is not. We note that the interaction term *Woman * Old CEO* has a negative coefficient that is significant only in column (5), which suggests that CEO age magnifies the negative influence of women

CEOs on earnings management and supports H2. We also provide further evidence on the age/gender interaction in columns (6) and (7), in which we focus on the youngest (first age quartile) and oldest (fourth age quartile) CEOs, respectively. A more precise and confirmatory pattern emerges from the results: gender-based differences in earnings management appear for only the fourth age quartile, that is, the sensitivity of abnormal accruals to gender is higher in SMEs that are led by an old CEO. This result corroborates H2 as it demonstrates that the gender effect is of paramount importance for those firms that are led by an old CEO. Conversely, for the youngest CEOs, we do not find any support for a gender-based difference in earnings management.

Discussion

Overview

This study provides a first analysis of the impact of CEO demographics on the magnitude of earnings management for private SMEs. Using a 2012 sample of 30,476 French private companies, we show that regardless of the accrual model, firms run by female CEOs significantly engage in less earnings management than do firms run by male CEOs. We also highlight a more general effect of the feminization of the executive committee on earnings quality. In investigating the influence of CEO age, we first observe that it is negatively correlated with the magnitude of accruals. Moreover, both CEO age and gender appear as significant determinants of the propensity to engage in earnings management. A deeper analysis of age-gender interactions yields certain notable findings: in particular, although older female CEOs have a significantly lower propensity to manage earnings than their male counterparts, the accounting behavior of younger male and female CEOs appears to be more homogenous.

We complement the existing evidence of the impact of top management demographics on earnings management. The closest papers are Barua et al. (2010) and Liu, Wei, and Xie (2016), which rely on U.S. and Chinese public companies, respectively, and show that firms with female CFOs report lower discretionary accruals. Their research setting is relevant to the extent that CFOs’ risk preferences (more than those of CEOs) have been shown to affect decisions concerning accruals in listed firms (Chava and Purnanandam 2010). The distinctive features of our

Table 4
Female CEOs, CEO Age, and Earnings Management

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent Variable	DA_MJ	DA_MJ	DA_MJ	DA_MJ	DA_K	DA_MJ	DA_MJ
Sample	Full Sample	Full Sample	Full Sample	Full Sample	Full Sample	First Age Quartile	Fourth Age Quartile
Ln(CEO age)	-0.013*** (-3.76)	-0.013*** (-3.91)	-0.008** (-2.40)			-0.003 (-0.21)	-0.034** (-2.36)
Woman		-0.009*** (-4.44)	-0.008*** (-3.83)	-0.007** (-2.18)	-0.007** (-2.14)	-0.005 (-1.36)	-0.013*** (-3.23)
Mid. Age CEO				-0.002 (-1.24)	-0.002 (-1.19)		
Old CEO				-0.003** (-2.02)	-0.003* (-1.81)		
Woman * Mid. Age CEO				0.003 (0.68)	0.004 (0.70)		
Woman * Old CEO				-0.006 (-1.23)	-0.008* (-1.71)		
Log(Assets)			0.001 (0.37)	0.001 (0.34)	-0.001 (-0.44)	0.011** (2.49)	-0.008** (-2.21)
Leverage			-0.005 (-0.98)	-0.005 (-0.99)	-0.004 (-0.78)	-0.010 (-0.96)	-0.001 (-0.05)
PPE			-0.017*** (-9.03)	-0.017*** (-9.04)	-0.018*** (-9.78)	-0.014*** (-3.38)	-0.018*** (-5.28)
Growth			0.019*** (2.86)	0.020*** (2.88)	0.019*** (3.06)	0.016 (1.24)	0.016 (1.18)
% Loss			0.028*** (7.27)	0.028*** (7.28)	0.024*** (6.37)	0.036*** (4.38)	0.017** (2.24)
Std_ROA			0.562*** (22.84)	0.561*** (22.82)	0.533*** (22.50)	0.556*** (11.92)	0.586*** (10.84)
Score_decile			-0.001*** (-4.31)	-0.001*** (-4.31)	-0.001*** (-3.18)	-0.001 (-1.43)	-0.001** (-2.43)
Industry Dummies	Y	Y	Y	Y	Y	Y	Y
Constant	0.133*** (9.57)	0.136*** (9.78)	0.101*** (6.78)	0.072*** (8.39)	0.077*** (9.21)	0.025 (0.53)	0.237*** (3.96)
Observations	27,016	27,016	27,016	27,016	27,016	6,764	6,751
R ²	0.030	0.030	0.101	0.101	0.095	0.114	0.118
Adjusted R ²	0.028	0.028	0.099	0.099	0.093	0.106	0.110

The sample consists of 30,476 French SMEs for the year 2012. The reduced number of observations is due to missing data about CEO age. In columns (6) and (7), the focus is on firms that are run by the youngest (first age quartile) and the oldest (fourth age quartile) CEOs. Variable definitions are provided in Appendix B. Industry dummies (based on 2-digit NACE codes) are included in the regressions, but their coefficients are not reported. The t-statistics based on standard errors adjusted for heteroskedasticity are in parentheses. Asterisks indicate statistical significance at the 1 percent (***), 5 percent (**), or 10 percent (*) level.

work are (1) an examination of the CEO's (rather than of the CFO's) gender and (2) a focus on private SMEs. Whereas public and private firms have different incentives to manage earnings, our study interestingly suggests that the economic magnitude of the gender effect appears similar in both subpopulations. We indeed note that having a female CEO induces a 0.008 decrease in discretionary accruals or a decrease of more than 8.5 percent (12.9 percent) in the average (median) value (see above). These figures are similar to those found in Liu, Wei, and Xie (2016) and in Barua et al. (2010), who report a 12.5 percent decrease in the average value of discretionary accruals for U.S. listed firms with a female CFO.¹⁰ Whereas previous studies investigate a CFO gender effect, our results suggest that private firms' CEOs are key actors in producing accounting information. This finding is consistent with the peculiar role of CEOs in SMEs: because they are not strongly monitored by a board of directors and have an undiversified portfolio, they face idiosyncratic incentives to manage earnings.

Finally, we bring into question the generalizability of our research findings. At first glance, the issue of France's "uniqueness" arises. The typical French institutional framework (which strongly relies on both bank financing and on specific accounting standards) might generate specific attitudes toward earnings management. However, it must be noted that France does not appear as an outlier in this regard. Indeed, Burgstahler, Hail, and Leuz (2006) examine the levels of private firms' earnings management in a cross-country study (13 European Union countries) and conclude that French firms do not behave differently from their European counterparts. We also note that Faccio, Marchica, and Mura (2016) rely on a European cross-country sample and conclude that gender has a moderating effect on corporate risk-taking. We are thus confident that our results are not solely attributable to a specific institutional setting.

Limitations and Extensions

Our empirical analysis fortifies the hypothesis that gender and age affect earnings quality. We recognize that several cautionary notes pertaining to our research design and methodology might be raised. Addressing those issues that are listed in this section might be a potentially

fruitful direction for purposes of enhancing our understanding regarding why CEO demographics affect earnings management and corporate risk-taking, more generally.

In this paper, we use the value of discretionary accruals as the proxy for earnings quality. This is one measure among many reviewed by Dechow, Ge, and Schrand (2010), who assess the state of the literature and conclude that "there is no measure for earnings quality that is superior for all decision models" (p. 345). Clearly, our focus on private SMEs leads us to eliminate certain measures, such as those that assess investor responsiveness to earnings and those that capture an opportunistic willingness to beat analysts' forecasts. Beyond accrual-based earnings management, SMEs can also engage in real activities manipulation. According to Zang (2012, p. 676), this latter is "achieved by changing the accounting methods or estimates used when presenting a given transaction in the financial statements." Our research design focuses on accrual-based earnings management, and we thus do not assess the magnitude of real activities management in French SMEs. This is a promising avenue for future work. More generally, further research is needed to determine the extent to which a given earnings quality proxy is relevant to a given research design. Nonetheless, to the best of our knowledge, there is no paper that compares earnings quality indicators in the context of SMEs.

As emphasized by Coles, Lemmon, and Meschke (2012, p. 150), "endogeneity and causation problems [...] commonly plague empirical corporate finance." We recognize that our empirical approach may be susceptible to an omitted variable problem; CEO demographics may be highly correlated with an unobserved/unobservable variable that strongly affects financial reporting. For example, it might be worth controlling for CEO education (McDaniel, Martin, and Maines 2002), but this variable is not available from our data sources. Collecting fine-grained data (perhaps through a survey) would strengthen our understanding of CEO effects and thus mitigate endogeneity concerns. The use of panel data sets is often analyzed as a means of addressing omitted variable bias: under the assumption that omitted variables do not vary over time, the inclusion of firm-fixed effects allows controlling for unobservable firm-

¹⁰We are grateful to Abhijit Barua for providing us with these figures.

specific characteristics. Unfortunately, we cannot use this technique because our study relies on a one-year cross-sectional sample, and we lack historical data concerning CEO demographics. Consequently, examining longitudinal panel data sets would be a fruitful extension of the present work; moreover, such use might allow for an investigation of changes in earnings quality around CEO transition (in the spirit of Francis et al. 2015).

We also acknowledge that women might choose to self-select among firms with low potential for earnings manipulation. We have partially addressed this issue through a matching procedure (see above) that generates a control sample of male-run firms that have *observable* characteristics similar to those of female-run companies. Because these samples differ only along one dimension (the CEO gender), this procedure allows us to isolate any gender effect. Self-selection might also arise from *unobservable* CEO and firm characteristics. Following Faccio, Marchica, and Mura (2016), we address this concern with a variation of the Heckman (1979) two-step procedure.¹¹ Unreported tests (available upon request) show that our results are robust to controlling for self-selection.

Implications

Our paper contributes to the literature that relates CEO personal risk aversion to corporate financial decision-making. A key issue in this research area is to find a relevant explanatory variable. Piloting small aircrafts (Cain and McKeon 2016), marital status (Roussanov and Savor 2014), personal contributions to the Republican Party (a proxy for conservatism, according to Hutton, Jiang, and Kumar 2014), and early-life exposure to natural disasters (Bernile, Bhagwat, and Rau 2017) have been used to elicit attitudes toward risk. Although admittedly good proxies for risk aversion, such sophisticated measures are difficult to collect, and their use generates significant data losses.¹² The advantage of CEO demographic variables is that they are directly observable. It is notable

that in the above-mentioned studies, age or gender remain significant when estimating firm risk, with significant interaction effects. For example, Roussanov and Savor (2014) observe that the impact of marital status is not as important for older CEOs. In a nutshell, our study (as others) suggests that researchers interested in whether CEO traits affect corporate policies must consider the simplest demographic variables (namely, age and gender).

Our results have important implications for practitioners and particularly for bankers. Several studies in finance show that access to credit is more difficult for female-run firms and that such firms pay higher interest rates. As Alesina, Lotti, and Mistrulli (2013) emphasize, this finding would be relevant if women were riskier borrowers. However, their empirical study shows that this obvious explanation is not valid insofar as women-led businesses are less likely to experience bankruptcy. Thus, a puzzle remains as to why bankers are cautious toward women entrepreneurs. Our paper also questions this puzzling discrimination, as it clearly shows that earnings quality is higher for women-run firms than for male-run firms. Thus, women experiencing difficulty accessing credit cannot be explained by a greater propensity to manipulate earnings. The paper by Garcia-Teruel, Martinez-Solano, and Sanchez-Ballesta (2014) suggests that higher earnings quality reduces information asymmetries with bankers, which in turn favors access to bank loans. The more reliable accounting information provided by women CEOs should encourage bankers to recognize their benefit and reward them with more credit and more favorable loan terms.

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¹¹In the first stage, we estimate a Probit model predicting whether the firm is run by a woman. In the second step, we re-estimate our regressions with the inverse Mills ratio (that is generated from the first-stage regression) as an additional explanatory variable. A detailed description of this empirical approach is available upon request.

¹²For example, Bernile, Bhagwat, and Rau (2017) use a sample of S&P 1500 firms over the 1992–2012 period. There are 6,804 CEOs in their initial database, but relevant and reliable information is available only for 31 percent of the sample.

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Appendix A

Discretionary Accrual Models

We derive the value of abnormal accruals from four widely used models.

First, we rely on the Jones model (1991) and estimate equation (A1):

$$\frac{Accruals_{i,t}}{Assets_{i,t-1}} = \alpha_0 \frac{1}{Assets_{i,t-1}} + \alpha_1 \frac{\Delta Sales_{i,t}}{Assets_{i,t-1}} + \alpha_2 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t} \quad (A1)$$

For a given firm i , $Accruals_{i,t}$ is computed as net income minus cash flow from operations in year t ; $\Delta Sales_{i,t}$ refers to the change in net sales between $t - 1$ and t ; and $PPE_{i,t}$ refers to gross property, plant, and equipment in year t . These variables are scaled by the lagged value of total assets ($Assets_{i,t-1}$). The parameters of equation (A1) are estimated for each industry group using the 2-digit NACE code, which identifies the major industry groups in the European classification, conditional on the availability of sufficient observations for each industry group. A minimum of 20 observations is generally required (see, e.g., Hope, Thomas, and Vyas 2013). In our sample, the smallest number of observations is 56. To control for the possible effect of outliers, all variables are winsorized at 1 percent and 99 percent. Discretionary accruals are the residuals $\varepsilon_{i,t}$ from these cross-sectional industry regressions.

Second, we rely on the modified Jones model proposed by Dechow, Sloan, and Sweeney (1995) (see equation (A2)). This model is based on the reasoning that earnings can be managed by exercising discretion over the recognition of sales. To take into account this possibility, the change in net sales is adjusted by the change in receivables between $t - 1$ and t ($\Delta Receivables_{i,t}$ in equation (A2)).

$$\frac{Accruals_{i,t}}{Assets_{i,t-1}} = \alpha_0 \frac{1}{Assets_{i,t-1}} + \alpha_1 \frac{\Delta Sales_{i,t} - \Delta Receivables_{i,t}}{Assets_{i,t-1}} + \alpha_2 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \varepsilon_{i,t} \quad (A2)$$

Finally, we use two models developed by Kothari, Leone, and Wasley (2005) that are based on the intuition that accruals correlate with firm performance (see equation (A3)). Kothari, Leone, and Wasley (2005) argue that previous models (equations (A1) and (A2)) may be misspecified when applied to firms with extreme performance because performance and estimated discretionary accruals exhibit a mechanical relationship. We thus augment previous models with return on assets for year $t - 1$, computed as the ratio of operating income to total assets for year $t - 1$ (see equation (A3)).

$$\frac{Accruals_{i,t}}{Assets_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{i,t-1}} + \alpha_2 \frac{\Delta Sales_{i,t} - \Delta Receivables_{i,t}}{Assets_{i,t-1}} + \alpha_3 \frac{PPE_{i,t}}{Assets_{i,t-1}} + \alpha_4 \frac{Operating\ income_{i,t-1}}{Assets_{i,t-1}} + \varepsilon_{i,t} \quad (A3)$$

In the spirit of Kothari, Leone, and Wasley (2005), we also adjust accruals for firm performance through a matching procedure. The matching criterion is the lagged value of the return on assets ($ROA_{i,t-1}$). For each industry, we rank the firms into 10 performance groups. For a given firm, discretionary accruals are computed as the difference between its discretionary accruals (generated from the modified Jones model) and the median value of discretionary accruals for firms in the same industry and ROA decile. The median value is computed by excluding the particular sample firm.

Appendix B

Variable Index: Definitions

Variable	Definition
DA_J	Absolute value of discretionary accruals, computed with Jones' (1991) methodology.
DA_MJ	Absolute value of discretionary accruals, computed with a modified Jones model (see Dechow, Sloan, and Sweeney 1995).
DA_K	Absolute value of discretionary accruals, computed following Kothari, Leone, and Wasley (2005).
DA_PM	Absolute value of performance-matched discretionary accruals, computed as the difference between DA_MJ and the median value for DA_MJ in the firm's performance decile.
Woman	Binary variable, set equal to one for companies run by female CEOs, and 0 otherwise.
Woman Ex.Com.	Binary variable, set equal to one if there is at least one woman in the executive committee, and 0 otherwise.
Female%Ex.Com.	Percentage of top management positions that are occupied by women.
Assets	Total assets (in thousands euro). Winsorized at 0.01 and 0.99.
Log(Assets)	Logarithm of total assets. Winsorized at 0.01 and 0.99.
Leverage	Financial leverage, measured as the ratio of financial debts to total assets. Winsorized at 0.01 and 0.99.
PPE	Ratio of property, plants, and equipment to total assets. Winsorized at 0.01 and 0.99.
Growth	The average value of one-year sales growth, computed over a three-year (2010–2012) period. Winsorized at 0.01 and 0.99.

(Continued)

Appendix B (Continued)

Variable	Definition
% Loss	Cumulative percentage of years the firm reported a loss, calculated over a five-year (2008–2012) period.
Std_ROA	Standard deviation of return on assets over a five-year (2008–2012) period. The return on assets is equal to operating income over total assets. Winsorized at 0.01 and 0.99.
Score	A score computed following Conan and Holder's (1979) discriminant analysis model. This model was developed by Banque de France to detect default risk.
Score_decile	Conan and Holder (1979) score, ranked in deciles.
CEO Age	CEO age (in years). Winsorized at 0.01 and 0.99.
Ln(CEO Age)	The natural logarithm of CEO age. Winsorized at 0.01 and 0.99.
Mid. Age CEO	A binary variable that is equal to 1 when CEO age belongs to the second tercile, and zero otherwise.
Old CEO	A binary variable that is equal to 1 when CEO age belongs to the third tercile, and zero otherwise.
Industry Dummies	Indicator variables, based on the 2-digit European Union industry classification (NACE).