Multilevel transformational leadership and management innovation

Intermediate linkage evidence

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Abstract

Purpose – The purpose of this paper is to extend management innovation theory and research by going beyond analysis at a single level. Focussing on management innovation at the lower level in the organizational hierarchy, the authors develop a multilevel framework; in doing so, the authors answer earlier calls for a study of the effects of multilevel transformational leadership (TFL) on management innovation and innovation in general.

Design/methodology/approach – This study collected multisource and multilevel data from 169 managers, 423 employees of 141 units from 21 banking service firms in an emerging economy.

Findings – The results from hierarchial linear modeling analysis reveal that unit-level TFL was positively related to unit-level management innovation. Furthermore, firm-level TFL was positively associated with firm-level empowerment climate, which in turn enhanced unit-level management innovation. In addition, firm-level empowerment climate strengthened the relationship between unit-level TFL and unit-level management innovation. Finally, the unit-level trust mediates the relationship between firm-level empowerment climate and unit-level management innovation.

Practical implications – Firms operate more effectively when they generate management innovation. To help ensure the effectiveness of management innovation, it is essential that firms, especially those from the banking sector, encourage their managers to engage in TFL behaviors. The managers must consider how to utilize their TFL behaviors to create trusting relationships in order to achieve the organizational goals. Firms can also take steps to develop a supportive climate of higher levels of autonomy, delegation, freedom and task accountability, in order to promote higher levels of trust at the lower levels of the organizational hierarchy.

Originality/value – The current study develops and tests a mediation model that links firm-level TFL to unit-level management innovation, and identifies unit-level trust as the intermediate outcome. With this theorizing and the findings, the authors deepen the current knowledge regarding the organizational implications of TFL behaviors for management innovation.

Keywords Transformational leadership, Management innovation, Firm-level empowerment climate, Multilevel evidence, Unit-level trust

Paper type Research paper

1. Introduction

How can the performance of the banking sector be enhanced? An important competitive advantage of the banking sector lies not only in the offering of new products and services, but also in the transformation of current management practices, processes and structures to create valuable resources for organizations (Yu *et al.*, 2013). While scholars have traditionally focussed on product and technological innovation, there has been growing attention paid recently to management innovation (Birkinshaw *et al.*, 2008;

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Vaccaro *et al.*, 2012). Management innovation refers to "the generation and implementation of a management practice, process, structure or technique that is new to the state of the art and is intended to further organizational goals" (Birkinshaw *et al.*, 2008, p. 829). Management innovation can benefit organizations by enhancing their performance and long-term competitive advantage (Hamel, 2006; Mol and Birkinshaw, 2009). This evolving line of study has also shown that management innovation is affected by the organizational empowerment context, a trusting relationship within the business unit and transformational leadership (TFL) (Conger and Kanugo, 1988; Mol and Birkinshaw, 2009; Vaccaro *et al.*, 2012).

As management practices, processes, structures and techniques are applied at all hierarchical levels of the organization, innovation can also occur at all organizational levels. In fact, since the multi-unit firm has become a pervasive organizational form in the contemporary business landscape (Usher, 1999), management innovation at the unit level is vital to such organizations. The lower level units often operate in closer and more direct contact with important organizational stakeholders such as employees and customers. Thus, unit-level innovation with respect to their practices, processes, structures and techniques could be significant for the firm's success. However, few attempts have been made to explore how organizations may facilitate management innovation at the unit level. Although insights gained from existing studies on organization-level management innovation may be applicable also at the lower levels of the organizational hierarchy, the theory will be incomplete if the cross-level effects are not considered (Gupta *et al.*, 2007; Jansen *et al.*, 2012). Specifically, while unit-level management innovation may be fostered by intra-unit attributes, the empowerment climate in the broader context of the organization in which the business unit is embedded is also expected to exert a non-negligible influence. This occurs because individual business units may benefit from and/or be constrained by interaction with peer units within the organization (Dutton and Ashford, 1993) in pursuing their own strategic initiatives and performance norms. Given the importance of management innovation at the unit level and the scarcity of knowledge regarding how this may be affected by multilevel organizational factors (Gupta *et al.*, 2007), our study aims to address this significant gap in the literature.

Human agents are viewed as the key drivers in facilitating management innovation (Birkinshaw *et al.*, 2008). In effect, relevant individuals can initiate and drive the process of change within an organization or can propose an innovative solution to a specific problem that the organization is facing (Burgelman, 1983a; Howell and Higgins, 1990). The role of leaders, as important human agents, is particularly emphasized in the discussion of management innovation (Vaccaro *et al.*, 2012). However, research in this area to date is very limited and is concentrated on the simple direct effect of leadership at a single organizational level. By studying management innovation at the unit level, we extend this human agency explanation, not only by examining the effects of leadership behaviors across multiple organizational levels, but also by explicitly testing the intermediary processes through which the effects of these leadership behaviors occur.

In this study, we use a "Substitute for Leadership" perspective (Kerr and Jermier, 1978), arguing that exploration of the effects of leadership action will be enhanced by taking into account the interactive effects of a leadership and empowerment climate as well as a trusting relationship, using the relationship between leadership and management innovation as a critical example. The literature on TFL was examined because leaders serve as the key agents who can stimulate others with their vision of an innovation's potential (Howell and Higgins, 1990). The research into empowerment was

reviewed because leaders can create an organizational climate that is favorable to a management innovation (Conger and Kanugo, 1988; Jung *et al.*, 2003) and because the effect of empowerment varies depending on the nature of the different industries in question (Jung *et al.*, 2008).

We theorize that unit-level management innovation is facilitated by TFL at the unit level as well as at the higher, firm level. We argue that a firm's empowerment climate serves as a key mediator for innovation. A firm-level empowerment climate is composed of three main dimensions – information sharing, autonomy through boundaries and team accountability. It is theorized that individual employees are more confident and have greater control over their task completion when they perceive themselves as having more autonomy and accountability in carrying out their work tasks (Blanchard *et al.*, 1995; Randolph, 1995). This will also encourage information exchange and innovative activities (Jung *et al.*, 2003, 2008). Despite the relevance of a firm's empowerment climate to innovation, it remains to be seen whether such an empowerment climate may shape the mediated relationship between TFL and management innovation. Notwithstanding the strong arguments for the relevance of an empowerment climate to innovation (Blanchard *et al.*, 1995; Jung *et al.*, 2008; Randolph, 1995; Seibert *et al.*, 2004), it is still not clear whether organizations that do have a strong empowerment climate will be more effective in assisting their TFL in the introduction of unit-level management innovation. We reason that a firm-level empowerment climate has a top-down, cross-level, amplifying effect on the positive impact of unit-level TFL on unit management innovation.

We endeavor to make several theoretical contributions. First, our study aims to contribute to management innovation theory and research by extending the analysis beyond a single level. Focussing on management innovation at the lower levels in the organizational hierarchy, we develop a multilevel framework. In so doing we answer earlier calls for a study of the effects of multilevel TFL on management innovation and innovation in general (Gupta *et al.*, 2007; Jung *et al.*, 2003). The importance of multilevel theory and multilevel empirical findings lies in their capacity to clarify the complex and dynamic systems and processes in organizational phenomena (Hitt *et al.*, 2007; Kozlowski and Klein, 2000) and to offer alternative approaches to expand our understanding of organizational systems and leadership behavior occurring across different levels by viewing them through macro- and micro- as well as meso-lenses (Hitt *et al.*, 2007; Porter, 1996). Second, this study examines whether the relationship between TFL and management innovation at the unit level would be similar to that found at the firm level by Vaccaro *et al.* (2012) (i.e. homology; Hofmann and Morgeson, 1999). As Chen, Bliese and Mathieu (2005, p. 376) stated, "If researchers find that relationships are homologous across levels of analysis, it adds to the parsimony and breadth of theories. In contrast, should relationships prove not to be homologous across levels, it signals a boundary condition and a need to refine theories."

Third, we go beyond previous studies (e.g. Vaccaro *et al.*, 2012) to uncover the empowerment climate mechanism through which both the unit- and the firm-level TFL influence unit management innovation. Moreover, we show that the empowerment climate at the firm level also serves as a boundary condition for the unit-level relationship between TFL and management innovation. In addition, although some studies have examined the direct effects of TFL and management innovation (Vaccaro *et al.*, 2012), researchers have not sought to recognize and elucidate the mechanisms through which TFL may have an impact on management innovation. The current study develops and tests a mediation model that links firm-level TFL to unit-level

management innovation, and identifies unit-level trust as the intermediate outcome. Unit-level trust refers to a unit-level climate of trust among employees across an entire unit that will result in the employees being more willing to share their own knowledge to help colleagues in the same unit (Lau and Liden, 2008), as they perceive that such an exchange will be used for the greater good of all (Jones and George, 1998). By articulating these intervening mechanisms, our study provides a more detailed model of the process by which TFL affects the relational aspect of trust to assist individual employees to engage in knowledge exchange and accept innovations in the management processes, techniques and structures. With this theorizing and the associated findings, we extend the current knowledge on the organizational implications of TFL for management innovation.

1.1 Theory and hypotheses

Management innovation relates to changes in how managers set directions, make decisions, coordinate activities and motivate people (Hamel, 2006). Consistent with Birkinshaw *et al.* (2008), we examine management innovation from the agency perspective. This assumes that new practices, processes, structures or techniques are consciously sought, promoted and introduced by key individuals within organizations in order to improve organizational performance (Burgelman, 1983a; Damanpour and Evan, 1984). The multilevel framework (Figure 1), which we adopted for this study, is informed by the literature on transformational leaders, empowerment and social capital. Management innovation typically involves a number of interconnected sub-processes, including problem identification, idea generation, idea implementation and theorization, and each sub-process is shaped by both internal and external change agents (Birkinshaw *et al.*, 2008) such as leaders and employees. As far as management innovation in a specific business unit is concerned, the employees within the unit may act as internal change agents, proactively creating interest in, experimenting with, and validating the management innovation. At the same time, individuals outside the unit but within the same firm may act as external change agents, influencing the development and legitimization of management innovation in that unit.

According to TFL theory, leaders play a central role in facilitating management innovation (Howell and Higgins, 1990), and can affect innovation in a variety of ways due to their positions within their organizations (Elenkov *et al.*, 2005). While leaders are

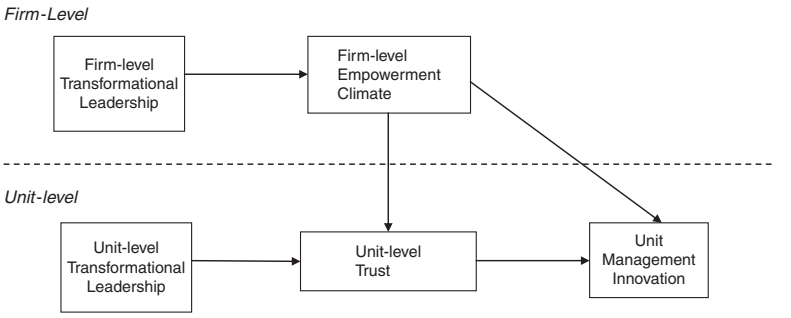

Figure 1.
An integrated multilevel model of transformational leadership, empowerment climate, unit-level trust, and unit management innovation

Notes: The dashed line separates unit-level constructs and firm-level constructs. Arrows crossing the dashed line represent cross-level relationships with the outcome variables

not necessarily the ones who directly develop the innovation, they are the key individuals who prompt the purposeful pursuit of the innovation. On the one hand, they are influential in motivating and promoting the identification of new trends in the environment and the needs within the organization for which management innovation may be required (Vaccaro *et al.*, 2012). On the other hand, they are involved in supporting and nourishing initiatives associated with changes in current practices, processes, structures and techniques. Several scholars have conceptually linked TFL to the innovation process (Bass, 1985; Conger and Kanugo, 1987). Bass (1985) argued that transformational leaders are active innovators that use intellectual stimulation to improve their followers' capacity to think for themselves, to cultivate new ideas and to question the management rules and structures that no longer serve the organization's mission. Transformational leaders will use individualized consideration and intellectual stimulation to improve their followers' confidence and skills to enable them to create and implement innovative responses (Howell and Higgins, 1990) to the existing management practices, processes, techniques or structures in their organizations.

Grounding our study in TFL, empowerment and social capital perspectives, we investigate the multilevel relationship between transformational leaders and unit management innovation, and the use of a firm-level empowerment climate as a mediator between transformational leaders and unit management innovation across both firm and unit levels. Moreover, we investigate the effects of multilevel TFL on unit-level management innovation, and the use of unit-level trust as a mediator between transformational leaders and unit management innovation across an entire unit. Estimating the multilevel effects of TFL offers a framework for understanding the extent to which it impacts unit management innovation. Our tests for moderation and mediation across levels support agency and TFL theories, suggesting that it matters where key agents such as leaders promote innovation in existing management processes, practices, techniques or structures, and how key agents attempt to form a social climate to promote such innovation in their organizations.

2. Literature review and hypotheses development

2.1 Multilevel TFL and unit-level management innovation

Drawing on TFL theory and literature, we anticipate that in a multi-unit firm, unit management innovation is greater when TFL is exercised at both the unit and the firm levels. TFL is widely considered to be desirable when there is a need to progress beyond the status quo and transform individuals, units and firms to that end (Ling *et al.*, 2008). Bass (1985) identified four types of TFL behaviors: idealized influence, in which the leaders represent a trustworthy role model to follow and demonstrate the need for an extra effort in novel and complex environments; inspirational motivation, in which leaders set, articulate and communicate a compelling vision of the future that motivates their followers to take initiatives to change the organization; intellectual stimulation, in which leaders encourage subordinates to question their beliefs and assumptions, reframe problems, take risks and search for new ways of doing things; and individualized consideration, in which leaders relate to their followers on a one-on-one basis, focus on their individual strengths and needs, coach them and help them to tackle stressful situations (Avolio *et al.*, 1999; Judge and Piccolo, 2004; Zhu *et al.*, 2013).

When the business unit manager exhibits such TFL, the unit is more likely to cooperate with management innovation. This reasoning is similar to Vaccaro *et al.*'s (2012) argument. In particular, through their idealized influence, transformational unit leaders may motivate unit employees to cooperate with management innovation by

reducing the employees' perceptions of the risk of the innovative actions (Bass *et al.*, 2003). This can enable and empower unit employees to challenge the extant management practices, processes, structures or techniques (Bass, 1994). Transformational unit leaders that use inspirational motivation may also highlight the importance of searching for new ways of doing things and encouraging cooperation within their units (Sosik, 1997). This, in turn, provides new meaning for the tasks and helps unit employees succeed in coping with new challenges (Bass *et al.*, 2003). Such unit leaders also empower their subordinates to look for creative ways of addressing innovation in managerial practices, processes, structures and techniques (Amabile, 1996). Through intellectual stimulation, transformational unit leaders enable unit employees to question the effectiveness of the existing management practices used by organizations (Sosik, 1997). Such leaders make it clear that they expect to receive rational proposals and will demonstrate confidence in the ability of their subordinates to propose new solutions (Bass, 1994; Gong *et al.*, 2009; Jung *et al.*, 2003). In this regard, intellectual stimulation can challenge the extant work practices and can inspire subordinates to consider various other ways of doing their jobs (Hunt, 1991). Individualized consideration by transformational unit leaders will make the unit employees feel appreciated and valued for their ideas and efforts in advancing new management processes, practices, structures and techniques. Overall, the above arguments suggest that unit-level TFL contributes to the success of innovation in unit management.

We further argue that firm-level TFL, i.e., the set of TFL behaviors demonstrated by the CEO, has a positive cross-level effect on management innovation at the unit level. Consistent with the argument regarding TFL at the unit level, when the CEO engages in idealized influence, inspirational motivation, intellectual stimulation and individual consideration (Bass, 1985), this creates a climate in which the workforce throughout the entire multi-unit firm feels motivated and secure when engaging in innovative thinking about management processes, practices, structures and techniques (Chen *et al.*, 2013). This influences unit management innovation in several positive ways. First, the CEO's TFL and the consequent firm-wide appreciation of management innovation can create a favorable environment for any business unit's own endeavors for management innovation. A unit that has a tendency to change and improve its management practices gains credibility. Original ideas and experiments are given their due value and errors and failures are well tolerated. This provides the unit with more latitude to pursue management innovation. Second, firm-level TFL is likely to promote cross-unit support for management innovation efforts in any individual business unit. In particular, when there is a shared vision of innovation, units may cooperate with and support each other by sharing experiences and learning lessons from similar experiments elsewhere, by exchanging relevant resources and by benchmarking the outcomes. These all help to facilitate the introduction of management innovation at the business unit level.

Accordingly, we argue that the existence of TFL at both the unit and the firm levels may explain a distinct variance in management innovation. This approach is also consistent with the contextual model (Johns, 2006), which suggests that there is a joint impact of unit- and firm-level predictors on unit-level outcomes (Hofmann and Gavin, 1998; Naumann and Bennett, 2000). Thus, we propose the following:

H1. Unit-level and firm-level TFL is positively related to unit management innovation.

2.2 Unit-level TFL and unit management innovation: trust among subordinates of the unit as mediator

To better elucidate the effects of TFL on unit management innovation, we discuss in detail one important mediating mechanism at the unit level. We argue that leadership exerts an influence on employees' behaviors and unit outcomes by creating a certain trust among employees at the unit level. We discuss the mediating effects of trust among employees within the same unit. We follow Collins and Smith (2006) by focussing on relational aspects of trust. We regard unit-level trusting relationships as an important mediating mechanism, because leadership often shapes the relationships in a unit or organization (Elenkov and Manev, 2005; Eisenbeiss *et al.*, 2008) and such trusting relationships in turn directly shape the motivation and actions of individuals who may act as change agents for unit management innovation. For several reasons, we argue that a trusting relationship among employees in the same unit reassures those employees about exchanging and recombining knowledge (Nahapiet and Ghoshal, 1998; Smith *et al.*, 2005), which is often recognized as a vital source of innovation (Argote *et al.*, 2003; Kogut and Zander, 1992).

First, we contend that TFL is vital in developing trust among subordinates (McAllister, 1995; Shaw, 1997). Through emphasizing and role-modeling the important values within the unit (i.e. idealized influence), unit leaders show themselves to be trustworthy professionals, and, in turn, this trust is likely to be transferred to other employees within the same unit (Zhu *et al.*, 2011). Second, through the consistent presentation of inspiring goals to subordinates (i.e. inspirational motivation), unit leaders can enable employees to develop a shared set of common goals and sense of purpose, and this commonality is likely to result in trusting relationships among them (Bennis and Nanus, 1985; Fairholm, 1994; Tsai and Ghoshal, 1998). Third, unit leaders show their respect, pride and confidence in all of their subordinates, which further builds a climate of trust through encouraging subordinates to critically reassess their existing presumptions and view problems in novel ways (i.e. intellectual stimulation). Fourth, by demonstrating their willingness to recognize the needs and capabilities of individual employees and making efforts to develop the strengths of these individuals and satisfy their needs (i.e. individualized consideration), unit leaders also demonstrate that they care about and value their subordinates. More supportive leaders are perceived to create deeper and more continuing trust among their subordinates (Ferrin *et al.*, 2007; Judge and Piccolo, 2004):

H2. Unit-level trust partially mediates the relationship between unit-level TFL and unit-level management innovation.

2.3 Firm-level TFL and unit management innovation: firm-level empowerment climate as mediator

Corresponding to both unit- and firm-level leadership behaviors in our theoretical framework, we discuss the mediating effects of the empowerment climate at the firm level. We follow previous studies (e.g. Blanchard *et al.*, 1995; Seibert *et al.*, 2004) by focussing on the empowerment climate. We regard the empowerment climate as a vital mediating mechanism, because the leadership often shapes the climate in a unit or organization (Elenkov and Manev, 2005; Seibert *et al.*, 2004; Kukenberger *et al.*, 2015), and, in turn, the empowerment climate directly shapes the motivation and actions of individuals who may act as change agents for management innovation. It refers to a work environment with a relatively descriptive focus, which asks respondents to assess

the meaning of organizational structures and practices in relation to information sharing (Seibert *et al.*, 2004, p. 336). An empowerment climate is often recognized as a vital source of innovation (Woodman *et al.*, 1993). We contend that the firm-level empowerment climate offers a powerful explanation for the cross-level, top-down impact of CEO leadership on business units. When the firm's CEO manifests idealized influence, intellectual stimulation, inspirational motivation and individualized consideration, the employees in the different units will have a comprehensive understanding of the firm's visions, goals and interrelated work task roles, and will be encouraged by such an empowerment context to share information gained from their own experience and presenting new ideas for management innovation. We argue that when the firm-level empowerment climate is high, the business units within the firm are more likely to accept and implement management innovation.

Consistent with what we noted earlier, a firm-level empowerment climate that is experienced by employees across different units will increase the willingness of the employees to share their own knowledge and information with other units (Kukenberger *et al.*, 2015), since they perceive that such information sharing will be used for the greater good (Jones and George, 1998). Moreover, the knowledge and skills of employees in different units are normally embedded in the organizational context (i.e. exist within individual teammates) (Kukenberger *et al.*, 2015). We believe that an empowerment climate is a mechanism that can facilitate the context-level influence of the firm-level empowerment on individual members' autonomy within a unit. This is because the firm-level empowerment climate can activate self-governance, which in turn can create an environment where employees have the ability and autonomy as well as the freedom to collectively engage in meaningful processes, and accept task accountability, as well as task accomplishment (Randolph, 1995). This will lead to a higher level of information sharing and acceptance of innovation, such as changes or initiatives in management processes, structures and techniques. In addition, when there is a high-level empowerment climate at the firm level, employees are not only more willing to cooperate in more complex tasks, but also see employees from different units taking higher order decisions and actions (Kukenberger *et al.*, 2015, p. 6), such as introducing changes or taking initiatives on management processes or structures. Such an environment of empowerment can provide significant and developmental experiences (Kolb, 1984) that are likely to generate higher levels of information sharing and innovative activities in management processes, techniques and structures. Therefore, a strong firm-level empowerment climate can enhance the generation of innovative activities across business units (Jung *et al.*, 2003) and this is arguably also beneficial for management innovation in a particular unit.

A collective empowerment environment allows employees from different units to help the focal unit identify problems that call for management innovation. Through information sharing, the focal unit may be inspired by different management practices in peer units, and may become aware that it has the freedom and autonomy to improve its own management routines. Exchanges with peer units may also open up new perspectives on the current status quo of the focal unit and enable it to visualize new opportunities and threats that are relevant to management innovation in the unit.

Furthermore, a strong firm-level empowerment climate may enhance the focal unit's ability and motivation to take responsibility for implementing new management ideas, because in a high-level empowerment climate, the focal unit may perceive itself as a valuable and respected unit that can be trusted to complete the task.

In summary, through the influence of higher levels of empowerment climate at the firm level, individuals in peer units perceive that they have the ability to carry out their tasks with a high level of autonomy and the freedom to undertake meaningful changes in management processes, techniques, structures or practices. Thus, we can expect that the firm-level social climate acts as a mediator through which firm-level TFL influences unit-level management innovation. As we do not hold that this is the only mechanism of influence, we propose a partial mediation hypothesis:

H3. Firm-level empowerment partially mediates the relationship between firm-level TFL and unit-level management innovation.

2.4 Firm-level empowerment climate and unit management innovation: unit-level trust as mediator

A higher firm-level empowerment climate not only mediates the effect of firm-level TFL on unit management innovation. It may also act as a driver to promote higher levels of trust among subordinates at the unit level and thus facilitate unit management innovation. There are several reasons for this argument.

First, a firm-level empowerment climate offers a context in which unit-level transformational leaders can transfer power and autonomy as well as freedom to individual employees by creating a trusting relationship among their subordinates (Burke, 1986; Gómez and Rosen, 2001; Manz and Sims, 1993). A higher level of trust among subordinates at the unit level not only implies that they will accept greater job responsibilities but can also articulate new contributions to the unit (Liden and Graen, 1980), such as changes to the unit management processes, structures or practices. Such a feeling of freedom to contribute arising from the trusting relationship among the subordinates at the unit level is one dimension of the impact of an empowerment climate at the firm level (Gómez and Rosen, 2001). We argue that when the focal unit is embedded in a firm-wide context characterized by a high level of empowerment, the unit employees are more likely to generate a higher level of trust in each other, which will contribute to the creation of constant goals and values, including unit-level management innovation. The result is enhanced information sharing across various units at the firm level, generated by an empowerment climate with higher levels of autonomy and freedom. This then enhances the trust relationship among subordinates at the unit level, which will facilitate further management innovation.

Second, as noted earlier, a firm-level empowerment climate promotes the intra-unit exchange of information and knowledge by creating a constructive relationship of trust within the unit. We reason that a firm-level empowerment climate, which facilitates an inter-unit flow of information and knowledge, complements the intra-unit exchange by enhancing management innovation in the focal unit. When there is a high level of intra-unit exchange, individual unit employees are likely to have exposure and access to a wider range of internal knowledge. Moreover, a trusting relationship among subordinates at the focal unit level is likely to give the employees more ability and willingness to accept task accountability as a result of the higher levels of empowerment climate across different units within the firm. In such a case, unit employees acquiring knowledge from peer units are more capable of interpreting and understanding the acquired knowledge, either using their own enhanced expertise or using the expertise of others that they can easily locate within the unit. Moreover, a higher level of trust among subordinates will offer employees ample opportunities to share information and acquire new knowledge across the unit as a result of the impact

of higher levels of autonomy and freedom to engage in unit task achievement and task accountability (Kukenberger *et al.*, 2015). In the context of empowerment at the firm level, employees are likely to perceive such a sustaining environment as benevolent support that allows them to solve problems and learn new knowledge and skills (Chan *et al.*, 2008). This will facilitate a higher level of trust among employees at the focal unit.

In effect, a firm-level empowerment climate becomes an indicator of organizational support related to various work-related outcomes (Chan *et al.*, 2008), such as information sharing (Kukenberger *et al.*, 2015) and innovation activities. Previous studies (e.g. Mayer *et al.*, 1995; Zhu *et al.*, 2013) have found that trust among subordinates within a unit enhances the willingness of individual employees to share information and knowledge with their colleagues and engage in proactive feedback-seeking behaviors (Mayer *et al.*, 1995). Grounded on the arguments discussed above, we expect that trust among subordinates at the unit level will be one important mechanism, although not the only one, by which a firm-level empowerment climate facilitates management innovation at the unit level:

H4. Unit-level trust partially mediates the effect of a firm-level empowerment climate on unit management innovation.

3. Methods

3.1 Sample and data

This research used a multilevel research design because multilevel theory is important in research design and such a design seeks to explain the precise boundary where one level of analysis ends and another begins. This is important in leadership research because leadership behaviors involve different levels of domains such as empowerment approaches or the relationship between leaders and followers in combination (Graen and Uhl-Blein, 1991). Researchers (e.g. Klein *et al.*, 1994; Rousseau, 1985) stated that a multilevel research design can assist researchers to obtain the most comprehensive illustration of the leadership process and account for more of the leadership contribution.

We tested our hypotheses using a sample of banking firms in Taiwan. The banking industry is especially suitable for our study, because management innovation is vital in assisting banking firms to respond to the changing business environment by initiating new internal practices, techniques, processes and systems. Management innovation is especially important at the banking unit level, because each unit needs to devise its own specific practices, techniques or processes to assist its employees to meet the unit's quarterly and annual targets. We chose the branches because they are geographically diverse, independent decision units with respect to the types of products and services provided and the markets as well as the customers to whom they offer these products and services. Each branch has its own senior management team that is responsible for the costs as well as the revenues with respect to the various traits of their operations such as following up on exploration and exploitative innovation. Each branch unit offers a variety of products and services as well as selling products that include enterprise and individual loans, mortgages, savings and insurance, corporate banking and corporate leasing, etc. In addition, the branches operate in markets with varying environments of dynamism and competitiveness which means that branches need to pursue diverse innovations (Jansen *et al.*, 2008). We identified a list of banking firms from the database of a consulting firm in Taipei, and were able to solicit support from the CEOs of 21 firms. For each participating firm, we approached all of its units

(branches). Typically, units have autonomy in setting up their own management techniques, practices, processes and systems. For each unit, we selected two managers in the unit management team (including one general manager and one operations manager) and randomly selected five employees to complete our surveys. In early 2012, we sent the surveys to the selected participants together with a supporting letter from their respective CEOs. The surveys were drafted in English and translated into Chinese using the back translation method (Brislin, 1980). Altogether, 300 managers and 700 employees were contacted across a total of 600 units. After four weeks, with three rounds of reminders, we received responses from 169 managers (56.3 percent response rate) and 421 employees (60.1 percent response rate). To construct the final sample, we eliminated those units from which we received usable responses from fewer than two managers or fewer than three employees.

The final sample includes 141 work units in 21 firms, with responses from a total of 169 managers and 421 employees. We compared the firms included in our final sample with those we had eliminated, and did not find significant differences between them in terms of the number of full-time employees or number of units. Following Armstrong and Overton (1977), we also compared early (first 10 percent) and late (last 10 percent) respondents to assess the non-response bias on each dimension of management innovation. No significant differences emerged across these dimensions. Of the managers in our sample, 53 percent were female. Their average age was 37.9 years, with an average organizational tenure of 8.58 years. Of the employees in our sample, 55 percent were female. Their average age was 28 years, with an average organizational tenure of five years.

To alleviate common method bias, we collected our data from multiple sources. First, the unit employees rated the TFL behaviors of their unit general managers as well as trust among subordinates in their own work units. Second, three employees (different from those rating unit-level TFL and unit-level trust among subordinates) rated the firm-level empowerment climate. Third, the two managers from each unit (unit general manager and operations manager) rated management innovation in their unit. Fourth, two senior managers from each firm's headquarters rated their CEO's TFL behaviors.

Measures. Unit management innovation[1]. We adopted the management innovation measure developed by Vaccaro *et al.* (2012) using a seven-point scale. We translated the scale into Chinese using the back translation method (Brislin, 1980). The Chinese version was then sent back to the 20 interviewed managers. In this study, management innovation shows good reliability ($\alpha = 0.82$). Mean $r_{wg(j)}$ is 0.95 and the ICC values (ICC[1] = 0.28, ICC[2] = 0.82) exceeded the levels suggested by Bliese (1998).

Unit-level TFL. We asked employees in each unit to rate the TFL behaviors of their unit general manager. We used the Multifactor Leadership Questionnaire (MLQ-5X)[2] developed by Bass and Avolio (2000) using a seven-point scale. This measure includes four components: charisma, inspirational motivation, intellectual stimulation and individualized consideration. Meta-analysis shows that these four dimensions of TFL are very highly correlated (at 0.90 after correction for unreliability), and it is difficult to separate them empirically from each other (Judge and Piccolo, 2004). Therefore, as in previous studies (e.g. Barling *et al.*, 2002; Bono and Judge, 2003), we created a single index of unit-level TFL by averaging the scores of all the items ($\alpha = 0.77$). Tests showed that employees from the same work unit had high agreement regarding the unit-level TFL (mean $r_{wg(j)} = 0.97$, ICC[1] = 0.22, ICC[2] = 0.88).

Firm-level TFL. Firm-level TFL was assessed by senior managers at the headquarters using the items of MLQ-5X (Bass and Avolio, 2000). The respondents

rated the TFL behaviors of their respective CEOs using a seven-point scale. As in previous studies (e.g. Barling *et al.*, 2002; Bono and Judge, 2003), we created a single index of firm-level TFL by averaging the scores of all the items ($\alpha = 0.82$). Tests showed that senior managers from the same firm had high agreement regarding the firm-level TFL (mean $r_{wg(j)} = 0.89$, ICC[1] = 0.25, ICC[2] = 0.78).

Firm-level empowerment climate. We adapted a firm's empowerment items from previous studies (Blanchard *et al.*, 1995; Randolph, 1995; Seibert *et al.*, 2004). Firm-level empowerment climate was rated by senior managers at the headquarters. The measures showed good reliability ($\alpha = 0.85$). Tests revealed that the senior managers from each headquarters had high agreement regarding the firm-level empowerment climate (mean $r_{wg(j)} = 0.88$, ICC[1] = 0.16, ICC[2] = 0.67). Therefore, we averaged the responses of the senior managers within each headquarters to create aggregated measures of the firm-level empowerment climate.

Unit-level trust. Following previous research (Chatman and Flynn, 2001; Collins and Smith, 2006; Mayer and Davis, 1999; Mayer *et al.*, 1995), trust was measured with a 12-item scale adapted from the method developed by Mayer and Davis (1999). The 12 items showed good reliability ($\alpha = 0.86$). Because of the high agreement between raters within the same unit (mean $r_{wg(j)} = 0.87$, ICC[1] = 0.20, ICC[2] = 0.72), we averaged the responses of employees within each unit to create an aggregated measure of unit-level trust.

Control variables. At the unit level, we controlled for unit age, unit size (logarithm of number of full-time employees in the unit), unit management team size, unit manager's age and tenure. The unit managers provided data on these variables. In addition, we controlled for environmental munificence for the banking units. We measured environmental munificence (i.e. over the five years of growth in net sales and in operating income in the banking industry) following the practice used in previous studies (e.g. Keats and Hitt, 1988). Environmental munificence can affect a bank branch's decisions, especially those by leaders to allocate resources to generate higher growth. Prior studies (e.g. House *et al.*, 1991; Jansen *et al.*, 2008; Pawar and Eastman, 1997; Waldman *et al.*, 2001) indicated that an organization's members pursue innovative activities which were influenced by the behavior of transformational leaders. This is because leaders adapt their decisions to meet the customers' preferences and demands in response to the availability of resources from external environments, such as changes in technologies and fluctuations in product demand or the supply of materials (Jansen *et al.*, 2006). The data were obtained from the *Taiwan Economic Journal* (*TEJ*) database. At the firm level, we controlled for firm age and firm size (logarithm of the number of full-time employees). In addition, we controlled for CEO age, CEO tenure and the size of the firm's top management team, as these variables may affect the extent to which organizations engage in change and innovation (Finkelstein and Hambrick, 1990; Siegel and Hambrick, 2005).

4. Results

Table I presents descriptive statistics and correlations.

Before conducting hierarchical linear modeling (HLM) analyses, we examined the degree of between-group variance in unit-level trust and unit management innovation. The results of the null models revealed that 33 percent of the variance in unit-level trust and 46 percent of the variance in unit management innovation existed between the units (the grouping variable), respectively. The χ^2 tests revealed that the between-unit variances were significant; i.e., the intercept terms varied significantly across units.

Table I.
Descriptive and unit-level and firm-level correlations

	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Unit manager age	37.9	5.65	–																
2. Unit manager tenure	3.58	0.49	0.00	–															
3. Unit age	4.85	1.77	0.00	0.00	–														
4. Unit size	10.75	0.83	0.00	0.07	0.3	–													
5. Unit management team size	1.45	0.51	0.04	−0.00	−0.04	0.1	–												
6. Top management team size	25.49	3.71	−0.00	0.09*	−0.02	0.03	0.2	–											
7. CEO age	51.90	3.14	0.06	−0.07	0.01	−0.00	−0.00	0.00	–										
8. CEO tenure	6.49	2.26	0.01	−0.00	−0.05	−0.19*	0.21**	−0.00	−0.01	–									
9. Firm age	25.43	5.87	0.00	0.00	0.02	−0.00	0.00	0.01	0.10*	−0.01	–								
10. Firm size	7,758.68	3572.56	0.00	0.00	0.00	0.00	0.00	−0.03	−0.04	0.02	−0.00	–							
11. Firm Top management team size	4.23	1.19	0.06	0.06	0.03	−0.06	0.04	0.01	0.01	0.01	0.00	0.03	–						
12. Unit- level Environmental munificence	4.98	0.99	0.05	0.01	0.03	0.01	−0.03	−0.02	0.00	−0.01	−0.01	0.02	0.02	–					
13. Unit-level TFL	4.28	1.32	0.00	0.00	−0.03	0.05	0.08	−0.02	−0.04	0.04	0.02	0.04	0.01	0.48**	–				
14. Firm-level TFL	4.21	0.67	0.02	0.15**	0.08*	0.09	0.01	0.08*	0.08*	0.05	0.06	0.07	0.03	0.44**	0.52**	–			
15. Unit-level trust	5.50	1.33	0.02	0.05	0.06	0.01	0.00	−0.02	0.02	0.04	0.06	0.04	0.00	0.24**	0.34**	0.50**	–		
16. Firm-level empowerment climate	5.17	0.86	0.01	0.00	0.02	0.05	0.00	−0.05	0.01	−0.03	0.01	0.05	0.00	0.22**	0.27**	0.60**	0.59**	–	
17. Unit-level management innovation	4.74	1.02	0.03	0.22**	0.01	0.08*	0.00	0.02	0.03	0.09	−0.03	0.02	0.01	0.49**	0.69**	0.66**	0.32**	0.28**	–

Notes: $n = 421$ employees, 169 managers, 141 units, 21 firms. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

Table II presents the HLM results for the effects of multilevel TFL on management innovation. *H1* predicts that unit-level TFL and firm-level TFL are positively related to unit management innovation. The results in Model 3 reveal that unit-level TFL and firm-level TFL were significantly related to unit management innovation ($\gamma = 4.46, 2.27$, $p < 0.01$, respectively). Thus, *H1* was supported.

The results of Model 2 reveal that unit-level TFL was significantly related to unit-level trust ($\gamma = 0.93$, $p < 0.01$, respectively), that unit-level trust mediated the relationship between unit-level TFL and unit management innovation ($\gamma = 2.84$, $p < 0.01$, Model 4), and that unit-level TFL remained significant but was reduced in magnitude ($\gamma = 2.00$, $p < 0.05$, Model 4). Thus, *H2* was supported.

H3 proposes that firm-level empowerment partially mediates the relationship between firm-level TFL and unit-level management innovation. We followed the four-step procedure for mediation described in Kenny *et al.* (1998) and controlled for firm-level TFL in the analyses. As the first step, firm-level TFL needs to be related to unit management innovation, which was supported in our testing of *H1*. In the test of step 2, the empowerment climate was found to be a firm-level outcome variable; thus it was appropriate to assess the effect of TFL on the empowerment climate at the firm level using a regular ordinary least squares analysis. The results reveal that firm-level TFL positively predicted the firm-level empowerment climate ($\beta = 0.74$ $p < 0.01$; adjusted $R^2 = 0.55$). In steps 3 and 4, we included the firm-level empowerment climate

	Unit-level trust		Unit management innovation				
Level variables	(M1)	(M2)	(M3)	(M4)	(M5)	(M6)	(M7)
Level 1 (n = 421)[a]							
Intercept	4.83***	3.18***	19.56***	19.48***	16.13***	19.67	19.31
Unit manager age (control)	−0.43	−0.34	0.67	0.66	0.71	1.85	1.49
Unit manager tenure (control)	−0.05	−0.00	0.29	0.28	0.32	0.27	0.28
Unit age (control)	−0.15	−0.01	0.66	0.65	0.76	0.62	0.73
Unit size (control)	0.99	0.56	1.04*	1.05*	−0.73	−0.89	−0.67
Unit management team size (control)	0.01	0.00	0.73	0.64	0.49	0.59	0.59
Unit-level environmental munificence	0.78*	0.22*	1.10*	1.04*	1.42*	1.91*	2.70
Unit-level TFL		0.93***	4.46***	2.00**	2.82***	0.97	1.84
Unit-level trust				2.84***			3.14***
Level 2 (n = 21)							
CEO age (control)	−0.36	−0.70	−1.47	−0.86	−0.97	−2.08	−4.51
CEO tenure (control)	−0.07	−0.11	−1.16	−1.14	−1.80	−1.36	−0.46
Firm age (control)	−0.30	−0.18	−1.31	−1.48	−1.82	−1.15	−2.45
Firm size (control)	−0.00	−0.08	1.05	1.10	1.51	1.55	2.13*
TMT size (control)	−0.00	−0.00	0.34	0.36	0.21	0.91	−1.63
Firm-level TFL	−0.26	−0.25	2.27***	2.12**	1.90**	0.96	1.17
Firm-level empowerment climate	4.17***				1.45*		2.69**
Pseudo R^2		0.31	0.01	0.02	0.19	0.02	0.07

Table II.
Hierarchical linear modeling results: effects of transformational leadership (TFL) on unit management innovation

Notes: M, model; TFL, transformational leadership. In all models, Level 1 variables were grand-mean centered. Entries corresponding to the predicting variables are estimations of the fixed effects, γs with robust standard errors. [a]The effects of unit-level TFL and firm-level TFL were controlled in Model 2 and Models 6-7. *$p < 0.10$; **$p < 0.05$; ***$p < 0.01$

as a Level 2 predictor together with the firm-level TFL and the other unit-level variables specified in Model 5. The results reveal that the firm-level empowerment climate significantly predicted unit management innovation, and that the effect of firm-level TFL remained significant but was reduced in magnitude ($\gamma = 1.90$, $p < 0.01$, Model 5). Thus, *H3* was supported. The result of the Sobel (1982) test confirmed that the mediation effect was significant ($z = 2.40$, $p < 0.05$, respectively).

H4 proposes that the unit-level trust among subordinates partially mediates the effect of the firm-level empowerment climate on unit management innovation. The results of Model 1 reveal that the firm-level empowerment climate was significantly related to unit-level trust ($\gamma = 4.17$, $p < 0.01$), that unit-level trust mediated the relationship between unit-level TFL and unit management innovation ($\gamma = 3.14$, $p < 0.01$, Model 7), and that the firm-level empowerment climate remained significant but was reduced in magnitude ($\gamma = 2.69$, $p < 0.05$, Model 7). Thus, *H4* was supported.

5. Discussion

In this study, we theorized about the multilevel effects of TFL on management innovation and the intermediate mechanisms that caused these effects. We found that both unit- and firm-level TFL were positively related to unit management innovation. Firm-level TFL was positively related to the firm-level empowerment climate. The firm-level empowerment climate partially mediated the relationship between firm-level TFL and unit management innovation. Unit-level trust partially mediated the relationship between unit-level TFL and unit management innovation. Finally, unit-level trust mediated the effect of the firm-level empowerment climate on unit management innovation. Overall, several contributions emerge from the findings.

5.1 Implications for theory

First, we have revealed multilevel effects of TFL on unit management innovation. Innovation researchers have tended to focus on only one level of analysis (Gupta *et al.*, 2007). In particular, extant research that examines leadership effects on management innovation (Vaccaro *et al.*, 2012), or other types of innovation (Elenkov *et al.*, 2005), has been focussed on leadership at a single level. Our theory suggests that a single-level leadership approach (either at the firm or the unit level) is not sufficient to explain innovative outcomes in complex organizations. It is desirable that innovative activities occur also at lower levels of the organizational hierarchy (Burgleman, 1983b). To this end, it is important to recognize that leaders at both the lower unit levels and the higher firm level play a significant role in unit-level management innovation. Our results show that neglecting any level of TFL will result in a deficient understanding of unit management innovation. For this reason, we call for future research on the simultaneous effects of leadership behaviors at multiple organizational levels. Specifically, this approach bridges the macro- and micro- views of leadership. It enriches the well-established upper echelons theory (Hambrick and Mason, 1984) by showing that leaders at lower levels complement top managers in achieving desirable organizational outcomes.

Second, we have identified the empowerment climate as a partial mediator in disentangling the effects of firm-level TFL on unit management innovation. We have expressed the opinion that the empowerment climate is significant and can be shaped by leaders. We show that an empowerment climate that exists across the units is critical to management innovation. Thus, we have enhanced the management

innovation literature by underscoring the empowerment context as a factor that fosters innovation and as an important mechanism through which leaders influence management innovation.

Third, contrary to the finding of Jung *et al.* (2008) of a negative relationship between empowerment and firm innovation, we found a significant positive relationship between the firm-level empowerment climate and unit-level management innovation. Although there is a relatively high power distance in Taiwan (Hofstede, 1997), people in a high power distance context anticipate that leaders will act robustly to guide their subordinates and will seldom delegate in the work setting (Adler, 2002). It is true that leaders tend not to empower their subordinates in Taiwanese electronics and telecommunications firms (Jung *et al.*, 2008) even in the case of extremely popular and fast selling innovative products with a short life span (Bharadwaj and Konsynski, 1997) as a result of the highly competitive consumer electronics industry and the uncertain environment in Taiwan. Alternatively, in the context of the banking industry, with the focus on both service and sales simultaneously (Yu *et al.*, 2013), empowerment is vital to assist frontline employees to be flexible and adaptive in their service to customers (Ahearne *et al.*, 2007; Chebat and Kollias, 2000; Hartline and Ferrell, 1996). Selling is also a fairly free function which makes it essential that frontline staff at the branch level have more autonomy in performing their roles (Oliver and Anderson, 1994). Moreover, in order to achieve branch-level service and sales targets, frontline employees are allowed to be flexible in their efforts to meet the different customers' demands and to search for opportunities to create their own operational guidelines (Mittal and Lasser, 1996; Yagil, 2006). For instance, employees at the branch-level are given more freedom to reduce their up-and cross-selling efforts during rush periods and to focus mainly on serving customers and generating a higher service performance (Yu *et al.*, 2013). Such forms of empowerment can help the frontline staff to make their own "judgment of whether it is better not to sell" (Yu *et al.*, 2013, p. 54). As a result, there may be more delegation in the banking sector, which helps managers and employees to be flexible and innovative in their service to customers.

Fourth, we theorized and demonstrated the mediating effects of unit-level trust on the relationship between unit-level TFL, the firm-level empowerment climate, and unit management innovation. Our results indicate that the positive effect of unit-level TFL on unit management innovation can be achieved through the creation of higher levels of trust at the unit level as cultivated by the unit's leaders. This finding has significant implications, illustrating that the effects of leadership at different levels do not occur in isolation. In particular, due to the nested nature of business units within a firm, the effect of the behavior of unit leaders can be affected by the broader organizational context, which is ultimately attributed to the behavior of the top leaders. Likewise, the firm-level empowerment climate, as shaped by the firm's top leaders, will result in only a sub-optimal outcome if there is a lack of effective leadership at the lower unit level. Moreover, the firm-level empowerment context influences unit management innovation by fostering higher levels of unit-level trust. Therefore, we contend that an effective theory of leadership should also consider the interdependent relationship of leadership behaviors across multiple levels. In fact, the current study is a useful response to the call for cross-level research in the field of leadership (Mumford *et al.*, 2007) and management innovation (Birkinshaw *et al.*, 2008). This study also extends our understanding of the multilevel research in management especially in that it offers a more detailed explanation of the relationship between leadership behaviors and management innovation. Hitt *et al.* (2007) stated that the organizational real-world

problem is too complex to understand only in macro- or micro- terms and needs to integrate the insights from macro- and micro- research. Moreover, the findings of this study support the notion that "improving the sense of fairness perceived by individuals in a workplace requires improving understanding of the context within which employees interact on a one-to-one basis" (Hitt *et al.*, 2007, p. 1386) and the underestimation of the cross-level effects (Hitt *et al.*, 2007).

In addition to our theoretical contributions, our examination of the multilevel TFL effect on management innovation in the banking sector of an emerging economy has expanded the literature that hitherto has focussed on high technology sectors in developed economies.

5.2 Practical implications

Firms operate more effectively when they generate management innovation. To help ensure the effectiveness of management innovation, it is essential that firms, especially those in the banking sector, encourage their managers to engage in TFL behaviors. The managers must consider how to utilize their TFL behaviors to create trusting relationships in order to achieve the organizational goals. For example, firms can train leaders, by using role-playing to teach managers how to engage in such behaviors, and by including goal setting as a way to motivate managers to apply those behaviors when interacting with employees. Such efforts should be carried out at multiple levels in the hierarchy, as the TFL activities at different levels should complement each other if they are to enhance management innovation.

Firms can also take steps to develop a supportive climate, including higher levels of autonomy, delegation, freedom and task accountability, in order to promote higher levels of trust at the lower levels of the organizational hierarchy. Organizational efforts in areas such as the selection and training of employees can help the employees acquire relational skills and attitudes that will lead them to look for new initiatives or modifications to the existing management practices, processes, structures or techniques. Managers can also generate a socially supportive environment within which individual employees will be able to develop trusting relationships to support empowerment initiatives (Spreitzer, 1996). Moreover, because unit managers operate within the organizational context, firms should develop higher levels of autonomy, freedom, task accountability and task accomplishment at the firm level, including selecting and/or training unit managers on TFL. This would further enhance the effectiveness of both the firm-level empowerment climate and the unit manager's TFL in implementing unit management innovation.

5.3 Limitations and further research directions

This study has several limitations that indicate directions for fruitful future research. First, building on this study, which examines the multilevel effects of TFL on management innovation, future research may also use multilevel studies to examine the interaction between individuals, firms, the external environment and industry-specific factors, in order to gain an understanding of how management innovation is adopted and diffused (Dijksterhuis *et al.*, 1999).

Second, this study did not examine whether other types of leadership, such as transactional leadership, might help or hinder management innovation across levels. For example, transactional leaders might use contingent rewards to motivate employees to achieve the organizational goals associated with management innovation across units and at both the unit and the firm levels.

Third, we found that the empowerment climate in a firm is a partial mediator for management innovation. One interesting line of future research would be to identify and examine other potential mediators linking TFL and management innovation through multilevel perspectives.

Fourth, the data of this research mainly focussed on the banking sector in Taiwan. There is a need to explore whether the relationships found in this study, especially the positive relationship between empowerment and management innovation, are due to the specific features of the banking sector and/or cultural values embedded in a relatively high power distance society (e.g. Taiwan) from which this study drew the banking sample. Future research could examine more samples from different industries, such as manufacturing, and different cultures such as a low power distance society (e.g. UK) with a view to increasing the generalization of this study's results.

Finally, the measurements used in this study dealt with new management practices, processes, structures or techniques at the unit level. While we took steps to assess the validity and reliability of our measurement method, future research may further assess its psychometric properties using additional samples.

Notes

1. Previous studies have examined administrative innovation (Damanpour and Evan, 1984). Administrative innovation typically refers to a narrow range of innovations around organizational structure and human resource policies and does not include innovations in, for instance, marketing or operations management (Birkinshaw *et al.*, 2008). In this study, we adopted Birkinshaw *et al.*'s (2008) term of and definition for management innovation.
2. This research project had purchased the copyright of the Multifactor Leadership Questionnaire (MLQ-5X), developed by Bass and Avolio (2000), to conduct the data collection.

References

Adler, N.J. (2002), *International Dimensions of Organizational Behavior*, South Western, Cincinnati, OH.

Ahearne, M., Jelinek, R. and Jones, E. (2007), "Examining the effect of salesperson service behavior in a competitive context", *Journal of the Academy of Marketing Science*, Vol. 35 No. 4, pp. 603-616.

Amabile, T.M. (1996), *Creativity in Context*, Westview Press, Boulder, CO.

Argote, L., McEvily, B. and Reagans, R. (2003), "Managing knowledge in organizations: an integrative framework and review of emerging themes", *Management Science*, Vol. 49 No. 4, pp. 571-582.

Armstrong, J.S. and Overton, T.S. (1977), "Estimating non-response bias in mail surveys", *Journal of Marketing Research*, Vol. 14 No. 3, pp. 396-402.

Avolio, B.J., Bass, B.M. and Jung, D.I. (1999), "Re-examining the components of transformational and transactional leadership using the multifactor leadership questionnaire", *Journal of Occupational and Organizational Psychology*, Vol. 72 No. 4, pp. 441-462.

Barling, J., Loughlin, C. and Kelloway, E.K. (2002), "Development and test of a model linking safety-specific transformational leadership and occupational safety", *Journal of Applied Psychology*, Vol. 87 No. 3, pp. 488-496.

Bass, B.M. (1985), *Leadership and Performance Beyond Expectations*, Free Press, New York, NY.

Bass, B.M. (1994), "Transformational leadership and team and organizational decision making", in Bass, B.M. and Avolio, B.J. (Eds), *Improving Organizational Effectiveness through Transformational Leadership*, Sage, Thousand Oaks, CA, pp. 104-120.

Bass, B.M. and Avolio, B.J. (2000), *Manual for the Multifactor Leadership Questionnaire (Form 5X)*, Mindgarden, Redwood City, CA.

Bass, B.M., Jung, D.I., Avolio, B.J. and Berson, Y. (2003), "Predicting unit performance by assessing transformational and transactional leadership", *Journal of Applied Psychology*, Vol. 88 No. 2, pp. 207-218.

Bennis, W.G. and Nanus, B. (1985), *Leaders*, Harper & Row, New York, NY.

Bharadwaj, A. and Konsynski, B.R. (1997), "Capturing the intangibles", *Information Week*, Vol. 649 No. 4, pp. 71-74.

Birkinshaw, J., Hamel, G. and Mol, M.J. (2008), "Management innovation", *Academy of Management Review*, Vol. 33 No. 4, pp. 825-845.

Blanchard, K.H., Carlos, J.P. and Randolph, W.A. (1995), *The Empowerment Barometer and Action Plan*, Blanchard Training and Development, Escondido, CA.

Bliese, P.D. (1998), "Group size, ICC values, and group-level correlations: a simulation", *Organizational Research Methods*, Vol. 1 No. 4, pp. 355-373.

Bono, J.E. and Judge, T.A. (2003), "Self-concordance at work: toward understanding the motivational effects of transformational leaders", *Academy of Management Journal*, Vol. 46 No. 5, pp. 554-571.

Brislin, R.W. (1980), "Translation and content analysis of oral and written material", in Triandis, H.C. and Berry, J.W. (Eds), *Handbook of Crosscultural Psycholog Boston*, Allyn & Bacon, Boston, MA, pp. 349-444.

Burgelman, R.A. (1983a), "A process model of internal corporate venturing in the diversified major firm", *Administrative Science Quarterly*, Vol. 28 No. 2, pp. 223-244.

Burgelman, R.A. (1983b), "Corporate entrepreneurship and strategic management: insights from a process study", *Management Science*, Vol. 29 No. 12, pp. 1349-1364.

Burke, W. (1986), "Leadership as empowering others", in Srivastra, S. and Associates (Eds), *Executive Power*, Jossey-Bass, San Francisco, CA, pp. 51-77.

Chan, Y.H., Taylor, R.R. and Markham, S. (2008), "The role of subordinates' trust in a social exchange driven psychological empowerment", *Journal of Managerial Issues*, Vol. 20 No. 4, pp. 444-467.

Chatman, J.A. and Flynn, F.J. (2001), "The influence of demographic heterogeneity on the emergence and consequences of cooperative norms in work teams", *Academy of Management Journal*, Vol. 44 No. 5, pp. 956-974.

Chebat, J.-C. and Kollias, P. (2000), "The impact of empowerment on customer contact employees' roles in service organizations", *Journal of Service Research*, Vol. 3 No. 1, pp. 66-81.

Chen, G., Bliese, P.D. and Mathieu, J.E. (2005), "Conceptual framework and statistical procedures for delineating and testing multilevel theories of homology", *Organizational Research Methods*, Vol. 8 No. 4, pp. 375-409.

Chen, G., Farh, J.L., Campbell-Bush, E.M., Wu, Z. and Wu, X. (2013), "Teams as innovative systems: multilevel motivational antecedents of innovation in R&D Teams", *Journal of Applied Psychology*, Vol. 98 No. 6, pp. 1018-1027. doi: 10.1037/a0032663.

Collins, C.J. and Smith, K.G. (2006), "Knowledge exchange and combination: the role of human resources practices in the performance of high-technology firms", *Academy of Management Journal*, Vol. 49 No. 3, pp. 544-560.

Conger, J.A. and Kanugo, R.N. (1987), "Toward a behavioral theory of charismatic leadership in organizational setting", *Academy of Management Review*, Vol. 12 No. 4, pp. 637-647.

Conger, J.A. and Kanugo, R.N. (1988), "The empowerment process: integrating theory and practice", *Academy of Management Review*, Vol. 13 No. 3, pp. 471-482.

Damanpour, F. and Evan, W.M. (1984), "Organizational innovation and performance: the problem of 'organizational lag'", *Administrative Science Quarterly*, Vol. 29 No. 3, pp. 392-409.

Dijksterhuis, M.S., Van Den Bosch, F.A.J. and Volberda, H.W. (1999), "Where do new organizational forms come from? Management logics as a source of coevolution", *Organization Science*, Vol. 10 No. 5, pp. 569-582.

Dutton, J.E. and Ashford, S.J. (1993), "Selling issues to top management", *Academy of Management Review*, Vol. 18 No. 3, pp. 393-428.

Eisenbeiss, A., Knippenberg, D.V. and Boerner, S. (2008), "Transformational leadership and team innovation: integrating tem climate principles", *Journal of Applied Psychology*, Vol. 93 No. 6, pp. 1438-1446.

Elenkov, D.S. and Manev, D.S. (2005), "Top management leadership and influence on innovation: the role of sociocultural context", *Journal of Management*, Vol. 31, pp. 381-402.

Elenkov, D.S., Judge, W. and Wright, P. (2005), "Strategic leadership and executive innovation influence: an international multi-cluster comparative study", *Strategic Management Journal*, Vol. 26 No. 7, pp. 665-682.

Fairholm, G.W. (1994), "Leading diverse followers", *The Journal of Leadership Studies*, Vol. 1 No. 4, pp. 82-93.

Ferrin, D.L., Bligh, M.C. and Kohles, J.C. (2007), "Can I trust you to trust me?: a theory of trust, monitoring, and cooperation in interpersonal and intergroup relationships", *Group and Organization Management*, Vol. 32 No. 4, pp. 465-499.

Finkelstein, S. and Hambrick, D.C. (1990), "Top-management-team tenure and organizational outcomes: the moderating role of managerial discretion", *Administrative Science Quarterly*, Vol. 35 No. 3, pp. 484-503.

Gómez, C. and Rosen, B. (2001), "The leader-member exchange as a link between managerial trust and employee empowerment", *Group and Organization Management*, Vol. 26 No. 1, pp. 53-69.

Gong, Y., Huang, J.C. and Farh, J.L. (2009), "Employee learning orientation, transformational leadership, and employee creativity: the mediating role of employee creative self-efficacy", *Academy of Management Journal*, Vol. 52 No. 4, pp. 765-778.

Graen, G.B. and Uhl-Blein, M. (1991), "Partnership-making applies equally well to teammate-sponsor teammate-competence network, and teammate-teammate relationships", *Journal of Management Systems*, Vol. 3 No. 3, pp. 49-54.

Gupta, A.K., Tesluk, P.E. and Taylor, M.S. (2007), "Innovation at and across multiple levels of analysis", *Organization Science*, Vol. 18 No. 6, pp. 885-897.

Hambrick, D.C. and Mason, P.A. (1984), "Upper echelons: the organization as a reflection of its top managers", *Academy of Management Review*, Vol. 9 No. 2, pp. 193-206.

Hamel, G. (2006), "The why, what, and how of management innovation", *Harvard Business Review*, Vol. 84 No. 2, pp. 72-84.

Hartline, M.D. and Ferrell, O.C. (1996), "The management of customer-contact service employees: an empirical investigation", *Journal of Marketing*, Vol. 60 No. 4, pp. 52-70.

Hitt, M.A., Beamish, P.W., Jackson, S.E. and Mathieu, J.E. (2007), "Building theoretical and empirical bridges across levels: multilevel research in management", *Academy of Management Journal*, Vol. 50 No. 6, pp. 1385-1399.

Hofmann, D.A. and Gavin, M.B. (1998), "Centering decisions in hierarchical linear models: implications for research in organizations", *Journal of Management*, Vol. 24 No. 5, pp. 623-641.

Hofmann, D.A. and Morgeson, F.P. (1999), "The structure and function of collective constructs: implication for multilevel research and theory development", *Academy of Management Review*, Vol. 24 No. 2, pp. 249-265.

Hofstede, G. (1997), *Cultures and Organizations*, McGraw-Hill, New York, NY.

House, R.J., Spangler, W.D. and Woycke, J. (1991), "Personality and charisma in the US presidency: a psychological theory of leader effectiveness", *Administrative Science Quarterly*, Vol. 36 No. 2, pp. 364-396.

Howell, J.M. and Higgins, C.A. (1990), "Champions of technological innovation", *Administrative Science Quarterly*, Vol. 35 No. 2, pp. 317-341.

Hunt, J.G. (1991), *Leadership: A New Synthesis*, Sage, Newbury Park, CA.

Jansen, J.J.P., Simsek, Z. and Cao, Q. (2012), "Ambidexterity and performance in multiunit contexts: cross-level moderating effects of structural and resource attributes", *Strategic Management Journal*, Vol. 33 No. 11, pp. 1286-1303.

Jansen, J.J.P., Vera, D. and Crossan, M. (2008), "Strategic leadership for exploration and exploitation: the moderating role of environmental dynamism", *Leadership Quarterly*, Vol. 20 No. 1, pp. 5-18.

Jansen, J.J.P., Van den Bosch, F.A.J. and Volberda, H.W. (2006), "Exploratory innovation, exploitative innovation, and performance: effects of organizational antecedents and environmental moderators", *Management Science*, Vol. 52 No. 11, pp. 1661-1674.

Johns, G. (2006), "The essential impact of context on organizational behavior", *Academy of Management Review*, Vol. 31 No. 2, pp. 386-408.

Jones, G.R. and George, J.M. (1998), "The experience and evolution of trust: implications for cooperation and teamwork", *Academy of Management Review*, Vol. 23 No. 3, pp. 531-546.

Judge, T.A. and Piccolo, R.F. (2004), "Transformational and transactional leadership: a meta-analytic test of their relative validity", *Journal of Applied Psychology*, Vol. 89 No. 5, pp. 755-768.

Jung, D.I., Chow, C. and Wu, A. (2003), "The role of transformational leadership in enhancing organizational innovation: hypotheses and some preliminary findings", *Leadership Quarterly*, Vol. 14 No. 4, pp. 525-544.

Jung, D.I., Chow, C.W. and Wu, A. (2008), "Towards understanding the direct and indirect effects of transformational leadership on firm innovation", *Leadership Quarterly*, Vol. 19 No. 5, pp. 582-594.

Keats, B.W. and Hitt, M.A. (1988), "A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance", *Academy of Management Journal*, Vol. 31 No. 3, pp. 570-598.

Kenny, D.A., Kashy, D.A. and Bolger, N. (1998), "Data analysis in social psychology", in Gilbert, D., Fiske, S. and Lindzey, G. (Eds), *The Handbook of Social Psychology*, McGraw-Hill, Boston, MA, pp. 223-265.

Kerr, S. and Jermier, J.M. (1978), "Substitutes for leadership: meaning and measurement", *Organizational Behavior and Human Performance*, Vol. 22 No. 3, pp. 375-403.

Klein, K.J., Dansereau, F. and Hall, R.J. (1994), "Levels issues in theory development, data collection and analysis", *Academy of Management Review*, Vol. 19 No. 2, pp. 195-229.

Kogut, B. and Zander, U. (1992), "Knowledge of the firm, combination capabilities, and the replication of technology", *Organization Science*, Vol. 3 No. 3, pp. 383-397.

Kolb, D.A. (1984), *Experiential Learning: Experience as the Source of Learning and Development*, Prentice Hall, Upper Saddle River, NJ.

Kozlowski, S.W.J. and Klein, K.J. (2000), "A multi-level approach to theory and research in organizations: contextual, temporal, and emergent processes", in Klein, K.J. and Kozlowski, S.W.J. (Eds), *Multilevel Theory, Research, and Methods in Organizations: Foundations, Extensions, and New Directions*, Jossey-Bass, San Francisco, CA, pp. 3-90.

Kukenberger, M.R., Mathieu, J.E. and Ruddy, T. (2015), "A cross-level test of empowerment and process influences on members' informal learning and team commitment", *Journal of Management*, Vol. 41 No. 3, pp. 987-1016. doi: 10.1177/0149206312443559.

Lau, D.C. and Liden, R.C. (2008), "Antecedents of coworker trust: leaders' blessings", *Journal of Applied Psychology*, Vol. 93 No. 5, pp. 1130-1138.

Liden, R.C. and Graen, G. (1980), "Generalizability of the vertical dyad linkage model of leadership", *Academy of Management Journal*, Vol. 23 No. 3, pp. 451-465.

Ling, Y., Simsek, Z., Lubatkin, M. and Veiga, J. (2008), "Transformational leadership's role in promoting corporate entrepreneurship: examining the CEO-TMT interface", *Academy of Management Journal*, Vol. 21 No. 3, pp. 557-576.

McAllister, D.K. (1995), "Affect-and cognition-based trust as foundations for interpersonal cooperation in organizations", *Academy of Management Journal*, Vol. 38 No. 1, pp. 24-59.

Manz, C.C. and Sims, H.P. (1993), *Business Without Bosses*, John Wiley, New York, NY.

Mayer, R.C. and Davis, J.H. (1999), "The effect of the performance appraisal system on trust management: a field quasi-experiment", *Journal of Applied Psychology*, Vol. 84 No. 1, pp. 123-136.

Mayer, R.C., Davis, J.H. and Schoorman, F.D. (1995), "An integrative model of organizational trust", *Academy of Management Review*, Vol. 20 No. 3, pp. 709-734.

Mittal, B. and Lasser, W.M. (1996), "The role of personalization in service encounters", *Journal of Retailing*, Vol. 72 No. 1, pp. 95-109.

Mol, M.J. and Birkinshaw, J. (2009), "The sources of management innovation: when firms introduce new management practices", *Journal of Business Research*, Vol. 62 No. 12, pp. 1269-1280.

Mumford, T.V., Campion, M.A. and Morgeson, F.P. (2007), "The leadership skills strataplex: leadership skill requirements across organizational levels", *The Leadership Quarterly*, Vol. 18 No. 2, pp. 154-166.

Nahapiet, J. and Ghoshal, S. (1998), "Social capital, intellectual capital, and the organizational advantage", *Academy of Management Review*, Vol. 23 No. 2, pp. 242-266.

Naumann, S.E. and Bennett, N. (2000), "A case for procedural justice climate: development and test of a multilevel model", *Academy of Management Journal*, Vol. 43 No. 5, pp. 881-889.

Oliver, R.L. and Anderson, E. (1994), "An empirical test of the consequences of behavior-and outcome-based sales control systems", *Journal of Marketing*, Vol. 58 No. 4, pp. 53-67.

Pawar, B.S. and Eastman, K.K. (1997), "The nature and implications of contextual influences on transformational leadership: a conceptual examination", *Academy of Management Review* Vol. 22 No. 1, pp. 80-109.

Porter, L.W. (1996), "Forty years of organization studies: reflections from a micro perspective", *Administrative Science Quarterly*, Vol. 41 No. 2, pp. 262-269.

Randolph, W.A. (1995), "Navigating the journey to empowerment", *Organizational Dynamics*, Vol. 24 No. 4, pp. 19-32.

Rousseau, D. (1985), "Issues of level in organizational research: multilevel and cross-level perspectives", in Cummings, L.L. and Staw, B.M. (Eds), *Research in Organizational Behavior*, Vol. 7, JAI Press, Greenwich, CT, pp. 1-37.

Seibert, S.E., Silver, S.R. and Randolph, W.A. (2004), "Taking empowerment to the next level: a multiple-level model of empowerment, performance, and satisfaction", *Academy of Management Journal*, Vol. 47 No. 3, pp. 332-349.

Shaw, R.B. (1997), *Trust in Balance: Building Successful Organizations on Results, Integrity, and Concern*, Jossey-Bass Publishers, San Francisco, CA.

Siegel, P.A. and Hambrick, D.C. (2005), "Pay disparities within top management groups: evidence of harmful effects on performance of high-technology firms", *Organization Science*, Vol. 16 No. 3, pp. 259-274.

Smith, K.G., Collins, C.J. and Clark, K.D. (2005), "Existing knowledge, knowledge creation capability, and the rate of new product introduction in high-technology firms", *Academy of Management Journal*, Vol. 48 No. 4, pp. 346-357.

Sobel, M.E. (1982), "Asymptotic intervals for indirect effects in structural equations models", in Leinhart, S. (Ed.), *Sociological Methodology*, Jossey-Bass, San Francisco, CA, pp. 290-312.

Sosik, J.J. (1997), "Effects of transformational leadership and anonymity on idea generation in computermediated groups", *Group and Organization Management*, Vol. 22 No. 4, pp. 460-487.

Spreitzer, G.M. (1996), "Social structural characteristics of psychological empowerment", *Academy of Management Journal*, Vol. 39 No. 2, pp. 483-504.

Tsai, W. and Ghoshal, S. (1998), "Social capital and value creation: the role of intrafirm networks", *Academy of Management Journal*, Vol. 41 No. 4, pp. 464-476.

Usher, J.M. (1999), "Specialists, generalists, and polymorphs: spatial advantages of multiunit organization in a single industry", *Academy of Management Review*, Vol. 24 No. 1, pp. 143-150.

Vaccaro, I.G., Jansen, J.J., Van Den Bosch, F.A. and Volberda, H.W. (2012), "Management innovation and leadership: the moderating role of organizational size", *Journal of Management Studies*, Vol. 49 No. 1, pp. 28-51.

Waldman, D.A., Ramirez, G.G., House, R.J. and Puranam, P. (2001), "Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty", *Academy of Management Journal*, Vol. 44 No. 1, pp. 134-143.

Woodman, R., Sawyer, J. and Griffin, R. (1993), "Toward a theory of organizational creativity", *Academy of Management Review*, Vol. 18 No. 2, pp. 293-221.

Yagil, D. (2006), "The relationship of service provider power motivation, empowerment and burnout to customer satisfaction", *International Journal of Service Industry Management*, Vol. 17 No. 3, pp. 258-270.

Yu, T., Patterson, P.G. and de Ruyter, K. (2013), "Achieving service-sales ambidexterity", *Journal of Service Research*, Vol. 16 No. 1, pp. 52-66.

Zhu, W., Avolio, B.J., Riggio, R.E. and Sosik, J.J. (2011), "The effect of authentic transformational leadership on follower and group ethics", *The Leadership Quarterly*, Vol. 22 No. 5, pp. 801-817.

Zhu, W., Newman, A., Miao, Q. and Hooke, A. (2013), "Revisiting the mediating role of trust in transformational leadership effects: do different types of trust make a different?", *The Leadership Quarterly*, Vol. 24 No. 1, pp. 94-105.

Further reading

Bryk, A.S. and Raudenbush, S.W. (1992), *Hierarchical Linear Models: Applications and Data Analysis Methods*, Sage, Newbury Park, CA.

Dirks, K.T. and Ferrin, D.L. (2001), "The role of trust in organizational settings", *Organization Science*, Vol. 12 No. 4, pp. 450-467.

Howell, J.P., Dorfman, P.W. and Kerr, S. (1996), "Moderator variables in leadership research", *Academy of Management Review*, Vol. 11 No. 1, pp. 88-102.

Marcus, A.A. (1988), "Implementing externally induced innovations: a comparison of rule-bound and autonomous approaches", *Academy of Management Journal*, Vol. 31 No. 2, pp. 235-256.

Szulanski, G. (1996), "Exploring external stickiness: impediments to the transfer of best practice within the firm", *Strategic Management Journal*, Vol. 17 No. S2, pp. 27-43.

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