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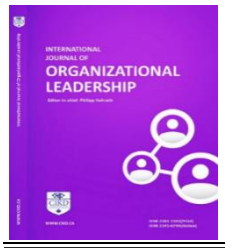

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Highlighting the Leadership Role of Top Management and Business Strategy Between Institutional Pressures and the Adoption of Environmental Management Accounting

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ABSTRACT

The quest for sustainability has compelled the leadership of many firms to embrace pro-environmental practices. Environmental Management Accounting helps lower environmental impacts through informed decisions made on costs related to materials and energy. This study is grounded in an Institutional perspective that is utilized to empirically test the environmental management accounting practices adopted by the manufacturing firms operating in China. Structural equation modeling is employed to test the path model relationships among various constructs of the study. The framework employs the three institutional forces, normative pressure, coercive pressure, and mimetic pressures, as antecedents of environmental management accounting directly and through the mediating mechanism of environmental strategy. The moderating impacts of top management support and environmental uncertainty are also taken into account. Survey data was collected from 249 Chinese manufacturing firms. The results demonstrated the significant central role of environmental strategy that fully mediates the relationships between institutional pressures and EMA implementation with the maximum impact of coercive pressures. The central role of leadership in curtailing superficial efforts was revealed through the moderating results of top management support, and the sparingly tested environmental uncertainty over mimetic pressures was also confirmed. The findings present sound and interesting practical and theoretical implications for the management and leadership of the organizations.

Given the severity of environmental degradation, a wide range of stakeholders, including governments, suppliers, employees, shareholders, and consumers, are becoming more aware

of environmental issues and expect organizations to develop pro-environmental behavior. Most of the firms lack a sound environmental strategy that drives the organization to address many of its environmental concerns. Secondly, traditional accounting practices fail to estimate the environmental impacts and costs. Environmental Management Accounting (EMA) provides the solution to this problem by providing both financial and physical environmental information in order to minimize environmental damage and maximize the efficiency of natural resources and helps senior management make evidence-based decisions on environmental concerns by exposing environmental expenses that are frequently disregarded in traditional management accounting. The leadership of many firms view the use of environmental management accounting (EMA) and the implementation of environmental strategy as crucial competitive advantages for improving corporate environmental management (Gunarathne & Lee, 2015; Wagner & Schaltegger, 2004).

Most researchers have employed the institutional lens for the adoption of environmental behavior and related accounting practices (Asiri et al., 2020; Ball & Craig, 2010; Gunarathne et al., 2023; Nurunnabi, 2015; Oware & Mallikarjunappa, 2022). According to institutional theory, the institutional environment has a major impact on organizational behaviors and practices, which are not solely driven by internal causes. A complex network of official and informal components, such as laws, values, cultural norms, and societal expectations, make up this environment (DiMaggio & Powell, 1983). The institutional theory involves three different types of pressures that the leadership of firms faces, and each one of these external pressures is driven by different sources and sets of stakeholders (DiMaggio & Powell, 1983). According to the first driver, coercive pressure, powerful players (such as suppliers, governments, etc.) shape organizational behavior by enforcing conformity through coercive isomorphism. The second factor, normative pressure, comes from common organizational standards and forces businesses to follow them. Lastly, in uncertain settings, mimetic pressure leads businesses to copy their successful peers.

A number of research works have looked at the combined effect of institutional pressures or have centered on the effects of individual pressures; for instance, Bansal (2005) and Gluch and Stenberg (2006) worked on mimetic and normative pressure, while Clemens and Douglas (2006) concentrated on coercive pressure. In this study, we examined the comparative effects of coercive and normative pressures, offering specific insights into their varying impacts and practical implications.

Furthermore, most works (Abd et al., 2020; Asiri et al., 2020; Latif et al., 2020) have linked the institutional pressures with the desired environmental practices and hence have ignored the underlying mechanisms and processes that make these pressures work. We have identified the central role of environmental strategy in achieving EMA as a potential mediator. A number of organizational efforts are included in the environmental strategy to reduce the environmental impact of company policies, operational procedures, and product life cycles. The environmental strategy promotes a more sustainable approach by consciously integrating company operations with environmental issues. One of the main forces behind converting environmental strategy into concrete actions is the development of EMA. The importance of a sound environmental strategy cannot be ignored, and if the leadership fails to conceptualize a sound environmental strategy, much will not be achieved due to a lack of focus.

Another contribution of this paper is the identification of suitable moderators for the linkages between institutional pressures and EMA. The fundamental role of leadership in the

form of top management support and sparingly tested moderation effect of environmental uncertainty provides valuable insights in this study. A large number of studies have employed institutional theory, but environmental uncertainty has not been empirically tested as a moderator of mimetic pressures.

In this regard, the primary goal of this paper is to investigate the roles of top management support and environmental uncertainty while also empirically testing a framework on how institutional forces affect EMA through environmental strategy. Specifically, we want to address the following research questions:

What is the comparative effect of each institutional pressure on EMA through the environmental strategy of the firm?

How does the role of TMS and environmental uncertainty moderate the relationships of coercive and mimetic pressures, respectively, with the implementation of EMA?

Literature Review

Environmental Management Accounting

EMA is based on the idea that accounting data should be used to support corporate environmental management for planning, decision-making, and control (Burritt, 2002; Burritt & Schaltegger, 2010; Ferreira et al., 2010; Schaltegger, 2018). EMA is an evolutionary stage, and XIaomei (2004) defines it as the identification, gathering, estimation, analysis, internal reporting, and utilization of materials and energy flow data, environmental cost data, and other cost data for both traditional and environmental decision-making within an organization. The primary distinction between traditional management accounting and EMA is that the former independently identifies, measures, analyzes, and interprets environmental aspects of business operations. Improving company image, lowering employee turnover, and lessening the regulatory burden are some advantages of EMA implementation (Christ & Burritt, 2013; Johnstone, 2018).

In addition to financial data, EMA also looks at physical information about business performance and environmental effects (Jasch, 2003). Thus, EMA is composed of two components: the monetary component and the physical component. Monetary EMA produces data for internal management usage and mostly concentrates on the environmental aspects of businesses' operations that are expressed in monetary units (e.g., costs of fines for breaking environmental regulations and investment in capital projects that improve the environment). However, physical EMA primarily concentrates on how businesses affect the environment, as measured in tangible measures (Burritt et al., 2002). EMA enhances both environmental performance and economic value by giving senior managers access to two forms of environmental information for decision-making (Wilmshurst & Frost, 2000). Therefore, EMA aligns with the environmental strategy of the organization by providing monetary and physical environmental accounting information (Burritt et al., 2002).

Institutional Theory

The main question of why all organizations in a field have a tendency to appear and behave alike is addressed by institutional theory (DiMaggio & Powell, 1983). "Regulative, normative, and cognitive structures and activities that provide stability and meaning for social behavior" is how Scott (2008) defines institutions. Laws, rules, traditions, professional and social standards, culture, and ethics are a few examples of institutions. Organizations are subject to three different kinds of isomorphic pressures from institutions: normative, coercive, and

mimetic (DiMaggio & Powell, 1983). The term "coercive isomorphism" describes demands from organizations that rely on their resources. According to Garud et al. (2007), normative isomorphism describes the professional standards and practices that are developed by educational and training techniques, professional networks, and employee mobility within organizations. When an organization is unsure what it should do, it mimics or copies other successful organizations. This is known as mimetic isomorphism. Since organizations seek legitimacy from outside institutions, these forces lead to isomorphic behaviors.

By adhering to external social settings, corporations retain or gain legitimacy (Colwell & Joshi, 2013; DiMaggio & Powell, 1983). According to Brunton and Eweje (2010), legitimacy gives a company the authority to conduct business in a particular manner.

EMA implementation through institutional pressures

Several recent research works (Alnaim & Metwally, 2024; Asiri et al., 2020; Chaudhry & Amir, 2020; Chetanraj et al., 2024; Gnarathne et al., 2023; Kong et al., 2022; Latif et al., 2020; Nguyen, 2024) have studied the relationship between institutional pressures and EMA implementation. Some studies have combined the effect of the three pressures as a single antecedent (Gunarathne et al., 2023; Kong et al., 2022), while others have employed only one of the pressures (Nguyen, 2024). Furthermore, there is a varying effect of pressures on EMA implementation through the three pressures. The majority of the studies have demonstrated the strongest effect of coercive pressures on EMA implementation (Alnaim & Metwally, 2024; Asiri et al., 2020; Latif et al., 2020; Nguyen, 2024). Nguyen et al. (2022) highlighted coercive pressure as the most influential factor for EMA implementation in Vietnam's pulp and paper industries. Chetanraj et al. (2024) confirmed coercive pressure as a key determinant of EMA adoption in Indian manufacturing firms. We, therefore, propose the following hypothesis:

H1: Coercive pressures positively influence the implementation of EMA in organizations

In recent studies, a positive and significant relationship is found between normative pressures and EMA (Alnaim & Metwally, 2024; Chetanraj et al., 2024). However, in some cases, normative have shown an insignificant (Asiri et al., 2020) or a negative relationship (Latif et al., 2020) with EMA implementation. In light of the mixed results, we feel that the following hypothesis needs to be proposed:

H2: Normative pressures positively influence the implementation of EMA in organizations

In the case of the relationship between mimetic pressures and EMA implementation, most of the recent studies have demonstrated a positive significant relationship (Alnaim & Metwally, 2024; Chetanraj et al., 2024; Latif et al., 2020). We also find some exceptions in which this relationship is not found to be significant (Asiri et al., 2020). After carefully evaluating the extant literature, we believe that a generalized comparative effect of the three institutional pressures is missing, and we, therefore, propose following the following hypothesis to test the comparative relationship effects between the institutional pressures and EMA implementation:

H3: Mimetic pressures positively influence the implementation of EMA in organizations.

The Central Role of Environmental Strategy Between Institutional Pressures and EMA Implementation

Environmental strategy refers to a company's deliberate efforts to reduce its ecological footprint through sustainable practices in products, operations, and policies. This involves initiatives such as eco-efficiency, pollution prevention, and sustainability innovations, including reducing energy use, minimizing waste, and adopting environmental management systems. It is a critical element of modern business strategy (Aragón-Correa et al., 2008; Hart, 1995).

Environmental Management Accounting (EMA) plays a key role in executing environmental strategies. Companies with proactive strategies are more likely to implement EMA, as it provides essential data on environmental costs and performance. This integration helps businesses manage their impact and achieve better sustainability outcomes. Research confirms that aligning environmental strategies with EMA enhances resource allocation and reduces environmental effects (Burritt & Schaltegger, 2010).

Studies further reveal the strong link between environmental strategies, institutional pressures, and EMA adoption. Firms with advanced environmental strategies implement EMA more extensively (Gunarathne et al., 2023) and use it to improve performance outcomes (Solovida & Latan, 2017). This highlights the importance of aligning strategic environmental goals with accounting tools to achieve sustainability.

An active environmental strategy effectively alleviates the adverse impacts of a company's growth on the environment. While institutional forces are considered significant influences on the environmental strategies of firms, the outcomes remain variable. We find a direct link of institutional pressures and the environmental strategy of the firm (Gunarathne et al., 2021; Li et al., 2023); the role of environmental strategy as a moderator between institutional pressures and EMA has been explored by Alnaim and Metwally (2024), the combined mediating effect of environmental strategy and EMA is studied by Gunarathne et al., (2021) and Kong et al., (2022), and the role of environmental strategy as a mediator between three institutional forces and firm performance (Eiadat et al., 2008) is also explored. The above literature review suggests a mediating role of environmental strategy between institutional pressures and EMA which remains unexplored as such. We therefore suggest the following three hypotheses:

H4a: Environmental strategy mediates the relationship between coercive pressures and EMA
H4b: Environmental strategy mediates the relationship between normative pressures and EMA
H4c: Environmental strategy mediates the relationship between mimetic pressures and EMA

The Role of Top Management Support

Top management support is instrumental in developing various organizational behaviors and implementing desired practices, such as technology adoption behavior (Lin, 2010), environmental protection behavior (Colwell & Joshi, 2013), and the implementation of EMA (Phan et al., 2017). Top managers offer leadership, communication, and training opportunities to boost employee commitment throughout the firm to create suitable environmental plans and handle environmental uncertainties (Latan et al., 2018).

Since decisions involving environmental strategies require organizational changes and resource commitment, top management is essential to their implementation (Bansal & Roth, 2000). According to Wijethilake et al. (2017), senior management's dedication to and philosophy on sustainability are important indicators that impact the success of adopting sustainability initiatives, even while organizations retain sustainability policies and practices as a normative institutional pressure. Furthermore, top management that is devoted to

sustainability occasionally presents its own sustainability agenda independent of the organization's objective (Wijethilake, 2017). The growing significance of environmental challenges is pushing organizations to internalize organizational strategies in which top management support is an important ingredient for success.

Support from top management functions as a vital intermediary. Wang et al. (2019) shown that institutional forces favorably influence the application of Environmental Management Accounting (EMA), with top management support acting as a mediator in this relationship. Their research demonstrates that when senior management is dedicated to environmental activities, the firm is more inclined to implement EMA practices in reaction to external constraints.

To guarantee that an organization understands and is committed to environmental challenges, top management support is necessary. A company may lose motivation to implement an environmental plan and reap its benefits if top management does not own it (Phan & Baird, 2015). Top management support is also more important in cultures with high power distance scores, such as Chinese culture (Insights, 2022). Therefore, we suggest that:

H5: Top management support moderates the relationship between coercive pressures and Environmental Strategy

Environmental Uncertainty

Unpredictable events (like climate change or natural disasters) or market shifts (such as consumer preferences, rivals' tactics, and technical advancements) are examples of environmental uncertainty that influence how a business responds now or in the future. This shift resulted from environmental uncertainty or new uncertainties related to the natural environment. Today's businesses face environmental uncertainty, which is linked to the dearth of knowledge about green accounting and the speed at which environmental information is available as a constraint on an activity (Kong et al., 2022).

A company's response to environmental uncertainty and other institutional influences is guided by environmental management accounting procedures. Based on institutional theory, numerous studies examine how institutional pressures, eco-innovation, an environmental strategy, environmental uncertainty, and top-management support relate to the implementation of environmental management accounting and a company's environmental performance. The process of copying others in a similar industry (such as top companies or rivals) to deal with environmental uncertainty that comes from the organizational environment and shapes its behavior is known as mimetic pressure, and it is a component of institutional pressure (Latan et al., 2018).

The foundation of mimetic pressures is based on environmental uncertainty (DiMaggio & Powell, 1983). When organizations face environmental uncertainty, they imitate the practices of successful firms in their industries, perceiving that those practices are the reason of their success. Despite a strong foundation of this moderating role, there is very little empirical work in which this is investigated and remains a fundamental research gap. Research suggests that environmental uncertainty plays a significant role in shaping firms' environmental strategies and performance. Environmental uncertainty also moderates the relationship between stakeholder integration capability and environmental strategy adoption (Rueda-Manzanares et al., 2008). Mimetic pressures, a form of institutional pressure, significantly influence

environmental performance and the implementation of environmental management accounting (Amir & Chaudhry, 2019). These findings highlight the complex interplay between environmental uncertainty, institutional pressures, and firms' environmental strategies across various contexts. We therefore suggest that the moderating role of environmental uncertainty should be empirically studied on the relationship between mimetic pressures and the environmental strategy of the firm, and hence we propose:

H6: Environmental uncertainty moderates the relationship between mimetic pressures and environmental strategy

Theoretical Framework

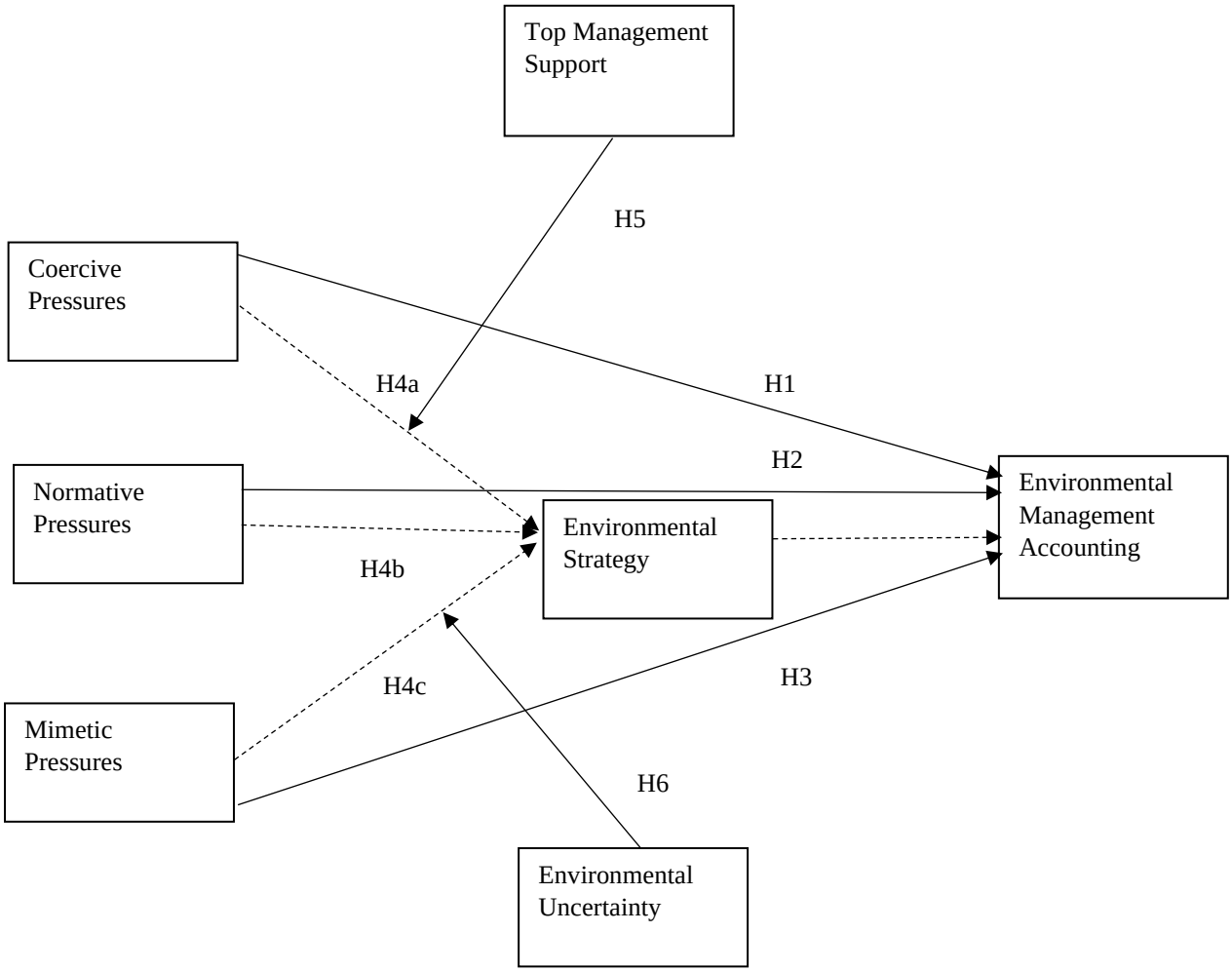
DiMaggio and Powell (1983) assert that the institutional environment is the source of institutional forces, which have the potential to influence managerial choices and practices in businesses. Furthermore, Scott (2005) distinguishes between normative, mimetic, and coercive institutional forces. Governments, non-governmental groups, suppliers, and customers are the primary sources of these pressures on businesses (Oliver, 1997). The political influence of the influential stakeholders (such as governments) that the focal firm depends on is the source of coercive pressures. These influential parties give businesses clear direction through regulations, incentives, and penalties (DiMaggio & Powell, 1983). The main source of normative pressure in a given organizational setting is the group expectations, norms, and standards (DiMaggio & Powell, 1983). Businesses are pushed to embrace dominant behaviors and practices through formative pressure created by professional expectations, norms, and standards (Teo et al., 2003). When businesses encounter an uncertain environment, mimetic pressure entails intentional imitation (Liang et al., 2007). Businesses would prefer to follow more successful peers if they lack a clear understanding of what is going to happen in their environment (DiMaggio & Powell, 1983). Businesses are more inclined to adopt EMA in the context of environmental protection when their counterparts get the benefits of doing so, even if they are unclear about the functions of EMA implementation. Based upon the above discussion and supporting literature review, the direct relationships between institutional pressures and EMA are established, as depicted in Figure 1.

Most studies treat these three institutional pressures collectively, overlooking their distinct effects (Delmas & Toffel, 2004). Additionally, research often lacks context-specific insights, particularly in developing countries, where institutional dynamics differ significantly (Zeng et al., 2012). Furthermore, environmental strategy is frequently considered a static mediator, with limited exploration of its evolution or interaction with factors like organizational culture (Bansal & Roth, 2000). While the relationship between institutional pressures and EMA has been explored, the internal processes and mechanisms remain under-researched (Henri & Journeault, 2010). A significant gap exists in understanding how institutional pressures (coercive, mimetic, and normative) uniquely influence Environmental Management Accounting (EMA) through the mediating role of environmental strategy. Therefore, the mediating role of environmental strategy is included in the theoretical framework between the three institutional pressures and EMA.

Similarly, to understand the underlying dynamics of the relationship between the three institutional pressures and the implementation of EMA, the moderating role of selected constructs is explored. The role of top management support is explored as a moderator between

coercive pressures and environmental strategy. Finally, the role of environmental uncertainty is explored as a moderator between mimetic pressures and environmental strategy.

Figure 1
Proposed Theoretical Framework



Method

Sample and Data Collection

The study used a survey-based research approach to collect data from industrial companies in Chengdu, China's southwestern area. Four hundred thirty-eight replies were collected, with 249 legitimate responses preserved for data cleansing. To guarantee the survey instrument's clarity and dependability, 28 businesses participated in a pilot test during an industrial expo. Feedback from the pilot research was utilized to improve the questionnaire for the final data collection.

The unit of analysis for the current research comprised manufacturing enterprises from several industries. The study only targeted respondents with decision-making roles (e.g., CFO, CXO positions) who also were the custodians of financial controlling and management accounting operations (Christ & Burritt, 2013). We conducted this study in 2023, but we reverted to online data collection. The data on manufacturing firms was acquired from the local government office, and with the help of local Chinese students and interns, the translated questionnaire was sent out to various firms. The study used a survey-based research approach

to collect data from industrial companies in Chengdu, China's southwestern area. The final sample size selected for analysis was 249, resulting in a 39% response rate, which is comparable to other similar studies (Wang et al., 2019).

The dataset comprises firm-specific attributes from 249 firms. 33% belong to the age group of 15 to 20 years, around 31% fall in the 10 to 15-year range, while the remaining firms belong to the younger age group of 10 years or below. The ownership structure reveals a predominance of joint ventures (45%), followed by foreign-controlled entities (30%), while the state-owned chunk remains at 25%. 42% of firms employ between 1001 and 2000 individuals, 37% employ over 2000, and the remaining are staffed with 1000 workers or below.

Measurement Instrument

The instrument from Phan and Baird (2015) was used to measure institutional pressure across three categories (coercive, mimetic, and normative). Each of these dimensions was measured using four items, which are also included in the relevant literature. For example, we measured normative pressure using 'The increased environmental concern of consumers has prompted our organization to apply environmental management accounting'. One example of a coercive pressure measure is: "Environmental regulations are crucial for our firm to implement environmental management accounting." We measured mimetic pressure with the same instrument used by Phan and Baird (2015), and a sample measuring it shows that 'the top businesses in our sector are renowned for using environmental management accounting'.

Seven items from Pondeville et al. (2013) were used to measure perceived environmental uncertainty. For instance, "My organization is facing a challenge due to uncertainty related to Changes in the competitor's environmental strategies" is an example of a sample item for this metric.

Seven items were taken from Latan et al. (2018) were used to measure the construct of environmental strategy. "My organization has an organized KPI mechanism for air, waste, water, and energy areas" is an example item for this measure.

The six items were taken from Wang et al. (2019) to measure the EMA adoption. As an illustration, consider the following sample item: "Our company's accounting system can identify, estimate, and classify environmental-related costs and liabilities". While the top management support construct is measured with four items adopted from Wang et al. (2019). One sample item is here; 'The top management team has sufficient resources to enable the adoption of environmental management accounting.

Each concept was assessed using a multi-item scale using a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The questionnaire addressed important factors such as coercive pressures (CP), normative pressures (NP), mimetic pressures (MP), environmental strategy (ES), environmental management accounting (EMA), top management support (TMS), and perceived environmental uncertainty (PEU).

Outer Model Testing

The outer model was evaluated to ensure the reliability and validity of the constructs. Key tests included are reported below.

Reliability: Internal consistency was assessed using Cronbach’s alpha and Composite Reliability (CR). As shown in Table 1, all constructs met the threshold of .70 (Nunnally & Bernstein, 1994; Sarstedt et al., 2021).

Convergent Validity: Convergent validity was confirmed by examining the Average Variance Extracted (AVE), with all constructs exceeding the .50 benchmark (Sarstedt et al., 2021), as shown in Table 1.

Table 1

The Reliability, Convergent Validity, and Collinearity VIFs

Composite reliability coefficients						
ES	PEU	EMA	TMS	CP	NP	MP
.92	.92	.91	.88	.89	.90	.89
Cronbach's alpha coefficients						
.90	.90	.89	.83	.85	.86	.83
Average variances extracted						
.64	.63	.65	.66	.69	.71	.67
Full collinearity VIFs						
2.56	2.91	2.98	2.30	1.89	1.85	1.68

Discriminant Validity: The correlations among different independent variables are compared against square root values of AVEs, and results in Table 2 show that discriminant validity is achieved in the model as per recommended thresholds (Hanif et al., 2023).

Table 2

Discriminant Validity

	Correlations among l.vs. with sq. rts. of AVEs						
	ES	PEU	EMA	TMS	CP	NP	MP
ES	.80						
PEU	.18	.79					
EMA	.47	.49	.80				
TMS	.35	.38	.65	.81			
CP	.46	.43	.28	.37	.83		
NP	.40	.47	.27	.36	.23	.84	
MP	.36	.44	.26	.35	.22	.20	.82

Note. Square roots of average variances extracted (AVEs) shown on diagonal.

Inner Model Testing

The inner model was put to the test to assess the connections between latent variables. WarpPLS, a second-generation structural equation modeling (SEM) program, was used to do the research. WarpPLS-v8 is a standard PLS-SEM tool for conducting the path analysis for complex models that involve multiple relationship testing including mediation and moderation of different variables (Kock & Kock, 2020; Kock & Lynn, 2012; Rasoolimanesh et al., 2017).

The model fitness was observed through model goodness of fitness, and the results were according to recommended thresholds. The results show acceptable statistical validity and strong model performance. There are substantial correlations, as evidenced by the Average Path Coefficient (APC) of .18 with $p < .001$. Moderate explanatory power is indicated by the Average R-squared (ARS) of .31 and the Average Adjusted R-squared (AARS) of .30, both of which are significant at $p < .001$. Minimal multicollinearity is confirmed by the Average Block VIF (AVIF) of 1.15 and the Average Full Collinearity VIF (AFVIF) of 2.03, both of which fall within acceptable bounds (≤ 5, ideally ≤ 3.3). Strong model fit is indicated by the Tenenhaus GoF (GoF), which is .48 and classified as large ($\geq .36$). The R-squared Contribution Ratio

(RSCR) is .99, and the Simpson's Paradox Ratio (SPR) is .88, both of which fall within acceptable bounds (≥ .7 and ≥ .9, respectively). The optimal threshold (≥ .7) is met by the Statistical Suppression Ratio (SSR), which is 1.000. Finally, being inside the permitted range (≥ .7), the Nonlinear Bivariate Causality Direction Ratio (NLBCDR) is .88.

The results with Path Coefficients (β) and P-values are used to evaluate the significance of each proposed association. Our model can explain 39% variance for the environmental strategy ES, and the value of R2 for the EMA variable is .25, i.e., 25% variance is explained. For the independent variable effect Size (f2), each predictor's impact on the dependent variable was assessed. Every effect size observed falls between .02 and .19, which is the range of low to medium impacts. Variance Inflation Factor (VIF) was assessed for individual and block effects, and the highest value noted was 3.27, which is well below the threshold of 5. This small value of VIF also eliminates any chances of common method bias for this model (Kock, 2015; Kock & Lynn, 2012).

Results

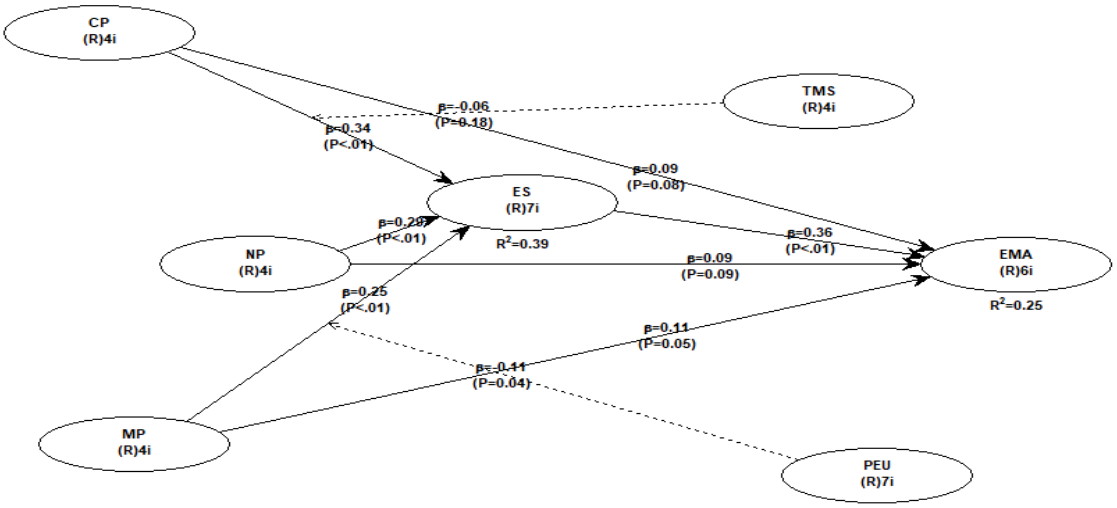
The study examined the relationships between institutional pressures (coercive pressures [CP], normative pressures [NP], and mimetic pressures [MP]), environmental strategy (ES), and environmental management accounting (EMA). Additionally, the moderating roles of top management support (TMS) and perceived environmental uncertainty (PEU) were explored. The results are summarized below. We have tested this model to check two primary questions:

1) What is the direct impact of institutional pressures (CP, NP, MP) on the EMA implementation?
2) What is the mediating role of environmental strategy ES on the relationships between institutional pressures (CP, NP, MP) on the EMA implementation?

The results are provided in Figure 2. The model explained 39% of the variance in ES (R^2 = .39) and 25% of the variance in EMA (R^2 = .25), indicating a moderate explanatory power. Results reveal that the direct effect of various institutional pressures on the EMA Implementation is negligible. Only Mimetic pressure MP shows some effect with β = .11, p < .05, and two others show no significant effect. However, the major effect comes through the mediating effect of environmental strategy ES. The details of these mediation effects are provided below. We discuss the results in sequence, starting with the direct effects and ending with the mediation effects.

Figure 2

Model Output with Coefficient Values and P-values



Impact of Institutional Pressures on Environmental Strategy (ES)

Hypothesis 1 was supported by the considerable positive correlation between coercive pressures (CP) and ES (β = .34, p < .01). Hypothesis 2 was confirmed by the considerable positive influence of normative pressures (NP) on ES (β = .29, p < .01). Hypothesis 3 was supported by the considerable beneficial effect of mimetic pressures (MP) on ES (β = .25, p < .01). The hypothesis examines how Environmental Strategy (ES) affects Environmental Management Accounting (EMA). Hypothesis 4 was supported by the positive and substantial relationship between ES and EMA (β = .36, p < .01).

Direct Effects of Institutional Pressures on Environmental Management Accounting (EMA):

Hypothesis 5 was partially supported by the marginally significant association between mimetic pressures (MP) and EMA (β = .11, p = .05). Hypotheses 6 and 7 were not supported by the non-significant direct effects of normative pressures (NP) and coercive pressures (CP) on EMA (β = .09, p = .09, and β = -.06, p = .18, respectively).

Moderating Roles of Top Management Support (TMS) and Perceived Environmental Uncertainty (PEU)

The moderating effect of top management support TMS was tested for the relationship between environmental strategy ES and coercive pressures CP which was reported as insignificant as the result showed (β = .06, p = .18). But for our second relationship, we observed a moderate negative effect of perceived environmental uncertainty PEU for the relationship between mimetic pressure MP and environmental strategy with (β = -.11, p = .04) which means that a high environmental uncertainty will weaken the effect of mimetic pressures on environmental strategy. The results are discussed in detail under the discussion.

Mediation Effects

The research showed that all three pressures had an insignificant effect on the EMA within the organization. Hence, we observe a full mediation effect through the construct of environmental strategy. The effect sizes and p-values for the indirect effects are presented in Table 3. The strongest mediation effect is observed for the coercive pressures, while the mimetic pressures

exhibited the weakest effect of the three pressures, which will be elaborated on in the discussion section shortly.

Table 3

Indirect Effects

Indirect effects for paths with 2 segments					
ES	PEU	EMA	TMS	CP	NP
EMA			.12	.10	.09
Number of paths with 2 segments					
EMA			1	1	1
P values of indirect effects for paths with 2 segments					
EMA			.003	.01	.01

Discussion

The results of this study reveal interesting results. The first three hypotheses are rejected, and the last three are accepted in this study. The first three hypotheses were related to the direct relationship of the three institutional pressures with EMA. The last three hypotheses proposed the mediating role of ES between institutional pressures and EMA. The direct relationships become insignificant in the case of full mediation. The results indicate full mediation of ES between all three institutional pressures and EMA, signifying the role of ES in implementing EMA by the organizations.

According to institutional theory, each of the three pressures has a different source that compels organizations to act in a certain manner. Coercive pressures are normally driven by governmental regulations, mimetic pressures are inspired by the practices of leading competitors and normative pressures are backed by professionalism in the industry. This study's results indicate that all three pressures work through ES in implementing EMA by the organizations. This means that when the organizations face external pressures, they define the environmental strategy of their firms and this environmental strategy then drives the firms to implement environmental programs in their organization. ES has a strong effect on EMA reflected by a high beta value of 0.39, meaning that the environmental strategy positively enforces the implementation of EMA.

Another aspect that needs to be discussed is the individual effect of each of the institutional pressures on ES. We can observe that Coercive pressures have the strongest effect on ES with a beta value of .36 compared to the other two pressures with a comparative beta value of .28 and .25 for normative and mimetic pressures, respectively. The strong effect of coercive pressure in the Chinese economy indicates either a strong role of coercive pressures or a complying attitude of Chinese firms in obeying governmental regulations.

Another interesting avenue is the moderating role of TMS over the relationship between coercive pressures and EMA implementation. The moderating effect is significantly negative in nature. It is presumed that TMS will positively moderate the institutional pressures and encourage employees to comply with governmental regulations. When TMS is weak, the employees adopt EMA due to coercive pressures; however, in the case of strong top management support, the employees pursue EMA implementation as part of their organizational vision instead of just external compliance. Coercive pressures sometimes enact the firms in de-coupling. The strong role of TMS can overcome this tendency, as evidenced by the results, and the firms will adopt environment-friendly behavior depending upon the commitment of the top management.

Finally, the significant moderating role of environmental uncertainty over the relationship between mimetic pressures and EMA implementation supports the theoretical stance of the institutional theory that mimetic pressures work best under environmental uncertainty. When faced with environmental uncertainty, firms look at their leading competitors for best practices and, in this case, seek the role of leading competitors in implementing EMA.

Theoretical Contributions

Institutional theory represents one of the most extensively utilized frameworks for analyzing firm behavior in adopting organizational initiatives. This study, however, emphasizes the distinct origins and drivers of coercive, normative, and mimetic pressures, rather than viewing their aggregated impact as a single antecedent. These pressures provoke varied organizational responses, necessitating an in-depth understanding of their comparative influences. By evaluating the individual effects of these pressures, the research identifies coercive pressures as the most significant determinant of organizational behavior. This finding underscores the pivotal role of regulations and formal mandates in shaping corporate actions (DiMaggio & Powell, 1983; Oliver, 1997).

Additionally, integrating the mediating role of environmental strategy enriches institutional theory by elucidating the mechanisms through which independent variables (institutional pressures) influence dependent outcomes such as EMA implementation. The study demonstrates that institutional pressures exert their effects indirectly, mediated by the organization's environmental strategy. Recognizing the latent influence of environmental strategy enhances the comprehension of the processes underpinning institutional theory (Bansal, 2005; Zeng et al., 2020).

The application of moderators further substantiates and refines theoretical premises. For instance, the inclusion of top management support as a moderator highlights its critical influence in the relationship between coercive pressures and organizational responses, providing insights into the phenomenon of de-coupling—a dimension often overlooked in institutional theory research (Scott, 2008). Moreover, empirical investigations rarely address the moderating role of environmental uncertainty in the context of mimetic pressures. This study contributes to the literature by explicitly identifying environmental uncertainty as a key factor affecting the relationship between mimetic pressures and environmental strategy (Guerci et al., 2016).

Practical Implications

The findings highlight the central mediating role of environmental strategy in the adoption of EMA practices. Organizations must integrate institutional constraints, including industry norms, competitive dynamics, and regulatory requirements, into a formalized environmental strategy. Such an approach is essential to facilitate the effective implementation of EMA, enabling managers to craft strategies that align internal objectives with external expectations. This integrated approach promotes sustainable compliance, proactive environmental initiatives, and enduring benefits such as enhanced profitability and reputation (Hart, 1995).

Leadership is indispensable in fostering pro-environmental behavior within organizations. In the absence of strong leadership, firms risk engaging in superficial practices, such as acquiring certifications without substantive operational changes. Addressing climate change and ensuring meaningful corporate contributions require leaders committed to genuine

environmental transformation. Robust leadership is pivotal in cultivating organization-wide commitment to sustainability initiatives fostering long-term ecological and organizational resilience (Delmas & Toffel, 2004).

Limitations and directions for future research

This study is cross-sectional in nature and, therefore, has certain limitations. The data is collected at a certain time and can only present a snapshot of what is happening at that point instead of capturing the entire trend over time.

The r-square values of .38 and .24 of ES and EMA, respectively, suggest that other factors account for their variance. Future studies need to identify more factors that could be missing in this model and could contribute to identifying missing mechanisms and processes.

Conclusion

Organizations can effectively address environmental issues and related economic performance with the aid of EMA. This study looked at the relationships between institutional pressures, environmental strategy, and EMA implementation, as well as the moderating effects of environmental uncertainty and top management support. The data was collected from firms working in China.

This study contributes to the literature on institutional theory, strategy, and EMA in several ways. This study iterates that the three institutional pressures should be studied in a comparative way instead of as a single construct. Second, apart from the direct effect of institutional pressures, mediating, and moderating mechanisms should be explored to uncover the hidden mechanisms underlying the direct relationships between the theory and EMA. Third, the central role of environmental strategy is highlighted for the implementation of EMA. None of the previous studies have studied the role of environmental strategy as a mediator between institutional pressures and EMA. This connects the literature on strategic management, Institutional theory, and EMA. Finally, this study contributes by empirically testing the moderating role of environmental uncertainty for mimetic pressures. The role of environmental uncertainty has been continuously linked with mimetic pressures; however, very limited studies have empirically tested this phenomenon.

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