Managerial Ability And The Effectiveness Of Internal Control Over Financial Reporting

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ABSTRACT[1]

Able managers are considered more likely to produce high quality earnings, as suggested by earlier studies in related fields. Considering a positive association between earnings quality and effectiveness of internal control over financial reporting, I investigate the association between the latter, and managerial ability. As a result, I find that managerial ability is negatively associated with the existence of material weakness(es) in internal control over financial reporting. This result suggests that able managers are more likely to establish and maintain effective internal control over financial reporting, which helps them better monitor their firms' financial reporting.

Keywords: Managerial Ability; Material Weaknesses; SOX 404

INTRODUCTION

In this paper, I investigate the relation between managerial ability and internal control weakness (ICW) over internal control over financial reporting (ICFR).[2] A recent study by Demerjian et al. (2012) introduces a new proxy for managerial ability, which is measured as managers' contribution to the achieved firm efficiency. Using this measurement of managerial ability, another recent study by Demerjian et al. (2013) provides evidence that managerial ability is positively associated with earnings quality, resulting in lower incidence of subsequent restatements, and earnings and accruals persistence, suggesting that able managers including Chief Executive Officers (CEOs) and Chief Financial Officers (CFOs) can positively influence financial reporting quality.

In addition to managerial ability, effective internal control is another significant factor that affects financial reporting quality. While the management is required to establish and maintain effective ICFR, I expect that able managers are likely to have a greater demand for effective ICFR, to monitor the financial reporting quality of their respective firms better. Accordingly, Demerjian et al. (2013) suggest that future research investigate the association between managerial ability and internal control quality. In this study, by extending the study of Demerjian et al. (2013), I examine how managerial ability affects the effectiveness of ICFR, and specifically test for the association between the two variables using ICFR disclosures under Section 404(b) of the Sarbanes-Oxley Act of 2002 (SOX 404). I find that managerial ability is significantly, and negatively associated with the existence of material weakness(es). When a positive association between earnings quality and managerial ability, or between earnings quality and effectiveness of ICFR is expected, my finding suggests that able managers are more likely to establish and maintain effective ICFR, which helps them better monitor their firms' financial reporting.

[1] Data Availability: The data used in this study are available from public sources.

[2] Auditing Standard (AS) No. 5 describes the importance of effective internal control over financial reporting as follows: "Effective internal control over financial reporting provides reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes. If one or more material weaknesses exist, the company's internal control over financial reporting cannot be considered effective." Thus, In this study, I focus on a material weakness(es) disclosed in compliance with Section 404(b). AS No. 5 defines "material weakness" as a "deficiency, or a combination of deficiencies, in internal control over financial reporting, such that there is a reasonable possibility that a material misstatement of the company's annual or interim financial statements will not be prevented or detected on a timely basis."

My study contributes to the relevant literature on both internal control and managerial ability. While it is well perceived that under SOX 404, management is instrumental in establishing and maintaining effective ICFR, there is, however, little archival research on the subject. My study provides empirical evidence that managerial ability is positively associated with the effectiveness of ICFR, suggesting that able managers are more likely to have great demand for an effective ICFR. In addition, my study suggests that for the study of corporate policy, personal characteristics of management such as managerial ability are critical factors that will be utilized in the future.

This paper is organized as follows. Section 2 provides a literature review, and hypothesis development. Section 3 describes the research design and empirical model. Section 4 presents the sample and data. Section 5 documents the empirical results, and the summary and conclusion are presented in the last section.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

As suggested by Peter Drucker, "The productivity of work is not the responsibility of the worker but of the manager," it can therefore be implied that managers are central to a firm's business activities. Their primary objective is to obtain a maximum output from minimum inputs (i.e., firm efficiency). Accordingly, managers' ability can be measured by firm efficiency, which is defined as the maximum revenue obtained with minimum resources (Demerjian et al. 2012). Prior literature primarily focuses on the relation between managerial ability and firm performance. Chemmanur and Paeglis (2005) find a positive association between managerial quality and initial public offering (IPO) characteristics, and post-IPO firm performance. Additionally, Chemmanur et al. (2010) find under seasoned equity offerings (SEOs) that SEOs' performance is positively associated with managerial quality. Bertrand and Schoar (2003) provide evidence that top executives play a critical role in making several corporate policy decisions such as acquisition or diversification, and dividend policy. In addition, the recent study by Demerjian et al. (2013) reported that managerial ability positively affects earnings quality such as lower incidence of subsequent restatements, and earnings and accruals persistence.

In the literature pertaining to internal control effectiveness, there is more emphasis on the (financial) characteristics of firms with ICW, and its impact on financial reporting quality. First, with regard to the characteristics of firms disclosing ICWs, the related studies provide evidence that firms with complex business, higher accounting risk, financial distress, auditor change are more likely to have ICWs (e.g., Ge and McVay, 2005; Ashbaugh-Skife et al., 2007; Doyle et al., 2007a; Ogneva et al., 2007; Bedard et al., 2009). Firm size, profitability, or firm age is negatively associated with the existence of ICWs (e.g., Ge and McVay, 2005; Ashbaugh-Skife et al., 2007; Doyle et al., 2007a; Ogneva et al., 2007). For example, Ashbaugh-Skaife et al. (2007) report using disclosures under SOX Section 302 that internal control deficiencies are positively correlated with operational complexity, recent restructuring, accounting risk, and auditor resignations, and negatively associated with firm size. Secondly, the relevant studies reveal that internal control weakness is negatively associated with financial reporting quality such as discretionary accruals, accruals quality, or cost of equity. For instance, Doyle et al. (2007b) and Ogneva et al. (2007b) document that firms with ICWs over financial reporting are more likely to have higher discretionary accruals. Doyle et al. (2007b) report that firms with material weaknesses over ICFR have lower accruals quality or cash flow predictability or earnings persistence. Further, Beneish et al. (2008), and Hammersley et al. (2008) show that the markets negatively react to the disclosure of ICWs under SOX Sections 302 or 404. Further, Ashbaugh-Skife et al. (2009) show that firms with ICWs over ICFR are more likely to have higher cost of equity. Feng et al. (2009) report using internal control disclosures under Section 404 that firms with material weaknesses are more likely to have less accurate management forecasts. Related to the association of managerial ability and internal control quality, Li (2015) shows a positive relation between them using Chinese firms.

The literature mentioned above suggests that managerial ability is one of the most important factors affecting firm performance or earnings quality. Effective internal control is also a key factor affecting financial reporting quality. In this study, I argue that both capable and incapable managers have a demand for effective ICFR for different reasons. While the former's incentive for effective internal control could be the enhancement of their monitoring function on financial reporting, the latter may require it to support a lack of their monitoring ability. Further, both of them may be neutral to ICFR effectiveness. Based on the discussion above, I do not take a specific direction on the relation between managerial ability and internal control weakness. Therefore, I hypothesize (at the null form):

Hypothesis: There is no association between managerial ability and effective internal control over financial reporting.

RESEARCH DESIGN

To test the hypothesis of the impact of managerial ability on the existence of material weakness, I use the following logit model.

$$ICW_{it}=\beta_0+\beta_1*Managerial\_Ability_{it}+\beta_2*InvRec_{it}+\beta_3*Num\_Segment_{it}+\beta_4*Foreign\_OP_{it} +\beta_5*M\&A_{it}+\beta_6*Restructure_{it}+\beta_7*Salesgrowth_{it}+\beta_8*Size_{it}+\beta_9*Loss_{it}+\beta_{10}*Bankz_{it} +\beta_{11}*Restatement_{it}+\beta_{12}*Big4_{it}+\beta_{13}*Litigation\ risk_{it}+\beta_{14}*Age_{it}+\beta_{15}*Auditor\_Resign_{it} +Ind\_dummies+Year\_dummies+\varepsilon_{it} \quad \text{Eq (1)}$$

See APPENDIX for definitions of the variables.

In the empirical model above, dependent variable is *ICW*, which is coded one if a firm discloses material weakness(es) under SOX Section 404(b), and zero otherwise. *Managerial_Ability* is the variable used in Demerjian et al. (2012),[3] and its measurement procedures are well documented in the same study. First, firm efficiency and then managerial ability are measured using Data Envelopment Analysis (DEA). Managerial ability is measured as residuals from the second-stage model, representing managers' contribution to the achieved firm efficiency. In this study, I use decile ranks (by year, and Fama-French industry classification) of the residuals from the second-stage model as dependent variables. The values of decile ranks range from 0.1 to 1.0, with a larger value depicting higher managerial ability. Thus, if able managers are more likely to establish and maintain effective ICFR, I expect the coefficient of *Managerial_Ability* to be negative in the empirical model above. Next, following prior literature (e.g., Ashbaugh-Skaife et al. 2007; Doyle et al., 2007a), I control for the factors affecting the existence of ICWs, and the incentives to discover and report them. Prior studies document that accounting risk, business complexity, merger & acquisition, or restructuring is positively associated with the existence of ICWs. Thus, I control for a portion of inventory and accounts receivable to total assets (*InvRec*) for accounting risk, the number of business segments (*Num_Segment*) and the existence of foreign operation(s) (*Foreign_OP*) for business complexity, the activities of mergers and acquisitions (*M&A*), recent organizational restructure (*Restructure*). Also, it is known that rapid growth (firm size) are positively (negatively) associated with the presence of ICWs, thus control for *Salesgrowth (Size)*, respectively. It is documented that firms with higher profitability, financial distress, less firm age, financial statements restatement, or auditor resignation are more likely to have ICWs. Thus, I include firm losses (*Loss*), financial stability (*Bankz*), firm age (*Age*), restatement of previously reported financial statements (*Restatement*) and auditor resignation (*Auditor_Resign*) as control variables. Next, I control for external auditor (*Big4*) and litigation risk (*Litigation risk*). Lastly, industry and year dummies are included to control for industry and year fixed effects.

SAMPLE AND DATA

Table 1 shows the sample selection procedures. Initially, 32,503 firm-year observations were identified from the disclosures under SOX Section 404(b). Then, the ICW data was merged with managerial ability and financial data. Subsequently, 14,602 firm-year observations with missing values and within SIC 6000-6999 (i.e., financial institutions) were deleted. After the sample procedures, a final sample of 17,901 firm-year observations was obtained, which comprised 1,439 (16,462) firm-year observations that (did not) disclosed material weakness(es) under SOX Section 404(b). Data for ICW, auditor, auditor change and financial variables was collected from the Audit Analytics database and the Compustat database, respectively, from 2004-2011.[4]

[3] Data is publicly available at http://faculty.washington.edu/smcvay/abilitydata.html.

[4] In this study, the sample period begins in 2004 because SOX Section 404 has been effective for accelerated filers from the fiscal year beginning on or after November 15, 2004. Also, the sample period ends in fiscal year 2011 due to availability of the managerial ability data. See footnote 2.

Table 1. Sample Selection Procedure

Description	Sample
Firms with an audit opinion on the effectiveness of internal control over financial reporting under SOX Section 404(b) during the fiscal years between beginning on or after 11/15/2004 and ending on or before 12/31/2011, which are obtained from Audit Analytics	32,503
Firms with missing Managerial Ability, auditor, auditor change, or financial variables; Excluding financial institutions (SIC 6000-6999)	(14,602)
Final Sample	17,901
ICW firms	1,439
No ICW firms	16,462

EMPIRICAL RESULTS

Univariate Analysis

Table 2 reports the mean and median differences of all the independent variables used in the empirical model between firms that (did not) disclose material weaknesses over ICFR under SOX Section 404(b). As shown in columns 2, 3, and 6 in Table 1, the mean (0.48) of *Managerial_Ability* for firms with material weakness over ICFR is less than that 0.50 of firms without material weakness over ICFR, and the mean difference is significant at the 1 percent level (t-statistics =-8.61), suggesting that firms operated by able managers are less likely to have ineffective ICFRs. As expected, firms with more inventories and accounts receivable (*Invrec*), recent organizational restructure (*Restructure*), smaller firm size (*Size*), net loss (*Loss*), higher financial risk (*bankz*), restatement of previously reported financial statements (*Restatement*), and higher litigation risk (*Litigation*) are more likely to have ICW over financial reporting. Unexpectedly, *Num_Segment, M&A,* and *Big4* are negative and significant at the 1 or 5 percent level. *Foreign_Op* and *Salesgrowth* also have unexpected (negative), but insignificant signs. The results of the median difference test are presented in columns 4, 5, and 7 in Table 2, and are similar to those from the mean difference test, except for *Num_Segment*, which is not significant.

Table 2. Univariate Analysis: Internal Control Weaknesses and their Economic Determinants

	Mean		**Median**		**Mean Difference**	**Median Difference**
	ICW=1	*ICW=0*	*ICW=1*	*ICW=0*	t-statistics	z-statistics
Managerial_Ability	0.48	0.55	0.50	0.55	-8.61***	-8.63***
Control Variable:						
InvRec	0.23	0.22	0.20	0.19	2.98***	2.20**
Num_Segment	2.28	2.38	1	1	-2.23**	-1.57
Foreign_OP	0.54	0.54	1	1	-0.45	-0.45
M&A	0.09	0.13	0	0	-4.78***	-4.20***
Restructure	0.36	0.33	0	0	2.27**	2.27***
Sales_growth	0.43	1.04	0.10	0.10	-0.83	-0.59
Size	6.00	6.69	5.86	6.54	-15.97***	-14.03***
Loss	0.47	0.28	0	0	13.95***	15.12***
Bankz	-1.73	-2.26	-2.27	-2.55	5.36***	6.60***
Restatement	0.17	0.10	0	0	7.04***	8.56***
Big4	0.73	0.86	1	1	-10.68***	-13.00***
Litigation risk	0.42	0.39	0	0	2.21**	2.21**
Age	17.32	20.47	13.00	15.00	8.77***	8.47***
Auditor_Resign	0.06	0.01	0	0	7.83***	16.06***
No. of observations	1,439	16,462	1,439	16,462		

***/**/* Significant at or below the 0.01/0.05/0.1 level (two-tailed).
Refer to APPENDIX for variable definitions.

Table 3 presents the correlations between all the variables used in the empirical model. As shown in Table 3, ICW and managerial ability are negatively correlated at the 1 percent level, which provides a preliminary evidence that able managers are more likely to establish, and maintain effective ICFRs. Consistent with the results in Table 1 (univariate analysis), *ICW* is significantly, and positively correlated with *InvRec, Restructure, Bankz,*

Restatement, and *Auditor_Resign* and negatively with *Size*. All the correlations between independent variables are below 0.40.

Table 3. Correlation Matrix for Variables used in the ICW Model

Variable	*Managerial_ Ability*	*InvRec*	*Restructure*	*Sales growth*	*Size*	*Bankz*	*Restatement*	*Big 4*	*Auditor Resign*
ICW	-0.06 (<0.01)	0.02 (<0.01)	0.02 (0.02)	-0.00 (0.80)	-0.10 (<0.01)	0.06 (<0.01)	0.06 (<0.01)	-0.10 (<0.01)	0.12 (<0.01)
Managerial_ Ability		0.18 (<0.01)	-0.08 (<0.01)	-0.00 (0.81)	0.10 (<0.01)	-0.12 (<0.01)	-0.02 (<0.01)	0.03 (<0.01)	-0.01 (0.06)
InvRec			0.06 (<0.01)	-0.01 (0.18)	-0.04 (<0.01)	-0.06 (<0.01)	0.02 (0.04)	-0.03 (<0.01)	0.02 (0.03)
Restructure				-0.01 (0.37)	0.20 (<0.01)	0.12 (<0.01)	-0.00 (0.84)	0.12 (<0.01)	-0.02 (<0.01)
Salesgrowth					-0.02 (0.01)	0.00 (0.55)	-0.00 (0.76)	-0.02 (0.01)	-0.00 (0.93)
Size						-0.01 (0.46)	-0.06 (<0.01)	0.36 (<0.01)	-0.07 (<0.01)
Bankz							-0.00 (0.75)	0.01 (0.23)	0.01 (0.05)
Restatement								-0.02 (0.04)	0.02 (0.03)

Note: The table reports Pearson correlations. P-values appear in parentheses.
Refer to Table 2 for variable definitions.

Multivariate Analysis

Table 4 presents the results of the logistic regression to test the relation between managerial ability and ICW. The dependent variable, *Managerial_Ability* is the decile rank, with a higher rank (i.e., greater value) representing greater managerial ability. Columns 3 and 4 in Table 3 report the logistic regression results of the relation between managerial ability and ICFR effectiveness, after controlling for factors affecting ICW over ICFR. According to the results, the coefficient (-0.48) of *Managerial_Ability*, a test variable, is negative and significant at the 1 percent level (t-statistic =-4.39), suggesting that firms with able managers are more likely to have effective ICFRs.[5]

[5] Contrary to prior literature (e.g., Ashbaugh-Skife et al. 2007), *M&A* and *Big4* have unexpected signs. Thus, as a sensitivity analysis, I dropped the two variables and then re-estimate the coefficients in Eq.(1). I consistently find that the coefficient of *Managerial Ability* is significantly negative at the 1 percent level.

Table 4. Results of Logistic Regression of the Effect of Managerial Ability on Internal Control Weakness

		DV=*ICW*	
Variable	**Exp. Sign**	**Coefficients**	**t-statistics**
Intercept	?	-1.47***	-8.71
Managerial_Ability	?	-0.48***	-4.39
InvRec	+	0.86***	4.53
Num_Segment	+	0.08***	3.85
Foreign_OP	+	0.27***	4.21
M&A	+	-0.19*	-1.90
Restructure	+	0.20***	3.00
Salesgrowth	+	-0.00	-0.22
Size	-	-0.12***	-5.00
Loss	+	0.61***	8.95
Bankz	+	0.03***	3.32
Restatement	+	0.48***	6.02
Big4	+	-0.56***	-7.39
Litigation risk	+	0.01	0.10
Age	-	-0.01***	-5.30
Auditor_Resign	+	1.41***	8.87
Ind_dummies		*Included*	
Year_dummies		*Included*	
Max R-Square		11.97%	
Likelihood ratio		942.54***	
Number of observations		17,901	

The dependent variable is *ICW*, which is coded one if a firm discloses a material weakness(es) under SOX Section 404(b), and zero otherwise. *Managerial_Ability* is depicted by decile ranks by Fama-French industry classification and year, which is used in Demerjian et al. (2012). Out of 17,901 firm-year observations, 1,439 (16,462) disclose (no) ICWs under SOX Section 404(b).
***/**/* Significant at or below the 0.01/0.05/0.1 level (two-tailed).
Refer to APPENDIX for variable definitions.

Sensitivity Analyses

Audit quality literature (e.g., Boone *et al*. 2010; Lawrence *et al*. 2011) shows that since 2002, there has been no significant difference in audit quality provided by Big N or Second-tier auditors, which is proxied by discretionary accruals and financial analysts forecasting errors. Second-tier auditors are defined by whether an auditor is annually inspected by PCAOB (Public Company Accounting Oversight Board). The PCAOB inspection rule proscribes that an auditor with more than 100 issuers as audit clients should be annually inspected by PCAOB. Accordingly, there are four second-tier auditors prior to 2009: Grant Thornton LLP, BDO Seidman LLP, Crowe Chizek & Company LLC, McGladrey & Pullen LLP. In 2009, there are five second-tier auditors: Grant Thornton LLP, BDO Seidman LLP, McGladrey & Pullen LLP, Malone &bailey PC (LLP), Crowe Horwath LLP. In 2010, BDO USA LLP is newly added as a second-tier auditor. After replacing *Big4* with Large Auditors, which coded one if a firm's auditor is among Big 4 or Second-tier auditors and zero otherwise, then, I re-estimate Eq. (1). I find, consistent with the result in Table 4, that the coefficient (-0.47, t-statistics = -4.25) of *Managerial Ability* is significantly negative at the 1 percent level. Next, after replacing *Auditor_Resig* with auditor dismissal (*Auditor_Dismissal*) or auditor change (*Auditor_Change*), I re-conducted the regression model in Eq.(1) and consistently find that the coefficient of *Managerial Ability* is significantly negative at the 1 percent level (-0.48, t-statistics = -4.37 and -0.47, t-statistics = -4.27, respectively).

SUMMARY AND CONCLUSION

In this study, I examine the association between managerial ability and the effectiveness of ICFR. I find that managerial ability is significantly, and negatively associated with the disclosure of material weakness(es) in ICFR. When a positive association between earnings quality and managerial ability, or between earnings quality and effectiveness of ICFR is considered, the result suggests that able managers are more likely to establish and maintain effective internal control over financial reporting, which helps them better monitor their firms' financial reporting. My study provides researchers, regulators, and policy makers with evidence that the characteristics of managers

such as managerial ability play a critical role in establishing and maintaining effective ICFR, which is central in producing, and providing more reliable financial information to the markets.

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APPENDIX

Variable		Definition
ICW	=	Coded one if a firm discloses a material weakness(es) under SOX Section 404(b), and zero otherwise.
Managerial_Ability	=	Measured by decile ranks (0.1 to 1.0) by Fama-French industry classification, and year (Demerjian et al. 2012); Larger value of decile ranks represents higher managerial ability.
InvRec	=	The ratio of inventory and accounts receivable to total assets.
Num_Segment	=	The number of business segments.
Foreign_OP	=	Coded one if a firm undertakes a foreign operation, and zero otherwise.
M&A	=	Coded one if a firm is involved in a merger or acquisition, and zero otherwise.
Restructure		Coded one if a firm is involved in a restructuring, and zero otherwise.
Salesgrowth	=	Growth rate in sales, measured as (sales in the current fiscal year - sales in the previous fiscal year)/sales in the previous fiscal year.
Size	=	Natural logarithm of total assets in the current fiscal year.
Loss	=	Coded one if a firm reports net loss for the current fiscal year, and zero otherwise.
Bankz	=	Bankruptcy score (Zmijewski 1984), measured as -4.803-3.599*(net income/total assets)+5.406*(total liabilities/total assets)-0.100*(current assets/current liabilities).
Restatement	=	Coded one if a firm reports that they restated previously issued financial statements in the current fiscal year, and zero otherwise.
Big4	=	Coded one if a firm's auditor is among PWC, EY, Deloitte, or KPMG, and zero otherwise.
Litigation risk	=	Coded one if a firm belongs to a litigious industry—SIC code 2833 to 2836, SIC code 3570 to 3577, SIC code 3600 to 3674, SIC code 5200 to 5961, SIC code 7370 to 7374, or SIC code 8731 to 8734, and zero otherwise.
Age	=	The number of years since firm's incorporation.
Auditor_Resign	=	Coded one if a firm's auditor resigned, and zero otherwise.