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The *JMI* in Brief

Articles

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Articles published in *JMI* have traditionally come from a wide variety of universities and institutions.

The *JMI* in Brief

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ARTICLES

The COVID-19 pandemic and societal mitigation efforts (e.g., mandated quarantine and social distancing) inflicted mental and emotional strain on working parents navigating conflicting demands between the work and non-work interface. This research examines how organizational leaders can help employees cope with the additional stress of the crisis and reduce detrimental outcomes to their careers, families, and organizations. Utilizing stressor-strain theory, this study investigates the relationship between stressors (i.e., work-family conflict and role overload) and strain (i.e., turnover intentions) as a function of a relationally-influenced psychological state (i.e., trust in management) in the context of the COVID-19 crisis. Data analyzed from 393 working adults indicated that trust in management moderated (attenuated) the relationship between role overload and turnover intentions, and the interaction between role overload and trust in management mediated the relationship between work-family conflict and turnover intentions. This moderated-mediation model empirically validates how organizational leaders can help mitigate employee stress induced during crisis situations.
Keywords: Work-Family Conflict, Role Overload, Trust, Turnover Intentions, COVID-19

Prior literature shows that costs decrease relatively less when sales decline than they increase when sales rise by an equivalent amount, i.e., costs are "sticky" (Anderson et al., 2003). Considering firms' limited ability to add resources and managerial risk aversion, this study predicts that costs are sticky not only when sales decline but also when the magnitude of the sales increase is sufficiently large. Consistent with the prediction, empirical results based on a main sample consisting of U.S. public firms and a subsample consisting of S&P 1500 firms show that selling, general, and administrative costs are sticky at both sides of sales change and that the degree of the "upside" cost stickiness is affected by various firm characteristics such as firm size and availability of cash as well as economic condition and managerial compensation.
Keywords: Cost stickiness; Resource investment; Financial constraints; Risk aversion; Risk taking.

The mechanism through which entrepreneurial orientation (EO) impacts firm performance, is a meaningful research avenue yet insufficiently explored. In the previous literature, learning orientation and innovative performance have been considered as a missing link in the examination of the relationship between EO and corporate performance. To address this literature gap, this study aims to investigate how EO influences market performance by outlining the serial mediation of learning orientation and innovative performance. Data were gathered through a questionnaire survey from 259 Tunisian firms in the Information and Communications Technology sector (ICT). The data analysis follows a two-step procedure: Confirmatory Factor Analysis and Structural Equation Modeling. To confirm significance of the mediating effects, bootstrapping analysis was conducted using the method of Preacher and Hayes (2008). The main result shows that entrepreneurial orientation impacts market performance via a causal chain including learning orientation and innovative performance. This study provides IT managers with practical insights about the effect of EO as a strategy to achieving higher levels of market performance. This research contributes to a better understanding of SMEs' performance drivers. To the best of the author's knowledge, this study is the first to test a serial mediation model in order to investigate the effect of entrepreneurial orientation on market performance in the context of SMEs within an emerging economy.
Keywords: Entrepreneurial Orientation, Learning Orientation, Innovative Performance, Market Performance, Serial Mediation.

Prior research has shown that events that employees believe will impact them negatively lead to employees feeling that their psychological contract with the organization has been breached. This subsequently reduces affective organizational commitment and job satisfaction, while increasing intentions to leave. This model, however, does not sufficiently consider the role and latitude of a direct manager (i.e., supervisor) as the employee's proximal organizational agent. By modeling the effects from varying levels of a direct manager's discretion, as perceived by the employee, knowledge concerning psychological contract breach and its associated outcomes is advanced. To accomplish this, an existing scale was adapted to measure managerial discretion of middle level managers, which was validated using responses from 210 employees across many organizations. Using the new scale, analyses

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The COVID-19 Influence on the Global Business Environment Research

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COVID-19 has profoundly changed day-to-day life and has made a significant impact on the global economy. As of September 24, 2021, the COVID-19 pandemic had infected over 219 million people and caused 4.55 million deaths worldwide (Johns Hopkins University and Medicine, 2021). The pandemic has also brought a change to the business environments, and the way business organizations operate. Many organizations have experienced lockdowns, supply chain breakdowns, and major disruptions to customer service centers (Senawi, Haas, and McDougal, 2021).

The Covid-19 crisis has forced many organizations to rethink their strategies and explore opportunities to improve customer experience. As described in a recent study conducted during November 2020 and June 2021, 135 executives of major call centers in 14 countries indicate that their organizations are focused on providing more agile services, enhancing artificial intelligence capabilities, establishing distributed workplaces, channeling their customers to the right resources, and shifting their orientation from an emphasis on reducing costs toward the goal of generating business and customer value (Deloitte Digital, 2021).

Over the last two years, there has been widespread research on the advancement of business knowledge during the pandemic crisis and lessons learned by practitioners, business executives, and government managers. The research has explored conceptual models for managing business organizations during the pandemic (Mahdi and Nassar, 2021) and case studies and field experiments that describe the best practices of a strategic response to the pandemic (Wirtz *et al.*, 2021). The study of agile organizational structures and business disruptions has been of special interest. See, for example, the paper on agility, adaptability, and alignment by Patrucco and Kähkönen (2021) and the

research on managerial approaches that support business disruptions by Ivanov and Dolgui (2021).

The disruption of supply chains models has also been a constant focus of research during the pandemic. Farooq *et al.* (2021) discuss how supply chain management systems can survive during the global pandemic crisis. The pandemic has also motivated research on the importance of using artificial intelligence (Dubey *et al.*, 2021), the use of data analytics for disaster management (Elsotouhy *et al.*, 2021), and achieving an effective remote workplace environment during the time of crisis (Wang *et al.*, 2021).

Another area of research has been the impact of the COVID-19 crisis on traditional business functions. See, for example, the impact of the pandemic on the role of operations management (Gupta *et al.*, 2021), marketing management (Syaifullah *et al.*, 2021), financial management (Vasileiou, 2021), human resource management (Onwuegbuna *et al.*, 2021), and organizational entrepreneurship and creativity (Thukral, 2021).

The pandemic has also destroyed people's physical and mental health and dramatically changed daily life patterns (Alonzi *et al.*, 2020; Cullen *et al.*, 2020). In this context, We are pleased to introduce the paper entitled "A Moderated-Mediation Model of Work-Family Conflict in the COVID-19 Crisis" by Jack Smothers. The paper explores a unique aspect of the challenges that organizational leaders face during the pandemic: dealing with the mental and emotional stress inflicted on working parents during the crisis. The author uses the stressor-strain theory to investigate the relationship of the work-family conflicts and overloads with turnover intentions as a function of trust in management during the COVID-19 crisis. The study of 393 working adults concludes that trust in management can reduce the degree of the correlation between role overload and turnover intentions. The findings in the paper can empirically demonstrate the role of organizational leaders in mitigating the stress that employees endure during crises such as those created by the pandemic.

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EDITOR'S NOTE: Special Thanks to Guest Editors: We would like to thank the guest editors, Drs. Asllani and Trimi, for giving much of their time and effort to select this special study, "A Moderated-Mediation Model of Work-Family Conflict in the COVID-19 Crisis" by Dr. Smothers.

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A Moderated-Mediation Model of Work-Family Conflict in the COVID-19 Crisis

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Abstract: The COVID-19 pandemic and societal mitigation efforts (e.g., mandated quarantine and social distancing) inflicted mental and emotional strain on working parents navigating conflicting demands between the work and non-work interface. This research examines how organizational leaders can help employees cope with the additional stress of the crisis and reduce detrimental outcomes to their careers, families, and organizations. Utilizing stressor-strain theory, this study investigates the relationship between stressors (i.e., work-family conflict and role overload) and strain (i.e., turnover intentions) as a function of a relationally-influenced psychological state (i.e., trust in management) in the context of the COVID-19 crisis. Data analyzed from 393 working adults indicated that trust in management moderated (attenuated) the relationship between role overload and turnover intentions, and the interaction between role overload and trust in management mediated the relationship between work-family conflict and turnover intentions. This moderated-mediation model empirically validates how organizational leaders can help mitigate employee stress induced during crisis situations.
Keywords: Work-family conflict, Role overload, trust, turnover intentions, COVID-19

The COVID-19 pandemic brought about profound changes to the global workforce which required adaptation in both work and family life (Arruda, 2020). In a short span of time, routine and predictable work environments came to a quarantine-induced halt as working parents began navigating competing demands such as childcare, homeschooling, working from home and/or finding supplemental work to cover reduced income (Beer, 2020; Fisher *et al*., 2020). Not only did the COVID-19 pandemic traumatize the physical health of the global workforce, the resulting shutdowns of government and non-government organizations put mental and emotional strain on

families that will have repercussions for decades to come (Parker *et al*., 2020; Prime *et al*., 2020).

Work and family are two of the most important cornerstones in modern society (French and Allen, 2019) and the COVID-19 crisis impacted both domains substantially (Vaziri *et al*., 2020). As a result, there was increased potential for the demands of the work and family domains to conflict with one another, which is known in organizational research as work-family conflict (Greenhaus and Beutell, 1985). Work-family (WF) conflict has a robust history of empirical investigations which have established the influence of WF conflict on organizational and employee-related outcomes (e.g., Amstad *et al*., 2011; Ford *et al*., 2007; French and Allen, 2019).

The impact of the COVID-19 crisis is likely to have strong and lasting impacts on work and family life in ways that have not yet been fully realized (Vaziri *et al*., 2020). Of particular interest to applied psychologists is how organizations can intervene to reduce the potentially detrimental effects of the crisis on employees and their families. Therefore, the purpose of this research is to investigate the extent to which the relationship between stress-inducing factors (operationalized as work-family conflict and role overload) and experienced strain (operationalized as turnover intentions) is mitigated by a relationally-influenced psychological state (operationalized as trust in management) during a crisis. Identifying intervention strategies is not only beneficial for organizational continuity, but also the mental and emotional well-being of employees (French and Allen, 2019; Vaziri *et al*., 2020).

Based on stressor-strain theory (Frese and Zapf, 1988), this study investigated a moderated-mediation model in which the interaction between role overload and trust in management mediate the relationship between work-family conflict and turnover intentions. The proposed study contributes to the work-family conflict domain in several ways. First, this research clarifies the contextual implications of crisis situations on work-family conflict. As crisis scenarios impact both work and family life (Eby *et al*., 2016), investigating the implications of this contextual influence strengthens extant understanding of the work-family conflict phenomenon.

Second, while the constructs investigated in this study are popular in extant literature (e.g., Liao *et al*., 2019), the proposed moderated-mediation model is conceptually novel and provides a more nuanced understanding of the relationships between the variables in a crisis scenario. The moderating effect of a relationally-influenced psychological state contributes to the work-family conflict research domain by identifying potential boundary conditions around the work-family conflict phenomenon. Also, this study adopts a variable-centered approach to examine levels of bidirectional WF conflict and the resulting impact on individual outcomes which provides generalizable insight into between-person experiences (French and Allen, 2019).

Third, the proposed model has important practical implications for organizational managers. As managers play a key role in the relationship between employees and organizations (Dutton *et al*., 2014; Peng *et al*., 2017), they are vital in managing the potential conflict imposed by crisis situations. As crises like COVID-19 disrupt routines in both the work and family domains, it is imperative for organizations to mitigate the challenges with the resources they maintain. Furthermore, as trust in management is the proposed mitigating mechanism, this is a fiscally responsible way managers can support their employees and reduce conflict, role overload, and turnover intentions.

This study is organized in the following manner. First, literature on stressor-strain theory and the constructs of interest is reviewed to form a conceptual foundation for the hypothesized relationships. Second, the methodology is described to provide an overview of the subjects and measures for this study. Third, the results of the moderated mediation tests are presented, followed by a discussion of the implications of the research findings. Limitations and directions for future research are provided in the concluding thoughts.

LITERATURE REVIEW AND HYPOTHESES

Most adults today engage in full-time careers in the workplace while also maintaining families at home (Craig and Mullan, 2010). The roles associated with work and family life have responsibilities and behavioral expectations related to their position in the social structure (i.e., family or organization) (Rizzo *et al*., 1970). Maintaining multiple roles offers benefits such as additional income and personal fulfillment, but the responsibilities and behavioral expectations of these roles can increase stress due to constraints on time and resources (ten Brummelhuis and Bakker, 2012). Stress induced from limited time and resources needed to meet expectations, commitments, and obligations is known as role overload (Örtqvist and Wincent, 2006).

Strain can emanate from one role, or the conflict between multiple roles when responsibilities and expectations are conflicting, ambiguous, or overloading (Örtqvist and Wincent, 2006). The stressor-strain model is the most prominent conceptual framework in the work-family conflict domain (Grzywacz, 2016), and maintains that stress is induced by events or aspects of the environment (i.e., stressors) which elicit physical and/or psychological reactions (i.e., strain) (Frese and Zapf, 1988; Ganster and Rosen, 2013; McGrath and Beehr, 1990). Repeated exposure to stressors leads to dysfunctional reactions until strain reduction generates recovery (Brosschot *et al*., 2005; French and Allen, 2019). Strain reduction can occur naturally via changes in the environment, such as completing a large project, or by interventions such as hiring more staff to complete the work required (Baltes and Heydens-Gahir, 2003).

However, if exposure to the stressors is not reduced from an external source, individuals are likely to initiate their own strain reduction interventions (Vaziri *et al*., 2020). Strain reduction interventions can be minimal such as shirking responsibilities, or extreme such as removing oneself from the stress-inducing role entirely (Vaziri *et al*., 2020). Extreme interventions such as quitting one's job or leaving one's family are not only harmful to the social structure, they are detrimental to the individual as the roles associated with the work and family domains are central to individuals' identities (Aryee and Luk, 1996) and strongly impact satisfaction and well-being (e.g., Amstad *et al*., 2011; Ford *et al*., 2007; French and Allen, 2019). Therefore, it is in the best interest of these social structures and individuals to identify ways of mitigating stress and strain without extreme interventions.

Times of crisis are likely to increase strain due to factors such as additional or conflicting responsibilities, working overtime, job insecurity, and financial stress (McGinnity and Russell, 2013). However, organizations can intervene to reduce the likelihood that employees will remove themselves from the stress-inducing role entirely (Jensen *et al*., 2013). For example, managers can exhibit family-supportive supervisor behaviors during a crisis to help employees cope with stress by managing work and

family roles (Crain and Stevens, 2018), reducing turnover intentions (Vaziri *et al*., 2020), and lowering WF conflict (Hammer *et al*., 2009; Odle-Dusseau *et al*., 2012). Empathy and concern from leaders have been found to reduce employee anxiety and produce positive emotions which relieve stress and WF conflict (Davenport, 2015; Dutton *et al*., 2014; Peng *et al*., 2017). Therefore, managers who display compassion and empathy can intervene in the stressor-strain relationship to influence employees' psychological states and help them cope with stress.

Trust is a psychological state that exerts robust influence on the stressor-strain relationship, particularly regarding one's supervisors at work (Dirks and Ferrin, 2002). Trust in management is defined as one's beliefs, assumptions, or expectations regarding the likelihood that the actions of one's managers will be favorable, beneficial, or at least not harmful to one's interests (Robinson, 1996). Employees' trust in management has been found to moderate (attenuate) the negative relationship between work overload and burnout, as well as work interference with family (Harvey *et al*., 2003). Trust in management is also a dimension of political skill which has been found to attenuate the relationship between role overload and strain operationalized as job tension, job dissatisfaction, and anxiety (Perrewe *et al*., 2005).

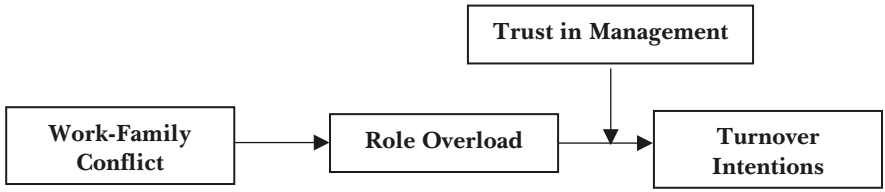
Furthermore, Jensen *et al*. (2013) found role overload to operate as a mediator between a stress inducer (i.e., high performance work systems) and turnover intentions when the moderation of job control was present. This study follows a similar conceptual approach in that role overload is expected to operate as a mediator between a stress inducer (i.e., work-family conflict) and turnover intentions when the moderation of trust in management is present. Jensen *et al*. (2013) found partial support for a mediated moderation model, whereas this study examines a moderated mediation model. In mediated moderation, the independent variable's effect on the dependent variable should fluctuate as a function of the moderator and work through the mediator (Hayes, 2018). In moderated mediation, the interaction itself becomes the mediator as the effect of the independent variable on the dependent variable should work through the interaction as the mediator (Hayes, 2018).

Based on stressor-strain theory and extant research findings, trust in management is expected to attenuate the relationship between role overload and strain operationalized as turnover intentions. Furthermore, the interaction between role overload and trust in management is expected to fully mediate the relationship between work-family conflict and turnover intentions. The hypothesized relationships are presented below and depicted in Figure I.

Hypothesis 1: Role overload will interact with (be moderated by) trust in management to influence turnover intentions (such that high trust in management will attenuate the relationship between role overload and turnover intentions).

Hypothesis 2: The interaction of role overload and trust in management will mediate the relationship between work-family conflict and turnover intentions.

Figure I
Hypothesized Moderating and Mediating Relationships



METHOD

Subjects

Data used to test the hypothesized relationships was collected from working professionals from a variety of industries to strengthen the generalizability of the results. Students enrolled in graduate business courses at a university in the midwestern United States were offered extra credit for recruiting up to two adult working professionals with at least five years of experience to complete the survey. Students who fit the required criteria could complete the survey once, and trained evaluators validated respondents' identities to ensure response legitimacy and track referrals for extra credit. This procedure resulted in 393 usable responses for the sample size. The sample was predominantly female (54%) and ranged in age from nineteen to sixty-four with an average age of thirty-five. Thirty-four industries were represented in the sample, the largest of which was Healthcare at twenty-eight percent. Average experience with respondents' current employer was six years, with average experience in their current position at 4.8 years. Thirty-three percent of the sample had managerial responsibility and seventeen percent of the sample supervised personnel. A profile of the sample is provided in Table 1.

Table 1
Sample Profile

Total Usable Responses	393
Gender	54% Female 46% Male
Age (in Years)	
Range	19-64
Mean	35
Standard Deviation	11
Top Five Industries Represented	
Healthcare	110
Engineering & Manufacturing	70
Finance & Banking	40
Sales and Marketing	35
Education	25
Experience	
Current Position	6
Current Employer	4.8
Managerial/Director Responsibility	129 (33%)
Supervision Responsibility	67 (38%)

Measures

The administered survey included measures of employee perceptions regarding work-family conflict, role overload, trust in management, turnover intentions, and demographic descriptors. The scales used in the questionnaire have shown adequate levels of reliability and validity in extant literature. Each scale was measured on a five-point Likert scale ranging from "strongly disagree" to "strongly agree." All scales were adapted to the COVID-19 context by framing the prompt in the following manner: "Think about the impact COVID-19 has had on your work and family life. Please indicate the extent to which you agree or disagree with the following statements."

Work-family conflict has been operationalized in extant research with either an episodic or levels approach (Maertz and Boyar, 2011). The levels approach assesses perceptions of work-family conflict using a continuous scale in a between-persons research design which has generated robust understanding of the work-family interface (French and Allen, 2019). Therefore, a between-persons research design is adopted in this study. Five items developed by Netemeyer *et al*. (1996) were used to measure work-family conflict. Three items developed by Seashore *et al*. (1982) were used to measure role overload. Four items developed by Treadway *et al*. (2004) were used to measure trust in management. Three items developed by Bothma and Roodt (2013) were used to measure turnover intentions.

These multi-item measures were first assessed for reliability and validity (i.e., convergent and discriminant). Each measure surpassed the recommended thresholds for Cronbach's Alpha and composite reliability (reliabilities >0.70) and the amount of variance extracted for each construct (AVEs >0.50) (Fornell and Larker, 1981). These results indicate satisfactory reliability of the measurement scales.

Confirmatory factor analysis (SPSS 24) was used to analyze the convergent validity of the measures. An oblique rotation (i.e., direct oblimin) was used in the confirmatory factor analysis which allows the factors to correlate. In this procedure, the standardized observed variables are expressed as a function of the factors and the item loadings represent standardized regression coefficients (Gorsuch, 1983; Thompson, 2004). Each of the observed indicators were statistically significant at the $p<0.01$ level for the corresponding factors. The measurement model fit statistics χ^2 (153) = 6207.94, $p <$ 0.00, NFI =0.98, CFI=0.99, TLI=0.98, RMSEA = 0.06 indicate that the observed indicators represent the constructs consistent with established standards regarding good model fit (Bagozzi and Yi, 2012; Hair *et al.*, 2006; Hu and Bentler, 1999). The full scales used to assess these measures are displayed in Table 2 along with respective standardized coefficients for each item.

Table 2
Results of Confirmatory Factor Analysis

Constructs and Items	Standardized Coefficient
Work-Family Conflict ***(Netemeyer et al., 1996)***	
The demands of my work interfere with my home and family life.	0.88
The amount of time my job takes up makes it difficult to fulfill family responsibilities.	0.93
Things I want to do at home do not get done because of the demands my job puts on me.	0.93
My job produces strain that makes it difficult to fulfill family duties.	0.93
Due to work-related duties, I have to make changes to my plans for family activities.	0.87
Role Overload ***(Seashore et al., 1982)***	
I never seem to have enough time to get everything done.	0.75
I have too much work to do to do everything well.	0.98
The amount of work I am asked to do is fair. (R)	0.69
Trust in Management ***(Treadway et al., 2004)***	
Management at my organization can be trusted.	0.89
I have complete trust that management and my supervisor will treat me fairly.	0.94
I can count on management for help if I have difficulties in my job.	0.88
I can discuss problems with management without it being used against me.	0.87
Turnover Intentions ***(Bothma and Roodt, 2013)***	
I consider leaving my job.	0.89
I would likely accept another job at the same compensation level if it were offered to me.	0.83
My current job is not satisfying my personal needs.	0.87

Note: All standardized coefficients are significant at $p<0.01$.
All measures scaled strongly agree to strongly disagree.

Discriminant validity among the constructs was sufficient as the amount of variance extracted for each construct was greater than the squared correlation between the constructs (Fornell and Larker, 1981). Altogether, these findings indicate support for the reliability and validity (i.e., convergent and discriminant) of the construct measures. The summated scores of these multi-item measures were used in testing the research hypotheses. Table 3 contains the means, standard deviations, correlations, and reliabilities for each measure.

Table 3
Descriptive Statistics, Correlations, and Reliabilities for Construct Measures

	Mean	SD	X1	X2	X3	X4
X1 Work-Family Conflict	3.2	1.26	0.96			
X2 Role Overload	3.0	1.09	0.50**	0.84		
X3 Trust in Management	2.3	1.18	-0.31**	-0.25**	0.94	
X4 Turnover Intentions	3.3	1.36	0.33**	0.29**	-0.63**	0.89

** Correlation is significant at $p<0.01$. Alphas are shown on the diagonal.

RESULTS

This study examines a moderated-mediation model in which trust in management was hypothesized to moderate the relationship between role overload and turnover intentions, and the interaction between role overload and trust in management was hypothesized to mediate the relationship between work-family conflict and turnover intentions. Before analyzing the hypothesized relationships, a preliminary regression test was run to validate the correlation between work-family conflict and turnover intentions without the hypothesized mediators or moderators. The preliminary test results indicated that work-family conflict was significantly correlated with turnover intentions ($p<0.00$). The hypothesized moderated-mediation model was assessed with the Hayes (2018) procedure which rigorously tests the direct and indirect effects of the independent variable on the dependent variables through a potential mediator, while measuring the effect of the potential moderator. This approach uses a robust "bootstrap" analysis by generating a sampling distribution from the dataset and generates bias-corrected confidence intervals for the indirect effects (Hayes, 2018).

Consistent with Hayes (2018), this second stage moderated mediation model assessed the effect of *M* (i.e., Role Overload) on *Y* (i.e., Turnover Intentions) which is specified as moderated by *W* (i.e., Trust in Management) and estimated with:

$$\hat{M} = i_M + aX$$

$$\hat{Y} = i_Y + c\acute{X} + b_1M + b_2W + b_3MW$$

From these two equations, the product of the conditional effect of *M* on *Y* ($b_1 + b_3W$) and the effect of *X* on *M* (a) is the indirect effect of *X* on *Y*, which estimates a linear function of *W* (Edwards and Lambert, 2007; Hayes, 2018; Preacher *et al*., 2007).

$$a(b_1 + b_3W) = ab_1 + ab_3W$$

Including *XW* in modelling *Y* allows the direct effect of *X* to be linearly moderated by *W*, but does not alter the function defining the indirect effect of *X* (Hayes, 2018).

A conditional process analysis is used in this procedure to assess whether moderated-mediation exists as the effect of the independent variable on the dependent variable should work through the interaction as the mediator (Hayes, 2018). Therefore, the effect of role overload should operate as a function of (i.e., be moderated by) trust in management and the interaction should mediate the effects of work-family conflict on turnover intentions. Conditional process analysis calculates "path" effects in the form of confidence intervals using the bootstrapping technique to strengthen the robustness of the test. Effects which are statistically different from zero are evidenced by confidence intervals that do not include zero (Hayes, 2018). Therefore, moderated mediation is indicated when full mediation exists after which the moderation effects have been accounted.

The Process macro version 3.4 (Hayes, 2018) was used in SPSS to conduct the analysis. The variables were mean centered to reduce potential collinearity between the regressor variables (i.e., independent variables and the interaction term) in the analysis (Shieh, 2011). Table 4 presents the results of the conditional effects tests which indicate support for the hypotheses. Specifically, trust in management was found to moderate the relationship between role overload and turnover intentions (H1, $p<0.01$), and the interaction between role overload and trust in management was found to mediate the relationship between work-family conflict and turnover intentions (H2, $p<0.01$).

Table 4
Linear Regression Results

	Turnover Intentions		
Antecedents	Coefficient	SE	p
Work-family Conflict	0.09	0.05	0.00
Role Overload	0.14	0.06	0.07
Trust in Management	-0.68	0.05	0.01
Role Overload X Trust in Management	-0.11	0.04	0.00
Constant	2.96	0.17	0.00
	$R^2 = 0.44$		
	$F(4, 388) = 74.9, p<0.00$		

The slopes of the first regression equation plotted in Figure II depict the interactive effects of role overload and trust in management on turnover intentions at the low, moderate, and high levels of the moderator. Low and high levels of the moderator are defined as one standard deviation below and above the mean, respectively. As expected, high levels of trust in management mitigates the effect of role overload on turnover intentions ($F=8.16$, $p<0.01$). In contrast, low and moderate levels of trust in management do not mitigate the effect of role overload on turnover intentions.

Table 5 contains the bootstrapping results for the conditional indirect effects of work-family conflict one standard deviation above the mean, at the mean, and one standard deviation below the mean values of the mediator (i.e., the interaction between role overload and trust in management) to influence turnover intentions. As displayed in the "Effect" column in Table 5, as the value of trust in management increased, the effect of work-family conflict on turnover intentions decreased. Evidence of moderated

mediation is indicated by the confidence intervals in the right-hand columns of Table 5. These columns show that the interaction between role overload and trust in management mediate the relationship between work-family conflict and turnover intentions as the lower and upper confidence intervals for the low and moderate levels of trust exclude zero. Furthermore, the confidence intervals in the index of moderated mediation did not include zero (Index= -0.049, LLCI= -0.0847, ULCI= -0.0179).

Figure II
Interactive Effects of Role Overload and Trust in Management on Turnover Intentions

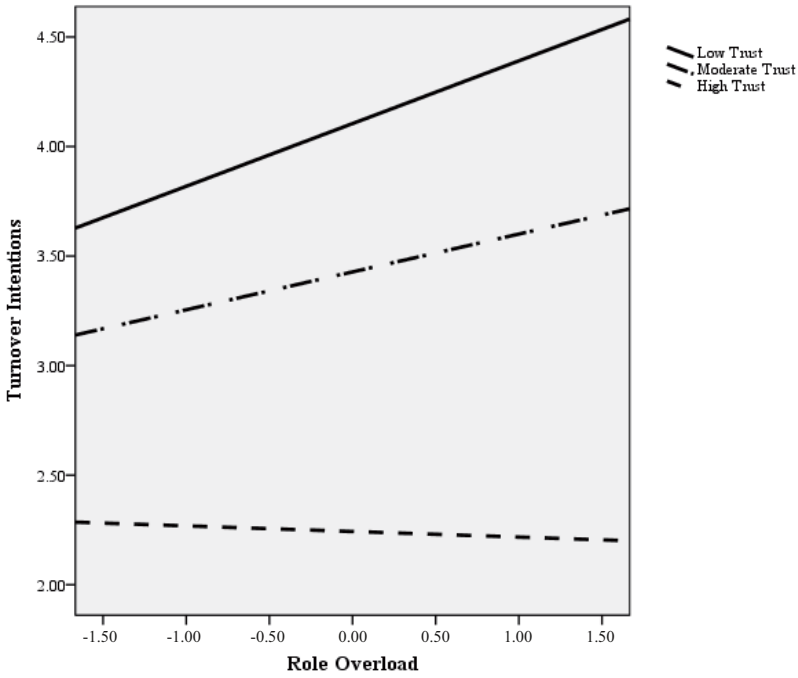


Table 5
Indirect Effects Through Role Overload for Different Levels of Trust in Management

Moderator	Value of the Moderator*	Effect	Bootstrap SE	Lower Level CI	Upper Level CI
Trust	-1.26	0.1236	0.039	0.051	0.203**
Trust	-0.26	0.0746	0.029	0.019	0.132**
Trust	1.49	-0.0110	0.032	-0.078	0.048

*Values for moderator are for the mean and +/- one SD from the mean.
**Signifies a 95% confidence interval.

Variance inflation factors (VIFs) were examined to assess potential collinearity among the independent variables and interaction in the two models. No VIFs above 10 were observed as the VIFs ranged from 1.12-1.40. Furthermore, no condition indices were above 30 as the condition indices ranged from 1.00-9.92. Therefore, the results do not indicate a collinearity problem according to commonly accepted thresholds (Hair *et al*., 2006).

In summary, the hypothesized moderated mediation model was supported. Specifically, during a time of crisis such as the COVID-19 pandemic, the relationship between work-family conflict and turnover intentions is fully mediated by the interaction of role overload and trust in management. Therefore, having a high level of trust in one's managers mitigates the likelihood that employees will leave the organization due to stress induced by work-family conflict and role overload. Accordingly, having a low level of trust in one's managers has no effect on the likelihood that employees will leave the organization due to work-family conflict and role overload. Furthermore, the interaction between role overload and trust in management is found to fully mediate the relationship between work-family conflict and turnover intentions.

DISCUSSION AND IMPLICATIONS

The Pew Research Center indicated the COVID-19 pandemic and related quarantine shutdowns impaired parents' ability to meet their financial and work obligations, and induced much hardship on families (Parker *et al*., 2020). Unemployment claims rose by more than 14 million as a direct result of the economic downturn created by COVID-19 (Kochhar, 2020), and parents experienced significant cost increases for utilities and food from being home all day with their children (Romm, 2020). In addition to these stressors during the COVID-19 quarantine, working parents had to assume the role of teacher to support the educational needs of their family while maintaining their typical work responsibilities.

The COVID-19 crisis has fundamentally altered many aspects of work and home life due to its impact on finances, health (physical/mental/emotional), families, and the workplace. While global crises are sporadic, they are not uncommon as two occurred in a twelve-year time span (i.e., 2008 recession and COVID-19 in 2020). Thus, prudent organizational managers should prepare for future crises by identifying ways to support employee needs and reduce detrimental repercussions. This study contributes to extant understanding of how applied psychology can enhance the public good by identifying the pivotal role leaders play in mitigating the negative outcomes of stress and strain on working parents.

These findings indicate that work-family conflict experienced during crisis situations is likely to increase role overload experienced by employees and their subsequent turnover intentions. While personal characteristics (e.g., locus of control and type A behavior) shape how employees respond to the stress and strain induced by crises (Hart and Cooper, 2001; Jex and Beehr, 1991; Kahn and Byosiere, 1992), there are also factors that organizations can influence to help employees manage the stress (e.g., job autonomy, job control, and trust in management). These influential factors help establish boundary conditions around the influence of WF conflict and role overload on turnover intentions.

Existing research indicates that roles within the work and family domain have important implications on the health and well-being of working parents (e.g., Amstad *et al*., 2011; Ford *et al*., 2007; French and Allen, 2019). This study adds to current understanding by identifying that WF conflict experienced during times of crisis increases turnover intentions, but this relationship is fully mediated by the interaction of role overload and trust in management. Therefore, leaders can intervene in crises by adopting family-supportive supervisory policies/practices to reduce role overload and strengthen employee trust.

LIMITATIONS AND FUTURE RESEARCH

This research investigated the moderating effect of trust in management on the relationship between work-family conflict, role overload, and turnover intentions. However, personal characteristics (e.g., locus of control, type A behavior) or situational factors (e.g., job autonomy, job control) have also been found to moderate the effects of stress on strain outcomes (Hart and Cooper, 2001; Jex and Beehr, 1991; Kahn and Byosiere, 1992). While this study focused on the relational dynamic between managers and employees, future research could expand on these findings by examining a conceptually relevant model that includes personal characteristics, situational factors, and relational dynamics.

Consistent with most research studies, the data used in this investigation has limitations that future research could build upon. A variable-centered approach was used in this study to examine how levels of bidirectional WF conflict influence individual outcomes which provides generalizable insight into between-person experiences. Thus, the data contained large variance regarding industries, work experience, age, income levels, race, and supervisory responsibility. While this variance-centered, between-persons research design is beneficial for the generalizability of the findings (Vaziri *et al*., 2020), it provides limited insight into specific job types, organizational levels, industries, and so forth. The Pew Research Center indicated that the impact of the COVID-19 crisis disparately impacted individuals based on income, education level, age, and race (Parker *et al*., 2020). Therefore, a fruitful avenue for future research is to adopt a person-centered approach to investigate how these variables define experiences for different groups of people during a crisis.

The inclusion of objective measures and/or a longitudinal research design in future investigations would strengthen confidence in these findings. Common method variance from self-reported measures is less of a concern when testing for moderation because this variance would reduce the strength of the moderating effect. Nevertheless, a combinatory approach which includes both subjective and objective measures would add value to this research domain. Crisis situations are likely to engender both short-term and long-term effects on organizations and individuals. This study used cross-sectional data which provides a snapshot of the short-term implications of crisis situations as the data analyzed in this research was collected during the COVID-19 crisis. Future research could build upon these findings with longitudinal explorations examining how long the mitigating effect of trust in management lasts, or the extent to which managers can establish a greater sense of trust with employees by their actions and behaviors during a crisis.

CONCLUSION

This research contributes to current understanding of how crisis situations impact employees' relationship with employers, as well as the extent to which employees' trust in management can mitigate the detrimental outcomes of stress and strain on employees induced by crises. Extant stress research has produced a mix of results on the effects potential moderators have on the relationship between stressors, such as work-family conflict and role overload, on measurements of strain (Harvey *et al*., 2003; Kahn and Byosiere, 1992). This research seeks to clarify these relationships, particularly within the context of a crisis, by examining data from 393 working adults. The results indicated that trust in management moderated the relationship between role overload and turnover intentions, and the interaction between role overload and trust in management mediated the relationship between work-family conflict and turnover intentions. The supported moderated mediation model indicates that organizational managers can reduce the strain experienced by their employees through the trust established in the superior-subordinate relationship. Leaders who develop trust with others not only reap beneficial rewards for their organizations, they improve the mental and emotional health of the people who follow them.

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Upside Cost Stickiness and Its Determinants

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Abstract: Prior literature shows that costs decrease relatively less when sales decline than they increase when sales rise by an equivalent amount, i.e., costs are "sticky" (Anderson *et al*., 2003). Considering firms' limited ability to add resources and managerial risk aversion, this study predicts that costs are sticky not only when sales decline but also when the magnitude of the sales increase is sufficiently large. Consistent with the prediction, empirical results based on a main sample consisting of U.S. public firms and a subsample consisting of S&P 1500 firms show that selling, general, and administrative costs are sticky at both sides of sales change and that the degree of the "upside" cost stickiness is affected by various firm characteristics such as firm size and availability of cash as well as economic condition and managerial compensation.
Keywords: Cost stickiness; Resource investment; Financial constraints; Risk aversion; Risk taking.

The prior literature on cost behavior finds that costs decrease relatively less when sales decline than they increase when sales rise by an equivalent amount (Anderson *et al*., 2003). This so-called "cost stickiness" is usually explained by a combination of potential temporariness of the sales decline and costs of changing levels of committed resources. In specific, when sales decline and there is uncertainty about the permanence of the demand fall, managers choose to retain some unutilized resources (e.g., labor) in order to avoid the adjustment costs. Among other studies on cost stickiness, Jin and Cary (2019), using a survey and interviews with middle managers who are considered to have a more limited ability to add resources and be more risk averse compared to top managers, find that cost decisions by middle managers are sticky not only when sales decline but also when the magnitude of the sales increase is sufficiently large.

The current study extends the behavioral findings of Jin and Cary (2019) and predicts that the two-sided cost stickiness observed at the middle management level also exists at the corporate or CEO level, considering firms' limited ability to add resources

and risk aversion of CEOs as well as significant influence of middle managers on corporate decisions. Based on 135,649 firm-year observations from 16,211 U.S. firms, this study provides strong empirical evidence that corporate-level selling, general, and administrative (SG&A) costs are sticky at both downside (i.e., when sales decline) and upside (i.e., when the magnitude of the sales increase is large) and that the upside cost stickiness is affected by firm size, availability of cash, and condition of the economy. Results of a subsample analysis based on 28,195 firm-year observations from 2,652 S&P 1500 firms further show that the upside cost stickiness is also affected by managerial compensation.

This study contributes to the literatures on cost stickiness, managerial decision-making, and financial statement analysis in various ways by providing a better understanding of the complex cost behavior. Most importantly, this study provides an important implication for earnings forecasts in both research and practice. Prior literature suggests that, if analysts fail to fully consider the cost stickiness, costs of firms facing sales decline will be under-forecasted, and, by extension, earnings of those firms will be over-forecasted since earnings are revenues minus costs (Weiss, 2010). Based on such inference, prior studies in the literature (e.g., Banker and Chen, 2006) suggest earnings prediction models can be improved by incorporating an understanding of (downside) cost stickiness. To add to the literature, the upside cost stickiness documented in this study suggests that earnings prediction models incorporating the downside cost stickiness can be further improved. In particular, the upside cost stickiness suggests that an earnings forecast model which incorporates only downside cost stickiness would over-forecast costs of firms facing a large sales increase and, by extension, under-forecast earnings of those firms. Accordingly, an earnings forecast model incorporating both downside and upside cost stickiness is expected to show a better performance compared to the existing models which incorporate only downside cost stickiness.

This study also contributes to the literature on cost stickiness by providing strong empirical evidence of two-sided cost stickiness at the corporate level, and thus by adding to the prior studies which have documented the downside cost stickiness (e.g., Anderson *et al*., 2003) as well as Jin and Cary (2019) whose findings are mostly based on behavioral tools. This study also contributes to the literature on cost behavior, which has been explained using one or two straight lines, by suggesting a refined way to capture the complex behavior of costs.

The rest of this study is organized as follows. Second section provides a literature review and hypotheses development. Third section outlines the research methodology including empirical models and data descriptions. Fourth section presents empirical results. The final section concludes with discussions.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

Cost Stickiness

Using archival data of U.S. firms for the period of 1979−1998, Anderson *et al*. (2003) documented that the magnitude of the change in costs relative to the change in sales revenue is smaller when sales decrease compared to when sales increase, i.e., the relation between sales change and costs change is non-linear. To describe such asymmetric behavior of costs, they coined the term "cost stickiness." They argued that

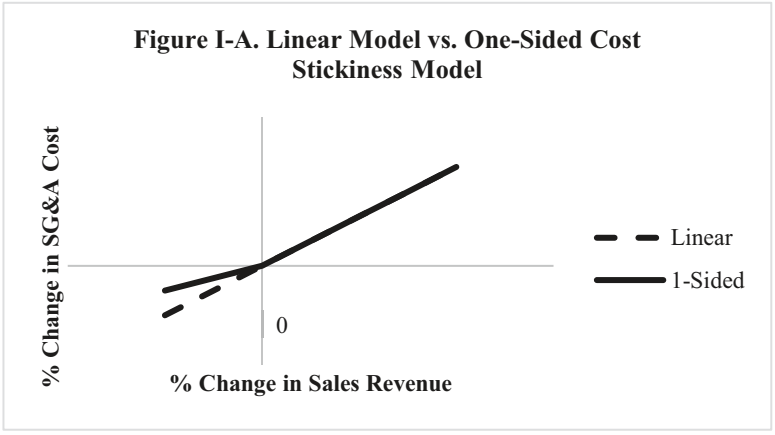
the main reason of the cost stickiness is that changing levels of committed resources is costly and thus firms are reluctant to cut slack resources when sales temporarily decrease. Anderson *et al*. (2003) and subsequent studies in the literature empirically identified determinants of cost stickiness.[1] For example, Anderson *et al*. (2003) showed that the degree of cost stickiness is (1) weaker when sales decrease for two consecutive years (and thus the sales decrease seems more permanent), (2) stronger during periods of macroeconomic growth (when it is more likely that the sales decline is only temporary), and (3) stronger when SG&A activities rely more on assets owned and people employed (and thus adjustment costs are higher). Balakrishnan *et al.* (2014) showed that firms' long-run cost structure decisions impact short-run asymmetric cost decisions. Venieris *et al*. (2015) documented that intensity of intangible assets induces stronger cost stickiness. There are also a number of studies examining employment-related issues. Among others, Banker *et al*. (2013) focused on cross-country differences and showed that the degree of cost stickiness is stronger when employment protection legislation is stricter. Kim and Wang (2014) documented that more generous unemployment insurance benefits lead to lower cost stickiness.

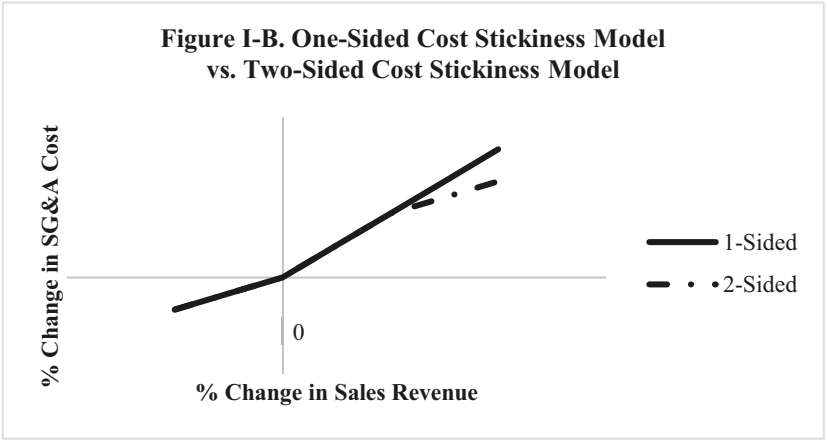
In addition to the studies examining economic determinants of cost stickiness, some studies focus on behavioral determinants. Dierynck *et al*. (2012) and Kama and Weiss (2013) documented that incentives to avoid losses and earnings decreases or to meet financial analysts' earnings forecasts expedite managerial downward adjustments of slack resources when sales fall, weakening cost stickiness. Chen *et al*. (2012) find that managers' empire building incentives, with the purpose of increasing personal utility, induce greater cost stickiness.

Upside Cost Stickiness

Unlike most of the prior studies in the cost stickiness literature that examine cost stickiness at corporate level or focus on CEOs as decision makers, Jin and Cary (2019) examine the asymmetric cost behavior at the middle management level. Middle managers such as division managers and regional managers are characterized as (1) having a limited ability to add resources and (2) more risk averse, compared to top managers, due to their compensation structure that relies relatively more on non-incentive components such as salary. Considering such distinctive characteristics of middle managers, Jin and Cary (2019) predict that costs are sticky at both ends of sales change. As graphically illustrated in Figure I, the two-sided cost stickiness can be described as costs changing relatively less not only when sales decrease but also when the magnitude of the sales increase is sufficiently large. Using a combination of a survey instrument and field interviews, they find that middle managers' cost decisions are indeed sticky when the increase in the sales is sufficiently large. They also use segment-level data and find empirical evidence that costs are sticky at both ends.

Figure I
Graphical Illustrations of Asymmetric Cost Behavior





Notes: Figure I graphically shows the relation between change in sales revenue and change in SG&A costs. Figure I-A compares the one-sided cost stickiness documented by Anderson *et al*. (2003) with a simple linear relation. The one-sided cost stickiness can be described as SG&A costs changing relatively less when sales decrease than when sales increase by an equivalent amount. The line is kinked at % change in sales revenue = 0. The y-intercept is not necessarily zero. Figure I-B compares the two-sided cost stickiness documented (at the middle management level) by Jin and Cary (2019) with the one-sided cost stickiness. The two-sided cost stickiness can be described as SG&A cost changing relatively less not only when sales decline but also when the change in sales revenue is sufficiently large in magnitude. The flatter parts at both ends are not necessarily parallel to each other.

Although Jin and Cary (2019) focus exclusively on cost decisions at the middle management level, the two-ended cost stickiness is predicted also at the top management or corporate level because of a few reasons. First, just like middle managers, top managers (and firms as a whole) have limited ability to add resources although the degree of constraint may be less severe than what middle managers face. In specific, firms' investments in resources are influenced by internal financial

constraints such as cash availability and budgets (Gilchrist and Himmelberg, 1995; Moyen, 2004; Abel and Eberly, 2011). The managerial investment decisions are also constrained by shareholders, especially institutional investors, whose aim is at maximizing shareholder value (i.e., stock price) rather than empire-building (Lazonick and O'Sullivan, 2000; Stockhammer, 2005; Schoder, 2014). Second, not only middle managers but also top managers are inherently risk averse as opposed to risk-neutral shareholders as generally assumed by most research (Jensen, 1986; Coffee, 1986; Gomez-Mejia and Wiseman, 1997). This suggests that, although the risk aversion is somewhat mitigated for top managers whose compensation generally includes relatively a large portion of incentives, an unusually large increase in sales revenue is still likely to be considered only temporary and thus top managers will limit their investment in additional resources in order to avoid adjustment costs in the current period (e.g., costs associated with hiring and training new employees) as well as re-adjustment costs in the future when the demand goes back to its normal level (e.g., layoff costs). Lastly, firm-level operational decisions, including those regarding investment in resource capacity, are significantly influenced by middle managers. Because of their deep involvement in the day-to-day operations, middle managers have the opportunity to report information and suggestions from the inside, which makes them play a critical role in the corporate level decision-making process (Dutton and Ashford, 1993; Floyd and Wooldridge, 1994; Dutton *et al*., 1997). This suggests that the two-sided cost stickiness at the middle management level documented by Jin and Cary (2019) is likely to be reflected in the corporate-level cost behavior.

Based on the above discussion, the first hypothesis is formulated as follows:

H1: Costs increase relatively less (i.e., costs become "sticky") when the magnitude of the sales increase is sufficiently large.

Combined with prior findings in the literature, *H1* suggests that costs are sticky at both upside (i.e., when the sales increase is large) and downside (i.e., when sales decline).

Firm- and Economy-Related Determinants

The upside cost stickiness is expected to have various firm- and economy-related determinants. First, large companies can access capital markets and bank financing relatively easily while small companies tend to face more difficulties in financing and more financial restrictions (Petersen and Rajan, 1997; Whited, 1992; Fazzari and Petersen, 1993). This suggests that large firms are likely to have less difficulties in adding an unusually large amount of resources, meaning the upside cost stickiness is expected to be weaker for large firms. Similarly, more cash available means making investment is easier because external financing is needed less. Also, it is easier for firms with more cash available to engage in risk shifting from safe cash to riskier activities or projects. Therefore, the magnitude of upside cost stickiness is expected to decrease with free cash flows.

The upside cost stickiness, like its downside counterpart, is also expected to be affected by the macro economy. The underlying assumption behind the upside cost stickiness is that an unusually large increase in sales is likely to be considered only temporary. When the macro economy experiences a recession, the large increase in sales is more likely to be considered only temporary by risk averse managers, suggesting that the degree of upside cost stickiness is expected to be stronger during a recession.

The above discussions lead to the following set of hypotheses:

H2A: The magnitude of the upside cost stickiness decreases with firm size.

H2B: The magnitude of the upside cost stickiness decreases with free cash flows.

H2C: The magnitude of the upside cost stickiness is stronger during a recession.

Manager-Related Determinants

In addition to the above-mentioned firm-level and economy-level factors, the degree of upside cost stickiness is expected to be affected also by managerial behavior, or to be more specific, managers' risk aversion. According to agency theories, managers are more risk averse than shareholders because of their career concerns and lack of diversification (Jensen and Meckling, 1976; Demsetz and Lehn, 1985) and thus avoid risky activities such as R&D, which may lead to an underinvestment problem (Hall and Lerner, 2010). To mitigate such agency problem and encourage managers to engage in risky but shareholder-value-increasing activities, shareholders need to properly design the compensation structure for managers (Murphy, 1985; Jensen and Murphy, 1990).

Prior studies find that structure of executive compensation indeed affects managerial decisions such as those regarding leverage (Cadenillas *et al*., 2004) and capital expenditure (Aggarwal and Samwick, 2006). Among others, the two dimensions of compensation that have received many researchers' attention are the sensitivity of CEO wealth to stock price (i.e., CEO pay-performance sensitivity) and the sensitivity of CEO wealth to stock volatility, which are also called *delta* and *vega*, respectively. Higher delta provides CEOs with incentives to work harder since they share gains and losses with shareholders, but at the same time higher delta also means increased exposure to risk for the CEOs. As a potential result, managers will forgo some positive net present value but risky projects (Amihud and Lev, 1981; Smith and Stulz, 1985; Guay, 1999). Such aversion to risky policies arising from high delta is expected to be mitigated by convex payoffs from option-based compensation where the convexity is positively associated with vega (Guay, 1999). Coles *et al*. (2006) argue that shareholders choose a combination of delta and vega to implement value-maximizing investment and financial policies. In particular, they find strong evidence that, controlling for delta, higher vega implements riskier investment choices, for instance, more investment in R&D. The relation between vega and managerial risk-taking suggests that CEOs with higher vega are more likely to make large (and risky) investments in resources when faced with unusually large sales increases, resulting in weaker upside cost stickiness. The expected relation between vega and upside cost stickiness can be hypothesized as follows:

H3: Controlling for CEO pay-performance sensitivity (delta), the magnitude of the upside cost stickiness decreases with sensitivity of CEO wealth to stock volatility (vega).

RESEARCH METHODOLOGY

Main Data and Model

To examine the upside cost stickiness (*H1*) and its firm- and economy-related determinants (*H2A*−*H2C*), this study uses financial statement data obtained from the Compustat fundamental annual files. The initial sample consists of 381,146 firm-year observations in the Compustat dataset for fiscal years 1987−2017. The dataset, then, is screened for (1) missing observations of SG&A costs and sales revenue in the current or

preceding year as well as other variables needed in the model and (2) duplicate observations, resulting in 140,359 observations. Finally, the top and bottom one percent of the observations with extreme values in the change of SG&A costs and the change of sales revenue are truncated.[2] The final sample consists of 135,649 observations for 16,211 firms for fiscal years 1988−2017.

For an estimation model, Jin and Cary's (2019) model which was originally an extension of Anderson *et al*. (2003) model, is extended as follows:

$$\begin{aligned}\Delta SG\&A = {} & \beta_0 + \beta_1 \Delta REV + \beta_2 LARGE\_INC\times\Delta REV \\ & + \beta_3 LARGE\_INC\times\Delta REV\times FIRM\_SIZE + \beta_4 LARGE\_INC\times\Delta REV\times FCF \\ & + \beta_5 LARGE\_INC\times\Delta REV\times RECESSION + \beta_6 DEC\times\Delta REV \\ & + \beta_7 DEC\times\Delta REV\times SUCCESSIVE\_DEC + \beta_8 DEC\times\Delta REV\times ASSETINT \\ & + \beta_9 DEC\times\Delta REV\times EMPINT + Industry/Year\ Fixed\ Effects \qquad (1)\end{aligned}$$

Following the prior literature (e.g., Anderson *et al*., 2003), this study examines the asymmetric cost behavior using SG&A costs. In specific, $\Delta SG\&A$ is natural logarithm of current SG&A costs over prior SG&A costs and ΔREV is natural logarithm of current sales revenue over prior sales revenue. *LARGE_INC* is a dummy variable for a large sales increase. Since how much sales increase is considered "sufficiently large" is likely to be different depending on numerous factors including industry, time period, and firm size (i.e., there is no absolute criteria), defining *LARGE_INC* is supposed to an empirical issue rather than a theoretical issue. As such, the estimation model uses various criteria for large sales increase, focusing on showing the existence of a point where the upside cost stickiness is triggered by a large sales increase (rather than pinpointing where the point is). In specific, *LARGE_INC* is defined in multiple ways using different criteria for sales increase, ranging from 15% increase to 40% increase. (See the empirical results section for further details). For a given criterion, *LARGE_INC* has a value of one if the sales increase is considered sufficiently large, and zero otherwise. The first main variable of interest is the two-way interaction term, $LARGE\_INC\times\Delta REV$. A negative β_2 would indicate that SG&A costs become sticky when the magnitude of the sales increase reaches a given level of sales increase. The next four three-way interaction terms are to examine the firm- and economy-level determinants of upside cost stickiness. *SIZE* is defined as market capitalization (in million USD). *FCF* (free-cash-flow) is defined as cash flows from operating activities less capital expenditure scaled by total assets. The hypotheses *H2A* and *H2B* suggest that the sign of coefficients β_3 and β_4 is expected to be positive, which is opposite to that of β_2. *RECESSION*, a dummy variable for recession, has a value of one for the 2007−2009 period, and zero for other periods. *H2C* suggests that the sign of coefficient β_5 is expected to be negative, same as that of β_2.

The model also includes standard cost stickiness variables as control variables. *DEC* is a dummy variable which takes the value of one if sales revenue of the firm decreases in the current period, and zero otherwise. A negative β_6 would indicate that costs decrease relatively less when sales decrease (i.e., downside cost stickiness). To also include determinants of downside cost stickiness, the two-way interaction term, $DEC\times\Delta REV$, is then interacted with a dummy variable for successive sales decrease (*SUCCESSIVE_DEC* = 1 if sales decreased for two consecutive years, = 0 otherwise), asset intensity (*ASSETINT* = log (total assets / sales revenue)), and employee intensity (*EMPINT* = log (number of employees / sales revenue)).

Data and Model for Managerial Compensation

To examine the impact of managerial incentives on upside cost stickiness (*H3*), vega and delta are defined following Coles *et al*. (2006), whose calculations are based on the methodology of Core and Guay (2002). To be specific, vega is defined as the dollar change in the CEO's wealth for a 0.01 change in standard deviation of returns. Delta is defined as the dollar change in the CEO's wealth for a 1% change in stock price. Data on vega and delta are obtained directly from the personal website of Naveen (n.d.), who is one of the authors of Coles *et al*. (2006). The initial sample consists of 232,548 manager-year observations for both CEOs and non-CEOs of S&P 1500 firms for the period 1992−2014. From the initial sample, observations with a missing vega or delta are dropped. The non-CEO observations are also excluded as this study focuses on CEOs, following the prior literature (e.g., Chen *et al*., 2012). The vega/delta dataset for CEOs is then merged with the financial statement dataset described in the previous subsection. The final subsample to test *H3* (hereafter "vega subsample") consists of 28,195 observations for 2,652 firms.

For an estimation model for the vega subsample, Jin and Cary's (2019) model is extended as follows:

$$\begin{aligned} \Delta SG\&A = {} & \gamma_0 + \gamma_1 \Delta REV + \gamma_2 LARGE\_INC \times \Delta REV \\ & + \gamma_3 LARGE\_INC \times \Delta REV \times VEGA + \gamma_4 LARGE\_INC \times \Delta REV \times DELTA \\ & + \gamma_5 DEC \times \Delta REV + \gamma_6 DEC \times \Delta REV \times SUCCESSIVE\_DEC \\ & + \gamma_7 DEC \times \Delta REV \times ASSETINT + \gamma_8 DEC \times \Delta REV \times EMPINT \\ & + Industry/Year\ Fixed\ Effects \end{aligned} \quad (2)$$

As it was in the previous section, a negative coefficient on the two-way interaction term, *LARGE_INC×ΔREV*, would indicate that SG&A costs become sticky when the magnitude of the sales increase reaches a given level of sales increase. The main variable to test *H3* is the three-way interaction term containing *VEGA*, which is the original vega scaled by 1000. *H3* suggests that upside cost stickiness decreases with vega and thus the sign of the coefficient γ_3 is expected to be positive, which is opposite to that of γ_2. The three-way interaction term containing *DELTA*, the original delta scaled by 1000, is included to simply control for delta, following Coles *et al*. (2006), and thus no prediction is made regarding the sign of γ_4. As in Equation (1), the interaction terms for downside cost stickiness and its determinants are also included as control variables.

Descriptive Statistics

Panel A of Table 1 provides descriptive statistics for the main sample and the vega subsample. On average, the main sample firms have $2,434.6 million of annual sales revenue (median = $162.5 million) and $435.2 million of SG&A costs (median = $35.8 million). Average market capitalization and total assets are $2,992.2 million and $3,237.5 million, respectively. Compared to the observations in the main sample, those in the vega subsample are significantly larger in terms of sales revenue, total assets, and market capitalization as both vega and delta are calculated using information obtained from ExecuComp which covers S&P 1500 firms only. In particular, the sample S&P 1500 firms have, on average, $4,845.1 million of sales revenue, $880.6 million of SG&A costs, $6,333.4 million of market capitalization, and $5,547.2 million of total assets. Overall, the descriptive statistics for the main sample are comparable to those reported by Anderson *et al*. (2003) while the statistics for the vega subsample are comparable to those reported by Chen *et al*. (2012) whose sample includes only S&P 1500 firms.

The sample distribution in Panel B of Table 1 shows that 30.9% (24.8%) of the observations in the main sample (vega subsample) is experiencing a sales decline, which is comparable to what prior studies document. More importantly, it also shows that a similar number of observations (27.8% of observations in the main sample and 21.9% in the vega subsample) are experiencing a sales increase larger than 20%. The number of firms with a sales increase even larger than 40% is also non-negligible (11.9% of the observations in the main sample and 6.8% in the vega subsample). The considerable number of firms with a relatively large sales increase suggests that any distinct cost behavior for these firms should not be treated as outliers. Observations during the 2007−2009 recession period, which are expected to show stronger upside cost stickiness, represent 10.1% of the main sample and 15.1% of the vega subsample.

Table 1
Summary Statistics

A. Descriptive Statistics

	Main Sample (n = 135,649)		Vega Subsample (n = 28,195)	
	Mean	**Median**	**Mean**	**Median**
Sales revenue ($ million)	2,434.6	162.5	4,845.1	1,056.1
SG&A costs ($ million)	435.2	35.8	880.6	203.9
Market capitalization ($ million)	2,992.2	154.1	6,333.4	1,138.9
Total assets ($ million)	3,237.5	175.8	5,547.2	1,039.4
Free cash flows ($ million)	113.3	0.8	285.5	37.9
Number of employees	8,894.6	802.0	18,200.1	4,900.0
Vega ($ thousand)			101.3	28.6
Delta ($ thousand)			1,086.6	162.0
Sample period	1988−2017		1992−2014	

B. Sample Distribution

	Main Sample (n = 135,649)		Vega Subsample (n = 28,195)	
	No. Obs	**% of Total**	**No. Obs**	**% of Total**
Firms with sales decline	41,900	30.9%	6,997	24.8%
Firms with sales increase over …				
15%	48,002	35.4%	8,694	30.8%
20%	37,717	27.8%	6,162	21.9%
25%	30,108	22.2%	4,484	15.9%
30%	24,186	17.8%	3,347	11.9%
40%	16,183	11.9%	1,904	6.8%
Firms in 2007−2009 (recession) period	13,698	10.1%	4,257	15.1%
Firms with 2-year successive sales decline	37,611	27.7%	6,692	23.7%

Notes: Market capitalization = Price per share × Number of outstanding shares; Free cash flows = Cash flows from operating activities – Capital expenditures; Vega = Dollar change in CEO's wealth for a 0.01 change in standard deviation of returns; Delta = Dollar change in CEO's wealth for a 1% change in stock price.

EMPIRICAL RESULTS

Upside Cost Stickiness and Firm-/Economy-Related Determinants

Table 2 presents the OLS estimation results of Regression (1), the model to examine upside cost stickiness and its firm-/economy-related determinants. A "sufficiently large sales increase" is defined as a sales increase of 15%, 20%, 25%, 30%, and 40% for the result shown in each of Columns (1) through (5), respectively. As intuitively predicted, all five columns show a positive coefficient on *ΔREV*, suggesting the relation between sales change and SG&A cost change is positive. As discussed in the previous section, the main variable of interest to test *H1* is the two-way interaction term, *LARGE_INC×ΔREV*. Column (1), which uses a 15% increase as the criterion for a sufficiently large sales increase, does not show a negative coefficient on this two-way interaction term, meaning a 15% sales increase does not trigger the upside cost stickiness, i.e., firms do not slow down their investment in resources. This suggests that, on average, a 15% sales increase is not considered sufficiently large. Column (2), which uses a 20% increase as the criterion, then shows a highly significant and negative coefficient on the two-way upside cost stickiness term, suggesting that SG&A cost becomes sticky when sales increase by more than 20%.[3] The results in Columns (2) through (5) further show that the negative coefficient on the upside cost stickiness term becomes larger in magnitude and more statistically significant (i.e., the upside cost stickiness becomes more pronounced) as the criterion for being "sufficiently large" increases.[4]

The coefficients on the next three three-way interaction terms show how the upside cost stickiness is affected by firm-/economy-related factors. Throughout all the columns, the coefficients on the three-way interaction terms containing *FIRM_SIZE* or *FCF* are all positive and highly significant, suggesting that the degree of upside cost stickiness decreases with firm size and free cash flows. The coefficient on the interaction term containing *RECESSION* is highly significant and negative in all columns, suggesting that the degree of upside cost stickiness is stronger when the economy experiences a large-scale recession.

Regarding control variables, the coefficient on the interaction term for downside cost stickiness, *DEC×ΔREV*, is significant and negative in all columns, consistent with the findings in the prior literature. Also consistent with Anderson *et al*. (2003), the positive coefficients on *SUCCESSIVE_DEC* interaction term and the negative coefficients on the *ASSETINT* interaction term respectively suggest that the degree of downside cost stickiness (1) becomes weaker when sales decline for two consecutive years and (2) increases with asset intensity. The coefficient on *EMPINT* interaction term is negative although it is not statistically significant at the conventional level of significance.[5]

Overall, the estimation results in Table 2 are consistent with the prediction that SG&A costs become sticky when the magnitude of the sales increase is sufficiently large (*H1*) and such upside cost stickiness is affected by firm size (*H2A*), amount of cash available (*H2B*), and condition of the economy (*H2C*).

Table 2
Estimation of Upside Cost Stickiness and Firm-/Economy-Related Determinants

	Criteria for "Sufficiently Large Sales Increase"				
	+15%	+20%	+25%	+30%	+40%
	(1)	(2)	(3)	(4)	(5)
VARIABLES	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*
ΔREV	0.458***	0.541***	0.588***	0.625***	0.648***
	(30.23)	(47.92)	(64.30)	(80.84)	(107.31)
LARGE_INC×ΔREV	0.052***	-0.028***	-0.073***	-0.111***	-0.142***
	(3.64)	(-2.63)	(-8.66)	(-15.41)	(-24.70)
LARGE_INC×ΔREV×FIRM_SIZE	0.002***	0.002***	0.003***	0.003***	0.004***
	(11.43)	(11.81)	(12.40)	(12.56)	(12.73)
LARGE_INC×ΔREV×FCF	0.054***	0.053***	0.053***	0.052***	0.050***
	(29.97)	(29.89)	(29.76)	(29.27)	(27.83)
LARGE_INC×ΔREV×RECESSION	-0.080***	-0.080***	-0.081***	-0.084***	-0.087***
	(-9.97)	(-10.12)	(-10.19)	(-10.47)	(-10.66)
DEC×ΔREV	-0.115***	-0.207***	-0.262***	-0.308***	-0.342***
	(-6.36)	(-14.01)	(-20.22)	(-26.06)	(-32.54)
DEC×ΔREV×SUCCESSIVE_DEC	0.210***	0.210***	0.211***	0.211***	0.211***
	(29.92)	(29.93)	(29.95)	(29.99)	(30.06)
DEC×ΔREV×ASSETINT	-0.134***	-0.133***	-0.132***	-0.131***	-0.129***
	(-45.89)	(-45.50)	(-45.14)	(-44.76)	(-44.44)
DEC×ΔREV×EMPINT	-0.001	-0.001	-0.001	-0.001	-0.001
	(-0.43)	(-0.40)	(-0.38)	(-0.37)	(-0.29)
Constant	0.033***	0.029**	0.025**	0.021*	0.016
	(2.80)	(2.47)	(2.15)	(1.85)	(1.40)
Industry/Year Fixed Effects	Included	Included	Included	Included	Included
Observations	135,649	135,649	135,649	135,649	135,649
Adjusted R-squared	0.359	0.359	0.360	0.361	0.362

Notes: ΔSG&A = Log (Current SG&A costs / Prior SG&A costs); *ΔREV* = Log (Current sales revenue / Prior sales revenue); *LARGE_INC* = 1 if *ΔREV* > given criterion, = 0 otherwise; *FIRM_SIZE* = Price per share × Number of outstanding shares (i.e., market capitalization); *FCF* = Cash flows from operating activities – Capital expenditures (scaled by total assets); *RECESSION* = 1 for the period of 2007−2009, = 0 for other periods; *DEC* = 1 if current sales revenue < prior sales revenue; *SUCCESSIVE_DEC* = 1 if sales declined for two consecutive years, = 0 otherwise; *ASSETINT* = Log (Total assets / Sales revenue); *EMPINT* = Log (Number of employees / Sales revenue). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01, respectively. T-statistics are in parentheses.

To reconfirm the findings from the main model, a number of robustness checks are performed. First, considering that there are other measures of firm size used in the literature, a comprehensive measure of firm size is used as an alternative. In specific, an alternative firm size variable is extracted using a principal component analysis where natural logarithms of total assets, sales revenue and market capitalization are used to calculate the component, following Khan and Vieito (2013).[6] The estimation results based on the alternative firm size variable in Table 3 remain highly consistent with those in Table 2. The only change is that now even a 15% sales increase seems to trigger the upside cost stickiness (i.e., significantly negative coefficient on *LARGE_INC×ΔREV* in Column (1)).

Table 3
Robustness Check – Estimation Based on Alternative Measure of Firm Size

	Criteria for "Sufficiently Large Sales Increase"				
	+15%	**+20%**	**+25%**	**+30%**	**+40%**
	(1)	(2)	(3)	(4)	(5)
VARIABLES	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*
ΔREV	0.541***	0.593***	0.623***	0.649***	0.661***
	(36.26)	(53.39)	(69.22)	(85.35)	(111.07)
LARGE_INC×ΔREV	-0.317***	-0.369***	-0.399***	-0.429***	-0.449***
	(-21.08)	(-32.23)	(-41.70)	(-50.75)	(-61.21)
LARGE_INC×ΔREV×FIRM_SIZE2	0.040***	0.040***	0.040***	0.041***	0.041***
	(71.39)	(70.82)	(70.01)	(69.30)	(66.45)
LARGE_INC×ΔREV×FCF	0.018***	0.018***	0.018***	0.017***	0.016***
	(9.79)	(9.77)	(9.76)	(9.36)	(8.57)
LARGE_INC×ΔREV×RECESSION	-0.098***	-0.099***	-0.099***	-0.102***	-0.104***
	(-12.47)	(-12.66)	(-12.72)	(-12.94)	(-12.83)
DEC×ΔREV	-0.223***	-0.280***	-0.315***	-0.348***	-0.365***
	(-12.50)	(-19.28)	(-24.65)	(-29.83)	(-35.22)
DEC×ΔREV×SUCCESSIVE_DEC	0.209***	0.209***	0.209***	0.210***	0.210***
	(30.21)	(30.25)	(30.29)	(30.35)	(30.43)
DEC×ΔREV×ASSETINT	-0.135***	-0.134***	-0.133***	-0.132***	-0.131***
	(-47.10)	(-46.77)	(-46.42)	(-46.03)	(-45.61)
DEC×ΔREV×EMPINT	0.003	0.003	0.003	0.002	0.002
	(1.16)	(1.05)	(0.92)	(0.80)	(0.60)
Constant	0.043***	0.040***	0.035***	0.031***	0.025**
	(3.72)	(3.45)	(3.06)	(2.75)	(2.18)
Industry/Year Fixed Effects	Included	Included	Included	Included	Included
Observations	135,649	135,649	135,649	135,649	135,649
Adjusted R-squared	0.382	0.382	0.381	0.382	0.382

Notes: ΔSG&A = Log (Current SG&A costs / Prior SG&A costs); *ΔREV* = Log (Current sales revenue / Prior sales revenue); *LARGE_INC* = 1 if *ΔREV* > given criterion, = 0 otherwise; *FIRM_SIZE2* (extracted using principal component analysis) = 0.5894 × Log (Total assets) + 0.5767 × Log (Sales revenue) + 0.5658 × Log (Market capitalization); *FCF* = Cash flows from operating activities – Capital expenditures (scaled by total assets); *RECESSION* = 1 for the period of 2007−2009, = 0 for other periods; *DEC* = 1 if current sales revenue < prior sales revenue; *SUCCESSIVE_DEC* = 1 if sales declined for two consecutive years, = 0 otherwise; *ASSETINT* = Log (Total assets / Sales revenue); *EMPINT* = Log (Number of employees / Sales revenue). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01, respectively. T-statistics are in parentheses.

Next, following prior studies in the cost stickiness literature (e.g., Anderson *et al.*, 2003), independent variables in Regression (1) do not include all possible combinations of interaction components. In order to address a potential omitted variables issue, Regression (1) is extended as a robustness check by adding all possible combinations of interaction components. Finally, an alternative definition of *RECESSION* is used to include two smaller-scale recessions during the periods of 1990−1991 and 2001 in addition to the great recession during the period of 2007−2009. For both tests, the (untabulated) results remain highly consistent with the main results.

Table 4
Impact of Managerial Compensation on Upside Cost Stickiness

	Criteria for "Sufficiently Large Sales Increase"				
	+15%	**+20%**	**+25%**	**+30%**	**+40%**
	(1)	(2)	(3)	(4)	(5)
VARIABLES	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*
ΔREV	0.698***	0.732***	0.752***	0.758***	0.741***
	(34.57)	(47.25)	(58.64)	(68.31)	(83.30)
LARGE_INC×ΔREV	-0.012	-0.045***	-0.066***	-0.076***	-0.069***
	(-0.67)	(-3.17)	(-5.61)	(-7.26)	(-7.65)
LARGE_INC×ΔREV×	0.110***	0.111***	0.116***	0.115***	0.090***
VEGA	(6.17)	(6.00)	(6.05)	(5.72)	(3.36)
LARGE_INC×ΔREV×	0.001	0.001	0.001*	0.001**	0.005***
DELTA	(1.61)	(1.42)	(1.65)	(2.20)	(5.35)
DEC×ΔREV	-0.325***	-0.364***	-0.389***	-0.398***	-0.380***
	(-11.71)	(-15.12)	(-17.59)	(-19.06)	(-19.59)
DEC×ΔREV×	0.237***	0.237***	0.237***	0.237***	0.237***
SUCCESSIVE_DEC	(16.35)	(16.36)	(16.36)	(16.36)	(16.38)
DEC×ΔREV×ASSETINT	-0.204***	-0.202***	-0.200***	-0.199***	-0.200***
	(-20.80)	(-20.61)	(-20.45)	(-20.38)	(-20.47)
DEC×ΔREV×EMPINT	0.032***	0.032***	0.032***	0.032***	0.032***
	(4.12)	(4.09)	(4.08)	(4.08)	(4.10)
Constant	-0.012	-0.014	-0.015	-0.016	-0.016
	(-0.75)	(-0.89)	(-0.98)	(-1.02)	(-1.02)
Industry/Year Fixed Effects	Included	Included	Included	Included	Included
Observations	28,195	28,195	28,195	28,195	28,195
Adjusted R-squared	0.543	0.543	0.543	0.543	0.544

Notes: ΔSG&A = Log (Current SG&A costs / Prior SG&A costs); *ΔREV* = Log (Current sales revenue / Prior sales revenue); *LARGE_INC* = 1 if *ΔREV* > given criterion, = 0 otherwise; *VEGA* = Dollar change in CEO's wealth for a 0.01 change in standard deviation of returns (scaled by thousand); *DELTA* = Dollar change in CEO's wealth for a 1% change in stock price (scaled by thousand); *DEC* = 1 if current sales revenue < prior sales revenue; *SUCCESSIVE_DEC* = 1 if sales declined for two consecutive years, = 0 otherwise; *ASSETINT* = Log (Total assets / Sales revenue); *EMPINT* = Log (Number of employees / Sales revenue). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01, respectively. T-statistics are in parentheses.

Manager-Related Determinants of Upside Cost Stickiness

Table 4 shows the estimation results of Regression (2) based on the vega subsample which includes only S&P 1500 firms. Consistent with the results based on the main sample in Table 2, the coefficient on *LARGE_INC*×*ΔREV* is not significantly negative when "sufficiently large" is defined as more than 15% in Column (1), suggesting that, also for the subsample firms, 15% is not large enough to trigger upside cost stickiness. Then, again, the coefficient becomes highly significant and negative when 20% is used as the criterion for being sufficiently large, suggesting that SG&A cost becomes sticky when sales increase by more than 20%.[7] More importantly, the highly significant and positive coefficient on *LARGE_INC*×*ΔREV*×*VEGA* in all columns suggests that the degree of upside cost stickiness decreases as the sensitivity of CEO wealth to stock volatility increases. Regarding *DELTA*, which is added as a control variable, the coefficient on the *DELTA* interaction term suggests that the impact of CEO pay-performance sensitivity on upside cost stickiness is relatively less significant for most of the model specifications. Overall, the result shown in Table 4 is consistent with *H3*, which is based on the argument that higher sensitivity of CEO wealth to stock volatility induces CEOs to make riskier operational decisions.

As robustness checks, Regression (2) is modified in two different ways. First, the model is extended by adding all components of interaction terms in the same way as Regression (1) is extended for the main sample. Second, in order to address a potential endogeneity issue due to a simultaneous relation between managerial decision-making and CEO compensation, the current values of *VEGA* and *DELTA* are replaced with one-year lagged values. The (untabulated) results show that findings in Table 4 remain unaffected for the extended model and the lag model.

Lastly, Regressions (1) and (2) are combined to examine both firm-/economy-related determinants and manager-related determinants simultaneously using the vega subsample. The results of the comprehensive regression model are shown in Table 5. The only notable change is that the impact of firm size is less significant. A possible explanation for the weak impact of firm size is that the vega subsample consists of only S&P 1500 firms, which share a common characteristic of being substantially large. Except for the less significant impact of firm size, the comprehensive estimation results are consistent with those reported in Tables 2 through 4.

Table 5
Comprehensive Estimation of Upside Cost Stickiness and Its Determinants

	Criteria for "Sufficiently Large Sales Increase"				
	+15%	**+20%**	**+25%**	**+30%**	**+40%**
	(1)	(2)	(3)	(4)	(5)
VARIABLES	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*	*ΔSG&A*
ΔREV	0.725***	0.749***	0.763***	0.765***	0.745***
	(35.99)	(48.52)	(59.79)	(69.29)	(84.14)
LARGE_INC×ΔREV	-0.027	-0.050***	-0.066***	-0.070***	-0.057***
	(-1.48)	(-3.52)	(-5.56)	(-6.72)	(-6.24)
LARGE_INC×ΔREV×	0.000	0.000	0.000*	0.000*	0.001*
FIRM_SIZE	(0.87)	(1.14)	(1.65)	(1.70)	(1.91)
LARGE_INC×ΔREV×FCF	0.397***	0.403***	0.408***	0.401***	0.415***
	(17.36)	(17.48)	(17.46)	(16.91)	(16.77)
LARGE_INC×ΔREV×	-0.046***	-0.050***	-0.048***	-0.050***	-0.051***
RECESSION	(-3.10)	(-3.34)	(-3.12)	(-3.09)	(-2.81)
LARGE_INC×ΔREV×	0.080***	0.078***	0.080***	0.079***	0.036
VEGA	(4.35)	(4.11)	(4.06)	(3.84)	(1.32)
LARGE_INC×ΔREV×	0.000	0.000	0.000	0.000	0.004***
DELTA	(0.74)	(0.48)	(0.56)	(1.03)	(4.60)
DEC×ΔREV	-0.356***	-0.384***	-0.403***	-0.408***	-0.385***
	(-12.87)	(-16.03)	(-18.30)	(-19.60)	(-19.94)
DEC×ΔREV×	0.236***	0.236***	0.236***	0.236***	0.236***
SUCCESSIVE_DEC	(16.39)	(16.41)	(16.41)	(16.42)	(16.43)
DEC×ΔREV×ASSETINT	-0.200***	-0.199***	-0.198***	-0.198***	-0.199***
	(-20.56)	(-20.43)	(-20.33)	(-20.31)	(-20.46)
DEC×ΔREV×EMPINT	0.030***	0.030***	0.031***	0.031***	0.032***
	(3.88)	(3.88)	(3.92)	(3.96)	(4.03)
Constant	-0.011	-0.013	-0.014	-0.014	-0.016
	(-0.71)	(-0.82)	(-0.89)	(-0.92)	(-1.02)
Industry/Year Fixed Effects	Included	Included	Included	Included	Included
Observations	28,195	28,195	28,195	28,195	28,195
Adjusted R-squared	0.548	0.548	0.548	0.548	0.548

Notes: ΔSG&A = Log (Current SG&A costs / Prior SG&A costs); *ΔREV* = Log (Current sales revenue / Prior sales revenue); *LARGE_INC* = 1 if *ΔREV* > given criterion, = 0 otherwise; *FIRM_SIZE* = Price per share × Number of outstanding shares (i.e., market capitalization); *FCF* = Cash flows from operating activities – Capital expenditures (scaled by total assets); *RECESSION* = 1 for the period of 2007–2009, = 0 for other periods; *VEGA* = Dollar change in CEO's wealth for a 0.01 change in standard deviation of returns (scaled by thousand); *DELTA* = Dollar change in CEO's wealth for a 1% change in stock price (scaled by thousand); *DEC* = 1 if current sales revenue < prior sales revenue; *SUCCESSIVE_DEC* = 1 if sales declined for two consecutive years, = 0 otherwise; *ASSETINT* = Log (Total assets / Sales revenue); *EMPINT* = Log (Number of employees / Sales revenue). *, **, and *** denote significance at levels of 0.1, 0.05, and 0.01, respectively. T-statistics are in parentheses.

DISCUSSION AND CONCLUSSION

This study examines the non-linear behavior of costs at the higher end of sales change. In specific, considering firms' limited ability to add resources and managers' risk aversion, the study predicts that firm's additional investment in resources is relatively less when the degree of sales increase is unusually (or sufficiently) large. Consistent with the prediction, empirical results based on 135,649 sample observations from U.S. show that (1) SG&A costs are sticky not only when sales decline but also when the magnitude of the sales increase is sufficiently large, and (2) such upside cost stickiness is affected by firm size, amount of cash available, and condition of the economy. A subsample analysis based on 28,195 observations from S&P 1500 firms shows that the upside cost stickiness is also affected by managerial compensation.

This study contributes to the prior literature on cost stickiness, managerial decision-making, and financial statement analysis by providing a number of important implications. As discussed in detail in the introduction section, prior studies suggest that ignoring the (one-sided) cost stickiness by analysts would cause a bias in cost forecasts for firms facing a sales decline, further resulting in a bias in earnings forecasts for those firms (e.g., Banker and Chen, 2006). The two-sided cost stickiness documented in this study suggests that earnings forecast models featuring the one-sided cost stickiness can be further improved by incorporating the upside cost stickiness as well. Additionally, existence of two kinked points documented in this study suggests that a linear regression (with a few interaction terms) is not likely to be the best way to examine highly complicated behavior of costs.

The findings in this study provide multiple venues for future research. First, as discussed above, the existing earnings forecast models are expected to be improved by incorporating the upside cost stickiness. In particular, future studies are expected to complement this study and contribute to the literature by comparing the earnings-forecasting ability of the refined model with those of commonly used models based on operating income (Fairfield *et al*., 1996), cash flows (Sloan, 1996), or downside cost stickiness (Banker and Chen, 2006). Second, also as discussed above, the non-linear relation between sales change and cost change kinked at two different points suggests that (1) there may also be other intervals where the relation is asymmetric, and (2) a linear regression with a few simple two-way interaction terms may not properly reflect the complex behavior of costs. As such, the two-sided cost stickiness model used in this study is expected to be further refined by applying a more sophisticated model specification such as spline regression or polynomial regression.

Notes

1. In addition to the studies examining determinants of cost stickiness, some studies focus on modeling issues (e.g., Banker *et al*., 2016). A broad literature review is provided by Guenther *et al*. (2014) and Banker *et al*. (2018), among others.
2. The main findings are robust when winsorization is used instead of truncation.
3. In order to pinpoint where the upside cost stickiness starts, the 15%−20% interval is broken down into smaller subintervals. The (untabulated) results show that the negative coefficient on $LARGE\_INC \times \Delta REV$ becomes significant at the conventional

level of significance when the criterion for being "sufficiently large" reaches +18.6%.

4. In addition, +50%, +60%, and +70% are also used to define a sufficiently large sales increase. The (untabulated) results show that the trend in the results remains constant.
5. The relatively weak impact of employee intensity on downside cost stickiness can be explained by the substantial increase in the use of temporary labor in recent years. See Chen *et al*. (2012) for a more detailed explanation.
6. Only one component has an eigenvalue greater than one.
7. Similar to the pinpoint estimation used for the main sample, the 15%−20% interval is broken down into smaller subintervals. The (untabulated) results show that, for the vega subsample, the negative coefficient on *LARGE_INC*×*ΔREV* becomes significant at the conventional level of significance when the criterion for being "sufficiently large" reaches +18.0%.

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How Entrepreneurial Orientation Impacts Market Performance? The Serial Mediation of Learning Orientation and Innovative Performance

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Abstract: The mechanism through which entrepreneurial orientation (EO) impacts firm performance, is a meaningful research avenue yet insufficiently explored. In the previous literature, learning orientation and innovative performance have been considered as a missing link in the examination of the relationship between EO and corporate performance. To address this literature gap, this study aims to investigate how EO influences market performance by outlining the serial mediation of learning orientation and innovative performance. Data were gathered through a questionnaire survey from 259 Tunisian firms in the Information and Communications Technology sector (ICT). The data analysis follows a two-step procedure: Confirmatory Factor Analysis and Structural Equation Modeling. To confirm significance of the mediating effects, bootstrapping analysis was conducted using the method of Preacher and Hayes (2008). The main result shows that entrepreneurial orientation impacts market performance via a causal chain including learning orientation and innovative performance. This study provides IT managers with practical insights about the effect of EO as a strategy to achieving higher levels of market performance. This research contributes to a better understanding of SMEs' performance drivers. To the best of the

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author's knowledge, this study is the first to test a serial mediation model in order to investigate the effect of entrepreneurial orientation on market performance in the context of SMEs within an emerging economy.
Keywords: Entrepreneurial Orientation, Learning Orientation, Innovative Performance, Market Performance, Serial Mediation.

Nowadays, in a customer-driven market, higher market performance (MP) is considered as the most relevant driver of financial performance (Gunday *et al*., 2011). The Information and Communications Technology (ICT) sector has to be customer centric to offer great services in adequacy with evolving customers' needs. Hence, the MP appears as the crucial source of financial performance of the IT companies.

The general aim of this study is to identify the drivers of MP and to investigate the relationship between these drivers in the case of the Tunisian ICT firms. Among the determinants of corporate performance, entrepreneurial orientation (EO) is one of the most plotted issues explaining business growth, especially for innovation oriented firms such as ICT companies. In fact, the relationship between EO and firm performance is widely studied in entrepreneurship research (Anderson and Eshima, 2013; Madsen, 2007; Zahra and Covin, 1995). However, this relationship may not be discernible (Dess and Lumpkin., 2005) because the association between EO and firm performance may entail other factors that are more directly sensitive towards EO (Alegre and Chiva, 2013). The black box inside corporate entrepreneurship which encompasses the mechanisms through which EO impacts firm performance, is a meaningful research avenue yet insufficiently explored (Lumpkin and Dess, 2001; Rhee *et al*., 2010; Wang, 2008). Noting this literature gap, the current study aims to investigate how EO influences MP. The objective of the paper is to explain the process through which EO impacts the performance of the Tunisian ICT firms.

In this respect, examining the direct effect of EO on firm performance may provide a superficial and incomplete picture. For that reason, certain past studies have integrated internal and external contingent factors as mediators in the EO–performance relationship. In this regard, Lumpkin and Dess (2001) suggest that "organizational activities" have a mediating role. Neglecting these mediating factors will forsake the corporate entrepreneurial activities (Wang, 2008; Wiklund, 1999). It is through the mediators that EO is made effective (Harms, 2013).

Nevertheless, learning orientation (Alegre and Chiva, 2013; Rhee *et al*., 2010; Wang, 2008) and innovative performance (Gunday *et al*., 2011; Helm *et al*., 2010) have been considered as a missing link in the examination of the relationship between organizational orientations (namely EO) and corporate performance. To bridge this gap, this paper demonstrates the mediating role of learning orientation (LO) and innovative performance (IP) in the relationship between EO and MP. As LO and IP were commonly correlated (Garcia-Morales *et al.*, 2006; Keskin, 2006), this paper used the serial mediation model.

Therefore, the aim of this paper is to explore the black box of the EO-MP relationship by highlighting the serial mediation of LO and IP. The hypothesized model is tested using Structural Equation Modeling (SEM) based on data collected from 259 ICT Tunisian firms.

The research question lies in: How and through which mechanism entrepreneurial orientation influences market performance? By addressing this question, this paper contributes to the ever-evolving EO conversation in the literature. This research contributes to a better understanding of the performance drivers by outlining the relationships between these drivers through a causal chain, which is not common in previous entrepreneurial research.

The outline of the paper is respecting the articulations of the theoretical model constructs. Firstly, the construction of the model begins with a review of existing literature on the relationships between the four main concepts (EO, LO, IP, and MP). Secondly, the building of the theoretical model introduces the empirical evidence, the analysis, and the discussion of the results.

THEORETICAL FRAMEWORK AND HYPOTHESES

In order to respond to the research question, this paper respects the four steps of the serial mediation technique according to Preacher and Hayes' method (2008): firstly the direct effect of EO on MP, then the indirect effect of LO, next the indirect effect of IP, and finally the indirect effect of both LO and IP in a causal chain manner.

In this study, corporate performance and firm performance are used interchangeably. Corporate performance is a composite assessment of how well a firm carries out its most relevant aspects (financial, market, and shareholder performance). Nevertheless, the market performance (MP) is a specific dimension of corporate performance which is a customer-driven focus. The main theme of market performance is to meet customers' needs, retain existing consumers, and improve customer relationships.

The main theoretical roots of the linkages between EO, LO, IP, and MP are provided by the Dynamic Capabilities Theory (Teece *et al.*, 1997). This theory was derived from the Resource-Based Theory and focuses on the issue of competitive survival in response to fast changing business conditions. Teece *et al*. (1997: 516) defined dynamic capabilities as "the firm's ability to integrate, build and reconfigure internal and external competencies to address rapidly changing environments." However, the development of dynamic capabilities relies on three organizational activities: the learning, the acquisition of new assets, and the transformation of existing assets. The former refers to LO while the two latter reflect the IP concept.

Entrepreneurial Orientation and Firm Performance

Entrepreneurial Orientation reflects the propensity of firms to engage in the "pursuit of new market opportunities and the renewal of existing areas of operation" (Hult *et al*., 2001: 901). Three dimensions have historically captured the entrepreneurial orientation concept: innovativeness, proactiveness, and risk-taking. Innovativeness reflects the firm's tendency to develop products and services that are noticeably different from past offerings (Lumpkin and Dess, 2001). Proactiveness indicates the firm's tendency to follow increased competitiveness comprising competitive aggressiveness and boldness (Antoncic and Hisrich, 2001). Risk-taking reflects the degree to which managers are willing to disrupt the tried-and-true methods and to make risky projects with reasonable chance of costly failures (Rauch *et al*., 2009).

In the current turbulent environment with shortened product life cycle (namely for IT companies), the future profit is uncertain. To overcome this deep uncertainty, firms need to innovate frequently while taking risks in their market strategies and constantly seek out new opportunities (Miller and Friesen, 1983). Also, efforts to anticipate demand and aggressively position new product offerings should be made to achieve strong performance (Ireland and Webb, 2007). Therefore, conceptual arguments suggest that firms may benefit from adopting an EO and that EO leads to higher market performance (Lumpkin and Dess, 2001).

Extant literature has commonly related EO to firm performance. It has been argued in several previous studies that EO has a positive effect on firm performance (Arshad *et al*., 2014; Madsen, 2007; Rauch *et al*., 2009; Zahra and Covin, 1995; Wiklund, 1999). Empirical studies have advocated that entrepreneurially oriented firms perform significantly better (Baker and Sinkula, 1999; Olokundun *et al*., 2017; Wales *et al*., 2013), especially among smaller sized firms within an hostile surrounding because they have a tendency to be flexible and innovative (Covin *et al.*, 2006).

Recent studies have claimed that high sales growth has been associated to a firm's entrepreneurial behavior (Covin *et al.*, 2006; Madsen, 2007; Wang, 2008). Covin *et al*. (2006) confirm the positive relationship between EO and market performance (sales growth) among manufacturing firms. Similarly, Dess and Lumpkin (2005) argue that firms grow and improve market performance via strategic renewal and new venture opportunities.

Hence, on the basis of the literature review advanced above, the first suggested hypothesis is the following *:*

H1: Entrepreneurial orientation has a positive and significant effect on market performance (direct path : EO→MP).

The Mediating Role of LO

To examine how EO impacts firm performance, several authors have suggested a set of mediating variables. Learning orientation is one of the most considered mediators in the past literature (Nonaka and Takeuchi, 1995; Slater and Narver, 1995). Learning orientation refers to the extent to which firms obtain and share information about changes in the market, customers' expectations, competitors' activities, and new technologies, in order to launch new products or services which are superior to those of competitors (Calantone *et al*., 2002).

Three organizational values are often associated with learning orientation: commitment to learning, open-mindedness, and shared vision. The commitment to learning reflects whether an organization is likely to promote a learning culture which challenges the status quo and develops new ideas (Bennett, 1998). The open-mindedness is linked to the notion of unlearning in which firms proactively question long-held assumptions, beliefs, and routines (Nystrom and Starbuck, 1984). While commitment to learning and open-mindedness influence the intensity of learning, shared vision reflects the direction of learning. Shared vision is necessary to avoid conflicting assumptions which may undermine the ability of the top management team to set up a focused response to market changes and trends.

EO and LO are generally found to be positively linked and are found to have positive impact on firm performance (Alegre and Chiva, 2013; Kantur, 2016; Wang, 2008; Wiklund and Shepherd, 2005). While prior studies povide evidence of a positive

effect of both EO and LO on corporate performance, the relationship between EO and LO remains understudied (Hakala, 2013).

On one hand, according to the learning theory, EO promotes learning-related firm processes (Wales, 2016), then EO will be positively related to LO. In fact, entrepreneurially and risk tolerant firms are inclined to encourage new ways of thinking, to provide a supportive innovative climate and an open atmosphere for learning. On the other hand, previous studies declare a positive effect of LO on firm performance (Baker and Sinkula, 2009; Calantone *et al.*, 2002; Martinette *et al*., 2014). In this context, an increase in LO is expected to affect the quality and quantity of market information, thus improving the market performance (Baker and Sinkula, 2009).

The more entrepreneurial a firm is, the greater extent to which it is involved in learning through exploration and experimentation (Slater and Narver, 1995). Nevertheless, to collect the benefits of entrepreneurial efforts, a firm must be committed to learning, open-minded and engaged in shared interpretation of information (Sinkula *et al.*, 1997; Slater and Narver, 1995). Therefore, it is clear that a firm maximizes the effect of EO on the firm's performance through LO (Wang, 2008).

This study argues that LO mediates the relationship between EO and firm performance in accordance to several prior studies (Hakala, 2013; Liu *et al*., 2002; Lin *et al*., 2008; Wang, 2008). Liu *et al*. (2002) found that LO mediates the link between EO and MP (marketing program dynamism and selling strategies). Wang (2008) also demontrated a mediating role of LO in the EO-MP link within a sample of UK companies. Hakala (2013) confirmd the mediating effect of LO in the relationship between EO and performance (growth and profitability) in the Finnish software sector. Finally, Lin *et al.* (2008) demonstrated that LO has a mediating role between EO, innovativeness, and business performance.

Hence, on the basis of the literature review advanced above, the second suggested hypothesis is the following:

H2: Learning orientation mediates the relationship between entrepreneurial orientation and market performance of a firm (EO→LO→MP).

The Mediating Role of IP

To understand the mechanisms through which EO impacts firm performance, prior research has proposed IP as a mediating variable (Helm *et al.,* 2010). Previous studies emphasized that IP is a missing link between corporate strategic orientations (such as EO and LO) and firm performance (Gunday *et al*., 2011).

IP is a composite construct based on various indicators of overall organizational achievements pertaining to the different aspects of firm innovativeness such as new patents, new products or projects, new processes, or new organizational arrangements (Hagedoorn and Cloodt, 2003). In his seminal workpaper, Gunday *et al.* (2011) argued that the different kinds of innovation have positive effects on IP and that IP is an effective hub that carries the positive effects of innovation to the various aspects of firm performance.

On one hand, former researchers have argued that EO is a key ingredient for firm innovation (Covin *et al.*, 2006; Ireland and Webb, 2007; Schumpeter, 1934). It is commonly accepted that entrepreneurial actions have direct effects on different types of innovation; product, process, and administrative innovations (Ireland and Webb, 2007).

On the other hand, the relationship between IP and corporate performance (market position) has been well established in several studies (Calantone *et al*., 2002; Damanpour and Evan, 1984; Garcia-Morales *et al.,* 2006; Gronum *et al.,* 2012; Gunday *et al*., 2011; Keskin, 2006).

As demonstrated by Gunday *et al.* (2011), IP is at the same time the result of different innovation activities and the precursor of the different performance aspects (production, market, and financial). Innovative performance, as a synergetic combination of the results of both technical and administrative innovations, may be considered as a relevant driver of different facets of corporate performance (Gunday *et al*., 2011; Han *et al*., 1998). Also, IP is considered as the more precise dependent variable of EO (Alegre and Chiva, 2013). For these reasons, the IP is chosen as a proxy of firm's innovativeness.

Furthermore, the empirical setting of the study (ICT sector) legitimizes the choice of MP that is essentially based on customers' satisfaction. Also, IP is firstly linked to the non-financial aspects of corporate performance, such as customer satisfaction, which will lead to higher financial returns (Wang and Wei, 2005).

These lines of argument demonstrate that EO has an impact on IP which in turn affects MP. Therefore, the following hypothesis is put forward:

H3: Innovative performance mediates the relationship between entrepreneurial orientation and market performance of a firm (EO→IP→MP).

The Serial Mediation of LO and IP

This section sets up the indirect effect of EO on MP via two mediators: LO and IP. In this sense, as a firm's degree of entrepreneurial orientation increases, the degree of learning orientation also increases, emphasizing the innovative performance thereby strengthening market performance. The theoretical framework underlying the links between EO and LO and between IP and MP has been described in the previous sections. Therefore, this section focuses on the link between LO and IP.

Previous studies assert that the organizational learning and the use of appropriate knowledge serve as the basis for innovation (Mills and Friesen, 1992) especially in the service sector (Greenhalgh *et al*., 2004). Many scholars argue that firm innovation is closely related to organizational learning that ensure the exploitation of extant resources (Nonaka and Takeuchi, 1995) and the exploration of new knowledge (Chang and Cho, 2008) which are the main ingredients for innovation (Ahmadi *et al*., 2018; Garcia-Morales *et al*., 2006; Keskin, 2006; Slater and Narver, 1995; Sinkula *et al*., 1997).

The above-mentioned literature review motivates the following hypothesis of the serial mediation between EO and MP through LO and IP.

H4 : The relationship between entrepreneurial orientation and market performance is serially mediated by the learning orientation and the innovative performance (EO→LO→IP→MP).

METHOD

Setting

The choice of ICT sector is guided mainly by the relevance of this sector in Tunisia and because the IT firms are naturally oriented towards entrepreneurship and innovation. According to the Tunisian National Institute of Statistics, this sector

generates 7.5% of GDP and employs about 86,000 people (in 2018). This sector encompasses more than 750 companies engaged in the distribution of IT products and engineering computer science (in 2019). The choice of the Tunisian context is legitimized by the importance of the business opportunities that exist in Tunisia. Although it is an emerging economy, the Tunisian market is the most suitable destination for foreign ICT companies that seek to access African markets (Cherni, 2020).

Sampling

The questionnaire was mailed to a sample of 500 Tunisian SMEs belonging to the ICT sector and randomly selected from the IPA (Industry Promotion Agency), NIS (National Institute of Statistics), and MCTDE (Ministry of Communication Technologies and Digital Economy) databases. Following two reminders, a total of 270 questionnaires were received. After eliminating nonvalid and incomplete responses, 259 usable responses were subsequently used in the statistical analysis. Data were gathered through questionnaire survey of 259 top managers (one senior manager per firm). As shown in Table 1, most of the studied firms are young, small, and belong to operating services of ICT sector. The sample seems to be a good reflection of the Tunisian ICT sector where the majority of the firms are small, comprising under 50 employees.

Table 1
Characteristics of the Sample (259 firms)

Variables	Frequency	Percentage
Firm age		
Under 5	47	18.15
5-10	79	30.50
Over 10	133	51.35
CEO age		
Under 30	39	15.06
30-40	81	31.27
40-50	90	34.75
Over 50	49	18.92
Number of employees		
Under 50	180	69.50
50-199	79	30.50
Activity sector		
Computer hardware manufacturing	100	38.61
Computer software, engineering and services	109	42.08
Telecom	50	19.31

The research questionnaire was developed in English then translated in French. The measurement scales were cross-validated using back translation. Prior to the questionnaire diffusion, the survey instrument was pretested among ten managers and

two university academics with expertise in the entrepreneurship field. The comments of the interviewees were undertaken in the designing of the final questionnaire.

All the items were measured using five-point Likert scales [ranging from 1 (strongly disagree) to 5 (strongly agree)] to ensure the consistency of the questionnaire. All the respondents completing the questionnaire were from top management.

To examine eventual non-response bias, ANOVA tests were performed by dividing respondents into three groups based on whether they responded to the first mailing, the first follow-up, or the second follow-up (Armstrong and Overton, 1977). The results show that there was no significant difference between the three groups on EO, LO, IP, and MP. Thus, there was no evidence of systematic non-response bias.

Measures

As recommended by Anderson and Gerbing (1988), the data analysis follows a two-step procedure: Confirmatory Factor Analysis (CFA) to assess measurement models and Structural Equation Modeling (SEM) to assess path relationships using the AMOS.25 software. The model fit was assessed using absolute fit indices [CMIN/df; Goodness-of-Fit Index (GFI; AGFI); Root Mean Square Residual (RMR); Root Mean Square Error of Approximation (RMSEA)] and incremental fit indices [Comparative Fit Index (CFI) and Normed Fit Index (NFI)]. The threshold for CMIN/df should be less than 3.0. For GFI and CFI, values above 0.90 indicate good fit, and smaller values for RMR ($\cong 0$) and RMSEA (< 0.08) indicate better fit (Hair *et al.*, 2014). To elaborate an appropriate factorial structure for the Tunisian specific sample, to attest multidimensional structure of the scales, and to epurate measurement scales (eliminating items with low loadings < 0.4), an Exploratory Factor Analysis (EFA) has been conducted using SPSS.22 as a first step of the statistical analysis (Roussel and Wacheux, 2005).

Entrepreneurial orientation-EO. This study adopted the EO scale developed by Covin and Slevin (1989). This scale is the most known in the entrepreneurship research.

Innovativeness is assessed by asking managers if their organizations have marketed new lines of products or services. Proactiveness is assessed by asking managers about the firm's tendency to lead, in terms of developing new products or services. Firm risk-taking is assessed by asking managers about the firm's propensity to engage in high risk investments. A "high-risk investment" is an investment that carries a high degree of risk and a low control on the returns with extreme consequences (devastating losses or huge gains).

According to Covin and Slevin (1989) and as has also been asserted by Hughes and Morgan (2007), the three dimensions of EO can be merged into a single construct in order to examine their combined effect on firm performance. Many scholars (Brown *et al.*, 2001; Wiklund, 1999) demonstrate that EO, as a singular construct, has a similar effect on firm performance in different contexts (different countries, markets, or types of firms).

In total, nine items were kept in the EO scale (EFA results). CFA tests were performed, with EO as a second-order latent construct, consisting of three first-order factors (three sub dimensions: innovativeness; proactiveness, and risk-taking). The measurement model resulted in a good fit: CMIN/df = 1.845, GFI = 0.953, AGFI = 0.921, CFI = 0.986, RMR = 0.059, RMSEA = 0.057. The first-order loadings ranged from 0.804 to 0.910 ($t > 1.96$, $p < 0.001$). The second-order loadings ranged from 0.735 to 0.760 ($t > 1.96$, $p < 0.001$).

Learning orientation-LO. This study adopted the LO scale developed by Baker and Sinkula (1999) who found further support for its validity and reliability. The second-order LO construct consisted of 11 items divided into three first-order factors which are the commitment to learning, the open-mindedness, and the shared vision.

Commitment to learning is measured through examining the extent to which firms give importance to organizational learning. Open-mindedness is measured through examining the extent to which a firm critically deal on existing assumptions and business processes. Shared vision is measured by examining the extent to which a firm holds a common goal at different levels (Baker and Sinkula, 1999).

The fit indices of the measurement model for these three dimensions of LO exhibit a good fit for the data: CMIN/df = 2.967, GFI = 0.935, AGFI = 0.885, CFI = 0.973, RMR = 0.078, RMSEA = 0.087. All loadings were significant ($t > 1.96$, $p < 0.001$), the first order loadings ranging from 0.725 to 0.906 and the second order loadings ranging from 0.667 to 0.820.

For EO and LO constructs, the dimensionality of each item was assessed by the loadings and their associated t-ratios (Anderson and Gerbing, 1988). The EFA and CFA results showed that each item loaded significantly on only its respective first-order factor (and subsequently the second order construct) without cross-loading to any other first-order factor of the same construct.

Innovative performance-IP. In order to measure IP, seven items adapted from Gunday *et al*. (2011) were quantified. The IP scale of Gunday *et al.* (2011) was inspired fom the papers of Antoncic and Hisrich (2001) and Hagedoorn and Cloodt (2003). The confirmatory factor analysis (CFA) confirmed the dimensionality of the IP scale and the goodness of the measurement fit (CMIN = 3.542; GFI = 0.986; AGFI = 0.931; CFI =0.995; RMR= 0.020; RMSEA = 0.099). The item loadings of IP are above 0.910.

Market performance-MP. The MP scale consisting of five items was adapted from the research of Gunday *et al.* (2011) by adding two items dealing with the brand image and the customer experience. These latter issues were considered, within the pretest step, as fundamental to assess the MP of interviewed firms.

The CFA confirmed the dimensionality of the MP scale and the goodness of the measurement fit (CMIN = 1.447; GFI = 0.997; AGFI = 0.972; CFI = 0.998; RMR= 0.006; RMSEA = 0.042). The item loadings of MP are above 0.915.

Assessing Common Method Variance. This study relies on self-reported data from single informants. This method may introduce common method-bias (Podsakoff *et al.*, 2003). To minimize this bias, both procedural method (by assuring confidentiality and anonymity as recommended by Podsakoff *et al*., (2003)) and statistical method (via Harman's one-factor test suggested by Podsakoff and Organ, 1986) were used. Regarding the Harman's one-factor test, all variables of the EO, LO, IP, and MP constructs were entered into an Exploratory Factor Analysis. The results revealed that there was no general factor that accounted for the majority of the variance. The first factor accounted for only 34.94% of the total variance. Thus, no major signs of common method-bias were noted. To ensure this result, the method of Common Latent Factor (CLF) as suggested by Podsakoff *et al.* (2003) was also used. After adding the CLF, strong composite reliability and AVE scores for every construct were obtained. Moreover, when comparing the loadings of the items before and after adding the CLF, no differences greater than 0.200 were noticed; thus, the measurement model is not significantly influenced by common method-bias (Dixon *et al*., 2019; Podsakoff *et al.*, 2003).

RESULTS

Measurement Model Results

As shown in Table 2, the overall measurement model fit is adequate.

Reliability was assessed using both Cronbach's α and construct reliability (Jorescog φ). The Cronbach's α for EO was 0.909, and for each first-order factor ranged from 0.881 to 0.931. The Jorescog φ of EO was 0.968, and for each first-order factor ranged from 0.884 to 0.933.

The Cronbach α for LO was 0.907, and for each first-order factor ranged from 0.883 to 0.941. The Jorescog φ for LO was 0.970, and for each first-order factor ranged from 0.883 to 0.943. The Cronbach α and Jorescog φ for IP were respectively 0.950 and 0.951, and for MP were respectively 0.955 and 0.953. All scales show a reliability of Cronbach's α and ρ Jorescog above 0.70 implying adequate internal consistency (Hair *et al*., 2014).

Convergent validity was examined by assessing the Average Variance Extracted (AVE) of the study constructs and their respective first-order factors. As shown in Table 2, all scales give an acceptable value of AVE (threshold of 0.5) underlying the convergent validity of all the study constucts (Fornell and Larcker, 1981). Moreover, the EFA results indicate that all of the indicators loaded substantively and significantly on their hypothesized factors, thus suggesting convergent validity (Bagozzi and Yi, 1988).

The discriminant validity was assessed by comparing AVE of each of the first-order factors with its shared variances with any other first-order factors. All AVEs were higher than all shared variances, indicating that all dimensions exhibit discriminant validity (Fornell and Larcker, 1981). As indicated in Table 2, the square root of AVE of each factor is larger than any of its correlations with the other factors. Also, Table 2 displays the descriptive statistics (mean, standard deviation, correlations), reliability, and validity indicators.

Structural Model Results and Mediation Analyses

The SEM model in this study, consisting of four latent constructs (EO, LO, IP, and MP) resulted in an adequate fit and the model fit indexes were: CMIN/DF = 2.103, GFI = 0.838, AGFI = 0.801, CFI= 0.951, RMR = 0.056, RMSEA = 0.065.

To assess the hypotheses, decomposition of effect results was adopted. The total effect of EO (independent variable) on MP (dependent variable) is disaggregated into its direct effect (H1) and indirect effects; firstly through LO (H2); secondly through IP (H3); and thirdly through LO and IP (H4) within a Serial Multiple Mediation Model (SMM). A significant indirect effect indicates that a substantive quantity of the EO's total effect on MP occurs via the mediators.

To confirm the significance of the mediating effects, the bootstrapping method was conducted using Preacher and Hayes (2008) Macro (Model 6 in PROCESS for SPSS macros). Bootstrapping analysis generated a confidence interval [CI] for the mediation effects and yielded significance tests of specific paths. A bias-corrected bootstrap confidence interval (based on 1000 bootstrap samples and 95% confidence intervals) was used. The bias corrected bootstrap method is often preferred vis a vis other tests that assume normality of sampling distribution of indirect effects (Hayes, 2009). The method of the bootstrap confidence intervals has been proven to have greater control of Type I error and higher power than traditional mediation tests (MacKinnon *et al*., 2002).

Table 2
Descriptive Statistics and Measurement Model (CFA) Results

	Mean	SD	Cross Correlations							
Scale			**IN**	**PR**	**RK**	**CL**	**SV**	**OM**	**IP**	**MP**
IN	3.55	1.33	**0.907**	0.600	0.507	0.513	0.449	0.360	0.450	0.418
PR	3.30	1.24		**0.809**	0.534	0.448	0.395	0.463	0.541	0.470
RK	3.36	1.29			**0.902**	0.472	0.557	0.582	0.424	0.437
CL	3.51	1.27				**0.920**	0.676	0.510	0.551	0.502
SV	3.23	1.35					**0.846**	0.508	0.460	0.470
OM	3.32	1.24						**0.858**	0.409	0.433
IP	3.36	1.41							**0.909**	0.633
MP	3.52	1.23								**0.915**
Cronbach'α			0.931	0.881	0.928	0.924	0.883	0.941	0.950	0.955
Construct Reliability			0.933	0.884	0.929	0.943	0.883	0.917	0.951	0.953
AVE			0.823	0.656	0.813	0.847	0.716	0.736	0.828	0.837
Goodness-of-fit-statistics CMIN = 2.056; GFI = 0.851; AGFI = 0.807; CFI = 0.955; RMR= 0.077; RMSEA = 0.064										

Note: (1) Correlation coefficients are reported in the upper diagonal half of the matrix, and are significant at $p<0.001$. (2) The square root of AVE of the constructs are reported in the diagonal of the correlation matrix and they are mentioned in bold format. (3) The measurement model is not perfect but it is acceptable considering the relatively large number of observed indicators in the study. The quality of fit is satisfactory despite the fact that the GFI and AGFI are slightly lower than the conventional cut-off of 0.9 (Zikmund, 2003).

Significance is indicated by 95% confidence intervals that exclude zero. The results revealed that in the three mediational processes neither of the confidence intervals surrounding indirect effects spanned zero (see Table 4).

Table 3 reports the results for the structural model including the direct effects of all paths. Mediation results with the bootstrapped tests of the indirect effects are displayed in Table 4.

The analysis of the EO→MP path show a significant (positive) direct relationship (c'= 0.1521, p < 0.05). Furthermore, path analysis results show a significant positive relationship between the two mediational variables: LO and IP (d21 = 0.3202, p < 0.001).

This study investigates the cause-and-effect relationships associated with LO. Path analysis results indicate a significantly positive relationship between EO and LO (a1 = 0.6377, p<0.001) and also a significantly positive relationship between LO and MP (b1 = 0.2154, p<0.001). The partial mediation of LO[2] was detected in the relationship between EO and MP (effect = 0.1373, Boot SE = 0.0471, Boot LLCI = 0.0530, Boot ULCI = 0.2436). The confidence interval does not contain the zero value, thus suggesting the significance of the mediating role of LO in the EO-MP relationship (Preacher and Hayes, 2008). Hence, H2 is supported. This result suggests the salient effect of LO in the linkage between EO and MP in ICT sector. The findings empirically confirm that EO plays a central role in improving MP on a learning-oriented basis.

Moreover, this study explores the cause-and-effect relationships associated with IP. The results show that EO has positive significant effect on IP (a2 = 0.3510, p <0.001), and in turn IP has positive significant effect on MP (b2 = 0.4027, p<0.001). The partial mediation of IP was detected in the relationship between EO and MP (Effect = 0.1414, Boot SE = 0.0403, Boot LLCI = 0.0734, Boot ULCI = 0.2293). Confidence interval does not comprise 0. Thus, the specific indirect effect via IP is significant. In other words, IP has a mediating role in the EO-MP relationship. Hence, H3 is supported. The results show that EO impacts effectively the corporate performance by influencing the ability of the companies to innovate and especially when the activities of innovation generate an increase in the IP which is an outcome of these innovation activities.

Finally, this study investigates the cause-and-effect relationships associated with both LO and IP within a serial mediation model (SMM). First, the total effect of EO on MP is found to be significant at 0.5130 (p=< 0.001). However, when the mediating variables of LO and IP are input into a SMM, the direct effect of EO on MP weakens at 0.1521 (p= < 0.001). This indicates significant serial mediating effect of LO and IP in the EO-MP relationship. The results indicated a significantly positive relationship between EO and LO (a1 = 0.6377, p<0.001), between LO and IP (d21 = 0.3202, p<0.001), and between IP and MP (b2 = 0.4027, p<0.001). The serial mediation of LO and IP was detected in the relationship between EO and MP (Effect=0.0822: Boot SE = 0.0237, Boot LLCI = 0.0415, Boot ULCI = 0.1361). Thus, H4 is supported.

[2] It is a partial mediation for two reasons: (1) direct effect (c') < total effect (c); (2) the direct effect is significant (direct effect =0.1521, t=2.3577, p=0.0191) (Zhao *et al*., 2010).

Table 3
Standardized Estimates of the Structural Model (Direct Effects)

Path	Coefficient	SE	t-value	*p*
EO→LO (a1)	0.6377	0.0481	13.270	0.0000
LO→MP (b1)	0.2154	0.0639	3.368	0.0009
EO→IP (a2)	0.3510	0.0644	5.4472	0.0000
IP→MP (b2)	0.4027	0.0592	6.8008	0.0000
LO→IP (d21)	0.3202	0.0644	4.9684	0.0000
EO→MP (c')	0.1521	0.0645	2.3577	0.0191
EO→MP (c)	0.5130	0.0535	9.5810	0.0000

***Note*:** Total effect (c) = direct effect (c') + total indirect effects (a1*b1 + a2*b2 + a1*d21*b2). The coefficients (c) and (c') are significant, thus H1 is supported.

As a whole, the results indicate that LO and IP mediate the effect of EO on MP. The empirical findings (indirect path 3) confirm the hypothesized causal chain mediation (H4).

Table 4
Tests of Indirect and Mediational Effects

Path	Effect	Boot SE	BootLLCI	BootULCI	Hypothesis
EO→LO→MP (H2)	0.1373	0.0471	0.0530	0.2436	supported
EO→IP→MP (H3)	0.1414	0.0403	0.0734	0.2293	supported
EO→LO→IP→MP (H4)	0.0822	0.0237	0.0415	0.1361	supported
Total Indirect Effect	0.3609	0.0584	0.2503	0.4827	supported

Note: N = 259, CI, confidence interval, LL, lower limit, UL, upper limit, based on 1000 bootstrap samples, 95%.

DISCUSSION

The results demonstrate firstly that EO is positively related to LO, secondly that higher levels of LO result in higher levels of IP, and thirdly that IP impacts positively MP.

EO-LO Link (EO→LO)

Extant literature on entrepreneurship has indicated that EO promotes the learning processes (Harrison and Leitch, 2005) and that entrepreneurial culture facilitates the exploitation of existing knowledge and the exploration of external knowledge, thereby fostering generative learning. Employees in entrepreneurial firms are typically motivated to develop and implement new solutions (Harrison and Leitch, 2005) and are often highly committed to learning, thus reinforcing the organizational learning

intensity and scope. Such firms may also reinforce open-mindedness, because they allow employees to "think outside the box" (Baker and Sinkula, 1999). Moreover, innovative companies may blur authoritarian structures and facilitate communication between employees, thereby enabling the development of a shared vision and favoring the attainment of the convergent effect of learning within an organization (Wang, 2008).

LO-IP Link (LO→IP)

The results show that LO is a core antecedent of innovativeness. In fact, as stated by Hurley and Hult (1998: 45), "LO stimulates receptivity to new ideas and innovation as part of an organization's culture (innovativeness)." Hence, IP depends on the extent to which a firm is learning-oriented and to which the knowledge is acquired and shared. The results are consistent with a wide number of studies that attest the positive effect of LO on innovation (Garcia-Morales *et al.,* 2006; Keskin, 2006; Rhee *et al.,* 2010).

IP-MP Link (IP→MP)

The results demonstrate that IP is a critical determinant of MP, thus confirming the large stream of research on innovation (Cooper, 2000; Hurley and Hult, 1998). In this context, innovativeness is considered as a strategic mean by which firms deal with market changes and current challenges in a turbulent environment. Hence, high-tech firms have to fuel innovativeness to improve their MP.

EO-MP Link: The Serial Mediation Through LO and IP (EO→LO→IP→MP)

As a whole, the results indicate that EO is one of the important factors to guide the level of MP and highlight the mediating effect of LO and IP in the EO-MP link. LO, as an organizational orientation, and IP, as an outcome of firm's innovativeness, constitute the mechanism through which EO influences MP. Knowledge about these two mediators provides insights to decision-makers of the activities that are necessary to make EO generate concrete outcomes.

Based on the results and from the earlier discussions, it is clear that EO of Tunisian IT firms positively brings about a capacity to innovate and then to improve MP when configured in a learning oriented culture. These findings seem to be consistant with the specificities of the Tunisian ICT-based SMEs which are often characterized by an enabling management style, a frequent horizontal communication, a supportive innovation climate, and intensive knowledge sharing (Harbi *et al.,* 2014).

The empirical evidence shows that the Tunisian ICT firms are small and young (World Bank (2008): around 80% of companies have less than 50 employees). The small size of Tunisian ICT firms seems to be a serious constraint that prevents them from competing with multinational firms. However, the flexibility and the proximity of managers in the SMEs might help them to behave entrepreneurially, to adapt quickly to the changing environment, to facilitate shared vision, and to foster commitment to learning and innovation (Wiklund and Shepherd, 2005).

The results of this research diverge from those of Alegre and Chiva (2013). Indeed, the paper of Alegre and Chiva (2013) demonstrates a full mediation whereas the results of this research attest a partial mediation. This disparity may be due to the difference of empirical contexts. In fact, Alegre and Chiva (2013) focused on a sample of Italian and Spanish ceramic tile producers, but the current study is based on a sample of Tunisian ICT firms. The significance of the direct effect of EO on MP may be explained by the

nature of the ICT sector which is often characterized by a clear EO attitude and a close relationship between EO and firm performance (Arshad *et al*., 2014). Also, contrary to Alegre and Chiva's (2013) paper which used financial performance (growth and profitability), the current research adopted MP which is an intermediary stage to make firm performance effective (Gunday *et al*., 2011). This fact may explain the significant direct effect of EO on MP.

CONCLUSION

The aim of this paper is to present an integrated model that exhibits the indirect effect of EO on MP through the serial mediation of LO and IP. Based on a sample of 259 Tunisian ICT firms and by using SEM, the results demonstrate that EO, LO, and IP are crucial drivers of MP. The main result is that EO impacts MP via a causal chain including LO and IP as serial mediators. In short, from the foregoing discussion, the causal relationships between the model constructs occur as follows : EO→LO→IP→MP.

Hence, as a firm's level of EO increases, the level of LO also increases, emphasizing the creation of the organizational values underlying LO (commitment to learning, open-mindedness, and shared vision). These latter factors positively impact the efficiency of organizational learning and further promote generative learning, thereby strengthening innovativeness and raising market performance.

Contributions

This research contributes to a theoretical extension of the determinants of market performance by proposing the causal chain that relates EO, LO, and IP. The findings indicate that LO is essential for the high-tech sector. LO, as a mediating variable, is likely to have a critical role to incorporating all the key variables which are influential on firm innovativeness and performance.

According to the literature on EO-performance linkage, it is not common to test more than one mediator. This study might be the first to test a serial mediation model of EO on MP and sets a stage for further analyses to use other interesting mediators.

Also, the merit of the current paper is to focus on SMEs in an emergent economy. The study results have contextual relevance given the dearth of empirical research on understanding EO in an African setting (Urban and Verachia, 2019) and namely in the Tunisian context.

Managerial Implications and Recommendations

This study provides IT managers with practical insights about the effect of EO as a strategy to achieving higher levels of corporate performance. Tunisian ICT operators have to be innovative and proactive in order to improve their firms' performance.

Furthermore, the results suggest that the managers of entrepreneurial ICT firms should develop a corporate culture that includes nurturing learning, in order to support innovative performance and hence market performance. The findings imply that LO must be in place to maximize the effect of EO on MP.

To reap the benefits of EO, a firm should be committed to learning. Overall, EO opens up the scope for learning by promoting divergent learning, while LO emphasizes both the intensity and direction of learning (convergent effect of learning: Wang, 2008).

Limitations and Suggestions for Future Research

The paper is not without limitations. First, the choice of EO as a focal independent variable may be criticized. Indeed, "EO does not necessarily generate positive outcomes per se. This is because EO appears to be an attitude toward the pursuit of opportunities, rather than behavior toward innovative actions" (Rhee *et al*., 2010: 68). In fact, there is a controversial debate about the nature of the EO construct. While some authors consider EO as a dispositional construct (Voss *et al*., 2005), others attribute a behavioral nature for it (Pearce *et al.,* 2010). However, other researchers incorporate both dispositional and behavioral items (Covin *et al.,* 2006).

Therefore, further research should take into account other mediators and predictors of corporate performance related to the firm's behaviors and activities such as information acquisition and utilization (Keh *et al*., 2007), access to financial resources (Wiklund and Shepherd, 2005), and network capability (Walter *et al.,* 2006). Previous studies assert the moderating role of the environmental characteristics (dynamism and hostility), but for this study, it seems not worthwhile to consider these variables because the interviewed firms belong to the same sector and the same country. However, the introduction of the strategy type as moderator may be of interest (Wales, 2016).

Then, the paper refers to an empirical study of ICT companies in Tunisia. Cross-cultural study can advance entrepreneurship research by identifying cultural effects. Further research in other countries and industry settings is recommended to confirm and extend the results and to ensure the generalizability of the findings. In the past literature, it is common to relate EO to firm performance. However, this relationship may not be discernible (Dess and Lumpkin, 2005) because EO outcomes are likely to appear after a long period (Zahra and Covin, 1995; Madsen, 2007), thus the usefulness of further longitudinal and qualitative research.

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Triggers and Psychological Contracts: The Influence of Managerial Discretion

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Abstract: Prior research has shown that events that employees believe will impact them negatively lead to employees feeling that their psychological contract with the organization has been breached. This subsequently reduces affective organizational commitment and job satisfaction, while increasing intentions to leave. This model, however, does not sufficiently consider the role and latitude of a direct manager (i.e., supervisor) as the employee's proximal organizational agent. By modeling the effects from varying levels of a direct manager's discretion, as perceived by the employee, knowledge concerning psychological contract breach and its associated outcomes is advanced. To accomplish this, an existing scale was adapted to measure managerial discretion of middle level managers, which was validated using responses from 210 employees across many organizations. Using the new scale, analyses showed that as perceived discretion of their direct manager increases, employees' feelings of

psychological contract breach from negative events increase and lead to greater reductions of affective organizational commitment and job satisfaction, as well as increased intentions to leave. The findings suggest that employees look to direct managers perceived to have greater discretion, holding them accountable for negative events, regardless of whether their managers were involved in decisions or operations associated with the event.
Keywords: Managerial discretion; psychological contracts; affective organizational commitment; job satisfaction; intentions to leave

Despite more than 50 years of research on the nature of psychological contracts and their inherent social exchanges, there are still many unanswered questions about how they influence individuals' attitudes and behaviors (Conway and Briner, 2009). Rousseau's (1995) influential reconceptualization of psychological contracts (PCs) in the workplace distinguished them from workplace expectations, defining them as "individual beliefs, shaped by the organization, regarding terms of an exchange agreement between the individual and their organization" (Rousseau, 1995: 9). Of critical importance in this reconceptualization was a clearer focus on the organization's role and employees' perceptions of organizational agents' explicit and implied obligations. There is still much to be learned regarding organizational agents' influence on employee perceptions of PC breach or fulfillment. As suggested by Tekleab and Taylor (2003), although top management can transmit information or messages to the organization's employees as a whole, it is one's immediate manager that is most likely to talk about aspects of the employment relationship that make up the PC. Using events thought to trigger consideration of one's PC from recent research (O'Neill and Cotton, 2017), the role that perceived managerial discretion has in employees' interpretation of events that may trigger perceptions of PC breach and their subsequent impact on employee attitudes is examined. One of this study's contributions is extending existing research by examining the moderating influence of the immediate manager's discretion on PC breach perceptions and subsequent indirect effects on employee outcomes.

A variety of social exchanges occur in the workplace and effects from these exchanges can vary, with those closest to the employee having the strongest influence on attitudes and behaviors (Alcover *et al*., 2017). Theory contends that employees have a strong commitment to their immediate supervisors since they are considered important referents (Clugston *et al*., 2000). As a result, decisions made (or perceived to be made) by one's manager are likely to affect the employees' perceptions of their PC with the organization (Ng and Sorensen, 2008). Parzefall and Coyle-Shapiro (2011) found that when discrepancies occur, responsibility for PC breach is primarily attributed to one's immediate manager. Despite these attributions, little research to date has examined how employees view PCs when responsibility for fulfilling them may or may not fall under the manager's control. A variety of studies have examined PC breach and three types of attributions: (1) those related to intentional PC breach (i.e., reneging), (2) those related to misunderstandings of the PC (i.e., incongruence), and (3) failure to meet obligations despite being outside of the organization's control (i.e., disruption) (Chao *et al.*, 2011; Kiewitz *et al*., 2009; Parzefall and Coyle-Shapiro, 2011). What has been overlooked to date, however, is whether or how managers might lessen the negative consequences of workplace events and PC breach (Wiechers *et al*., 2019). Mitigation of

PC breach requires that employees believe that managers have the necessary latitude to effectively communicate about impending events that may trigger PC breach or engage employees in ways that may alleviate deleterious impacts (Costa and Neves, 2017; Morrison and Robinson, 1997). As such, another contribution of this study is identifying whether employee perceptions of his or her manager's available discretion is useful for understanding PC breach and related work outcomes.

First, a brief review of how workplace events are thought to trigger employees' consideration of their PCs is provided. Next, the need to research managerial discretion of middle level managers (i.e., supervisory level managers) is discussed, along with how managerial discretion may influence subordinates' PC breach perceptions. This includes a review of existing research examining managerial discretion at an organization's lower levels. Hypotheses are then developed to examine how an employee's perception of their manager's discretion moderates the relationship between various workplace events and perceptions of PC breach. These hypotheses are tested by estimating moderated mediation models. Lastly, academic and practical implications of the findings, along with limitations of the study and directions for future research, are discussed.

LITERATURE REVIEW

Triggers, Psychological Contract Breach, and Workplace Outcomes

Schalk and Roe (2007) asserted that despite the continual presence of PCs in the workplace, full attention is only paid to them when events occur that are deemed important enough to warrant a response. The impact of PC breach can be described using affective events theory (Weiss and Cropanzano, 1996) in which work events trigger affective reactions that influence work attitudes and subsequent behaviors. This theory employs PCs as the process producing these affective reactions.

Work environmental features include PC obligations, as well as good and bad work features that the employee experiences. These work features can lead to specific events that O'Neill and Cotton (2017) consider trigger events. Notably, PC obligations are perceptual, existing in the mind of employees and organizational agents, including direct managers. Earlier research suggests that individuals do not consider these obligations until something triggers them to do so. That is, they remain dormant until awakened (i.e., triggered) by some event that requires sensemaking (O'Neill *et al.,* 2007). Once triggered, these events can lead employees to consider whether a PC breach has occurred, which can subsequently influence various workplace attitudes (Costa and Neves, 2017). Morrison and Robinson (1997) theorized that an employee perceiving PC breach considers whether an organizational agent is aware of the events and whether the agent's actions related to the events were deemed intentional. The authors claim that employee attributions of the agent's involvement may vary from an honest oversight to the agent making excuses.

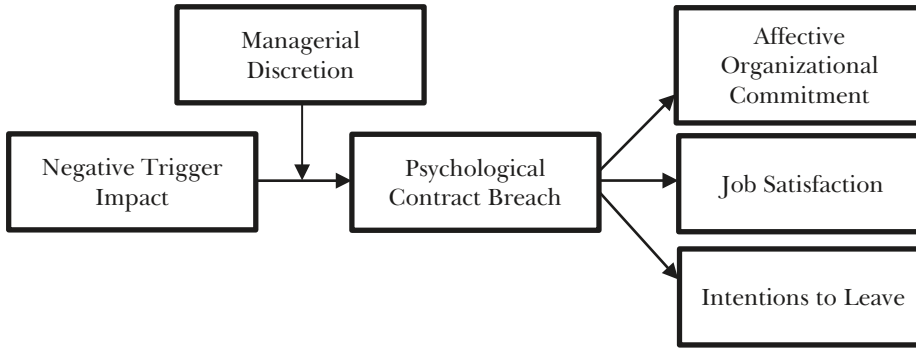
O'Neill and Cotton (2017) identified a set of 40 work events that respondents said caused them to think about their employment relationship. Examples of events included: "Performance Reviews," "Turnover in Staff," "Promotion of Co-workers," and "Cutbacks in Benefits." In a second study, respondents were asked about the frequency and perceived directionality of these events (called triggers). Most triggers were perceived negatively, though some were viewed positively. Although not examined in that study, positive or negative perceptions may have resulted from attributions of the

agents associated with various events. This may include considerations of purposeful intent, excuses, or attributing control over the event to the agent (Morrison and Robinson, 1997). The triggers were then assessed and found to influence job satisfaction, pay satisfaction, organizational commitment, and intentions to leave. O'Neill and Cotton (2017) utilized procedural, interactional, and distributive justice as moderators of the triggers and several work outcomes, finding some significant effects. In the present study, PC breach is employed as the mediator between triggers and work attitudes, and managerial discretion is hypothesized to have a moderating effect on these relationships.

Several models of PC breach have taken an approach similar to Weiss and Cropanzano (1996). For example, Coyle-Shapiro and colleagues argue that, "Viewing breach as a process beginning with triggers that jolt an individual into conscious awareness paints a more complex portrayal of breach as a process unfolding over time" (2019: 152). Ballinger and Rockmann (2010) described how a trigger (which they labeled an anchor event) can subsequently affect the perceptions for future exchanges in a quick, dramatic, and durable manner. Such perceptions potentially lead to perceptions of PC breach. In addition, Solinger *et al.* (2016) examined employees' post-violation trajectories and found that a fairly complex process is necessary before an employee perceives a satisfactory resolution to a breach.

To examine work events that lead to PC breach in this study, participants were asked about significant work events and whether they felt these events were positively or negatively impactful (O'Neill and Cotton, 2017). Trigger events that were perceived as negative were of particular interest since they are more likely to cause employees to evaluate their PCs with the employer, potentially resulting in PC breach perceptions as well as negative work attitudes and behaviors. In the next section, managerial discretion, including its applicability to middle level managers and its importance in PCs, is discussed. It is hypothesized that the degree of discretion an employee perceives is available to his or her supervisor moderates the relationship between triggers and breach perceptions, which subsequently influences the workplace outcomes hypothesized below. Figure I provides the conceptual model illustrating these relationships.

Figure I
Conceptual Model



Middle Level Managerial Discretion and Psychological Contracts

Research concerning managerial discretion's influence on firm-based outcomes is well-established. Hambrick and Finkelstein (1987) defined managerial discretion as an executive's latitude of action, which spans his or her ability to conceive ideas, promote preferred directions, make decisions, and lead implementation efforts. Thus, managerial discretion has been shown to be an important moderating influence on organizational outcomes [see Wangrow *et al*. (2015) for a review]. Research operationalizing managerial discretion has often focused on CEOs and used industry assumptions or measures as a proxy for the degree of discretion available to executives. Yet, there has been minimal examination of managerial discretion at the micro-level, which requires measures that also consider enabling and constraining forces from the organization and the manager's personal characteristics (Wangrow *et al*., 2015).

Similar to the managerial discretion of top executives in an organization, the perceived discretion of managers lower in the organization may also be influenced by the industry, the managers' personal factors (e.g., locus of control, cognitive complexity, domain-specific self-efficacy), and factors related to the organization and its culture (Caza, 2011). Managers can also hold varying degrees of power and authority for decision-making, including establishing goals and assignments, supervision of work, providing rewards, and enforcing sanctions. Thus, it is logical to consider the direct supervisor's discretion within the broader organization and its association to interactions with his or her subordinates (Conway and Briner, 2009).

Research examining managerial discretion at the supervisory level has often used related terms to frame the construct (e.g., autonomy; see Kuratko *et al*., 2005). Scholars have found that middle level managers, similar to CEOs, can be constrained by powerful internal and external forces, as well as limited resource availability (Christensen and Bower, 1996). However, unconstrained middle level managers are able to more effectively champion company initiatives, such as corporate entrepreneurship (Kuratko *et al*., 2005) and innovation (Christensen and Bower, 1996). Floyd and Wooldridge (1997) suggested that middle level managers can increase their discretion by sharing, filtering, or withholding relevant information to promote new initiatives or create awareness of the need for changes to existing initiatives. Dutton *et al*. (2001) frame this as "issue selling" that orients executives' attention and understanding, although the authors caution that timing, location, and context are essential aspects of issue selling.

While this research highlights the managerial discretion model's applicability to middle level managers, it also underlines an important difference between discretion for CEOs and middle level managers. In the context of executives, Shen and Cho (2005) stressed that the managerial discretion construct includes two separate facets: latitude of objectives and latitude of action. Latitude of objectives is the degree that executives can follow their own personal goals towards their preferred outcomes. Latitude of action includes the range of options that executives can realistically take to meet the objectives of powerful stakeholders (e.g., members of the board of directors). As middle level managers are less likely to influence objectives, latitude of action is more salient to middle level managers. Yet, some middle level managers may be able to influence objectives. They may be in boundary-spanning roles (e.g., leading a major customer relationship; Floyd and Wooldridge, 1997) or may be more skilled at issue selling, sensemaking, and seizing the optimal moment (Dutton *et al*., 2001; Rouleau and Balogun, 2011).

Supervisors (i.e., middle level managers) not only have their own PCs, they also make PCs with employees on behalf of the organization. As such, they "play a special role in making or breaking the psychological contracts of their employees" (Rousseau, 1995: 64). While changes to PCs over time depend on various relationships that employees have with the organization's distal and proximal representatives (Alcover *et al*., 2017; Tekleab and Taylor, 2003), it is the immediate supervisor who is more likely to directly impact perceptions associated with PCs. In addition, Wiechers and colleagues (2019) suggest that organizational obligations can be made by one organizational agent and broken by a different agent. Their model suggests that organizational agents who are closest to the employee (e.g., direct supervisors and team members) pay greater attention to PC terms than those considered more distal to the employee (e.g., top management). Further, Ng and Sorensen (2008) argue that direct supervisors may be more relevant agents since their support is viewed as more consistent over time, and involves conveying context and applicability, offering suggestions or directions, and providing access to resources necessary to perform various work tasks.

In examining PCs' reciprocal nature, Tekleab and Taylor (2003) found that supervisors (as organizational agents) and employees tended to disagree on both employee obligations and breach of their PCs. However, they found that supervisors and employees are likely to agree on the organization's obligations to the employee and whether the organization had breached its PC with the employee. While some of these differences are related to the employee's tenure with the supervisor and team members (Tekleab and Taylor, 2003), perceptions of the manager's discretion may also explain these differences since the employee relies on the manager for understanding and interpreting PC obligations from all organizational levels.

In summary, what is clear from prior research is that while PCs are fundamentally influenced by an organization's actions, sensemaking of those actions is influenced by the employee's primary representative of the organization – his or her immediate supervisor (Tekleab and Taylor, 2003). Accordingly, a number of studies have examined supervisory involvement in PC breaches. Some scholars, for instance, found that support from one's supervisor reduces the negative impact of contract breach (Zagenczyk *et al*., 2009). Others examined how similarities between a supervisor and employee (e.g., in cognitive style, gender, and race) can reduce perceptions of PC breach, with leader-member exchange (LMX) mediating the relationship between similarity and breach perceptions (Suazo *et al*., 2008).

In the next section, the three hypotheses associated with this study's research question and supporting theoretical arguments are presented in greater detail.

HYPOTHESIS DEVELOPMENT

In their examination of trigger events that color employees' perceptions and attitudes, Ballinger and Rockmann (2010) suggest that a target is the person with whom an employee is engaged when he or she experiences an event. Since the employee's direct supervisor is likely to be that target, the employee's evaluation of this target will be relative to the event. Wood (1996) contends that when individuals consider a single fragment of social information in their work environment, they are engaging in social comparisons. As social comparisons involve acquiring information and reacting to it, one pertinent source of information an employee assesses is the amount of discretion

that his or her supervisor has within the organization (O'Neill and Mone, 2005). This evaluation of social information also fosters judgments regarding PC obligations. Since evaluating PCs also involves assessing the exchange relationship, it is likely that employees are also appraising the degree of their supervisors' managerial discretion and whether he or she exercises such discretion appropriately. What remains unknown, however, is whether managerial discretion influences employees' perceptions of their PCs and whether that breach mediates other outcomes.

Affective Organizational Commitment and Job Satisfaction

This study examines the moderating effect of managerial discretion on the impacts between trigger events and three outcome variables (affective organizational commitment, job satisfaction, and intentions to leave) that are mediated by PC breach. Prior research has shown strong correlations and significant relationships between these three outcome variables (Clugston, 2000). However, since a supervisor's latitude of action may affect these variables in distinctly different ways, the conditional indirect effect of managerial discretion on each of the three outcome variables is examined.

Affective organizational commitment refers to feelings of warmth and caring for the organization. It combines a desire for the organization to succeed with a sense of pride and a preference to be identified with the organization (Allen and Meyer, 1990). An employee may be affectively committed to one or more groups within the organization, including his or her workgroup, a project, a division, or the entire organization.

As a highly proximal organizational agent, it is the supervisor whom the employee relies upon for comprehension and justification of strategies, objectives, and decisions throughout the organization (Alcover *et al*., 2017). An employee who believes that his or her supervisor has greater discretion will look to the supervisor when negative events occur, regardless of the supervisor's actual involvement in the events. Thus, perceptions of PC breach are likely to be greater when the managerial discretion of one's supervisor is perceived to be higher, which subsequently reduces affective organizational commitment.

> *H1a: Managerial discretion will moderate the indirect effect of negative trigger impact on affective organizational commitment via psychological contract breach such that the mediated effect is stronger when managerial discretion is greater.*

While affective organizational commitment is associated with loyalty and warmth toward the organization, job satisfaction involves attitudes that employees have about their work and role in the organization (Jones and George, 2008). Like affective commitment, job satisfaction involves complex and multifaceted perceptions. However, job satisfaction is related to personal perceptions of fulfillment, self-efficacy, and achievement (Christen *et al*., 2006). Recent scholarly work argues and finds that trigger events lead to perceptions of job-specific PC breach, which, in turn, reduces job satisfaction (e.g., Suazo, 2009).

An employee will believe that a supervisor with higher discretion should be more capable of avoiding or diminishing the effects of trigger events. This includes believing that the supervisor is highly aware of initiatives and decisions within the organization, even if such beliefs are potentially unrealistic. The employee will therefore perceive greater PC breach and, thus, will be less satisfied with his or her job. The following is hypothesized.

H1b: Managerial discretion will moderate the indirect effect of negative trigger impact on job satisfaction via psychological contract breach such that the mediated effect is stronger when managerial discretion is greater.

Intentions to Leave

Fulfillment of the PC has been shown to be one factor associated with intentions to leave (Robinson and Rousseau, 1994). In the unfolding model of voluntary turnover, Lee and Mitchell (1994) contend that employees who experience shocks are induced (i.e., triggered) to deliberate about their job and whether they wish to continue. Deliberations regarding job fit, organizational fit, and job satisfaction play a major part of whether the employee perceives that his or her PC with the organization and its leaders has been breached (Robinson and Rousseau, 1994).

Once an employee develops perceptions of PC breach, it is unlikely that his or her supervisor can disrupt the cognitive processes generated by such negative perceptions. Moreover, since the supervisor is the employee's proximal organizational agent, the employee is more likely to associate his or her supervisor with the cause(s) of the event that led to PC breach perceptions. Thus, the employee believes that a higher discretion supervisor should have been able to take action to eliminate or ameliorate the event. Feeling that his or her PC was breached, deliberations regarding leaving are likely to intensify. In sum, the following hypothesis is made.

H2: Managerial discretion will moderate the indirect effect of negative trigger impact on intentions to leave via psychological contract breach such that the mediated effect is stronger when managerial discretion is greater.

METHODS

Sample and Data Collection

A leading experience management firm, Qualtrics, was enlisted in December of 2018 to gather data from individuals currently employed by firms of various sizes within the United States. Participants, who were modestly compensated for completing the online questionnaire, were required to be at least 18 years of age and to have worked full-time for their current employer for at least three months. Qualtrics requires participants to have a unique ID and eliminates questionnaires with few responses to all items or the same answer to each item. Additionally, the authors reviewed the time for each participant to complete the questionnaire to ensure that responses seemed sincere. The study's 210 participants represented a wide variety of industries, with no single industry providing more than 17 percent of the participants.

The following section discusses variables used to measure the constructs in the conceptual model. First, the processes used to measure the three dependent variables (*Affective Organizational Commitment*, *Job Satisfaction*, *Intentions to Leave*), the independent variable (*Negative Trigger Impact*), and the mediating variable (*Psychological Contract Breach*) are detailed. The steps taken to create and validate a scale for *Managerial Discretion*, which serves as the moderating variable in the moderated mediation model, are then discussed.

Dependent Variables

For each of the three dependent variables, participants responded to items using a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Each dependent variable was measured as the mean of responses to its scale's items.

Affective Organizational Commitment was measured using Allen and Meyer's (1990) six-item affective commitment scale. This scale measures emotional attachment to the organization and was chosen due to its value as a "psychological summary of equity and expectancy considerations" (Meyer and Allen, 1991: 5). An example of an item from this scale is, "My organization has a great deal of meaning for me." Consistent with prior use of this scale, the responses suggested good internal reliability ($\alpha = 0.762$).

Job Satisfaction was measured using Brayfield and Rothe's (1951) five-item scale, which assesses individuals' agreement with a range of evaluative statements. An example of an item from this scale is, "I find real enjoyment in my work." The responses suggested excellent internal reliability ($\alpha = 0.852$).

Intentions to Leave was measured using responses to the Michigan Organizational Assessment's three-item scale. An example of an item from this scale is, "I will probably look for a new job this year." Again, the responses suggested excellent internal reliability ($\alpha = 0.919$).

Independent Variable

It was not possible to know *a priori* if triggers (e.g., performance reviews or turnover in staff) would be perceived as positive or negative by the participants. Because of this, negative events were uniquely determined for each participant from his or her own perceptions of the various trigger events. The measure for *Negative Trigger Impact* utilized responses to two questions for 20 workplace event items (see Appendix B). For each event, participants were first asked to answer the following question, "How frequently does this cause you to think about your relationship with your company," with answers ranging from "1" which corresponded with never to "5" which corresponded with always (referred to as FREQ). Then, participants were asked to answer the following question for each event using a seven-point Likert scale, "What impact do you believe this event has on you as a company employee," with "1" being strongly negative and "7" being strongly positive (referred to as IMPACT). The *Negative Trigger Impact* for each participant was then calculated as the sum of the results from Equation 1 for all events in which the participant answered the second question with responses of 1, 2, or 3 (i.e., strongly negative to slightly negative).

Equation 1: Negative Trigger Impact of a Single Event = -1 * (IMPACT – 4) * (FREQ – 1)

Mediator

Psychological Contract Breach was measured using the mean of responses to Robinson and Morrison's (2000) five-item scale that was derived from prior theoretical and conceptual work associated with the construct. An example of an item from this scale is, "I did not receive everything promised to me in exchange for the contribution I made to my employer." Responses suggested excellent internal reliability ($\alpha = 0.854$).

Moderator

Scale Development. To develop a new scale to measure managerial discretion for middle level managers, methods prescribed by DeVellis (2012) were employed. First, a previously developed managerial discretion scale for CEOs (see Wangrow *et al*., 2017) was used to draft 13 items appropriate for an employee to assess his or her supervisor's managerial discretion. A panel of nine academic and professional experts reviewed the 13 items and made suggestions regarding clarity, redundancy, and applicability. The panel recommended that two items ("My manager's attention is directed towards our organization's most important issues" and "My manager is actively engaged in the execution of his/her team's operations") be removed since they believed that these items were not applicable to the construct. The 13 items were also tested with 46 MBA and senior level undergraduate students, who completed responses after reading one of two cases associated with middle level managers who possessed varying degrees of discretion. T-tests for each item between the groups of students from each case did not show significant differences for two items identified by the panel of experts. Additionally, exploratory factor analysis and a test of internal reliability indicated that the two items identified by the panel should be removed. The remaining 11 items showed excellent internal reliability ($\alpha = 0.810$) and loaded on a single factor.

Managerial Discretion. The 210 participants used a seven-point Likert scale to assess their supervisors' managerial discretion, with their responses to the 11 items suggesting excellent internal reliability ($\alpha = 0.908$). However, factor loadings were low for two of the items ("The nature of my employer's industry limits what my manager can do" and "My manager cannot envision and create multiple courses of action within our organization"). These results were reviewed with the panel of experts to determine whether the new scale remained valid if either of these items were removed. As industry likely has much less impact on managers' discretion at lower levels of the organization, the authors and the panel of experts agreed that the first of these two items could be removed. They also agreed that the second item could be removed since a supervisor's process to envision and create multiple courses of action may not be visible to his or her employees. Internal reliability remained excellent with the removal of the two items ($\alpha = 0.928$) and factor loadings for the nine items were all equal to or greater than 0.5. Thus, *Managerial Discretion* for each respondent's supervisor was calculated as the mean of responses to the nine items. The average level of managerial discretion of all supervisors from the 210 responses was 4.56 (on a scale ranging from 1 to 7) with a standard deviation of 1.13. The nine items and results from a confirmatory factor analysis are provided in Appendix A.

Fit between the measures and data was assessed by conducting confirmatory factor analyses (CFAs) that corresponded with each of the three hypothesized relationships. Each CFA included *Managerial Discretion*, *Psychological Contract Breach*, and a dependent variable. For the measurement model with *Affective Organizational Commitment*, the model fit indices were $\chi 2\ (153) = 344.72$, $p < 0.001$; comparative fit index (CFI) = 0.939; incremental fit index (IFI) = 0.939; and root mean square error of approximation (RMSEA) = 0.077. The model fit indices for measurement model with *Job Satisfaction* were $\chi 2\ (138) = 296.38$, $p < 0.001$; CFI = 0.950; IFI = 0.951; and RMSEA = 0.074. Lastly, the fit indices for the measurement model with *Intentions to Leave* were $\chi 2\ (106) = 252.05$, $p < 0.001$; CFI = 0.950; IFI = 0.951; and RMSEA = 0.081. Overall, these model fit indices suggest that the measurement models satisfactorily fit the data.

Table 1
Participants' Demographic Data

Age	
18-25	6.2%
26-35	32.9%
36-45	26.7%
46-55	18.6%
56-65	14.8%
Above 65	1.0%

Gender	
Male	33.8%
Female	65.7%
Trans Male	0.5%
Trans Female	0.0%
Gender Queer/Non-conforming	0.0%
Different Identity	0.0%

Ethnicity	
African-American	5.2%
Asian/Pacific Islander	11.4%
Hispanic	5.2%
Mixed/Multiple Races	1.4%
Native American	1.0%
White	75.7%

Job Tenure	
< 1 year	5.2%
1-3 years	15.2%
3-5 years	15.2%
5-10 years	30.0%
10-15 years	15.2%
15-20 years	8.6%
> 20 years	10.5%

Position Tenure	
< 1 year	7.6%
1-3 years	22.9%
3-5 years	22.9%
5-10 years	24.8%
10-15 years	12.9%
15-20 years	2.9%
> 20 years	6.2%

Firm Size (# of Employees)	
0-10	0.0%
11-49	0.0%
50-99	10.5%
100-499	23.8%
500-999	19.5%
1000-4999	21.4%
5000-10000	10.5%
Above 10000	14.3%

Control Variables

To limit other sources of variation, controls for factors thought to influence the three dependent variables were included. In all cases, the values used were from participants' responses. Table 1 shows the response options and distribution of responses for each of the demographic control variables. *Age* was coded from 1 to 6. *Gender* was coded as "1" for female and "0" for all other selections. *Ethnicity* was coded as "1" for White and "0" for all other selections. *Job Tenure* and *Position Tenure* were coded from "1" to "7," while *Firm Size* was coded from "1" to "8."

As related above, it was not possible to know *a priori* if triggers (e.g., performance reviews or turnover in staff) would be perceived as positive or negative by the participants. Since events that cause an employee to feel optimistic, enthusiastic, and confident may attenuate the effects of negative events, positive events were also uniquely determined for each participant from his or her own perceptions of the various trigger events. For each participant, *Positive Trigger Impact* was calculated in a similar manner to the calculation of negative events, but instead captured workplace events that participants rated positively. *Positive Trigger Impact* was then used as a control variable in each of the moderated mediation models.

Common Method Bias

Since the latent constructs' items were collected from the same respondents, these constructs are subject to potential common method bias. As systematic variance from such bias may inflate or deflate relationships among variables (Doty and Glick, 1998), two tests were performed to assess potential common method bias. First, Harman's single factor test, which loads all variables into a factor analysis with the number of factors constrained to one (Podsakoff and Organ, 1986), was employed. Results from this test showed that the variance explained by the single factor, 31.4%, was below the conventional criteria of 50%. Next, common variance using the common latent factor method (Meade *et al*., 2007) was assessed. A new latent variable was modeled to relate to all manifest variables, with the paths constrained to be equal and the variance of the common factor set to 1. The common variance, 0.33, was below the threshold of 0.50. Thus, common method bias does not pose a serious threat to the validity of the constructs.

ANALYSIS

To test the conceptual model (shown in Figure I), path 1 (the moderated relationship between the independent variable and the mediator) and path 2 (the relationships between the mediator and the dependent variables) were simultaneously estimated. The results were used to compute the conditional indirect effects. In the model, the indirect effect of *Negative Trigger Impact* varies due to the influence of a moderating variable, *Managerial Discretion*, such that the mediating effect of *PC Breach* on the three dependent variables (*Affective Organizational Commitment, Job Satisfaction, and Intentions to Leave*) is altered. If the hypothesized moderated mediation exists, testing should indicate that the indirect effect (i.e., from *Negative Trigger Impact* to *PC Breach* to the dependent variable) is conditional on the moderator.

Methods developed by Preacher *et al*. (2007) and Hayes (2013) were used to compute and compare the scale of indirect effects under different values of the moderator. Seemingly unrelated regression (SUR) was used to estimate the regression coefficients from the two paths. In the same manner as structural equation modeling (SEM), SUR simultaneously estimates a series of regression paths. SUR, however, offers the added benefit of using robust standard errors (Brown *et al*., 2005). Next, non-linear combination in STATA (i.e., the Delta method) was used to compute the conditional indirect effects from *Managerial Discretion* (for a detailed example see https://stats.idre.ucla.edu/stata/faq/how-can-i-do-moderated-mediation-in-stata/). Conditional indirect effects were determined at very low (i.e., minus two standard deviations), low (i.e., minus one standard deviation), medium (i.e., the mean), high (i.e., plus one standard deviation), and very high (i.e., plus two standard deviations) levels of *Managerial Discretion*. Non-linear combination was then used to determine whether the conditional indirect effects on the dependent variable differed between each of the levels of *Managerial Discretion*.

RESULTS

Descriptive statistics and correlations are reported in Table 2 and path analysis results are reported in Table 3. Path 1 is the relationship of *Negative Trigger Impacts* and *Psychological Contract Breach* moderated by *Managerial Discretion* and is the same for all three analyses. The relationship between *Negative Trigger Impact* and *Psychological Contract Breach* is positive and significant ($b = 0.023$; $p < 0.001$). Additionally, this relationship is positively moderated by *Managerial Discretion* ($b = 0.005$; $p = 0.047$). Path 2 is the relationship between *Psychological Contract Breach* and the dependent variable.

Table 2
Descriptive Statistics and Correlations

	Mean	SD	Min	Max	1	2	3	4
1. Affective Organizational Commitment	0.00	1.28	-3.52	2.48				
2. Job Satisfaction	0.00	1.45	-3.93	2.07	0.73			
3. Intentions to Leave	0.00	1.97	-2.43	3.58	-0.56	-0.72		
4. Psychological Contract Breach	0.00	1.47	-2.32	3.69	-0.65	-0.64	0.49	
5. Age	3.06	1.20	1.00	6.00	0.03	0.06	-0.14	0.00
6. Gender (1 = Female)	0.66	0.48	0.00	1.00	-0.10	-0.07	-0.01	0.03
7. Ethnicity (1 = White)	0.76	0.43	0.00	1.00	-0.06	-0.07	0.00	0.06
8. Firm Size	5.40	1.56	3.00	8.00	-0.07	-0.04	-0.02	0.08
9. Job Tenure	4.02	1.64	1.00	7.00	0.07	-0.03	-0.05	0.06
10. Position Tenure	3.46	1.53	1.00	7.00	0.03	-0.03	-0.03	0.02
11. Positive Trigger Impact	0.00	52.00	-44.27	195.73	0.36	0.28	0.03	-0.36
12. Negative Trigger Impact	0.00	23.63	-13.53	168.47	-0.33	-0.40	0.22	0.40
13. Managerial Discretion	0.00	1.13	-3.22	2.44	0.43	0.33	-0.15	-0.39

	5	6	7	8	9	10	11	12
6. Gender (1 = Female)	-0.02							
7. Ethnicity (1 = White)	0.09	-0.01						
8. Firm Size	0.05	0.04	0.05					
9. Job Tenure	0.48	-0.03	0.08	0.10				
10. Position Tenure	0.48	-0.07	0.10	0.01	0.64			
11. Positive Trigger Impact	-0.11	-0.24	-0.11	-0.07	-0.07	-0.01		
12. Negative Trigger Impact	0.06	0.18	0.14	0.15	0.11	-0.02	-0.28	
13. Managerial Discretion	-0.16	-0.28	0.01	-0.19	-0.04	-0.01	0.49	-0.30

N = 210; $p < 0.05$ for $r > 0.13$; $p < 0.01$ for $r > 0.18$
Independent, mediator, moderator, and dependent variables have been mean-centered.

Table 3
Regression Results

Path	1	2		
Dependent Variable	Psychological Contract Breach	Affective Organizational Commitment	Job Satisfaction	Intentions to Leave
Independent Variable				
Negative Trigger Impact	0.023**	-0.004	-0.012**	0.010
	(0.006)	(0.004)	(0.004)	(0.007)
Mediator				
Psychological Contract Breach		-0.469**	-0.518**	0.691**
		(0.058)	(0.074)	(0.109)
Moderator				
Managerial Discretion	-0.464**	0.203**	0.146+	-0.175
	(0.092)	(0.067)	(0.079)	(0.124)
Interaction				
Negative Trigger Impact × Managerial Discretion	0.005*	-0.001	-0.003	0.005
	(0.003)	(0.003)	(0.004)	(0.005)
Control Variables				
Age	-0.158+	0.031	0.149+	-0.244*
	(0.086)	(0.060)	(0.081)	(0.116)
Gender (Female = 1)	-0.401*	-0.016	0.002	-0.025
	(0.183)	(0.136)	(0.152)	(0.247)
National Origin (White = 1)	0.053	-0.060	-0.075	-0.001
	(0.208)	(0.132)	(0.150)	(0.238)
Firm Size	-0.019	0.001	0.042	-0.073
	(0.061)	(0.045)	(0.049)	(0.077)
Job Tenure	0.032	0.122*	0.006	-0.025
	(0.071)	(0.061)	(0.067)	(0.095)
Position Tenure	0.046	-0.060	-0.077	0.058
	(0.072)	(0.062)	(0.072)	(0.112)
Positive Trigger Impact		0.002	-0.000	0.011**
		(0.002)	(0.002)	(0.003)
Constant	0.566	-0.338	-0.409	1.099*
	(0.439)	(0.342)	(0.387)	(0.533)
Adjusted R-squared	0.239	0.460	0.423	0.285

Affective Organizational Commitment

To first test the mediated relationship, the path from *Negative Trigger Impact* to *Affective Organizational Commitment* through *Psychological Contract Breach* was examined. The relationship of *Psychological Contract Breach* with *Affective Organizational Commitment* (i.e., Path 2) is negative and significant ($b = -0.469$; $p < 0.001$). However, the direct effect of *Negative Trigger Impact* on *Affective Organizational Commitment* was found to be negative, but not significant ($b = -0.004$; $p = 0.274$), indicating a fully mediated model.

The indirect effect (*Negative Trigger Impact* to *Affective Organizational Commitment* through *Psychological Contract Breach*) shown in Table 4 is significant for varying levels of

Managerial Discretion. Additionally, as *Managerial Discretion* increases, the indirect effect on *Affective Organizational Commitment* becomes increasingly negative. Testing using the non-linear combination method indicates that the changes in the indirect effect are significant across various levels of *Managerial Discretion* (p = 0.054). Thus, the results show that the indirect effect of *Psychological Contract Breach* is contingent upon *Managerial Discretion*, providing support for Hypothesis 1a.

Table 4
Conditional Indirect Effects (H1a: DV = Affective Organizational Commitment)

	b	Std. Err.	p > |z|	[95% CI]
Very Low Managerial Discretion	-0.0048	0.0030	0.109	[-0.0106, 0.0011]
Low Managerial Discretion	-0.0077	0.0026	0.003	[-0.0127, -0.0026]
Mean Managerial Discretion	-0.0106	0.0030	0.000	[-0.0165, -0.0047]
High Managerial Discretion	-0.0135	0.0040	0.001	[-0.0213, -0.0057]
Very High Managerial Discretion	-0.0164	0.0052	0.002	[-0.0266, -0.0062]

Job Satisfaction

First, the path from *Negative Trigger Impact* to *Job Satisfaction* through *Psychological Contract Breach* was examined. The relationship of *Psychological Contract Breach* with *Job Satisfaction* (i.e., Path 2) is negative and significant (b = -0.518; p < 0.001). Also, the direct effect of *Negative Trigger Impact* on *Job Satisfaction* is negative and significant (b = -0.012; p = 0.003), indicating a partially mediated model.

The indirect effect (*Negative Trigger Impact* to *Job Satisfaction* through *Psychological Contract Breach*) shown in Table 5 is significant for varying levels of *Managerial Discretion*. Additionally, as *Managerial Discretion* increases, the indirect effect on *Job Satisfaction* becomes increasingly negative. Testing using the non-linear combination method indicates that the changes in the indirect effect are significant across various levels of *Managerial Discretion* (p = 0.050). Thus, the results show that the indirect effect of *Psychological Contract Breach* is contingent upon *Managerial Discretion*, providing support for Hypothesis 1b.

Table 5
Conditional Indirect Effects (H1b: DV = Job Satisfaction)

	B	Std. Err.	p > |z|	[95% CI]
Very Low Managerial Discretion	-0.0053	0.0035	0.129	[-0.0121, 0.0015]
Low Managerial Discretion	-0.0085	0.0032	0.007	[-0.0146, -0.0023]
Mean Managerial Discretion	-0.0117	0.0036	0.001	[-0.0187, -0.0046]
High Managerial Discretion	-0.0149	0.0046	0.001	[-0.0239, -0.0058]
Very High Managerial Discretion	-0.0181	0.0059	0.002	[-0.0297. -0.0065]

Intentions to Leave

The path from *Negative Trigger Impact* to *Intentions to Leave* through *Psychological Contract Breach* was first examined. The relationship of *Psychological Contract Breach* with *Intentions to Leave* (i.e., Path 2) is positive and significant (b = 0.691; p < 0.001). The direct effect of *Negative Trigger Impact* on *Intentions to Leave* was found to be positive, but not significant (b = 0.010; p = 0.146), indicating a fully mediated model.

The indirect effect (*Negative Trigger Impact* to *Intentions to Leave* through *Psychological Contract Breach*) shown in Table 6 is significant for varying levels of *Managerial Discretion*. Also, as *Managerial Discretion* increases, the indirect effect on *Intentions to Leave* becomes increasingly positive. Testing using the non-linear combination method indicates that the changes in the indirect effect are significant across various levels of *Managerial Discretion* (p = 0.050). Thus, the results show that the indirect effect of *Psychological Contract Breach* is contingent upon *Managerial Discretion*, providing support for Hypothesis 2.

Table 6
Conditional Indirect Effects (H2: DV =Intentions to Leave)

	b	Std. Err.	p > |z|	[95% CI]
Very Low Managerial Discretion	0.0070	0.0047	0.135	[-0.0022, 0.0163]
Low Managerial Discretion	0.0113	0.0043	0.009	[0.0029, 0.0198]
Mean Managerial Discretion	0.0156	0.0049	0.002	[0.0059, 0.0253]
High Managerial Discretion	0.0198	0.0063	0.002	[0.0075, 0.0322]
Very High Managerial Discretion	0.0241	0.0080	0.003	[0.0084, 0.0399]

Robustness Testing

To test the robustness of the findings of conditional indirect effects, STATA's bootstrapping process, with replication set to 1000, was used to obtain standard error and confidence intervals. Bootstrapping did not yield any meaningful changes in the results. The hypothesized moderated mediation relationships were also tested using Baron and Kenny's (1986) classic causal step approach (see Mihalache *et al*., 2014 for an example). Results were consistent with those using the methods prescribed by Preacher *et al*. (2007) and Hayes (2013).

DISCUSSION

First, the relationships between negative trigger events and affective organizational commitment, job satisfaction, and intentions to leave were shown to be mediated by PC breach. Second, managerial discretion was found to significantly moderate each of these mediated relationships, with affective organizational commitment and job satisfaction declining and intentions to leave increasing as managerial discretion increases. These results suggest that employees look to their supervisors when events occur that affect their PCs with the organization, regardless of whether their supervisor is directly associated with the triggering event. Indeed, the results provided in Tables 4 through 6 show that the only employees who do not hold their manager responsible for PC breach are those who believe that their manager has very low managerial discretion.

Psychological Contract Breach and Perceptions of Managerial Discretion

Prior research shows that PC breach is the state in which employees believe that their employer is not meeting obligations that they are owed, leading them to feel less affection and obligation to the organization (Suazo, 2009; Zhao *et al*., 2007). Executive decisions and events within and outside the organization also influence PC perceptions (O'Neill and Cotton, 2017), but no prior research examines the latitude of the organization's proximal agent to the employee. These findings suggest that employees assess their supervisor's ability to take action and apply it to their judgment of PC breach or fulfillment. While not asserting a conscious or ongoing assessment of their supervisor's discretion, the results from this study suggest that perceptions of supervisor influence lead to greater breach perceptions when there are negative triggering events.

The significant impact of supervisors' discretion emphasizes the importance of the immediate manager in the PC evaluation process. Although the PC was originally theorized to exist with the organization (Rousseau, 1995), the face of that organization is typically one's supervisor. Given that supervisors are employees' proximal agents for the organization, it is not surprising that the results suggest that employees perceive greater PC breach when they are impacted by triggering events and believe that their supervisor has greater discretion.

Informational and Interpersonal Actions between Managers and Employees

Prior research also suggests that informational and interpersonal actions may be the dominant factors driving an employee's perceptions of his or her supervisor's managerial discretion. Scott *et al*. (2009) theorized that middle level managers have greater discretion over informational and interpersonal actions and less discretion over distributive and procedural actions. Distributive and procedural justice tend to be systemic and formalized by the organization, with middle level managers' latitude of action associated with rules and justice dimensions that might be highly constrained (Schminke *et al*., 2000). However, information sharing and interpersonal relationships afford greater discretion to the middle level manager, since regular encounters between the supervisor and employee foster candid exchanges that can include proactive notification, sensemaking, and possible mitigating courses of action (Scott *et al*., 2009). These indicate directions that supervisors can take to reduce PC breach.

One possible conclusion based on this study's results is that middle level managers should have less autonomy or be more measured and detached from their employees to reduce the likelihood of declines in commitment and satisfaction, as well as increased intentions to leave, that may occur with negative events. In such an argument, employees would have lower expectations, which would reduce the likelihood of PC breach perceptions. Yet, such inferences miss the nature of PCs and how they relate to managerial discretion. Employers want their employees to develop perceptions of fulfilled PCs since they can be a significant source of motivation and enthusiasm (Lee and Lin, 2014). In turn, fulfilled PCs create binding ties that drive employee motivation and optimism that lead to greater effort, effectiveness, and concern for all stakeholders (Zhao *et al*., 2007). Thus, organizations should seek to maximize PC's positive attributes, but need to recognize that greater latitude of action and attentiveness for supervisors will likely increase deleterious outcomes if PC breach occurs.

The results suggest the need for greater information sharing and deeper interpersonal relationships between employees and supervisors. The measure of

participants' perceptions of negative events provides some insight into how often employees think about possible triggering events and the impact that they perceive from those events. Regular and open communication between the supervisor and employee may help the employee avoid irrational or unfounded conclusions on potential or ongoing events and may allow for the supervisor and employee to develop alternatives to reduce the negative impact various events may have on attitudes and behavior. To accomplish this, the supervisor needs greater latitude to openly communicate and find effective solutions with employees (see Scott *et al*., 2009), and thus needs to be afforded greater discretion by the organization. Indeed, perceived managerial discretion may lead to greater feelings of PC breach if perceptions are inconsistent with actual managerial discretion.

Contribution of New Managerial Discretion Scale for Middle Level Managers

Beyond advancing prior research regarding the antecedents of PC breach and how the antecedents' interactions with managerial discretion affect outcomes from PC breach, this study also contributes to the literature by developing and validating a new scale for middle level managerial discretion. Despite the multidimensional nature of managerial discretion (Hambrick and Finkelstein, 1987; Wangrow *et al*., 2015), this new scale exhibits strong reliability and loading to a single factor. As managerial discretion theoretically integrates enabling and constraining forces that define a manager's latitude of action, application of this new scale in future studies may offer fresh insights regarding contextual influences on workgroup composition, performance, and turnover.

Study Limitations and Future Research

As with any study, there are limitations and subsequent opportunities for future research. First, the supervisor is assumed to be the primary actor that influences the degree of PC breach from triggering events, which, in turn affects employee outcomes. However, while controls are included for firm-level traits, this study does not consider internal processes at the division or firm level that may also mitigate PC breach. Braekkan (2012), for instance, found that investments in High Performance Work Systems that emphasize human capital competencies and desired employee behaviors reduced employees' emotional reactions when expectations were not met. Future research that integrates supervisory-level managerial discretion with firm-level processes may shed light on how a manager's actions and a firm's processes can complement or clash with one another.

While the new managerial discretion scale presented in this study shows promise, the measure (and subsequently the estimates of scale reliability and factor loading) rely on a single person assessing his or her supervisor's discretion. Although the participants were in suitable positions to evaluate their supervisors' discretion, biases of some participants may prevent them from accurately assessing their supervisors' discretion. However, inaccuracies or biases are not as relevant in the current study since employees' perceptions of discretion were the focus of this study. However, future studies that survey two or more of a managers' subordinates would further strengthen the scale reliability shown in this study.

Steps were taken to reduce potential social desirability bias, including anonymity of all participants, but it is possible that some participants may have addressed survey items

with the intention that they are viewed favorably by others. Relatedly, while maintaining participants' anonymity was an intentional part of the research design to limit social desirability bias, this also prevented assessing test-retest reliability. Additionally, a manager's discretion may change over time due to successes, failures, or exogenous events. Future longitudinal studies that assess a middle level manager's discretion at multiple points in time are recommended.

Despite prior research supporting the mediated relationships that provide the study's foundation, the data used in this study is cross-sectional and conclusions drawn from the data are subjective to alternative causalities. Further research to verify this study's findings is encouraged. Indeed, a replication study using experiments or a study that collects data to build a longitudinal sample would enhance understanding causality among the constructs. Additionally, future research could further extend this study's model by adding on-the-job performance and behaviors as outcomes from reduced affective organizational commitment and job satisfaction.

Approximately 78 percent of the participants reported that their highest completed education level was a Bachelor's degree or higher. Thus, the results may not reflect the relationships between supervisors and employees with less formal education. Future research that focuses on employees in specific demographic groups, the nature of their PC, and the degree that their supervisors' discretion influences PC development, breach, and repair is encouraged. Another area worthy of future examination is how managerial discretion applies to managers of temporary and contract workers, since there is an expanding labor market in the United States of workers who prefer short-term contracts or freelance work (i.e., the gig economy; Bureau of Labor Statistics, 2017). For these workers, scholars have offered a wide range of views on PCs. Rousseau (1990), for instance, claimed that PCs of temporary and contract workers are simple monetary exchanges, while McDonald and Makin (2000) maintained that they are similar to those of permanent employees. The findings from this study suggest that discretion of these workers' managers may play a critical role in determining these workers' PC perceptions.

CONCLUSION

To date, little is known about the effects of middle level managers' discretion on employees and their relationship with the organization. Yet, as employees' proximal agents to the organization, middle level managers have substantial influence on whether employees feel psychologically connected to the organization. Prior research has shown PCs to be directly related to job satisfaction, organizational identification and loyalty, and intentions to leave (or stay), and that events which employees believe will impact them negatively potentially create breaches in PCs with the organization. Hypotheses were created that build on this prior scholarly work, arguing that perceptions of greater managerial discretion are associated with an increase in adverse outcomes due to greater feelings of psychological breach. By creating, validating, and operationalizing a new scale for managerial discretion of middle level managers, support was found for these hypothesized relationships. This may be due to increased perceptions of managerial discretion from greater information sharing and interpersonal relationships between supervisors and employees, causing them to feel a deeper breach when one or more events occur that they believe will impact them negatively. Middle level managers may

be able to prevent PC breach if actual discretion is consistent with employees' perceptions of their discretion. These findings, aided by the new scale of managerial discretion for middle level managers, shed new light on PCs and associated outcomes. Further research of managerial discretion's effects at all management levels is warranted and encouraged.

Appendix A
Managerial Discretion Items and Factor Loading

Eigenvalue (First Factor) = 5.471, Variance Explained = 99.3%

1.	My manager has the freedom that is necessary to choose whether or not to bring about improvements in our organization.	0.81
2.	My manager has a great amount of latitude in determining how the organization invests its resources.	0.82
3.	When I consider our company, I feel that my manager is authorized to decide which courses of action should be taken to impact organizational outcomes.	0.84
4.	When I consider groups within my employer that rely on outputs from my manager, I feel that my manager is authorized to decide which courses of action should be taken to impact that output.	0.86
5.	There have been cases where my manager and the organization have chosen a new or revised course of action, but the management above my manager has rejected the course of action. (reverse coded)	0.50
6.	My manager's judgement is the primary factor in determining what courses of action are taken by the organization in which we work.	0.83
7.	I feel that my manager is authorized by the senior leadership at the organization to decide which courses of action should be taken to improve organizational outcomes.	0.89
8.	The culture within the organization where I'm employed makes it easy to implement changes initiated by my manager.	0.75
9.	The performance (good or bad) of my employer is related to decisions made by my manager.	0.67

Appendix B
Workplace Trigger Events (O'Neill and Cotton, 2017)

Performance reviews
Human resource policy changes
Receiving a promotion
Changes to your job duties
Personal goal-setting activities
Others getting a reward you wanted
Turnover in staff
Unclear job roles
New people joining your company
Attending professional meetings
Promotion of co-workers
Strength of your company's industry
Cutbacks in benefits
The economy in general
Meetings with your supervisor
General feedback from management
Sharing information with others
Restructuring at your company
Changes in your organizational rewards
Future opportunities at your company

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The Information Content of Management Disclosures on Going Concern: An Industry Level Analysis of Bankruptcy Prediction and Investor Reaction

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Abstract: This study examines the informativeness of disclosures under Accounting Standards Update (ASU) 2014-15 issued by Financial Accounting Standards Board (FASB) in 2014 that provides guidance to management of companies to evaluate whether there is substantial doubt about the entity's ability to operate as a going concern and to make required disclosures. The information content of the new disclosures is assessed by first identifying the determinants of the disclosures and then examining whether the disclosures are useful in bankruptcy prediction and whether investors react to the new information in the disclosures. The analysis is conducted at the industry level by focusing on industries that experienced low stock returns. Overall, the results are consistent with the disclosures providing new information, but the nature of information is contextual to the industry setting.
Keywords: Management Disclosures; Going Concern; Bankruptcy Prediction; Investor Reaction

Audit standards and federal securities laws have required that an auditor evaluate whether there is substantial doubt about the entity's ability to continue as a going concern. In contrast, generally accepted accounting principles (GAAP) did not require management to evaluate the going concern status of the firm. ASU 2014-15 mandates such disclosures from 2016. ASU 2014-15 was promulgated after considerable debate and there were several critical responses questioning the need for additional disclosures and there were significant dissenting opinions within the Financial Accounting

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Standards Board (Whitehouse, 2012). This study examines whether the disclosures prescribed under ASU 2014-15 provide new information on the going concern status of the firm.

The sample consists of firms from industries that had the lowest stock returns for the year 2016 (the first year of post-ASU 2014-15 period). Broadly, these fall under two industry categories – Oil and Gas, and Pharma and Biotech. The financial reports of these firms for the fiscal years 2016-18 comprise the sample. Using criteria provided in ASU 2014-15 and variables widely used in the auditor going concern opinion literature, the study identifies firm-specific factors that determine management expression of substantial doubt over going concern. To assess the information content of the new disclosures, the study first identifies firm-specific factors that are determinants of management expressing substantial doubt on the going concern status. Second, empirical analysis is conducted to assess whether the disclosures are incrementally significant in a bankruptcy prediction model and whether investors react negatively to such disclosures.

The results for the bankruptcy prediction model confirm that the new disclosures have predictive power for firms in the Oil and Gas industry. Second, following Mayew *et al*. (2015) who document a negative investor reaction to voluntary going concern disclosures in the pre-ASU 2014-15 period, this study finds a similar result in the post ASU 2014-15 period. The results for bankruptcy prediction and investor reaction differ notably for the Pharma and Biotech industry, however. Firms in this industry group rarely go bankrupt yet receive a significant number of substantial doubt disclosures on going concern – financial constraints rather than bankruptcy appear to drive the substantial doubt disclosures in this industry. Additional tests that use a matched pair analysis of firms filing for bankruptcy across all industries supports the inferences on bankruptcy prediction and negative investor reaction documented for the Oil and Gas industry.

The study makes the following contributions: first, the study confirms factors that determine a management disclosure of substantial doubt on the going concern status of the firm under ASU 2014-15. Second, the results show that management disclosures on going concern are significant in predicting bankruptcy. These findings extend the results of Mayew *et al*. (2015) to the post ASU 2014-15 period, and furthermore advance this literature by documenting that the information content of management going concern disclosure is contextual, i.e., in industries with high R&D intensity such as Pharma and Biotech, it is indicative of the severity of financial constraints rather than bankruptcy. The study's focus at the industry level facilitates this distinction.[2] Third, the study documents differential investor reaction to the management disclosures, consistent with the results for bankruptcy prediction. Finally, in contrast to Mayew *et al*. (2015) who study only annual disclosures, the study shows that while almost all management disclosures of going concern overlap with a going concern opinion from the auditor, the investor reaction to the interim management disclosures (unlike audit opinions which are made annually) demonstrates that there is distinct information content in management disclosures under ASU 2014-15.

[2] Note that even in the extensive auditor going concern literature, very few studies have conducted the analyses at the industry level (see for example Bruynseels *et al*., 2011).

The rest of the study is organized as follows: the next section provides the background on ASU 2014-15 and develops the rationale for factors underlying management disclosures on going concern and the information content of such disclosures. The subsequent sections outline the sample, methodology, and empirical results. The final section provides a summary and discusses limitations.

ASU 2014-15

Prior to ASU 2014-15, there was no requirement in GAAP that managements evaluate and disclose on the going concern status of the firm, although some firms voluntarily did so (Mayew *et al*., 2015). ASU 2014-15 requires that when preparing financial statements, management evaluate whether there are conditions or events that raise substantial doubt about the entity's ability to continue as a going concern within one year after the financial statements are issued. If management identifies conditions or events that raise substantial doubt, then management should make disclosures about plans to mitigate the conditions or events that led to substantial doubt. If substantial doubt is alleviated, then disclosures should be made about the conditions that led to the substantial doubt and management's plans that alleviated the substantial doubt. If substantial doubt is not alleviated, then management should disclose this and in addition, the conditions that led to substantial doubt and management's plans that are intended to mitigate the substantial doubt. The standard requires the threshold of "probable" to be met in assessing the effectiveness of implementation and mitigation of conditions and events that raise substantial doubt. The ASU 2014-15 requirements are effective for annual periods ending after December 15, 2016.

ASU 2014-15 notes the lack of guidance in GAAP, differing views about when there is substantial doubt about an entity's ability to continue as a going concern, and diversity in how an entity discloses relevant conditions and events in footnotes, as the primary reasons for requiring new disclosures. A direct implication of these new requirements is that such disclosures should improve the predictive ability to identify potential bankruptcies, as bankruptcies signify cessation of firm as a going concern. Mayew *et al*. (2015) examined whether going concern disclosures voluntarily provided by management and textual narratives in the firm's MD&A help in assessing the likelihood that the firm will fail as a going concern, in the period prior to ASU 2014-15. They find that 39% of their sample firms explicitly discuss the possibility of bankruptcy and such MD&A disclosures are found to be leading indicators of bankruptcy. They show that the management disclosure is incrementally useful in addition to the other sets of available information such as financial information, market-based information, and audit opinions.

As noted in Mayew *et al*. (2015), prior to the new accounting rules several firms made disclosures in the Management's Discussion and Analysis (MD&A) section of the 10-K expressing an evaluation on the going concern status. In addition, securities law and auditing standards require that auditors evaluate whether there is substantial doubt about an entity's ability to continue as a going concern. Considering the existence of these disclosures, critics argued that the new accounting rules are unlikely to provide incremental information (Whitehouse, 2012). Moreover, dissenting FASB members argued that by requiring disclosure only when it is probable that an entity will be unable to meet its obligations as they become due within one year after the financial statements

are issued, the guidance will be too late to be of significance to users of financial statements (ASU 2014-15 p.16). Furthermore, early anecdotal evidence also challenged the effectiveness of the new disclosures, as some notable firms such as Toys-R-Us went bankrupt but did not provide any management disclosures under ASU 2014-15 in the months leading up to the bankruptcy (Walworth, 2018). Given these opposing perspectives, it is not clear whether disclosures under the new accounting rules provide new information that is helpful to financial statement users as stated in the justification for ASU 2014-15 or whether the disclosures are redundant or untimely as noted by the critics.

To assess whether there is information content in management's going concern opinion under ASU 2014-15, the study conducts the following empirical procedures: first, it identifies the determinants of management disclosures on going concern; second, information content is assessed by way of a bankruptcy prediction model and through investor reaction in an event study framework.

DETERMINANTS OF MANAGEMENT DISCLOSURES ON GOING CONCERN

To assess factors considered by management in disclosing a substantial doubt about the going concern status of the firm, this study relies on the guidelines specified in ASU 2014-15 and the prior literature on auditor going concern opinions. ASU 2014-15 states that conditions or events that raise substantial doubt about an entity's ability to continue as a going concern relate to the entity's ability to meet its obligations as they become due within one year after the date the financial statements are issued. In evaluating the ability to meet its obligations, ASU 2014-15 specifies that the entity should consider [a] its current financial condition including liquidity sources, [b] its conditional and unconditional obligations, [c] the funds necessary to maintain entity's operations, and [d] other conditions or events, when considered in conjunction with the above, may adversely affect the entity's ability to meet its obligations. Extensive literature on auditor going concern opinions has documented several firm-specific variables that capture the financial condition, obligations, and conditions that may adversely affect the ability to meet obligations (Mutchler *et al*., 1997; Carson *et al*., 2013; DeFond *et al*., 2016). This study relies upon prior going concern opinion literature (tabulated below) to identify empirical proxies that represent the four conditions outlined in ASU 2014-15.

ASU 2014-15 Condition	Empirical proxy	Reference
Current Financial condition	*LAT*, *ZSCORE*, and *LOSSD*	Reynolds and Francis (2000), DeFond *et al*. (2002), DeFond *et al*. (2016)
Conditional and unconditional obligations	*LEV* and *CHLEV*	DeFond *et al*. (2002), Mutchler *et al*. (1997)
Funds necessary to maintain operations	*OCF*, *LIQUID*, *INVEST*, and *NEWFIN*	DeFond *et al*. (2002), DeFond *et al*. (2016), Mutchler *et al*. (1997)
Other conditions or events that may adversely affect ability to meet obligations	*RET*, *BM*, *AGE*, and *BIG4*	Carson *et al*. (2013), DeFond *et al*. (2016), Dopuch *et al*. (1987), Shumway (2001)

Using the proxies, the following empirical model is specified:

$$MO\_GC_{it} = \alpha_0 + \alpha_1 LAT_{it} + \alpha_2 LEV_{it} + \alpha_3 CHLEV_{it} + \alpha_4 BIG4_{it} + \alpha_5 ZSCORE_{it} + \alpha_6 OCF_{it} + \alpha_7 BM_{it} + \alpha_8 LIQUID_{it} + \alpha_9 RET_{it} + \alpha_{10} INVEST_{it} + \alpha_{11} NEWFIN_{it} + \alpha_{12} AGE_{it} + \alpha_{13} LOSSD_{it} + e_{it} \quad (1)$$

MO_GC is an indicator variable equal to 1 for firms that disclose a management expression of substantial doubt about the going concern status of the firm and 0 otherwise. To represent current financial conditions, the following variables are used: *LAT*, *ZSCORE*, and *LOSSD*. Reynolds and Francis (2000) argue that financial conditions are better for large firms as they have more resources and thus are more likely to avoid financial difficulties. They use *LAT*, measured as the log of total assets, to proxy for size. The sign on *LAT* is expected to be negative. To capture extreme negative financial conditions, prior literature (DeFond *et al*., 2002) has used *ZSCORE* representing Zmijewski's (1984) bankruptcy score. The expected sign on the variable is positive as higher values in the score indicate that the firm's financial condition is very poor, and the risk of bankruptcy is higher. DeFond *et al*. (2002) and DeFond *et al*. (2016) argue that prior losses indicate poor financial condition and thus a higher likelihood of firm encountering financial distress. To measure this, they use *LOSSD* as an indicator variable that takes the value of 1 if the firm reported a net loss in the prior year, representing poor operating history negatively impacting financial condition. The expected sign on *LOSSD* is positive. Conditional and unconditional obligations specified in ASU 2014-15 are measured by *LEV* and *CHLEV* that represent the ratio of total liabilities to total assets and change in *LEV* during the year, respectively. DeFond *et al*. (2002) and Mutchler *et al*. (1997) argue that high obligations as represented by high leverage are associated with debt covenant violations and substantial changes in leverage move firms closer to covenant violation. Such violations may result in cessation of firm as a going concern. Thus, the expected signs on *LEV* and *CHLEV* are positive. The funds necessary to maintain operations noted in ASU 2014-15 are measured by *OCF*, *LIQUID*, *INVEST*, and *NEWFIN*. Mutchler *et al*. (1997) argue that new financing reduces the probability of financial distress by shoring up the funds needed for operations. To measure this, an indicator variable *NEWFIN* is used that equals 1 if long term debt or stock was issued in the following year, and 0 otherwise. It is expected to have a negative sign as this increases liquidity and reduces the probability of bankruptcy. DeFond *et al*. (2002) show that firms with more cash, investments, and other liquid assets are more likely to stave off bankruptcy as they have funds to withstand financial difficulties. To measure liquidity, two variables are used: *LIQUID* is the ratio of current assets to current liabilities and *INVEST* is cash, cash equivalents, and short- and long-term investment securities deflated by total assets. Both are expected to have negative signs based on DeFond *et al*. (2002). Another measure of funds required to maintain operations used by DeFond *et al*. (2016) is *OCF*, representing operating cash flows scaled by total assets. The expected sign on the variable is negative. To represent other conditions and events referred to in ASU 2014-15, the following variables that have been documented in the prior literature as capturing other dimensions of a firm's financial condition are used, namely *RET*, *BM*, *AGE*, and *BIG4*. Based on Shumway (2001), a stock return variable, *RET* the compounded stock return of the firm, is used to represent other conditions as it incorporates not only financial but also non-financial information about the firm. Higher the stock return, lower the probability of financial deterioration and thus a

negative sign is expected on *RET*. Dopuch *et al*. (1987) show that an important factor in financial distress is age of the firm and that younger firms are more likely to fail. The log of the number of years the firm has COMPUSTAT data, *AGE*, is used and is expected to have a negative sign. DeFond *et al*. (2016) use the book to market ratio (*BM*) as a risk factor reflecting financial conditions of the firm. Firms with low book to market ratios are riskier high growth firms and are thus more likely to fail, in contrast to high book to market firms. Thus, the expected sign on *BM* is negative. Another factor that has been extensively studied in the audit literature is auditor size. A Big N auditor variable is included consistent with prior going concern literature, though studies in the auditor going concern literature report mixed results on the relationship between auditor going concern opinion and auditor size (Carson *et al*., 2013). An indicator variable that equals 1 if the firm's auditor is a Big N auditor and 0 otherwise, *BIG4*, is used and the expected sign on this variable is not specified.

To assess information content of management disclosures on going concern, a bankruptcy prediction model and an event study model are specified.[3] A large literature documents several financial and market related variables to be important in bankruptcy prediction. Bellovary *et al*. (2007) and Beaver *et al*. (2010) provide an extensive summary of this literature.[4] The seminal work of Altman (1968) established the significance of financial statement variables in bankruptcy prediction. Since then several papers have examined and confirmed the importance of financial statement variables and in addition, the role of non-financial variables. Shumway (2001) showed the importance of including market-related variables that are useful beyond the financial statement variables. Subsequent work expands this set to include narrative disclosures and finds significance for such disclosures in predicting bankruptcy (Shirata *et al*., 2011). Campbell *et al*. (2008) find that other measures used in practice such as distance to default do not significantly add to the explanatory power of financial and market-based variables. Bellovary *et al*. (2007) note that while a large variety of variables and factors have been used in this literature, model accuracy is not simply a function of the number of variables used as some models with low number of factors perform as well as models with a very high number of factors.

The bankruptcy prediction model in this study is based on Mayew *et al*. (2015) and is specified as,

$$\begin{aligned} Pr(BRUPT_{t+1}) = {} & \beta_0 + \beta_1 MO\_GC_t + \beta_2 WCTA_t + \beta_3 RETA_t + \beta_4 EBITTA_t \\ & + \beta_5 MVETL_t + \beta_6 SALETA_t + \beta_7 EXRET_t + \beta_8 SIGMA_t \\ & + \beta_9 RELSIZE_t + \upsilon_t \end{aligned} \quad (2)$$

Where $BRUPT=0$ every year for firms that do not face bankruptcy, and in the years prior to bankruptcy year for firms that file for bankruptcy. $BRUPT=1$ in the year of bankruptcy for firms that file for bankruptcy. To the extent management disclosures are informative about potential bankruptcy, the expected sign on *MO_GC* is positive. All

[3] As noted in ASU 2014-15, if there are conditions and events that raise substantial doubt about the entity's ability to continue as a going concern, management disclosures are required, even if liquidation is not imminent. Thus, the prediction of bankruptcy is not the sole aim of these disclosures but more broadly conditions and events that raise a substantial doubt. The empirical literature has generally focused on bankruptcy as a simple measure to test information content in going concern opinions and management disclosures (Desai *et al*., 2020; Mayew *et al*., 2015).

[4] Bundy (2019) examines bankruptcy prediction in the context of audit engagements.

explanatory variables pertain to the year prior to bankruptcy. The original bankruptcy model of Altman (1968) considers the following five financial ratios in predicting bankruptcy: ratio of working capital to total assets (*WCTA*), retained earnings to total assets (*RETA*), earnings before interest and taxes to total assets (*EBITTA*), market value of equity to total liabilities (*MVETL*), and sales to total assets (*SALETA*). Subsequently, Beaver *et al*. (2010 and 2012) demonstrate the importance of these variables in predicting bankruptcy for more recent periods. Based on this literature, Mayew *et al*. (2015) include the five financial ratios in the model predict a negative relationship between these financial ratios and bankruptcy. Thus, the expected signs on *WCTA*, *RETA*, *EBITTA*, *MVETL* and *SALETA* are negative. Based on Shumway (2001) and Beaver *et al*. (2012), three market-based variables are also included. *EXRET* is the lagged cumulative abnormal stock return calculated as the excess of cumulative raw returns over the cumulative market returns, measured over the 12-month period preceding the date of filing of the 10-K. *SIGMA* is the lagged standard deviation of abnormal stock returns and is calculated as the standard deviation of the error terms in a regression of the firm's monthly stock return on the monthly market returns over the 12-month period preceding the date of filing of the 10-K. *RELSIZE* is the logarithm of relative market capitalization and is calculated as the ratio of the market capitalization of the firm to the market cap of the market index, measured at the end of the fiscal year. The expected signs on *EXRET* and *RELSIZE* are negative and the expected sign on *SIGMA* is positive (Mayew *et al*., 2015).

To assess investor reaction the following empirical specification is used (adapted from Mayew *et al*., 2015):

$$CAR3_t = \mu_0 + \mu_1 MO\_GC_t + Controls_t + \pi_t \quad (3)$$

Where *CAR3* is three-day cumulative abnormal returns (the difference between the stock return and the return on the market index) centered over the three-days around the 10-K filing date (or in the case of interim disclosures around the relevant 10-Q filing date) for a given firm-year. The expected sign on *MO_GC* is negative to the extent the management disclosure of substantial doubt portends potential bankruptcy and thus likely viewed negatively by the investors. Controls are the financial variables included in the bankruptcy prediction model and the cumulative security residual return for the 12-month period prior to the 10-K filing (in case of interim disclosures, the period prior to the relevant 10-Q filing) dates. The residual return variable is included to control for the information environment prior to the release of financial reports.

DATA

Identifying firms that make disclosures under ASU 2014-15 requires reading through 10-K reports of all traded firms, an extensive task as machine-readable data identifying ASU 2014-15 disclosures is not currently available. Based on prior literature (Shumway, 2001) which shows that firms with a significant decline in stock prices have a higher probability of going bankrupt, the sample selection procedure uses the industries (with a minimum of ten firms in the industry) that had the lowest stock returns in the year 2016 to identify firms that are likely to provide disclosures on going concern status. This procedure identified Coal, Crude Petroleum, Oil and Gas extraction (SIC codes 1220, 1311, 1381, 1382, and 1389) and Pharmaceutical Preparations and Biological Products industries (SIC codes 2834, 2935, and 2836). These SIC codes had 12-month

cumulative residual returns that were lower than -25% (with the lowest industry at -68%).[5] For these industries, U.S. firms with available 10-Q and 10-K reports filed with the SEC for the years 2016-18 and with data availability in COMPUSTAT and CRSP, comprise the final sample. These are tabulated in Table 1.

Table 1

Panel A: Sample – Oil and Gas

# firm-years in SIC 1220, 1311, 1381, 1382, 1389 in 2016-18	639
# firm-years for which market-related variables are not available	(261)
# firm-years for which financial statement variables in model 1 and 2 are not available	(106)
# firm-years available for analysis	272
# firms by year	
2016	100
2017	94
2018	78
Total	272

Panel B: Sample – Pharma and Biotech

# firm-years in SIC 2834, 2835, and 2836 in 2016-18	1987
# firm-years for which market-related variables are not available	(844)
# firm-years for which financial statement variables in model 1 and 2 are not available	(302)
# firm-years available for analysis	841
# firms by year	
2016	300
2017	283
2018	258
Total	841

For bankruptcy data, the study follows the procedures in Mayew *et al*. (2015) and collects data from the UCLA-LoPucki Bankruptcy Research Database and the COMPUSTAT Annual Database. The UCLA-LoPucki Bankruptcy Research Database contains data on public companies (with total assets worth $100 million or more in 1980 dollars) that have filed for bankruptcy (Chapter 11 or Chapter 7).

[5] Mayew *et al*. (2015) report cumulative annual residual return of -59% for their sample of bankrupt firms.

RESULTS

Univariate descriptive statistics are reported in Table 2. Panel A reports results for the Oil and Gas industry by partitioning the sample based on firms that report substantial doubt about their going concern status and firms that do not. Of the 272 firm-years in the Oil and Gas sample, 21 express substantial doubt on their going concern status and 251 do not. For these two groups, the descriptive statistics are reported for the variables included in Model 1.

Table 2
Panel A: Descriptive Statistics for Oil and Gas Industry

Variable	Firm-years that disclose substantial doubt on going concern n=21			Firm-years that do not disclose a substantial doubt on going concern n=251			T-stat of Diff. in means	Z-stat of Diff. in Medians
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.		
BRUPT	0.222	0.000	0.428	0.048	0.000	0.214	3.05***	3.004***
LAT	4.571	4.358	2.025	7.622	8.028	2.022	-6.18***	-5.005***
LEV	1.123	1.008	0.869	0.605	0.518	0.360	5.16***	1.872**
BIG4	0.167	0.000	0.383	0.652	1.000	0.477	-4.21***	-4.087***
ZSCORE	4.395	2.538	6.091	-0.726	-1.314	2.409	7.51***	4.372***
OCF	-0.116	-0.040	0.202	0.083	0.085	0.087	-8.30***	-5.052***
BM	-2.232	-0.016	6.158	0.599	0.631	1.692	-5.14***	-3.959***
LIQUID	1.115	0.421	1.859	1.807	1.276	1.814	-1.56	-3.534***
RET	-0.217	-0.181	0.454	0.293	-0.103	1.520	-1.42	-1.774**
INVEST	0.112	0.073	0.125	0.078	0.045	0.100	1.36	1.294*
NEWFIN	0.944	1.000	0.236	0.836	1.000	0.371	1.22	1.218
AGE	2.574	2.441	0.579	3.106	3.258	0.681	-3.23***	-3.200***
LOSSD	1.000	1.000	0.000	0.600	1.000	0.491	3.45***	3.381***

Table 2 (continued)
Panel B: Descriptive Statistics for Pharma and Biotech industry

Variable	Firm-years that disclose substantial doubt on going concern n=164			Firm-years that do not disclose a substantial doubt on going concern n=677			T-stat of Diff. in means	Z-stat of Diff. in Medians
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.		
BRUPT	0.018	0.000	0.135	0.007	0.000	0.086	1.30	1.296*
LAT	3.404	3.214	1.133	5.537	5.256	1.874	-13.93***	-14.062***
LEV	0.759	0.546	0.760	0.435	0.345	0.404	7.53***	6.331***
BIG4	0.466	0.000	0.500	0.712	1.000	0.453	-6.07***	-5.947***
ZSCORE	5.199	2.935	7.500	-0.355	-1.034	3.244	14.46***	13.488***
OCF	-0.984	-0.776	1.015	-0.247	-0.216	0.420	-14.46***	-13.580***
BM	0.225	0.197	0.701	0.329	0.230	0.601	-1.91*	-2.709**
LIQUID	3.546	2.850	2.776	6.599	4.766	5.688	-6.66***	-7.913***
RET	0.233	-0.395	1.770	0.185	-0.068	1.189	-0.42	-5.072***
INVEST	0.665	0.718	0.263	0.630	0.702	0.288	1.40	1.064
NEWFIN	0.951	1.000	0.217	0.954	1.000	0.209	0.18	-0.175
AGE	2.389	2.303	0.485	2.677	2.639	0.634	-5.43***	-4.953***
LOSSD	0.969	1.000	0.173	0.757	1.000	0.429	6.19***	6.052***

Variable definitions:
MO_GC = 1 for firms where management discloses substantial doubt about the going concern status, and 0 otherwise;
LAT = Log of total assets;
LEV = Total liabilities over total assets;
BIG4 = 1 if the firm's auditor is a Big N auditor, and 0 otherwise;
ZSCORE = Zmijewski's (1984) bankruptcy score;
OCF = Operating cash flows deflated by total assets;
BM = book-to-market ratio;
LIQUID = Current assets divided by current liabilities;
RET = the compounded stock return over the fiscal year;
INVEST = Cash, cash equivalents, and short- and long-term investment securities deflated by total assets;
NEWFIN = 1 if long term debt or stock issued in the following year, and 0 otherwise;
AGE = the natural log of the number of years the firm has COMPUSTAT data;
LOSSD = An indicator variable that equals 1 if the firm reported a loss in the prior year, 0 otherwise.

Panel A of Table 2 shows that more than one-fifth of the firms that disclose a discussion on substantial doubt ("disclosing firms") about their going concern subsequently go bankrupt and the disclosing firms are nearly five times (*BRUPT* has a mean value of 0.222 versus 0.048) more likely to go bankrupt than non-disclosing firms. This indicates that ASU 2014-15 disclosures are informative about future bankruptcy for firms in the Oil and Gas industry. Turning to other variables in Model 1, results show that disclosing firms are smaller in size (*LAT*), have more leverage (*LEV*), and are audited by a non-BIG N auditor (*BIG4*). Disclosing firms are also in poor financial condition based on Zmijewski's (1984) distress measure (*ZSCORE*). Note that the higher the *ZSCORE*, the poorer the financial health of the firm. Another indicator of financial health, operating cash flows (*OCF*), is also lower for disclosing firms. Disclosing firms have lower *BM* ratios, indicating these are firms that are higher in the book-to-market risk factor. Other significant differences between the two groups include liquidity (*LIQUID*) which is lower for disclosing firms, age (*AGE*), which indicates that disclosing firms tend to be younger, and a higher frequency of prior losses (*LOSSD*) for the disclosing firms. Overall, these results indicate that Oil and Gas firms that disclose substantial doubt on going concern status tend to be smaller, younger, highly leveraged firms that are in poor financial health. They are also more likely to go bankrupt in subsequent years.

Panel B of Table 2 reports results for the Pharma and Biotech industry. Of the 841 firm-years in the sample, 164 report a discussion on their going concern status and 677 do not. For these two groups, the descriptive statistics are reported for the variables included in Model 1. The results show that less than 2% of the disclosing firms subsequently go bankrupt and this proportion does not significantly differ from non-disclosing firms (although the nonparametric Z statistic is significant). This indicates that ASU 2014-15 disclosures are not indicative of future bankruptcy for firms in the Pharma and Biotech industry. Turning to other variables in Model 1, results show that disclosing firms are smaller in size (*LAT*), have more leverage (*LEV*), and are audited by a non-BIG N auditor (*BIG4*). Disclosing firms are also in poor financial condition based on Zmijewski's (1984) measure (*ZSCORE*) and operating cash flows (*OCF*) that is lower for disclosing firms. Disclosing firms have lower *BM* ratios, indicating these are firms that are higher in the book-to-market risk factor. These firms also have substantially lower liquidity (*LIQUID*) than non-disclosing firms and are lower in age (*AGE*). Finally, disclosing firms report higher frequency of prior losses (*LOSSD*). Overall, these results indicate that Pharma and Biotech firms that disclose substantial doubt on going concern status tend to be smaller, younger, highly leveraged firms that are in poor financial health. Management disclosure of substantial doubt does not lead to subsequent bankruptcy for a significant number of firms in this industry, however.

Table 3 reports correlations among the key variables in Model 1. While the management disclosure of substantial doubt on going concern status is positively correlated with subsequent bankruptcy for the Oil and Gas sample (Panel A), this correlation is not significant for the Pharma and Biotech sample (Panel B). Most correlations reported in Table 3 are significant but generally less than 50%. The exception is the correlation between leverage (*LEV*) and *ZSCORE*. This is by construction as evident from the definition of these variables.

Table 3
Panel A: Key Correlations for Oil and Gas Industry

	MO_GC	*BRUPT*	*LAT*	*LEV*	*OCF*	*ZSCORE*	*LIQUID*
MO_GC	1.000	0.184***	-0.306***	0.115*	-0.310***	0.268***	-0.216***
BRUPT	0.184***	1.000	-0.105*	0.205***	-0.149**	0.207***	-0.071
LAT	-0.354***	-0.050	1.000	-0.039	0.299***	-0.112*	-0.022
LEV	0.301***	0.232***	-0.145	1.000	-0.067	0.903***	-0.315***
OCF	-0.454***	-0.069	0.425***	-0.114*	1.000	-0.238***	-0.141**
ZSCORE	0.418***	0.221***	-0.216***	0.953***	-0.286***	1.000	-0.251***
LIQUID	-0.095	-0.005	-0.241***	-0.321***	-0.104*	-0.270***	1.000

Panel B: Key Correlations for Pharma and Biotech Industry

	MO_GC	*BRUPT*	*LAT*	*LEV*	*OCF*	*ZSCORE*	*LIQUID*
MO_GC	1.000	0.045	-0.486***	0.219***	-0.469***	0.466***	-0.224***
BRUPT	0.045	1.000	0.010	0.102***	0.021	0.086**	-0.083**
LAT	-0.434***	-0.007	1.000	0.072**	0.648***	-0.400***	-0.038
LEV	0.252***	0.088**	-0.022	1.000	-0.058*	0.687***	-0.385***
OCF	-0.447***	0.024	0.510***	-0.288***	1.000	-0.662***	0.132***
ZSCORE	0.447***	0.061*	-0.348***	0.805***	-0.715***	1.000	-0.338***
LIQUID	-0.221***	-0.084**	-0.046***	-0.386***	0.131***	-0.338***	1.000

Pearson (Spearman) correlations are below (above) the diagonal. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively. See Table 2 for variable definitions.

Results for Model 1

Table 4 presents results for Model 1. The model is estimated for each of the two industry groupings. All continuous explanatory variables are winsorized at the 1% and 99% levels in line with prior literature (Mayew *et al*., 2015). As noted previously, ASU 2014-15 specifies broad criteria about conditions or events that may adversely affect the entity's ability to meet its obligations and Model 1 uses the audit literature on going concern opinion to develop empirical proxies to represent these criteria. The results reported in Table 4 for Oil and Gas industry show that among variables that represent financial condition of the firm (*LAT*, *ZSCORE*, and *LOSSD*), firm size and *ZSCORE* are significant and have the predicted signs. This indicates that disclosing firms are smaller and have poorer financial health compared to non-disclosing firms. Variables representing conditional and unconditional obligations specified in ASU 2014-15 are measured by *LEV* and *CHLEV*, and firm leverage (*LEV*) is significant indicating that disclosing firms have higher leverage. Criteria on the funds necessary to maintain operation are measured by *OCF*, *LIQUID*, *INVEST*, and *NEWFIN*. Among these, only liquidity (*LIQUID*) is significant indicating that disclosing firms have lower liquidity and that along other dimensions of funds necessary to maintain operations, no significant differences exist. Among variables that represent other conditions and events specified in ASU 2014-15 (*RET*, *BM*, *AGE*, and *BIG4*), *RET* and *BM* are significant indicating that disclosing firms have lower book-to-market ratios and lower returns. While some of the variables are not significant for each of the criteria specified in ASU 2014-15, at least one variable is significant in each category indicating that criteria specified in ASU 2014-15 are the primary drivers in management disclosures of substantial doubt over going concern.

Table 4 also reports results for Pharma and Biotech industry. Similar to the Oil and Gas industry, firms that disclose are smaller and are in poorer financial health (*LAT* is lower and *ZSCORE* is higher). There are no significant differences in *LEV* and *CHLEV* suggesting that borrowing as a source of financing is not a significant factor for Pharma and Biotech firms in management disclosures on going concern. In contrast, three of the four variables representing funds necessary to maintain operations (*OCF*, *LIQUID*, and *INVEST*), are significant indicating that disclosing firms are characterised by lower operating cash flows, lower liquidity, and lower cash and investments. Finally, among variables that represent other conditions and events specified in ASU 2014-15, *AGE* and *BIG4* are significant indicating that disclosing firms are younger and firms audited by a BIG N auditor are more likely to provide management disclosures on going concern. Overall, the results for both industry groups show that management disclosure of substantial doubt on going concern status is driven by factors specified in ASU 2014-15 and these are similar to those documented in the auditor going concern opinion literature.

Table 4
Estimation of Conditional Logistic Regression Model

Variables	Predicted Sign	Oil and Gas Coefficient (Wald Statistic)	Pharma and Biotech Coefficient (Wald Statistic)	Pharma and Biotech with Financial Constraint Coefficient (Wald Statistic)
Intercept	?	-5.754 (0.001)	4.923 (15.547)***	4.711 (13.422)***
LAT	-	-0.541 (3.951)**	-1.028 (52.711)***	-1.026 (48.424)***
LEV	+	6.837 (3.975)**	0.147 (0.079)	0.047 (0.008)
CHLEV	+	-0.279 (0.022)	-0.497 (2.371)	-0.747 (2.355)
BIG4	?	-1.263 (0.663)	0.488 (3.001)*	0.627 (4.411)**
ZSCORE	+	1.073 (3.900)**	0.117 (2.918)*	0.116 (2.218)
OCF	-	-4.539 (1.295)	-0.969 (6.442)***	-1.161 (8.725)***
BM	-	-0.272 (3.558)*	0.078 (0.233)	0.060 (0.122)
LIQUID	-	-0.765 (3.621)*	-0.076 (2.825)*	-0.068 (2.076)
RET	-	-1.604 (3.556)*	-0.010 (0.127)	0.020 (0.070)
INVEST	-	1.953 (0.145)	-2.651 (15.658)***	-2.714 (14.139)***
NEWFIN	-	1.722 (0.663)	0.717 (1.647)	0.724 (1.619)
AGE	-	0.078 (0.124)	-0.811 (11.271)***	-0.726 (8.381)***
LOSSD	+	10.271 (0.004)	0.589 (0.936)	0.567 (0.812)
KZ	?			0.003 (4.510)**
Pseudo R^2 %		47.6	32.2	34.8
% Concordant		92.2	90.3	90.6
N		272	841	841

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively. Logistic regression is run clustered by firm (DeFond, Lim, and Zang (2016). For each variable, the logistic regression coefficient is reported, followed by the robust Wald statistic. The dependent variable is *MO_GC*. Variable definitions are in table 2.

KZ = −1.001909**CashFlow/K*+0.2826389**Tobin's Q* + 3.139193**Debt/Total Capital* −39.3678**Dividends/K* − 1.314759**Cash/K*

Tobins's Q = [total assets + fiscal year end price × common shares outstanding – common equity − deferred tax]/property plant and equipment (*ppent*)

CF/K = [income before extraordinary items + depreciation /lagged *ppent*

Debt/TotalCapital = [long-term debt + debt in current liabilities]/[long-term debt + debt in current liabilities + stockholder's equity]

Dividends/K = [dividends common + dividends preferred]/lagged *ppent*

Cash/K = cash holdings and short − term investments/lagged *ppent.*

Information Content of Management Disclosures on Going Concern

While results in Table 4 show that management disclosures are consistent with criteria established in ASU 2014-15, it is not clear whether such disclosures provide new information that is useful to financial statement users. Second, while Mayew *et al*. (2015) show that management disclosures on going concern in the period prior to ASU 2014-15 are informative in bankruptcy prediction, it is not clear whether such disclosures made under the new disclosure regime are also informative. To assess the information content of going concern disclosures by management in the post ASU-2014-15 period, this study examines first whether such disclosures are incrementally informative in a bankruptcy prediction model and then whether investors react to such disclosures.

Table 5 presents results for the bankruptcy prediction model (specified as Model 2). For the Oil and Gas industry, the disclosure of a management's substantial doubt on the going concern (*MO_GC*) is positive and significant at the 5% level after including the control variables in Mayew *et al*. (2015). This indicates that disclosures under ASU 2014-15 are helpful in predicting bankruptcy which is of significant interest to investors and creditors.[6] Among the control variables, three of the five financial variables (*RETA*, *MVETL*, and *SALETA*) are significant with the predicted signs. One of the market-related control variables (*EXRET*) is also significant with the expected sign. These results are consistent with the results reported in Mayew *et al*. (2015) and extends their findings to the post-ASU 2014-15 period.

Table 5 also reports the results of the bankruptcy prediction model for the Pharma and Biotech industry. In contrast to the results for the Oil and Gas industry, the disclosure of management's substantial doubt on the going concern (*MO_GC*) is not significant. Among the control variables, two of the financial variables and one of the market-related variables are significant.

The insignificance of the *MO_GC* variable for the Pharma and Biotech industry is surprising especially because nearly 20% of the firms in this industry disclose substantial doubt on their going concern status during the sample period as reported in Table 2. Despite the high number of negative management disclosures, less than 2% of the disclosing firms go bankrupt as seen in Table 2 Panel B, in contrast to 22% of disclosing firms in the Oil and Gas industry. Historically, bankruptcies tend to be low in the Pharma and Biotech industry. The UCLA-LoPucki Bankruptcy Research Database reports less than ten Biotech firms filing for bankruptcy in each year over the period 2011-18. This raises the issue as to what is the nature of information contained in the management disclosure of substantial doubt on going concern for Pharma and Biotech firms. To address this, the 10-K disclosures of disclosing firms are perused. Several Pharma and Biotech firms cite the inadequacy of cash and the need to raise financing to fund the ongoing operations (primarily R&D) as the reason for expressing substantial doubt on going concern. For example, Atossa Genetics Inc. states in its 10-K report for the year ending December 31, 2017: "As of December 31, 2017, the Company had

[6] As noted in the discussion of univariate results the number of firms that file for bankruptcy are a small proportion of the sample of firms. Mayew *et al*. (2015) report that about 1% of the Compustat firms file for bankruptcy in their sample. In the present study, for the Oil and Gas industry sample, nine firms (greater than 9% of the year by year sample) had filed for bankruptcy as of April 2019, and for the Pharma and Biotech sample, four firms (greater than 1% of the year by year sample) had filed for bankruptcy as of April 2019.

approximately $7.2 million in cash and cash equivalents and working capital of approximately $6.7 million. The Company has not yet established an ongoing source of revenue sufficient to cover its operating costs and allow it to continue as a going concern. The ability of the Company to continue as a going concern is dependent on the Company obtaining adequate capital to fund operating losses until it becomes profitable. The Company can give no assurances that any additional capital that it is able to obtain, if any, will be sufficient to meet its needs, or that any such financing will be obtainable on acceptable terms… These conditions raise substantial doubt as to the Company's ability to continue as a going concern."

Table 5
Bankruptcy Prediction Model

VARIABLES	***Predicted Sign***	**Oil and Gas**	**Pharma and Biotech**
Intercept	?	-2.180	-4.974**
MO_GC	+	1.307**	0.095
WCTA	-	1.275	-1.024**
RETA	-	-1.368**	-0.934
EBIITA	-	1.002	-2.471**
MVETL	-	-0.523*	-0.116
SALETA	-	-1.868*	-2.061
EXRET	-	-1.330*	-2.668**
SIGMA	+	1.430	1.495
RELSIZE	-	-0.071	-0.146
Pseudo R^2 %		21.5	26.7
% Concordant		83.7	92.7
N		272	841

Dependent variable is *BRUPT*. The model is run clustered by firm. ***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

BRUPT = Dummy variable that takes the value of one if the firm goes bankrupt in year t+1, and 0 otherwise
WCTA = Working Capital (current assets-current liabilities) divided by Total Assets
RETA = Retained Earnings divided by Total Assets
EBITTA = Earnings before Interest and Taxes divided by Total Assets
MVETL = Market Value of Equity (stock price at the end of the fiscal year* Shares outstanding) divided by Total Liabilities
SALETA = Sales divided by Total Assets
EXRET = Cumulative security residual return for the 12-month period before the date of filing of the 10-K (firm return - market return)
RELSIZE = Logarithm of market capitalization at the end of fiscal year t (market capitalization of the firm divided by market capitalization of the market index)
SIGMA = Standard deviation of security residual returns for the 12-month period before the date of filing the 10-K

The potential inability to fund all desired investments because of inadequacy of cash and other resources is considered a "financial constraint" (Lamont *et al*., 2001) and a large literature in finance and economics studies the role of financial constraints and firm performance (Kaplan and Zingales, 1997). Li (2011) shows that the impact of

financial constraints is more severe for R&D intensive firms as these firms are characterized by high information asymmetry (Hall and Lerner, 2010). An implication of this finding is that management disclosure on going concern is likely more consequential for firms that face significant financial constraints in the Pharma and Biotech industry. To test this conjecture, a measure of financial constraint developed by Kaplan and Zingales (1997) and tested in Lamont *et al*. (2001) is used to first assess whether the financial constraint measure distinguishes disclosing firms from non-disclosing firms and in subsequent analysis, whether the investor reaction to management disclosures is conditional on financial constraints. The measure developed by Kaplan and Zingales (1997) is known as the *KZ* index and it is higher for firms that are more financially constrained.[7] To test whether financial constraints are a factor in management's disclosures on going concern status, Model 1 is estimated by adding the *KZ* index as an additional explanatory variable.[8] The results are reported in the last column of Table 4 for the Pharma and Biotech industry. While most of the other variables remain similar in significance, the *KZ* variable is positive and significant (at the 5% level) indicating that financial constraints are a significant factor for disclosing firms in their decision to express substantial doubt on the going concern status.[9] When this analysis is conducted for the Oil and Gas industry, the *KZ* variable is not significant.

Investor Reaction to Management Disclosures on Going Concern

The evidence for the bankruptcy model suggests that management disclosures on going concern have incremental information content for prediction of bankruptcy in the case of Oil and Gas industry but not for the Pharma and Biotech industry. To assess the usefulness of the management disclosures on going concern from an investor perspective, the market reaction surrounding the management disclosures is examined by estimating Model 3.

One of the new requirements in ASU 2014-15 is that the management's evaluation of going concern should be done in interim periods too, in contrast to auditors' going concern opinions that are typically provided at the end of the annual periods. To address this, all 10-Q filings of the sample firms are read to identify whether the firms made any interim disclosures. This procedure found that of the 185 disclosing firm-years (the sum of 21 and 164 in Panels A and B in Table 2), 86 disclosed in the first quarter, 19 disclosed in the second quarter, 15 disclosed in the third quarter, and the remaining 65 disclosed in the 10-K filing. Accordingly, the investor reaction is measured around the earliest 10-Q filing date for the interim disclosers and around the 10-K filing date for the annual disclosers.

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[7] The measurement of the *KZ* index is described in Table 4. While other measures of financial constraints exist including text-based measures, *KZ* index is used here as it is based on accounting data (Li, 2011).

[8] Lamont *et al*. (2001) note that financial constraint is a different construct from financial distress. In Model 1, a variable representing financial distress, *ZSCORE*, is already included.

[9] A potential alternative explanation for disclosing firms in Pharma and Biotech industry not going bankrupt is that they merge with another firm or get acquired by a larger firm. To address this explanation, data from COMPUSTAT delisting (DLRSN=1) because of acquisition or merger is collected and the analysis is conducted by using this as a dependent variable. The disclosure variable, *MO_GC* is not significant in this analysis indicating that subsequent M&A (merger and acquisition) does not appear to be a significant factor for the disclosing firms.

Table 6
Investor Reaction to Management's Going Concern Disclosures

VARIABLES	*Predicted Sign*	Oil and Gas	Pharma and Biotech	Pharma and Biotech with Financial Constraint
Intercept	?	0.034	0.083	0.076
MO_GC	-	-0.053*	-0.006	-0.003
*EXRET**	+	0.008**	0.016**	0.017**
WCTA	?	-0.037	0.024**	0.024*
RETA	?	0.021	-0.012	-0.011
EBIITA	?	-0.002	0.011	0.009
MVETL	?	0.001***	-0.001**	-0.001*
SALETA	?	0.040	-0.002	-0.002
KZ	?			0.001*
*MO*KZ*	?			-0.001**
Adjusted R^2 %		6.32	2.83	3.17
N		272	841	841

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.
Dependent variable is *CAR3*, three-day cumulative abnormal returns (the difference between the stock return and the return on the market index) centered over the three-days around the10-K filing date (or in the case of interim disclosures around the relevant 10-Q filing date). *EXRET** is the cumulative security residual return for the 12-month period prior to the 10-K filing (in case of interim disclosures, for the period prior to the relevant 10-Q filing) dates. Other financial control variables are as of the 10-Q filing date for interim disclosers.

Results for Model 3 are reported in Table 6. The results for the Oil and Gas industry show that management disclosure of a substantial doubt (*MO_GC*) is negative and significant indicating investors react negatively to these disclosures. These results corroborate the bankruptcy prediction model results and are consistent with a characterization that the required disclosures under ASU 2014-15 provide new information to investors.[10] These results confirm Mayew *et al*. (2015) who find negative investor reaction for management disclosures made in the pre-ASU 2014-15 period. Table 6 also reports results for estimating Model 3 for the Pharma and Biotech industry. The management disclosure of a substantial doubt (*MO_GC*) is not significant indicating that investors do not perceive these disclosures to be informative of bankruptcy. These results confirm the bankruptcy prediction model findings that management disclosures of substantial doubt rarely result in subsequent bankruptcies for Pharma and Biotech firms. As discussed previously, financial constraints are more severe for R&D intensive firms and many firms in the Pharma and Biotech industry note the potential insufficiency of financing as a contributing factor to their negative outlook on going concern status. To assess whether investors react to the information in management

[10] Bedard *et al*. (2019) study investor reaction to audit opinions using Canadian data and report that when a management disclosure on going concern is accompanied by an auditor going concern opinion, incremental negative abnormal returns are found only for firms with weak (based on linguistic severity) disclosures.

disclosures in the Pharma and Biotech industry conditional on financial constraints faced by the firm, Model 3 is modified by interacting *MO_GC* with the financial constraint variable *KZ*. The results are reported in the last column of Table 6. In this modified specification, the main effect on *MO_GC* is insignificant while the interaction variable *MO*KZ* is negative and significant (at the 5% level). These results indicate that while management expressions of substantial doubt do not elicit an investor reaction, in the presence of financial constraints such disclosures are viewed negatively.[11] Overall, the results for investor reaction show that investors react negatively to management disclosure of substantial doubt but this reaction is contextual, i.e., in the Oil and Gas industry the reaction is negative for all disclosing firms; while in the Pharma and Biotech industry, the reaction is negative only for firms with severe financial constraints.

ADDITONAL ANALYSES

Auditor Going Concern Opinion and Management Disclosures under ASU 2014-15

Mayew *et al*. (2015) study management disclosures prior to ASU 2014-15 and document that 47% of the bankrupt firms received an auditor going concern opinion while 39% of the bankrupt firms had a management disclosure on going concern. Thus, in the pre-ASU 2014-15 period, there was a significant number of firms whose managements did not make disclosures on going concern status while the external auditors provided a going concern opinion. Both disclosures were made in the 10-K filings. Accordingly, Mayew *et al*. (2015) control for the going concern opinion in the bankruptcy prediction model. For the post ASU 2014-15 sample in this study, 99% of the firms that disclose a management expression of substantial doubt also have an auditor going concern opinion.[12] In contrast to the pre-ASU 2014-15 period, firms are now required to evaluate going concern status on an interim and annual basis. As discussed previously, in the current sample nearly 65% of the firms report a management disclosure on going concern in the interim quarters while the audit opinion continues to be disclosed at the end of the fiscal period, i.e., in 10-K filings. Thus, this study does not control for auditor going concern opinion in models 2 and 3. Note that a minority of firms report management disclosures on going concern in their 10-K filings. To address whether in such instances the information content is from the audit opinion rather than the management disclosure, the tests are conducted by removing the 10-K only disclosers. The results of this modified procedure are similar to the results reported in Tables 5 and 6.

Additional Disclosures under ASU 2014-15

If management identifies conditions or events that raise substantial doubt about the entity's ability to continue as a going concern, ASU 2014-15 requires disclosures on management's plans that alleviated substantial doubt or plans that are intended to

[11] When a similar financial constraint interaction is added for the Oil and Gas industry sample, the interaction effect is not significant.

[12] Auditing and accounting rules on going concern disclosures are similar, but some differences exist. Under ASU 2014-15, the definition of "substantial doubt" includes the "probable" threshold. In contrast, auditing standards do not provide an explicit definition nor a specific threshold and thus involve relatively more subjectivity. Also, while both rules ask for one-year look-forward periods, the definitions differ.

mitigate the conditions or events that raise substantial doubt. To address whether the bankruptcy prediction or investor reaction results differ based on the type of disclosures, the disclosing firms' statements are classified as those that address mitigating actions and those that do not. This classification is inherently subjective as most firms in the sample do not clearly state that their plans or actions "alleviated" the substantial doubt. Given this lack of clarity no significant differences are observed when the analysis is conducted based on the type of disclosure.[13]

Robustness Tests

To assess the robustness of the industry-level results reported in the study, two additional analyses are conducted. First, a matched pair sample is created by identifying all firms that filed for bankruptcy in the period starting after end of fiscal year 2016 till April 2019 from the UCLA-LoPucki Bankruptcy Research Database and the COMPUSTAT Annual Database. Forty-two firms are identified with available data in COMPUSTAT and CRSP databases. For these 42 firm-years, matching non-bankrupt firm-years are identified based on industry and total assets, for the fiscal year prior to the bankruptcy filing for the bankrupt firm.[14] The combined 84 firm-years span 18 major industries that had a minimum of one firm going bankrupt. The bankruptcy prediction and investor reaction analyses are conducted for this matched pair sample and the results are reported in Table 7. Panel A shows the results for model 2. The results show that management disclosure of substantial doubt on the going concern status (*MO_GC*) is positive and significant at the 5% level with some of the control variables significant with the predicted signs. The results for the investor reaction model reported in Panel B show that management disclosure of a substantial doubt (*MO_GC*) is negative and significant (at the 10% level) indicating investors react negatively to these disclosures. These results indicate that the new disclosures contain information content for bankruptcy prediction and that investor reaction is consistent with the information content.[15] This procedure also provides assurance that the information content of the new disclosures obtains for a cross-section of industries (beyond the Oil and Gas industry) and the informativeness regarding financial constraints rather than potential bankruptcy is unique to Pharma and Biotech industry.[16]

Second, the analyses are conducted for an additional industry grouping with low stock returns during 2016 – the Communications and Electric, Gas, and Sanitary services (two-digit SIC codes 48 and 49) industries. This grouping consists of 530 firm-years with available data and four firms that went bankrupt after 2016. The bankruptcy prediction and investor reaction analyses are conducted for this grouping. The results in Appendix A for the bankruptcy prediction model show that management disclosure of substantial doubt on the going concern status (*MO_GC*) is positive and significant at the 10% level. The results for the investor reaction model show that management disclosure of a

[13] Partitioning of the data also reduces the sample size which may also contribute to the lack of significant difference. Ideally, a larger sample of disclosing firms from all industries over a longer period may be needed to tease out the differences.

[14] Mayew *et al*. (2015) employ this matching design in conducting time series analysis in their sample.

[15] Krishnan *et al*. (2018) report that earnings response coefficients for firms with clean audit opinions increased in the first year under ASU 2014-15.

[16] When the KZ variable is included in the model, it is not significant.

substantial doubt (*MO_GC*) is negative and significant (at the 10% level) indicating investors react negatively to these disclosures. These results are in line with the results shown for the matched pair sample and the Oil and Gas industry sample.[17]

Table 7

Panel A: Bankruptcy Prediction Model Results for Matched Pair Sample

VARIABLES	*Predicted Sign*	Coefficients
Intercept	?	-3.060
MO_GC	+	0.452**
WCTA	-	-1.465
RETA	-	-1.995**
EBIITA	-	1.045
MVETL	-	-1.204*
SALETA	-	-0.076
EXRET	-	-3.093***
SIGMA	+	6.815*
RELSIZE	-	-0.129
Pseudo R^2 %		44.5
% Concordant		93.2
N		84

Panel B: Investor Reaction to Management's Going Concern Disclosures for Matched Pair Sample

VARIABLES	*Predicted Sign*	Coefficients
Intercept	?	0.031
MO_GC	-	-0.045*
*EXRET**	+	0.042**
WCTA	?	0.025
RETA	?	-0.001
EBIITA	?	0.015
MVETL	?	-0.002
SALETA	?	-0.020
Adjusted R^2 %		2.12
N		84

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

[17] Both in the matched pair sample and in the additional industry analyses, the results are sensitive to the inclusion of market-based variables. Excluding these variables substantially increases the significance of the management disclosure variable. The significance of the market-based variables in bankruptcy prediction is highlighted in Mayew *et al*. (2015).

Appendix A

Panel A: Bankruptcy Prediction Model Results for Communications and Electric, Gas, and Sanitary Services

VARIABLES	*Predicted Sign*	Coefficients
Intercept	?	-4.470
MO_GC	+	1.212*
WCTA	-	-5.705
RETA	-	-2.151*
EBIITA	-	1.672
MVETL	-	0.001
SALETA	-	-3.073
EXRET	-	-5.335**
SIGMA	+	7.399
RELSIZE	-	0.110
Pseudo R^2 %		41.1
% Concordant		93.6
N		530

Panel B: Investor Reaction to Management's Going Concern Disclosures for Communications and Electric, Gas, and Sanitary Services

VARIABLES	*Predicted Sign*	Coefficients
Intercept	?	0.067
MO_GC	-	-0.034*
*EXRET**	+	0.057**
WCTA	?	-0.012
RETA	?	-0.001
EBIITA	?	0.041
MVETL	?	-0.001
SALETA	?	-0.012
Adjusted R^2 %		1.72
N		530

***, **, * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

SUMMARY

ASU 2014-15 requires management evaluation of whether there is substantial doubt about the entity's ability to continue as a going concern and provide appropriate disclosures in interim and annual periods. Using a sample of Oil and Gas and Pharma and Biotech industry firms, this study finds that disclosures under ASU 2014-15 are incrementally useful in bankruptcy prediction and accordingly have a negative investor reaction in the Oil and Gas industry. In contrast, in the Pharma and Biotech industry, such disclosures do not anticipate bankruptcies but instead indicate the financial constraints faced by the firms. More broadly, a matched pair analysis of firms filing for bankruptcy across all industries supports the inferences on bankruptcy prediction and

negative investor reaction documented for the Oil and Gas industry. Such results not only extend the results of Mayew *et al*. (2015) to the post-ASU 2014-15 period and to interim disclosures but also underscore the importance of industry-specific analysis. The results in the study also speak to the discussion surrounding the effectiveness of the disclosures and are likely useful to accounting regulators who want to assess the impact of new disclosure rules, to auditors who need to consider effectiveness of management disclosures in providing their own assessment of going concern, and to investors who are interested in evaluating whether management disclosures are informative.

LIMITATIONS

The study uses industry groups that experienced low stock returns for collecting the sample and thus focuses on a limited number of industry groupings. A shortcoming of this approach is that the results for the two industry groups may not characterize the overall population of firms. Second, the study examines the first three years of reporting in the post-ASU 2014-15 period, and as such may not be reflective of long-term trends in going concern disclosures. Finally, because of the sample size and the short time period, the study is not able to assess the specificity of mitigating disclosures if any, at a granular level to assess whether different types of mitigating plans or actions elicit a different investor reaction. Future research can address these issues with longer time periods and larger samples.

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All submissions must adhere to these requirements. Submissions that deviate from these guidelines may receive desk rejections. If in doubt consult The Chicago Manual of Style.
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